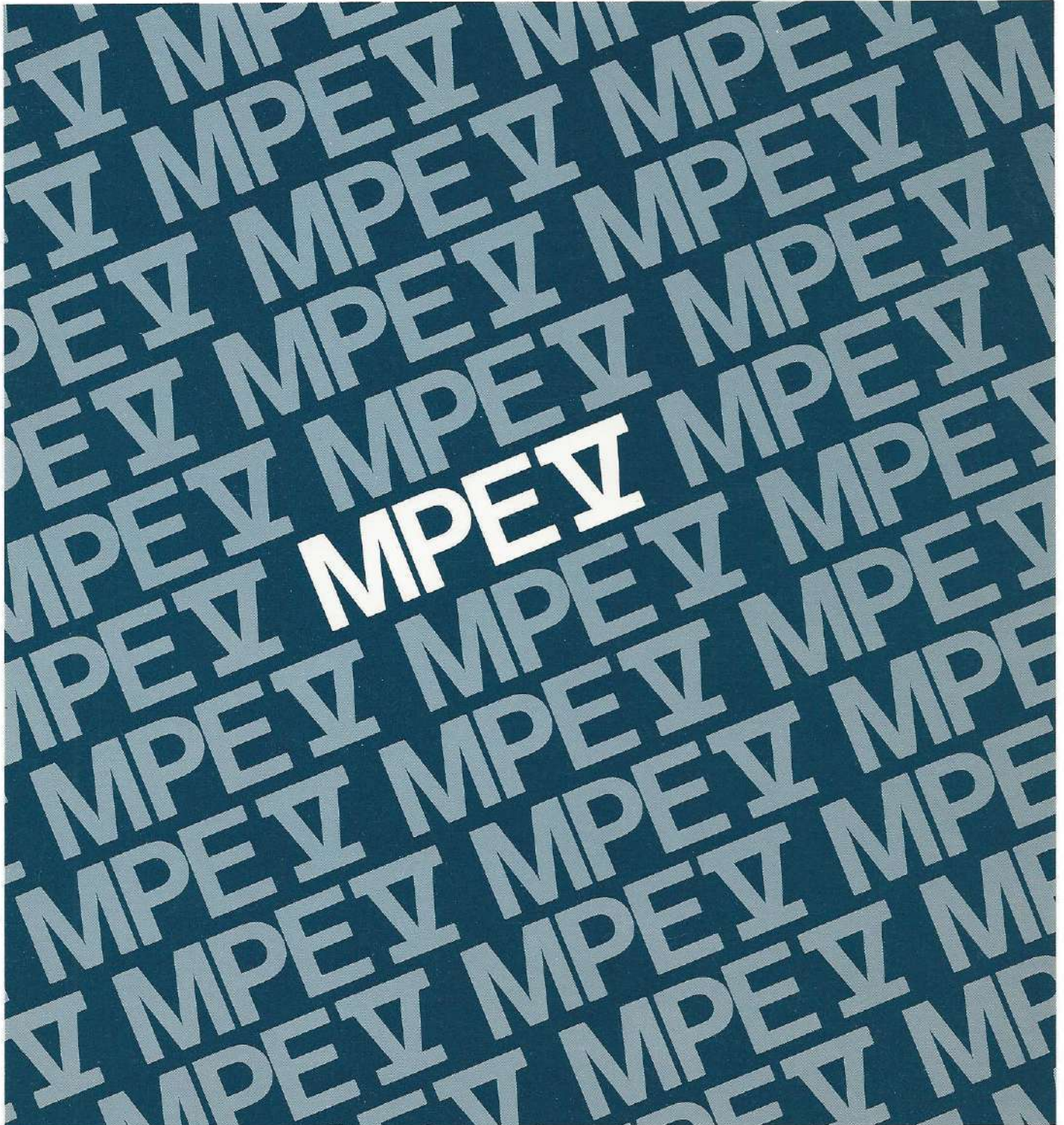


System Operation and Resource Management Reference Manual



HP 3000 Computer Systems

System Operation and Resource Management

Reference Manual



19447 PRUNERIDGE AVENUE, CUPERTINO, CA 95014

Part No. 32033-90005
I0185

Printed in U.S.A. 7/84

FEDERAL COMMUNICATION COMMISSION RADIO
FREQUENCY INTERFERENCE STATEMENT

The United States Federal Communications Commission (in Subpart J, of Part 15, Docket 20780) has specified that the following notice be brought to the attention of the users of this product:

"Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

"This product has been tested and licensed by the Fernmeldetechnisches Zentralamt (FTZ) for use in West Germany. Included with the system is a registration postcard to be completed and mailed for all German installations"

NOTICE

The information contained in this document is subject to change without notice.

HEWLETT-PACKARD MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material.

Hewlett-Packard assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Hewlett-Packard.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced or translated to another language without the prior written consent of Hewlett-Packard Company.

LIST OF EFFECTIVE PAGES

The List of Effective Pages gives the date of the current edition, and lists the dates of all changed pages. Unchanged pages are listed as "ORIGINAL". Within the manual, any page changed since the last edition is indicated by printing the date the changes were made on the bottom of the page. Changes are marked with a vertical bar in the margin. If an update is incorporated when an edition is reprinted, these bars and dates remain. No information is incorporated into a reprinting unless it appears as a prior update.

First Edition JUL 1984
Update #1 JAN 1985

Effective Pages	Date	Effective Pages	Date
1-1 to 1-2	JAN 1985	3-80 to 3-81	JAN 1985
1-3 to 2-2	ORIGINAL	3-82 to 3-84	ORIGINAL
2-3	JAN 1985	3-85	JAN 1985
2-4	ORIGINAL	3-86	ORIGINAL
2-5	JAN 1985	3-87	JAN 1985
2-6 to 2-8	ORIGINAL	3-88 to 3-89	ORIGINAL
2-9	JAN 1985	3-90	JAN 1985
2-10 to 3-1	ORIGINAL	3-91	ORIGINAL
3-2 to 3-6	JAN 1985	3-92	JAN 1985
3-7 to 3-10	ORIGINAL	3-93	ORIGINAL
3-11	JAN 1985	3-94 to 3-98	JAN 1985
3-12 to 3-14	ORIGINAL	3-99 to 3-100	ORIGINAL
3-15	JAN 1985	3-101	JAN 1985
3-16 to 3-18	ORIGINAL	3-102	ORIGINAL
3-19 to 3-20	JAN 1985	3-103	JAN 1985
3-21 to 3-27	ORIGINAL	3-104 to 3-108	ORIGINAL
3-28	JAN 1985	3-109	JAN 1985
3-29	ORIGINAL	3-110 to 3-111	ORIGINAL
3-30 to 3-32	JAN 1985	3-112 to 3-113	JAN 1985
3-33 to 3-34	ORIGINAL	3-114 to 3-117	ORIGINAL
3-35	JAN 1985	3-118	JAN 1985
3-36 to 3-38	ORIGINAL	3-119	ORIGINAL
3-39 to 3-45	JAN 1985	3-120 to 3-121a	JAN 1985
3-46 to 3-47	ORIGINAL	3-122	ORIGINAL
3-48	JAN 1985	3-123	JAN 1985
3-49 to 3-50	ORIGINAL	3-124 to 3-125	ORIGINAL
3-51	JAN 1985	3-126 to 3-127	JAN 1985
3-52 to 3-54	ORIGINAL	3-128 to 3-129	ORIGINAL
3-54a to 3-54b	JAN 1985	3-130	JAN 1985
3-55 to 3-56	ORIGINAL	3-131	ORIGINAL
3-57	JAN 1985	3-132	JAN 1985
3-58 to 3-62	ORIGINAL	3-133	ORIGINAL
3-63 to 3-64	JAN 1985	3-134 to 3-145	JAN 1985
3-65 to 3-76	ORIGINAL	3-146	ORIGINAL
3-77 to 3-78	JAN 1985	3-147	JAN 1985
3-79	ORIGINAL	3-148	ORIGINAL

LIST OF EFFECTIVE PAGES Cont.

Effective Pages	Date	Effective Pages	Date
3-149	JAN 1985	7-32	ORIGINAL
3-150 to 3-152	ORIGINAL	7-33 to 7-40	JAN 1985
3-153 to 3-154a	JAN 1985	7-41 to 7-42	ORIGINAL
3-155 to 3-164	ORIGINAL	7-43/7-54 to 7-56	JAN 1985
3-165	JAN 1985	7-57	ORIGINAL
3-166	ORIGINAL	7-58	JAN 1985
3-167 to 4-36	JAN 1985	7-59 to 7-62	ORIGINAL
4-37	ORIGINAL	7-63	JAN 1985
4-38 to 4-44	JAN 1985	7-64 to 7-67	ORIGINAL
4-45 to 4-48	ORIGINAL	7-68/7-70	JAN 1985
5-1 to 5-10	JAN 1985	7-71 to 7-72	ORIGINAL
5-11	ORIGINAL	7-73 to 7-75/7-83b	JAN 1985
5-12 to 5-13	JAN 1985	7-84 to 7-85	ORIGINAL
5-14	ORIGINAL	7-86	JAN 1985
5-15 to 5-18a	JAN 1985	7-87	ORIGINAL
5-19 to 5-20	ORIGINAL	7-88 to 7-89a	JAN 1985
5-21 to 5-24	JAN 1985	7-90	ORIGINAL
5-25	ORIGINAL	7-91 to 7-91f	JAN 1985
5-26 to 5-27	JAN 1985	7-92	ORIGINAL
5-28 to 5-31	ORIGINAL	7-93 to 7-98b	JAN 1985
5-32 to 5-33	JAN 1985	7-99 to 8-1	ORIGINAL
5-34 to 5-36	ORIGINAL	8-2 to 8-7	JAN 1985
5-37	JAN 1985	8-8	ORIGINAL
5-38	ORIGINAL	8-9	JAN 1985
5-39 to 5-42	JAN 1985	8-10	ORIGINAL
5-43 to 6-1	ORIGINAL	8-11 to 8-14a	JAN 1985
6-2 to 6-7	JAN 1985	9-1 to 9-2	ORIGINAL
6-8	ORIGINAL	9-3 to 9-5	JAN 1985
6-9	JAN 1985	9-6 to 9-7	ORIGINAL
6-10 to 6-14	ORIGINAL	9-8 to 9-12	JAN 1985
6-15 to 6-16	JAN 1985	9-13 to 9-14	ORIGINAL
6-17 to 6-23	ORIGINAL	9-15	JAN 1985
6-24 to 6-24b	JAN 1985	9-16 to 9-19	ORIGINAL
6-25 to 6-26	ORIGINAL	9-20	JAN 1985
6-27	JAN 1985	9-21 to 9-23	ORIGINAL
6-28 to 6-33	ORIGINAL	9-24	JAN 1985
6-34	JAN 1985	9-25	ORIGINAL
6-35 to 6-36	ORIGINAL	9-26 to 9-30	JAN 1985
7-1 to 7-7	JAN 1985	9-31	ORIGINAL
7-8	ORIGINAL	9-32 to 9-39	JAN 1985
7-9 TO 7-23a	JAN 1985	9-40 to 9-43	ORIGINAL
7-24	ORIGINAL	9-44 to 9-48	JAN 1985
7-25 to 7-25a	JAN 1985	9-49	ORIGINAL
7-26	ORIGINAL	9-50 to 9-54	JAN 1985
7-27 to 7-29a	JAN 1985	9-55 to 9-60	ORIGINAL
7-30	ORIGINAL	10-1 to 10-4a	JAN 1985
7-31 to 7-31a	JAN 1985	10-5	ORIGINAL

LIST OF EFFECTIVE PAGES Cont.

Effective Pages	Date	Effective Pages	Date
10-6 to 10-22a	JAN 1985	A-15	JAN 1985
10-23	ORIGINAL	A-16	ORIGINAL
10-24 to 10-26	JAN 1985	A-17	JAN 1985
10-27	ORIGINAL	A-18	ORIGINAL
10-28 to 10-33	JAN 1985	A-19	JAN 1985
10-34 to 10-35	ORIGINAL	A-20	ORIGINAL
10-36 to 10-38a	JAN 1985	A-21	JAN 1985
10-39	ORIGINAL	A-22 to A-23	ORIGINAL
10-40 to 10-49	JAN 1985	A-24	JAN 1985
10-50	ORIGINAL	A-26	ORIGINAL
11-1 to 11-1e	JAN 1985	A-27	JAN 1985
11-2 to 11-11	ORIGINAL	A-28	ORIGINAL
11-12 to 11-13	JAN 1985	A-29	JAN 1985
11-14	ORIGINAL	A-31 to A-32	ORIGINAL
11-15 to 11-24a	JAN 1985	A-33 to A-34	JAN 1985
11-25 to 11-27	ORIGINAL	A-35	ORIGINAL
11-28 to 11-29c	JAN 1985	A-36	JAN 1985
11-30 to 11-33	ORIGINAL	A-37	ORIGINAL
11-34 to 11-35a	JAN 1985	A-38	JAN 1985
11-36 to 11-37	ORIGINAL	A-39	ORIGINAL
11-38	JAN 1985	A-40	JAN 1985
11-39 to 11-42	ORIGINAL	A-41	ORIGINAL
11-43 to 11-44	JAN 1985	A-42	JAN 1985
11-45/11-46	ORIGINAL	A-43 to A-44	ORIGINAL
A-1	JAN 1985	A-45 to A-46	JAN 1985
A-2 to A-3	ORIGINAL	A-47	ORIGINAL
A-4 to A-6	JAN 1985	A-48 to A-50	JAN 1985
A-7 to A-10	ORIGINAL	A-51 to A-52	ORIGINAL
A-11 to A-13	JAN 1985	A-53	JAN 1985
A-14	ORIGINAL	A-54 to A-56	ORIGINAL

PRINTING HISTORY

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The date on the title page and back cover of the manual changes only when a new edition is published. When an edition is reprinted, all the prior updates to the edition are incorporated. No information is incorporated into a reprinting unless it appears as a prior update.

First Edition July 1984
Update #1 January 1985
Update #1 Incorp. January 1985

MPE V MANUAL PLAN

INTRODUCTORY LEVEL:

GENERAL
INFORMATION
Manual
5953-7553

GUIDE FOR THE
NEW USER
32033-90009
IN PROGRESS

GUIDE FOR THE
NEW OPERATOR
32033-90021
IN PROGRESS

STANDARD USER LEVEL:

MPE V COMMANDS
Reference
Manual
32033-90006

MPE V INTRINSICS
Reference
Manual
32033-90007

MPE V UTILITIES
Reference
Manual
32033-90008

SEGMENTER
Reference
Manual
30000-90011

DEBUG/STACK DUMP
Reference
Manual
30000-90012

FILE SYSTEM
Reference
Manual
30000-90236

ADMINISTRATIVE LEVEL:

MPE V SYSTEM OPERATION
& RESOURCE MANAGEMENT
Reference Manual
32033-90005

SUMMARY LEVEL:

MPE V
REFERENCE GUIDE
30000-90048
IN PROGRESS

There are many more manuals applicable to the HP 3000. A complete list may be found in every issue of the MPE V Communicator. Please contact your System Manager.

CONVENTIONS USED IN THIS MANUAL

NOTATION	DESCRIPTION
COMMAND	Commands are shown in CAPITAL LETTERS. The names must contain no blanks and be delimited by a non-alphabetic character (usually a blank).
KEYWORDS	Literal keywords, which are entered optionally but exactly as specified, appear in CAPITAL LETTERS .
<i>parameter</i>	Required parameters, for which you must substitute a value, appear in <i>bold italics</i> .
<i>parameter</i>	Optional parameters, for which you may substitute a value, appear in <i>standard italics</i> .
[]	<p>An element inside brackets is optional. Several elements stacked inside a pair of brackets means the user may select any one or none of these elements.</p> <p>Example: [A] [B] user may select A or B or neither.</p> <p>When brackets are nested, parameters in inner brackets can only be specified if parameters in outer brackets or comma place-holders are specified.</p> <p>Example: [parm1[,parm2[,parm3]]] may be entered as:</p> <p style="padding-left: 40px;"><i>parm1,parm2,parm3</i> or <i>parm1,,parm3</i> or <i>,,parm3</i> , etc.</p>
{ }	<p>When several elements are stacked within braces the user <i>must</i> select one of these elements.</p> <p>Example: { A } { B } user must select A or B.</p>
...	An ellipsis indicates that a previous bracketed element may be repeated, or that elements have been omitted.
<u>user input</u>	<p>In examples of interactive dialog, user input is underlined.</p> <p>Example: NEW NAME? <u>ALPHA1</u></p>
superscript ^c	Control characters are indicated by a superscript ^c . Example: Y ^c (Press Y and the CNTL key simultaneously.)
<input type="text"/>	<input type="text"/> indicates a terminal key. The legend appears inside.
<<COMMENT>>	Programmer's comments in listings appear within << >> .
** Comment **	Editor's comments appear in this form.

CONTENTS

Section I	Page
OVERVIEW	
MPE OPERATING SYSTEM	1-1
COMMAND INTERFACE	1-1
ACCOUNT STRUCTURE	1-2
SYSTEM OPERATION	1-3
System Startup and Modification	1-3
System Backup and Recovery	1-3
Spooling	1-4
System Logging	1-4
Section II	Page
INTRODUCTION	
COMMUNICATING WITH MPE	2-1
The Command Interpreter	2-1
System Prompts and Messages	2-2
Terminal Functions	2-2
Deleting a Character	2-2
Deleting a Line	2-3
Echoing and Non-Echoing Terminal Output	2-3
Interactive Access	2-3
Logging On	2-3
Logging Off	2-5
Batch Access	2-5
INTRODUCTION TO COMMANDS	2-5
Command Elements	2-6
Positional Parameters	2-7
Keyword Parameters	2-8
Continuation Characters	2-8
Command Errors	2-9
Interrupting Command Execution	2-10
Interrupting Nonprogram Commands	2-10
Interrupting Program Commands	2-10
Aborting a Program	2-11
Section III	Page
COMMANDS	
ABORTIO/=ABORTIO	3-9
ABORTJOB/=ABORTJOB	3-11
ACCEPT	3-13
ALLOCATE	3-15
ALLOW	3-17
ALTACCT	3-19
ALTGROUP	3-24
ALTJOB	3-28
ALTPOOLFILE	3-30
ALTUSER	3-32

CONTENTS (Continued)

COMMANDS (Continued)	Page
ALTVSET	3-35
BREAKJOB	3-37
CACHECONTROL	3-38
CONSOLE	3-40
DEALLOCATE	3-42
DEBUG	3-43
DELETESPOOLFILE	3-44
DISALLOW	3-46
DISCRPS.	3-48
DOWN.	3-49
DOWNLOAD	3-51
FOREIGN	3-53
FULLBACKUP	3-59a
GIVE.	3-55
HEADOFF.	3-57
HEADON	3-58
JOBFENCE	3-59
JOBPRI	3-61
JOBSECURITY	3-62
LDISMOUNT	3-63
LIMIT	3-64
LISTACCT.	3-66
LISTGROUP.	3-69
LISTUSER	3-72
LMOUNT	3-75
LOG	3-77
=LOGOFF	3-78
=LOGON.	3-79
NEWACCT	3-80
NEWGROUP	3-84
NEWUSER.	3-87
NEWVSET.	3-90
OPENQ	3-92
OUTFENCE	3-93
PARTBACKUP	3-94a
PURGEACCT	3-95
PURGEGROUP	3-97
PURGEUSER	3-99
PURGEVSET	3-100
RECALL/=RECALL.	3-101
REFUSE	3-102
REPLY/=REPLY	3-103
REPORT	3-105
RESETACCT	3-108
RESTORE	3-109
RESUMEJOB	3-116
RESUMELOG	3-117
RESUMESPOOL	3-118
SETCATALOG	3-120
SHOWALLOW.	3-122
SHOWCACHE	3-124

CONTENTS (Continued)

COMMANDS (Continued)	Page
SHOWCATALOG	3-126
SHOWCOM	3-127
SHOWLOG	3-129
SHOWQ	3-130
SHUTDOWN	3-132
SHUTQ	3-134
STARTCACHE	3-135
STARTSESS	3-135a
STARTSPOOL	3-136
STOPCACHE	3-138
STOPSPPOOL	3-139
STORE	3-141
STREAMS	3-147
SUSPENDSPOOL	3-149
SWITCHLOG	3-151
SYSDUMP	3-153
TAKE	3-155
TUNE	3-156
UP	3-159
VINIT	3-160
VMOUNT	3-163
WARN	3-165
WELCOME	3-167

Section IV	Page
THE SYSTEM OPERATOR	
THE SYSTEM OPERATOR'S ROLE	
Operator Tasks	4-1
Operator Commands	4-2
STARTING THE SYSTEM	
THE TIME OF CENTURY CLOCK (Series 37 Only)	
Starting the System with INITIAL	4-5a
Starting the Series 37	4-5a
Automatic WARMSTART (Series 37)	4-5c
Control B Mode (Series 37)	4-5c
Starting the Series 39/40/42, 44/48	4-5d
Starting the Series 64/68	4-6
The Five Startup Procedures	4-6
Enabling Other Devices and Processes During a Restart	4-9
Enabling the Private Volumes Facility	4-9
Enabling the STREAMS Facility	4-10
Starting a Spooler Process for Non-Spooled Devices	4-10
MONITORING THE EXECUTION OF JOBS AND SESSIONS	
The Introduction of Jobs and Sessions	4-10
Operator Control of Accepting Devices	4-11
Limiting the Execution of Jobs and Sessions	4-11
Limiting the Number of Jobs and Sessions	4-12
Displaying the Status of Jobs and Sessions	4-13
Aborting Jobs and Sessions	4-15
MANAGING PERIPHERAL DEVICES	
Device Files	4-15

CONTENTS (Continued)

	Page
THE SYSTEM OPERATOR (Continued)	
Device Classes	4-16
Active Device Files	4-16
Input Device Files	4-17
Output Device Files	4-18
Controlling Device Availability.	4-20
Using Disc Volumes	4-21
Disc Conditioning	4-21
Controlling the Use of Private Volumes	4-22
The Foreign Disc Facility	4-22
The Care and Handling of Disc Devices	4-23
Using Magnetic Tapes.	4-25
Operator Tasks Requiring Tapes	4-25
The Care and Handling of Tapes.	4-25
Using Printers.	4-26
Forms Message	4-27
Controlling Header/Trailer Output	4-28
SPOOLING	4-28
Input Spooling	4-29
Operator Control of Input Spooling	4-30
Maintaining Job Sequence	4-31
Abnormal Termination of the Spooler Process	4-31
Output Spooling.	4-31
Output Spool File States	4-32
Listing Output Spool Files	4-32
Controlling Spooled Devices and Device Classes	4-33
Suspending the Spooler.	4-33
Resuming the Spooler	4-33
Setting the Output Fence	4-34
Altering a Single Spool File	4-34
Controlling Spool Queues	4-34
BACKING UP SYSTEM AND USER FILES.	4-35
SYSDUMP versus STORE	4-35
File Backup With the :STORE Command	4-36
Store Tapes.	4-36
File Eligibility for Storage	4-36
Displaying the Results of STORE	4-36
Error Recovery During STORE	4-39
Retrieving Stored Files	4-39
File Eligibility for RESTORE	4-40
Displaying the Results of RESTORE.	4-40
RESTORE Error Handling	4-40
The :SYSDUMP Command	4-40
SYSTEM SHUTDOWN	4-41
DISTRIBUTING OPERATOR CAPABILITIES	4-42
THE :ASSOCIATE AND :DISASSOCIATE COMMANDS	4-42
Allowing Users Operator Commands	4-43
Allowing Users Control Over Their Own Jobs	4-43
Moving the Console	4-44

CONTENTS (Continued)

THE SYSTEM OPERATOR (Continued)	Page
DATA COMMUNICATIONS OVERVIEW	4-44
What is Data Communications?	4-44
Networks	4-44
Cluster and Distributed Networks	4-45
Telecommunications and Network Components	4-45
Terminals	4-46
Modems	4-46
Communication Links	4-46
Transmission Modes	4-46
Circuits	4-47
Grades	4-47

Section V	Page
THE SYSTEM SUPERVISOR	
THE SYSTEM SUPERVISOR'S ROLE	5-1
SYSTEM BACKUP	5-3
The Installation Tape	5-3
Scheduling Backups	5-4
A Choice of Backup Methods	5-4
The :SYSDUMP Command	5-5
Cold Load SYSDUMP	5-6
Partial SYSDUMP	5-7
Full SYSDUMP	5-7
Carriage Return SYSDUMP	5-8
Future Date SYSDUMP	5-8
STARTING THE SYSTEM	5-8
Using INITIAL	5-8
Five Restart Options	5-9
Warmstart	5-9
Coolstart	5-9
Update	5-9
Coldstart	5-9
Reload	5-10
RECONFIGURING THE SYSTEM	5-10
The I/O Configuration Table	5-10
Logical Device Number	5-11
Device Reference Table (DRT) Entry Number	5-12
Unit Numbers	5-12
Software Channel Number	5-12
Type/Subtype	5-12
Terminal Type/Speed	5-13
Terminal Type Descriptor Files	5-13
Record Width	5-13
Corresponding Output Device	5-13
Mode	5-13
Driver Name	5-15
Device Classes	5-15
Device Access Type	5-16
The Default Configuration Table	5-18a
Configuring the MPE Streaming Facility	5-19

CONTENTS (Continued)

	Page
THE SYSTEM SUPERVISOR (Continued)	
Changing System Tables and Queue Parameters	5-20
System and User Process Control Tables	5-21
Other System Tables, Queues, and Lists	5-22
System, Message, and Terminal Buffers	5-23
The Message Catalog	5-24
CHANGING OTHER SYSTEM PARAMETERS	5-24
Changing Miscellaneous Values	5-25
Allocating Resource Identification Numbers	5-25
Setting Logon Recognition Time	5-27
Limiting Concurrent Jobs and Sessions	5-27
Establishing the CPU Processing Time Limit	5-27
Changing Segment Limits	5-27
Modifying the Segmented Library	5-28
Changing Scheduling Queues	5-28
Permanently Allocating Programs and Procedures	5-29
Disc Caching	5-29
THE SYSTEM DISC	5-30
Disc Structure and Format	5-30
Disc Structure	5-30
Disc Platter Format	5-30
Disc Volume Conditioning	5-31
Disc Formatting	5-31
Disc Initialization	5-31
Disc Labeling	5-31
The System Volume Table	5-33
Checking Volume Tables During a Cold Load	5-33
Disc Error Recovery	5-33
Error Recovery During INITIAL	5-33
Special Considerations in Disc Error Handling	5-34
The Layout of the System Disc	5-34
Changing The System Disc Layout	5-35
Altering the Size of Virtual Memory	5-35
Changing the Size of the System Directory	5-36
Changing the Maximum Spool File Size	5-37
MPE LOGGING FACILITIES	5-37
System Logging	5-38
Creating and Naming Log Files	5-39
Log File Commands	5-39
Log Record and File Size	5-40
File Security	5-40
Console Messages for Log Files	5-41
File Error Handling	5-41
User Logging	5-43
User Logging Processes	5-43
The Number of Users Per Logging Process	5-43
Section VI	Page
THE SYSTEM MANAGER	
CAPABILITY SETS	6-1
User Attributes	6-1
System Manager Attribute (SM)	6-1

CONTENTS (Continued)

	Page
THE SYSTEM MANAGER (Continued)	
Account Manager Attribute (AM)	6-2
System Supervisor Attribute (OP)	6-2
Account Librarian Attribute (AL)	6-3
Group Librarian Attribute (GL)	6-3
Diagnostician Attribute (DI)	6-3
Standard User	6-3
File Access Attributes	6-3
Save User Files (SF)	6-3
Use Non-sharable Devices (ND)	6-4
Create Volume Sets (CV)	6-4
Use Private Disc Volumes (UV)	6-4
Use User Logging Facility (LG)	6-4
Use Communications Software (CS)	6-4
Programmatic Sessions	6-4
Capability-Class and Program Attributes	6-4
Extra Data Segments (DS)	6-5
Privileged Mode (PM)	6-5
Multiple RIN (MR)	6-5
Process Handling (PH)	6-5
Interactive Access (IA)	6-5
Batch Access (BA)	6-5
Local Attributes	6-6
FILE SECURITY	6-6
Account-Level Security	6-7
Group-Level Security	6-9
File-Level Security	6-10
ACCOUNT/GROUP/USER ORGANIZATION	6-11
Typical Accounts	6-12
A Multi-Division Company	6-13
An In-House Service Bureau	6-13
A Commercial Service Bureau	6-13
A Scientific Research Center	6-14
ACCOUNTING INFORMATION	6-14
ACCOUNTS SUPPLIED WITH SYSTEM	6-15
SYSTEM MANAGER CAPABILITIES	6-15
Defining Accounts	6-18
Displaying Accounting Information	6-20
Resetting Accounts	6-22
Storing Files Offline	6-22
Purging Accounts	6-23
Job/Session Priority Request	6-23
Listing Files	6-23
User-Defined Command (UDC) Files	6-23
Establishing a UDC Catalog	6-24
Listing UDCs	6-24a
SYSTEM STARTUP STATE CONFIGURATOR	6-24a
Managing Expanded Console Capabilities	6-25
Creating a Device-User Association Table	6-25
Creating OPERATOR.SYS	6-25

CONTENTS (Continued)

THE SYSTEM MANAGER (Continued)		Page
ACCOUNT MANAGER CAPABILITIES		6-26
Defining Groups		6-29
Defining Users		6-30
Altering Account Attributes		6-30
Account Discussion		6-30
Purging Groups and Users		6-32
Account Librarian/Group Librarian		6-33
Displaying Accounting Information		6-34
Account/Group/User Attributes		6-34
Account/Group Reports		6-34
Backing Up Disc Files on Tape or Serial Disc		6-34
Defining UDC Commands		6-34
Establishing a UDC Catalog		6-35
Listing UDCs		6-35

Section VII		Page
CONFIGURING YOUR SYSTEM		
DEVICE DEFAULTS		7-1
SYSDUMP/CONFIGURATOR DIALOGUE		7-1
Example of System Only Backup		7-33
Examples of a Full System Backup		7-34
Keeping the Accounting Structure Offline		7-36a
SYSTEM STARTUP AND MODIFICATION		7-37
INITIATOR/USER DIALOGUE		7-38
LOAD MAP		7-75
PERIPHERAL CONFIGURATION INFORMATION		7-77
ENDING THE SYSDUMP DIALOGUE		7-91e
SUGGESTED PARAMETER SETTINGS		7-92
OPTIONS FOR MODIFYING THE SYSTEM		7-99

Section VIII		Page
SPECIAL CONSIDERATIONS FOR PERIPHERAL DEVICES		
THE HP268X LASER PRINTERS: SPECIAL CONSIDERATIONS		8-1
Format Control of the HP 2680A and HP 2688A		8-1
Automatic Recovery of the HP 2680A and HP 2688A		8-1
Job-To-Job Integrity		8-2
HOW TO SWITCH BETWEEN PRIMARY AND SECONDARY CHARACTER SETS		8-2
THE HP 2608A/S AND HP 2563A PRINTER: SPECIAL FEATURES		8-3
FEATURE and TRANSPARENT Access Modes		8-3
Automatic VFC		8-3
Downloading VFC		8-4
Format of the Editor File		8-5
THE HP 2619 PRINTER: CHARACTERISTICS		8-13
PREVENTING PRINTER DATA LOSS		8-13
THE HP 7933 AND 7935 DISC DRIVES: SPECIAL CONSIDERATIONS		8-13
UNLOADING A SYSTEM DISC		8-14
UNLOADING A NONSYSTEM DISC		8-14
HP 9144 TAPE CARTRIDGE MEDIA LIFE CONSIDERATIONS		8-14
TAPE CARTRIDGE UNIT: CONTROLS AND INDICATORS		8-14a

CONTENTS (Continued)

Section IX	Page
MPE MESSAGE SYSTEM	
ERROR MESSAGES	9-1
Categories of System Failures	9-1
Cold Load Error Messages With Numbers	9-40
MESSAGE CATALOG	9-55
MAKECAT PROGRAM	9-56
MAKECAT Examples	9-57
HELP Subsystem Catalog	9-58

Section X	Page
SUBSYSTEMS AND UTILITIES	
PRIVATE VOLUMES OVERVIEW	10-1
Private Volumes Applications	10-1
Disc Domains	10-2
System Domain Devices	10-3
Nonsystem Domain Devices	10-3
Allocating Drives to a Domain	10-3
Adding a New Private Volume Disc	10-3
Adding a New System Disc	10-4
Converting a System Disc to a Private Volume Disc	10-4
Converting a Private Volume Disc to a System Disc	10-4a
Disc Volume Conditioning	10-6
System Volume Conditioning	10-6
Private Volume Conditioning	10-6
Mounting and Dismounting Private Volumes	10-7
Physical Mount/Dismount	10-7
Logical Mount	10-7
Managing Private Volumes	10-8
Logical Dismount	10-8
Obtaining Information About Private Volumes	10-9
Report ;VS	10-9
Moving a Volume Set from One System to Another	10-9
Volume Sets and Volume Classes	10-10
Volume Sets	10-10
Volume Classes	10-10
Home Volume Set	10-11
Volume Set/Class Definition	10-11
Altering a Volume Set Definition	10-13
Deleting a Volume Set Definition	10-13
Spanning Accounts	10-13
Assigning a Group to a Private Volume Set	10-14
Moving an Existing Group with Files to a Private Volume Set	10-16
Purging Accounts and Groups on Private Volumes	10-16
Private Volumes Summary	10-17
User Commands for Private Volumes	10-18
The :MOUNT Command	10-19
The :DISMOUNT Command	10-20
The :LISTVS Command	10-20
The :DSTAT Command	10-21

CONTENTS (Continued)

	Page
SUBSYSTEMS AND UTILITIES (Continued)	
Operator Commands for Private Volumes	10-21
The :VMOUNT Command	10-21
The :LMOUNT Command	10-22
The :LDISMOUNT Command	10-22
Examples Of User Mounts and Dismounts	10-22
THE VINIT SUBSYSTEM	10-24
The COND Command	10-26
The COPY Command	10-27
The DSTAT Command	10-29
The DTRACK Command	10-30
The EXIT Command	10-30
The FOREIGN Command	10-30
The FORMAT Command	10-30
The HELP Command	10-31
The INIT Command	10-32
The PDEFN Command	10-33
The PDTRACK Command	10-34
The PFSpace Command	10-34
The PLABEL Command	10-35
The SCRATCH Command	10-36
The SERIAL Command	10-36
The VERIFY Command	10-36
Using the VINIT Subsystem	10-37
SERIAL DISCS	10-38
Conditioning Serial Disc Media	10-39
Foreign Discs	10-39
THE SOFTWARE DUMP FACILITY	10-40
Creating a Backup SDF	10-42
How to Perform a Backup Software Dump	10-43
Changing the SDF Command File	10-45
THE DIAGNOSTIC UTILITY SYSTEM (DUS)	10-47
USING SLEUTHSM TO FORMAT SYSTEM PACKS	10-48

Section XI	Page
SYSTEM CONTROLS AND SPECIAL FUNCTIONS	
Series 37 SPU Front Panel	11-1
Four-Position Keyswitch	11-1a
Front Panel Status Indicators	11-1c
Front Panel LED	11-1d
THE SYSTEM CONTROL PANEL	11-1e
Device Reference Table (DRT) Number for Series 37	11-1e
Series 39/40/42	11-1e
Hardware-related Controls	11-2
Software (MPE) related controls	11-3
Security Level Control Switch	11-3
Status Indicator Lights	11-4
Decals	11-4
Thumbwheel Switches	11-4
Thumbwheel Switch Settings	11-4

CONTENTS (Continued)

SYSTEM CONTROLS AND SPECIAL FUNCTIONS (Continued)	Page
Device Address And Channel Address	11-5
Device Reference Table (DRT) Number	11-6
Series 44/48	11-7
Hardware Related Controls	11-9
Software (MPE) Related Controls	11-9
Security Level Controls	11-10
Status Indicator Lights	11-11
Thumbwheel Switches	11-11
THE CONTROL AND MAINTENANCE PROCESSOR (CMP)	11-12
FOR SERIES 39/40/42 and 44/48	11-12
Accessing CMP	11-12
CMP Commands	11-12
SYSTEM STATUS AND DISPLAY PANEL (SERIES 64/68)	11-15
THE DIAGNOSTIC CONTROL UNIT (DCU)	11-17
DCU Operating Modes	11-18
DCU Control Mode Commands	11-19
Default Parameter Values	11-23
DRT Calculation for Series 64/68	11-23
TELE-SUPPORT	11-24
Hardware Requirements	11-24
Software Requirements	11-24
Series 37	11-24a
Series 39/40/42 and 44/48	11-25
Terminal to Terminal Communication	11-25
Series 64/68	11-28
Terminal to Terminal Communication	11-29
DIAGNOSTICS	11-29
Series 37 Self Test	11-29
Control B Mode	11-29
Series 39/40/42 and 44/48	11-29c
CMP Commands for Diagnostics	11-29c
General CMP Error Messages	11-33
Series 64/68 Maintenance Mode and Diagnostics	11-34
Series 64/68 DCU Maintenance Mode Commands	11-34
SHIFT STRING DUMP-SERIES 64/68	11-35
OVERTEMPERATURE SHUTDOWN	11-35
Series 37	11-35
Series 39/40/42	11-35a
Series 44/48	11-36
Series 64/68	11-36
System Load (MPL) Errors	11-38
(DCU ROM Date Code earlier than 2403)	
Microcode Program Load (MPL) Error Messages	11-38
(DCU ROM Date Code Earlier than 2403)	
System Load (MPL) Errors	11-40
(DCU ROM 2403 and Later)	
Microcode Program Load (MPL) Error Messages	11-40
(DCU ROM Date Code 2403 and Later)	
SYSSTOP Error Messages (Printed on DCU Console)	11-43
System Halt Conditions	11-45

CONTENTS (Continued)

Appendix A	Page
QUICK REFERENCE GUIDE	
GENERAL INSTRUCTIONS	A-1
CHANGING FORMS	A-2
:SYSDUMP	A-3
STARTUP STATE CONFIGURATOR	A-4a
SOFTWARE DUMP - SERIES 37	A-4c
WARMSTART - SERIES 37	A-4f
COOLSTART - SERIES 37	A-4h
COLDSTART - SERIES 37	A-4i
UPDATE - SERIES 37	A-4k
RELOAD - SERIES 37	A-4m
ADDING I/O DEVICES - SERIES 37	A-4o
DELETING I/O DEVICES - SERIES 37	A-4q
RESTORING FILES	A-5
ENABLING/DISABLING LOGGING	A-6
SERIALIZING A DISC PACK	A-8
RESTART USER LOGGING	A-9
SYSTEM SHUTDOWN	A-10
POWER UP - SERIES 37/39/40/42, 44/48, & 64/68	A-11
POWER DOWN - SERIES 37/39/40/42, 44/48, & 64/68	A-12
WARMSTART - SERIES 39/40/42, & 44/48	A-13
COOLSTART - SERIES 39/40/42, & 44/48	A-15
COLDSTART - SERIES 39/40/42, & 44/48	A-17
UPDATE - SERIES 39/40/42, & 44/48	A-19
RELOAD - SERIES 39/40/42, & 44/48	A-21
ADDING I/O DEVICES - SERIES 39/40/42, & 44/48	A-25
DELETING I/O DEVICES - SERIES 39/40/42, & 44/48	A-27
SOFTWARE DUMP - SERIES 39/40/42, & 44/48	A-29
FORMATTING SYSTEM PACKS - SERIES 39/40/42, & 44/48	A-31
LOADING THE DUS - SERIES 39/40/42, & 44/48	A-33
LOADING THE DUS - SERIES 37	A-33a
WARMSTART - SERIES 64/68	A-34
COOLSTART - SERIES 64/68	A-36
COLDSTART - SERIES 64/68	A-38
UPDATE - SERIES 64/68	A-40
RELOAD - SERIES 64/68	A-42
Reload Options	A-44
ADDING I/O DEVICES - SERIES 64/68	A-46
DELETING I/O DEVICES - SERIES 64/68	A-48
SOFTWARE DUMP - SERIES 64/68	A-49
FORMATTING SYSTEM PACKS - SERIES 64/68	A-51
LOADING THE DUS - SERIES 64/68	A-53
SHIFT STRING DUMP - SERIES 64/68	A-54
GLOSSARY	Page
GLOSSARY	Glossary-1

ILLUSTRATIONS

Title	Page
Series 37 Front Panel	4-5b
Control Panel on the HP 2608S Line Printer	4-28
Simplified I/O Spooling Diagram	4-30
File Eligibility for Dumping to Tape	4-38
Disc Drive Structure	5-32
Disc Platter Format	5-32
Typical System Disc Layout	5-36
Accounting Structure in a Corporation	6-14
Sample Account Structure	6-30
Example of Domain Reassignment During System Startup	10-5
Spanning Groups and Accounts	10-15
Series 37 Front Panel	11-1
Series 39/40/42 System Processor Unit (SPU)	11-1e
Series 39/40/42 System Control Panel Switch/Indicator Function	11-2
Series 39/40/42 and 44/48 Thumbwheel Switches	11-5
Series 44/48 System Processor Unit (SPU)	11-8
Series 44/48 System Control Panel Switch/Indicator Function	11-9
Series 64 System Status and Display Panel (Product No. 32460A)	11-15
Series 64/68 (Product No. 32460B/32468B) System Status and Display Panel.	11-16
Local to Remote Cable Connections for Series 39/40/42	11-26
Local to Remote Cable Connections for Series 44/48	11-27
Local to Remote Cable Connections for Series 64/68	11-27
Maintenance Display	11-32

TABLES

Title	Page
Functional List of Commands Found in the MPE V System Operation and Resource Management Manual	3-3
Data Communications Subsystem Commands	3-5
Functional List of User Commands	3-6
Operator Commands	4-2
Series 37 Keyswitch	4-5b
Control B Mode Commands	4-5c
System Startup of the HP 3000	4-7
Source of MPE System Components	4-8
System Supervisor Commands	5-2
Device Defaults	5-18a
Log File Errors	5-42
File Access Modes	6-8
User Type Definitions	6-9
Default Security Provisions	6-11
Report Record Format	6-21
Device Defaults (DEFDATA.PUB>SYS), G.01.00	7-77a
Configuration Worksheet, Series 37	7-77b
Asynchronous Data Communication Controller (ADCC) for Terminals	7-78
Advanced Terminal Processor (ATP) for Terminals	7-79
Advanced Terminal Processor (ATP) for Terminals G.01.00 Modems	7-79a
Terminal Types Supported by MPE V/P and V/E	7-80
Terminal Subtypes for Device Type 16	7-81
Terminal Line Speeds for the ATP and ADCC	7-81
Printer Port Speeds for the ATP and ADCC	7-81
Serial Application Printer	7-82
HP2687 Printer	7-82a
Serial Spooled Printer	7-83
HP2932A, HP2933A, HP2934A or HP2686 Printer	7-83a
HP2601 or HP2602 Printer	7-83b
Line Printers	7-84
HP 2608S, 2563A Line Printers	7-85
HP 2680A, 2688 Laser Printing Systems	7-86
Card Reader	7-87
Nine-Channel Magnetic Tape Units	7-88
HP9140 Integrated Cartridge Tape Unit	7-89
HP9144A Tape Unit	7-89a
HP 9895 Flexible Disc	7-90
Discs	7-91
HP7945A Disc Drives (For Systems With Two Disc Drives)	7-91a
HP7945A Disc Drive (For Systems With One Disc Drive)	7-91d
Ending the Sysdump Dialogue	7-91e
Absolute Minimum & Maximum Configuration Settings for E/F.00.00	7-97
Absolute Minimum & Maximum Configuration Settings for G.00.00	7-98
System Table Default Sizes (G.01.00)	7-98a
Options for Modifying The System	7-100
Standard Six Line Per Inch Format	8-10
Standard Eight Line Per Inch Format	8-10
Carriage-Control Directives	8-11
System Failure List	9-3
Console Messages	9-26

TABLES Cont.

Title	Page
Cold Load Error Messages With Numbers	9-41
Cold Load Error Messages Without Numbers	9-54
CATALOG.PUB.SYS	9-56
Software Dump Facility Commands	10-46
Series 37 Keyswitch	11-1a
MPE Status Code	11-1b
Control B Mode Commands	11-c
Front Panel LED Codes	11-d
Decimal/Pseudo-Octal Conversion of DRT Numbers	11-7
Self Test Mode Commands	11-29a
General CMP Error Messages	11-33
MPL Error Codes (DCU ROM Date Code earlier than 2403)	11-38
MPL Error Codes (DCU ROM Date Code 2403 and Later)	11-41
SYSSTOP Error Messages	11-44
System Halt Conditions	11-45



PREFACE

This is the first update of the MPE V System Operation and Resource Management manual.

In response to your suggestion, we have combined the System Manager/System Supervisor Reference manual and the Console Operator's Guide into one convenient, comprehensive, reference document. It is intended for System Managers, Account Managers, System Supervisors, and System Operators. Although not a tutorial, the System Operation and Resource Management manual does explain basic tasks and procedures. The reader should, however, be familiar with the operation of the HP 3000, and understand the relationship between hardware and software.

This manual contains 11 sections plus an appendix:

- Section I **OVERVIEW.** Introduces the HP 3000 computer system and MPE.
- Section II **INTRODUCTION.** Explains MPE's Command Interpreter, system prompts and messages, batch and interactive processing, and command usage.
- Section III **COMMAND DEFINITIONS.** Describes all MPE commands requiring SM, AM, OP, or CV capability, as well as Operator and Console commands.
- Section IV **THE SYSTEM OPERATOR.** Explains System Operator tasks and the MPE commands the Operator uses to perform them.
- Section V **THE SYSTEM SUPERVISOR.** Discusses the role of the System Supervisor, including system modification and performance tuning.
- Section VI **THE SYSTEM MANAGER.** Discusses the role of the System Manager, including account creation and resource allocation.
- Section VII **CONFIGURING YOUR SYSTEM.** Details the SYSDUMP/INITIATOR dialogue and INITIATOR/USER dialogue, suggests parameter settings, explains options for modifying a system, and provides general configuration information.
- Section VIII **SPECIAL CONSIDERATIONS FOR PERIPHERAL DEVICES.** Presents issues which must be considered when using certain peripheral devices.
- Section IX **MPE MESSAGE SYSTEM.** Documents system failure messages, MPE error messages, and cold load error messages; explains the MAKFCAT program.
- Section X **SUBSYSTEMS AND UTILITIES.** Explains the use of Private Volumes, Serial and Foreign discs, the Software Dump Facility, and the Diagnostic Utility System.
- Section XI **SYSTEM CONTROLS AND SPECIAL FUNCTIONS.** Describes system controls for the HP 3000.
- Appendix A **QUICK REFERENCE GUIDE.** Describes frequently used procedures in a simple, easy-to-follow format.
- Glossary A glossary of technical terms.

PREFACE

The System Operation and Resource Management manual has been extensively indexed to assist you in finding information. Primary index entries indicate the most thorough treatment of a topic, while secondary entries provide further discussion, and lead you to other related topics.

This update of the System Operation and Resource Management manual includes many of the suggestions made by users, and reflects the ongoing development of the HP 3000 product line. It describes the E/F.00.00, G.00.00, and G.01.00 releases of MPE V. Throughout the manual, the majority of technical data applies to these releases of the operating system. A feature that does not apply to all three software releases is clearly noted, usually by listing the release number(s), e.g. G.01.00.

The E/F.00.00 and G.00.00 releases of MPE V are available for all models of the HP 3000 computer except four: the Series II and III, and the Series 30/33. The Series 37 is being introduced with the newest software release, G.01.00. Hardware-related information found in this edition of the System Operation and Resource Management manual, therefore, encompasses each of the following models of the HP 3000 computer: the Series 37, the Series 39/40/42, 44/48 and the Series 64/68. This edition also documents the operating system interface to new peripheral devices.

The System Operation and Resource Management manual was produced entirely on line, using Hewlett-Packard's software and hardware productivity tools. The text was written and formatted with the help of Text and Document Processor/3000 (TDP/3000), and printed on the HP 2680 Laser Page printer. All illustrations were created using HPDRAW and incorporated into the manual with TDP/3000 commands specifically designed to conveniently merge text with graphics.

Automating the production of technical manuals benefits you in two ways. First, the technical accuracy and clarity of the manual is improved since Hewlett-Packard retains complete control over its content and appearance. Second, since the information is on line, we can respond to your suggestions for improvement in a more timely manner. We encourage you to use the Reader Comment Sheets at the back of the manual to provide us with feedback, and welcome your suggestions.

As you use the System Operation and Resource Management manual, you may wish to consult the following additional sources:

- HP 3000 Computer Systems General Information Manual (5953-7553).
- MPE V Intrinsic Reference Manual (32033-90007)
- MPE V Commands Reference Manual (32033-90006)
- MPE V Utilities Reference Manual (32033-90008)
- Using Files (30000-90102)

This section introduces you to the HP 3000 computer systems, hardware and software, including the Multi-Programming Executive (MPE) operating system. It also directs you to the other sections of the manual which cover specific areas of interest in greater detail.

An HP 3000 computer system begins with hardware, the actual physical components of the computer. Generally, HP 3000 hardware includes a system processor unit (SPU), mass storage, and various peripheral devices. Each system will have different elements, depending on the applications, but will include such advanced design characteristics as stack architecture, variable length code segmentation, hardware-assisted virtual memory user protection, and dynamic storage allocation. For more specific information on system hardware, refer to the HP 3000 Computer Systems General Information Manual (5953-7553).

The Fundamental Operating Software (FOS) includes MPE, which is the fundamental heart of the HP 3000, plus utility programs, and data base management and data entry subsystems.

MPE OPERATING SYSTEM

The Multi-Programming Executive operating system (MPE) is the disc-based software system that supervises the processing of all programs which run on the HP 3000. MPE dynamically allocates system resources such as main memory, the central processor, and peripheral devices to each process as needed. MPE also coordinates all user interaction with the system and provides an easy-to-use command interface. In addition, MPE automatically maintains records of all resources used at the account, group, and user levels.

Through multiprogramming, MPE can execute many different jobs and sessions at the same time. The number of jobs or sessions that can be processed concurrently depends on such factors as the hardware and software configurations, limits defined by the System Operator, and the applications involved. Each user interacts with the computer as if it were a private machine; it isn't necessary to even be aware of others using the machine, since MPE permits system resources to be shared by multiple users, each of whom interfaces with the system independently.

MPE is equipped with many different utilities, subsystems, and programs to help each user to do his or her job quickly, efficiently, and conveniently. For more information on how an individual user interacts with MPE, refer to Section II.

COMMAND INTERFACE

The command or "user interface" portion of the operating system provides the means for users to communicate with MPE. This user interface consists of five subsets, or levels, of commands. With two exceptions (Operator commands and Console commands, explained below and in Sections III and IV), access to each command subset is primarily determined by the capabilities assigned to the user. For example, "System Manager" commands require SM capability, while user commands require no special capability; any user may execute them.

Overview

Many users communicate with the system via "user commands." These commands can be found in the MPE V Commands Reference Manual (32033-90006). Refer to Section III for a functionally arranged table of these commands. Whether you are a System Operator, System Manager, or System Supervisor, you should be thoroughly familiar with this subset of commands, as well as those found in this manual.

The next level of commands is the "Operator" command set. They are executed at the standard MPE colon prompt (:), but only from the device configured as the system console. These commands are executed by the System Operator, i.e. the user identified to the system as OPERATOR.SYS, to perform specific Operator tasks. The Operator may, however, choose to distribute Operator commands to standard MPE users.

A subset of commands which the Operator executes at the console can only be executed at the "=" prompt. This prompt is made by pressing A^C. No terminal other than the console generates this prompt, and hence commands requiring the "=" prompt are referred to as "Console commands", even though they are normally executed by the Operator. Section IV of this manual discusses both Operator and Console commands, as well as the System Operator function, in greater detail.

The next command set, "System Supervisor" commands, requires System Supervisor capability, identified by the mnemonic "OP". These commands allow you to have day-to-day external control of the system, manage scheduling of resources, alter configuration, make partial or complete backup copies of your software, maintain logging facilities, and display various items of system information. For more information on the function of the System Supervisor and the OP capability, refer to Section V.

Finally, there are the "System Manager" commands. Use of these commands is restricted to users who have been assigned System Manager capability (identified by the mnemonic "SM"). The SM capability grants the user the ability to manage the overall system and the accounts within it. Users with the SM capability can protect the system and its other users by limiting access to special system capabilities only to those who fully understand their correct use. For detailed information on the function of the System Manager and the SM capability, refer to Section VI.

ACCOUNT STRUCTURE

MPE provides a complete account structure and automatic resource accounting. This allows the System Manager, through the Command Interpreter, to set up a hierarchical accounting structure on the system in a style similar to a company organization chart. "Account/Group/User Organization" in Section VI offers some examples of this structure, as well as a detailed explanation.

When you log on to MPE, three basic elements must be defined: an identifiable unit to which system resources are allocated and charged (account), a local set of disc files which you may access (group), and a name (user name) which identifies you to the system as having access to the account and group.

The account is the major "billable unit" in MPE. Associated with each account are the following three items: one, a unique file domain; two, a set of users who can access MPE through this account; and three, a set of groups which partition the account's accumulated resources and divide its file domain into private sub-domains.

Just as the overall system has a manager (the user with SM capability who manages the system's resources), each account has a specific user who manages the resources of the account. This user has the Account Manager capability (identified by the mnemonic "AM"). The first Account Manager for each account is designated by the System Manager when the account is created.

MPE automatically keeps track of system resources used by each account and group. This resource usage information can be used for billing, accounting, or any other application which requires such data. "Accounting Information" in Section VI covers the account structure in greater detail.

SYSTEM OPERATION

General operation of the system is primarily the responsibility of those users identified as the System Manager, System Supervisor, and System Operator. Depending upon the installation, the associated responsibilities may be distributed among several individuals, or may all be done by one person.

These functions of system operation and resource management are categorized, for clarity, in this manual based on the capabilities they require. This does not imply that the tasks should be limited to the positions indicated here. Rather, they should be delegated so as to ensure the most efficient operation of your particular organization. In some installations, the System Operator may have to perform any and all system functions, and will therefore have all the capabilities needed. In others, certain functions may be restricted to the System Supervisor or System Manager user.

Once you are familiar with system organization and functions, you will be able to distribute the responsibilities of system operation and resource management, based on the structure and needs of your particular installation.

In general, the System Operator is responsible for routine, day-to-day system operation. The Operator responds to system messages and keeps the system and peripheral devices functioning smoothly and efficiently. More details on how specific operator functions are accomplished are available in Section IV. The System Supervisor maintains the system logging and resource accounting facilities, does system backup and configuration, can retrieve information, and change parameters relating to the master scheduling queue. Section V covers these tasks in greater detail. The System Manager implements and maintains the accounting structure, and appoints Account Managers to monitor account usage. Section VI is devoted to a thorough discussion of the responsibilities of the System Manager.

System Startup and Modification

MPE is initially "brought up" on an HP 3000 by the Operator at the system console, through one of five startup options: WARMSTART, COOLSTART, COLDSTART, UPDATE, or RELOAD. Although the mechanics of system startup may vary with the different systems, the interactive dialogue between the System Operator and the MPE Initiator program is virtually the same for all systems. (There are a few minor exceptions, which are detailed in Section VII.) This dialogue permits the Operator to change the configuration of the system, and/or to specify certain limits and defaults which will apply to users. Section IV offers step-by-step instructions for system startup procedures. The Quick-Reference Section (Appendix A) offers a simplified version of those instructions for use only after the overall processes are clearly understood.

System Backup and Recovery

System backup refers to copying the MPE operating system and optionally, user files, to a serial storage device (i.e., magnetic tape, serial disc, etc.). The serial storage device is then available for reloading the system in the event of lost data. System backups are done daily in most installations, but this may vary according to usage and other installation-dependent factors. Section V offers step-by-step instructions for backup and recovery procedures. The Quick-Reference Section

(Appendix A) offers a simplified version of those instructions for use only after the overall processes are clearly understood.

Spooling

This MPE facility permits the concurrent usage of devices which would otherwise be non-sharable, such as card readers, magnetic tape drives, and printers. This is accomplished by copying the input or output from these devices to disc, where it waits to be processed until the required device is available. The process is called spooling, from the acronym SPOOL, which stands for Simultaneous Peripheral Operation On-Line. The spooling facility includes commands for monitoring and controlling the spooling facility, a capability for recovering spooled device files (spool files) and jobs when restarting the system (WARMSTART), and the ability to generate multiple spooled output. Refer to Section IV for more details on Spooling.

System Logging

The MPE logging facility records details of system resource requests in a series of log files on disc, and can be used to monitor system resource usage. The System Supervisor selects those systems and user events that are to be recorded. Such events may include job and session initiation or termination, program termination, file closing, file spooling completion, and system shutdown. Refer to Section V for a discussion of System Logging.

To communicate with a computer, you should speak its language. The "language" for speaking with the HP 3000 is the Multi-Programming Executive (MPE) operating system: a disc-based system that supervises all processing and maintains the user interface.

In this section you'll learn how to use MPE. You'll find that this operating system, with its powerful and straightforward command language, is both versatile and easy to use.

COMMUNICATING WITH MPE

Using MPE, you can start, control, and end the processing of programs, and can ask for other system functions. Generally, you use MPE commands for functions that are outside of the application source-language programs which run on the system, although such functions can support these programs. For example, with the proper capabilities, you would use commands from this manual to:

- Obtain accounting information about accounts and groups (:REPORT command).
- Add or remove users from the system list of legitimate users (:NEWUSER and :PURGEUSER commands).
- Copy the software operating system (MPE) onto either magnetic tape or disc for backup and modification purposes (:SYSDUMP command).
- Control timeslice and priorities for executing processes (:TUNE command).
- Create, alter, or remove private-disc volume sets (:NEWSET, :ALTVSET, and :PURGEVSET commands).

Other commands and functions are available, as well. Section III contains the complete specifications for all commands.

The Command Interpreter

With one exception, you may enter any commands to MPE through any standard input device. The exception is the subset of MPE commands known as "Console Commands", which may only be issued from the System Console. All other MPE commands, including the user commands described in the MPE V Commands Reference Manual (32033-90006), Operator commands, System Supervisor commands, and System Manager commands, may be executed from devices configured to accept jobs and sessions and/or data. Terminals are used to conduct sessions, while either a terminal or tape drive is used to submit jobs. (Refer to the discussion of "BATCH ACCESS" in this section for information about jobs.)

When a command is entered for execution by MPE, it is first processed or "parsed" by the MPE Command Interpreter. The Command Interpreter (or "CI") is part of the operating system, and serves three main functions. The CI determines if the command you entered is legitimate, and whether

Introduction

the syntax is correct. The CI also determines if you have the capabilities to execute the command. If applicable, it passes the command on to an appropriate part of the operating system, where it is executed.

The CI is the way you communicate with MPE. In an interactive session (a session from a terminal), when MPE is ready to accept a command from you, it transmits a colon prompt, (:) to your terminal. In response to the colon prompt, you can enter a command, which is parsed by the CI, as described above. After typing the command on your terminal, you must always press **RETURN** on the terminal keyboard. This signals the system that you are ready to process your command.

If there is no colon prompt on your terminal, you can get the attention of the CI by pressing **RETURN** on your keyboard. The CI responds by printing the colon prompt.

MPE includes a special subset of commands, known as "Console Commands", which may only be executed at the Console. These include =LOGON, =LOGOFF, and =SHUTDOWN. They are issued following a "=" prompt, which is generated by simultaneously pressing the **CONTROL** key and the A key on the Console keyboard. This combination of characters, written A^C, only has meaning at the Console: no other terminal will generate the "=" prompt.

Four additional Operator commands may also be executed at the "=" prompt, but should only be used when the Console does not respond to the standard MPE (";") prompt. These are :ABORTIO, :ABORTJOB, :RECALL, and :REPLY. More information about Console and Operator commands is available in Section III and IV.

System Prompts and Messages

The system communicates with you through prompts, reports, and messages that appear on the System Console or your terminal. You communicate with the system by entering commands at the Console or your keyboard, as previously described.

Console messages can request Operator action: for example, a request that a tape be mounted, or special forms installed on the line printer. Operating messages can also provide records of current system activity. They might report the status of an I/O device, data transfer errors, or some other abnormal system condition.

Reports from the system reflect its state at any given time. They show the status of jobs or sessions, devices, device files, and queues (priority assignments).

Certain MPE commands initiate a dialogue with the user to simplify complex system processes. Such dialogues are used to initialize, backup, shutdown, and restart the operating system.

Terminal Functions

Some terminal functions allow you to manipulate text. The following paragraphs describe these capabilities.

DELETING A CHARACTER. To delete the previous character, either press the BACK SPACE key, or H^C. BACK SPACE and H^C work in the following ways for all HP terminals (including the System Console).

CRT Terminals. CRT terminals backspace the cursor. The BACK SPACE key or the H^C cause the cursor to move back one position at a time, leaving the cursor positioned over the character to be replaced. Although backspacing the cursor does not erase this character from the screen, the character is deleted from MPE's internal system buffer.

Hardcopy Terminals. For terminals that have physical backspacing capability, the BACK SPACE key and H^C cause a physical backspace to occur. The terminal then emits a line feed, unless the previous character was also a BACK SPACE or H^C. The result is that the user resumes typing beneath the first character to be replaced.

For hardcopy terminals without this capability, no backspacing takes place. Instead, these terminals verify the BACK SPACE or H^C by typing a backslash (\).

DELETING A LINE. To delete the current line of a command prior to pressing RETURN, press X^C. The terminal verifies the cancellation by printing three exclamation marks (!!!) followed by a carriage return and line feed.

ECHOING AND NON-ECHOING TERMINAL OUTPUT. Normally, your terminal operates in full-duplex mode. What you type on the terminal keyboard is "echoed" or printed on the screen or hardcopy output. However, certain conditions or programs can set your terminal to half-duplex mode, where input characters are not echoed. Also, for security reasons, you might occasionally want to turn the echo off, and then back on. The following paragraphs describe how to perform both functions.

Non-echoing Terminal Output. To place your terminal in half-duplex mode so commands entered on the console keyboard are not echoed as terminal output, press the escape (ESC) key followed by the semicolon (;) key.

Echoing Terminal Output. To change your terminal from half-duplex mode to full-duplex mode so commands entered on the terminal keyboard are once again echoed as terminal output, press the escape (ESC) key followed by the colon (:) key.

Interactive Access

In the interactive processing mode, users at remote or local terminals interact conversationally with the computer. This is called a session. During a session, users are prompted for input. They simultaneously share the central processor, main memory, and discs, all of which are used for program development, information retrieval, computer-assisted instruction (CAI), as well as other applications. Users can communicate with the System Operator, and vice versa, by way of messages between terminals and the system console.

LOGGING ON. To start a session, you must identify yourself to MPE in a process called "logging on". To do so, enter the word HELLO when the colon prompt (":") appears at the left side of your terminal's screen. Follow the :HELLO command with a space, then your user name, a period, and account name. If you are logging onto a group other than your home group, you must supply a comma, then the group name following the account name. You also have the option of entering a session name (before the user name, and separated from it by a comma) which will uniquely identify your session.

Introduction

After you have entered this information, MPE may respond with the message "ENTER ACCOUNT PASSWORD:", or prompt you for a group and user password as well. If it does, you are required to supply the correct password(s) to successfully log on. You have three chances to enter the correct password, otherwise you must re-issue the :HELLO command. Passwords are assigned to accounts by the System Manager and to groups and users by the Account Manager. Check with one or both of these people for the proper passwords.

The following steps comprise the logon procedure:

1. Press **RETURN** on the terminal keyboard and a colon (:) will appear at the left of your screen, next to the cursor.

If a colon prompt doesn't appear after pressing **RETURN**, check these items before calling your HP service representative:

- Be sure your terminal is plugged into an AC outlet, and turned on.
 - Be sure the keyboard cable, modem cable, and the cable connection from your terminal to the computer are all secure.
 - Be sure your terminal is not in Block mode, but in Remote mode.
 - Be sure there is not a program already operating from your terminal.
 - Check the System Console for a "system failure" message.
2. Enter your logon identification, consisting of:
 - A colon (:) provided by MPE.
 - The word HELLO, followed by a space.
 - A session name (optional), followed by a comma (,).
 - Your user name, followed by a period (.
 - Your account name, followed by a comma (,) if you are going to enter a group name.
 - Your group name (optional).

A typical logon might look like this:

```
:HELLO OPERATOR.SYS,PUB
```

When you log on successfully, the computer responds with a standard logon message similar to this:

```
HP3000/MPE V G.00.00. (BASE G.00.00) MON, SEP 1, 1983, 9:59 AM  
:
```

A brief welcome message may also appear (refer to the :WELCOME command in Section III). The colon below the message indicates that the computer is ready for your next command.

Incidentally, you must log on within a few minutes after pressing **RETURN** or the computer will not respond. The exact time varies from system to system because logon recognition time is selected by the System Supervisor when he or she configures the system. If you are disconnected, press **RETURN** again and repeat the process of logging on.

All of the commands listed in this manual are related to system operation and system management. You will also need to be familiar with other commands, called user commands, which can be found in the MPE V Commands Reference Manual (32033-90006).

LOGGING OFF. To end your session with the HP 3000, simply type the word **BYE** and press **RETURN**. The computer logs off, telling you how many seconds of CPU (Central Processing Unit) time your session used, the number of minutes your session lasted (connect time), the date, and the time your session ended, as shown in the following example:

```
:BYE
CPU=26. CONNECT=42. MON, SEP 1, 1983, 3:41 PM
```

Batch Access

Batch access allows you to submit a set of MPE commands to the computer as a single entity, called a job. They can be submitted on any input device, although non-sharable spooled devices such as tape drives or card readers are typically used. Because jobs contain predefined MPE commands, they require minimal input from the user or Operator once they are running.

Programmers may create job files at their terminal, and then submit one or several jobs for concurrent processing with the **:STREAM** command. MPE selects the jobs according to their input priorities, then sequentially executes their commands. Refer to the **:STREAM** and **:JOB** commands in the MPE V Commands Reference Manual (32033-90006) for more information.

The primary difference between interactive and batch processing is this: during a session, the programmer maintains a dialogue with system by controlling input and monitoring output. By contrast, a batch job relies upon a predefined command stream.

INTRODUCTION TO COMMANDS

There are many commands available to you for communication with MPE. They are logically divided into five major categories based on the different capabilities required to execute them.

- User commands, which do not require any special capabilities.
- Operator commands, which are executable only at the System Console unless the Operator specifically distributes them to other users.
- Console commands, which are only executable at the Console.
- System Supervisor commands require the user and account to have System Supervisor (OP) capability.
- System Manager commands require the user and account to have System Manager (SM) capability.

Introduction

This manual is solely concerned with those commands that deal with system operation and resource management. User commands are not discussed in detail here. Complete specifications and explanations of user commands can be found in the MPE V Commands Reference Manual (32033-90006).

Command Elements

Each MPE command consists of:

- Required colon prompt, supplied by the system in a session.
- Required command name.
- Optional parameter list.

A typical command includes all of the above elements and appears as follows:

```
:DEALLOCATE PROGRAM,COBOL
```

The colon identifies a statement as an MPE command. In a session, MPE prints the colon on the terminal whenever the system is ready to accept a command. You respond by entering the remainder of the command after the colon. In a batch job, however, you must enter the colon in the first column of either the source card or the disc file in which the command is to appear.

The command name, which you enter immediately after the colon, requests a specific operation. MPE prohibits blanks embedded within the command name and will reject the command if they appear; blanks, however, may appear between the colon and the command name. The system also interprets the first non-alphabetic character as the end of the command name. Typically, this character will be a blank.

The parameter list, which is required in some commands but optional or even prohibited in others, contains one or more parameters that specify options for the command. The list can include positional parameters and/or keyword parameter groups. These groups (defined later in this section) must be separated from each other by delimiters such as commas, semicolons, equal signs, or other punctuation marks. MPE permits both decimal and octal numbers as parameters. You distinguish between the two by preceding an octal number with a percent sign (%).

If a parameter is required, you must include a value for it in the parameter list. MPE substitutes default values for optional parameters not included in the list. These default values are specified in the parameter definitions in Section III.

Normally, you must separate the command name from the parameter list by one or more blanks. However, when you omit the first optional parameter in a list of positional parameters (refer to POSITIONAL PARAMETERS later in this section), you can begin the list immediately after the command name, starting with the comma or other delimiter that normally follows the first parameter. The comma in the place of blanks serves as a delimiter. Within the parameter list, any delimiter can be surrounded by any number of blanks, permitting a free and flexible command format.

The end of each command is indicated by the end of the record on which it appears. For example, a RETURN marks the end of terminal or disc file input. It is possible for the last nonblank character of the record to be a continuation character, in which case command line input continues to the next record (the next line). The maximum length of a command allowed is 280 characters; the maximum number of continuation lines permitted is 230. (For further information, refer to the discussion of "CONTINUATION CHARACTERS" in this section.)

POSITIONAL PARAMETERS. In many commands found in this manual (for example: :STORE and :RESTORE), the meaning of a parameter depends upon its position in the parameter list. In the case of :STORE, the system expects to see the required parameters, which indicates the file set to be stored, followed by the required parameter, which indicates the file to which the file set is to be stored. In some commands such as :LISTUSER, some of the positional parameters are optional; if they are omitted, a default value is supplied by the system.

Positional parameters are separated (delimited) from one another by commas or semicolons. When you omit an optional positional parameter from within a list, you must still include the delimiter that would normally follow that parameter. Thus, on a listing, two adjacent delimiters indicate a missing optional parameter. When you omit a positional parameter that would otherwise immediately follow a command name, indicate this by entering its delimiter as the first character in the parameter list. When you omit positional parameters from the end of the list, however, you need not include delimiters to signify this — the terminating return or end-of-card is sufficient. The following examples show how to properly omit parameters from a command.

```

:FORTRAN , OUT, *LST, MFL, NFL          ** First parameter omitted. **
:FORTRAN INP,, *LST, MFL, NFL          ** Second parameter omitted. **
:FORTRAN INP, OUT, *LST                ** Last two parameters omitted. **
:FORTRAN                               ** All parameters omitted. **

```

For some commands you may substitute "wild card characters" for certain parameters in the list. Note the wild card characters count toward the 8-character limit for file names. Here is a list of the wild card characters, and their meanings:

@	Specifies zero or more alphanumeric characters. When used by itself, @ denotes "all members of the set" as in ":LISTF @". @ occupies a character position within the file, group, or account name; thus, :LISTF @A1234567, and similar syntaxes are not acceptable since they contain more than eight characters.
#	Specifies one numeric character.
?	Specifies one alphanumeric character.

These characters, placed in the parameter list just as the actual parameter name would be, allow for greater flexibility when using the list commands. The characters can be used as follows:

k@	Represents all file names starting with the character "k".
@n	Represents all file names ending with the character "n".
n@x	Represents all file names starting with the character "n" and ending with the character "x".
k##...#	Represents all file names starting with the character "k" followed by up to seven digits (useful for working with EDIT/3000 temporary files).
?n@	Represents all file names whose second character is "n".

Introduction

n?	Represents two-character file names starting with the character "n".
?n	Represents two-character file names ending with the character "n".

KEYWORD PARAMETERS. When a parameter list is so long that it becomes difficult to use positional parameters, MPE provides keyword parameter groups. A keyword group consists of a keyword that denotes the group's meaning, sometimes followed by an equal sign and one or more subparameters.

You can enter keyword groups in any order because their meaning is independent of their position in the list. Each keyword group is preceded by a semicolon. When more than one subparameter appears in the group, they are usually separated from each other by commas. It is optional to precede or follow the delimiters with blanks. In the following example, a :PREP command contains both positional and keyword parameters. INPT and OUTP are the variable names of the positional parameters; DL and CAP are keywords that designate the keyword parameter groups; and IA, PH, DS, and MR are subparameters of the keyword group CAP.

```
:PREP INPT,OUTP;DL=500;CAP=PH,DS,MR,IA
```

When both positional parameters and keyword groups form a list, positional parameters always occur before the keyword groups. If you omit trailing parameters from the positional group in this list, you do not need to include their delimiters, since the occurrence of the first keyword indicates the omission.

To illustrate parameter choices for easy referencing, syntax boxes are included for each command in Section III. Brackets ([]) that enclose separate groups of keyword parameters within the syntax box indicate that the choice of that group is optional. If, however, the individual choices are further enclosed in braces ({ }), this indicates that if you do choose to include that group in your command string, you must choose exactly one of its members. Refer to "CONVENTIONS USED IN THIS MANUAL" on page vi for a more detailed explanation.

CONTINUATION CHARACTERS. When the length of a command exceeds one record (for example, one entry-line or source card), you may enter an ampersand (&) as the last nonblank character of the record and continue the command on the next record. This new record must begin with a colon. You may embed blanks between the colon that begins the continuation record and the first nonblank character of the continuation record. In the following example, the command contains a continuation character at the end of the first line and an embedded blank at the beginning of the second line:

```
:RUN PRDGB;NOPRIV;LMAP;STACK=500;PARM=5;&  
: DL=600;LIB=G
```

You can continue commands up to 278 characters, excluding the colon prompt and continuation ampersands, which are not counted as part of this total.

When continuing a command onto another line, you must not divide a command name, keyword, positional parameter, or keyword subparameter. MPE does not permit any such element to span more than one line. MPE does not begin to interpret a command until the last record of the command has been issued, even if it spans several lines.

Command Errors

If you make an error while entering a command in an interactive session, MPE suppresses the execution of that command and attempts to determine the cause of the error. The cause of the error might be of a nature that can be easily pointed out to you. If so, MPE will print a caret (^) under the incorrect part of the command, along with an appropriate message. On the other hand, the command entry might be such that MPE cannot print the caret to signify a specific error point. If this is true, the system displays an appropriate error message. In either case, control returns to your terminal.

If you enter an erroneous command in a batch file and do not precede this command with a :CONTINUE command, MPE suppresses the execution of the command. Refer to the MPE V Commands Reference Manual (32033-90006) for more information on the uses of the :CONTINUE command. The system will print an error message on your standard list device, ignore all subsequent commands in this job, and abort (flush) the job.

If you continue a command over several lines and the system detects an error, MPE will echo the offending line preceded by its line number. MPE reads all continued entries as though they were portions of the commands on one line.

```
:FILE ABC&
:=TAP%&
:;NEW
(1)=TAP%
  ^
```

```
UNEXPECTED CHARACTER IN FILE NAME; EXPECTED "." OR "/".
IS THE DELIMITER BETWEEN PARAMETERS CORRECT? (C1ERR 582)
```

The MPE :REDO command can save you time when you enter a command improperly. It allows you to edit the last command that you entered. To use it, enter :REDO and your terminal will echo the previous command. Using the following edit symbols you can then:

I	Insert a character(s).
D	Delete a character(s).
R	Replace a character(s).
U	Undo the previous edit. (Entering U again will undo all previous edits.)

If you do not use an edit symbol, MPE assumes that you want to replace a character(s). Refer to the :REDO command in Section II of the MPE V Commands Reference Manual (32033-90006) for more information.

MPE provides an online facility for obtaining information on MPE commands. To access the HELP subsystem, enter :HELP followed by the name of the command that you want information about. The :HELP command has several optional parameters such as PARS, OPERATION, ALL, and EXAMPLE, which can be very useful for quickly obtaining additional information. For more information, refer to the :HELP command in Section II of the MPE V Commands Reference Manual (32033-90006).

Interrupting Command Execution

It is sometimes necessary to interrupt an executing MPE command to execute another command, such as listing your files (:LISTF), creating a new disc file (:BUILD), or determining information about other jobs and sessions (:SHOWJOB). You can stop a command by pressing **BREAK** on your terminal (sometimes labeled "INTERRUPT" or "ATTENTION"). In some cases, pressing **BREAK** will cause the executing command to be either suspended or aborted. In other cases, **BREAK** will be ignored. The exact effect that **BREAK** will have on your currently executing command depends upon, among other things, whether the command executes either a subsystem or a user program (program command), or whether the command does not execute such a program (nonprogram command).

INTERRUPTING NONPROGRAM COMMANDS. Breaking from a breakable nonprogram command will abort the command, and the Command Interpreter will issue a colon prompt for a new MPE command.

Several commands, such as :STORE, :RESTORE, :REPORT and the list commands (:LISTF, :LISTACCT, :LISTGROUP, :LISTUSER, and :LISTVS), may require the operator to mount a tape for the output file. If you break from one of these commands while waiting for the operator to intervene, only three commands will function after the colon prompt is displayed. These are :RECALL, :RESUME, and :REPLY. If you use any other command, MPE issues a warning message and ignores the command. Note, however, that the CONTROL A (denoted A^c) version of the :RECALL and :REPLY commands can be executed from the system console, even when a program is running.

If you log on with the :HELLO command and press **BREAK** during the output of your logon message, MPE terminates the output, keeps you logged on, and prompts you for your next command.

INTERRUPTING PROGRAM COMMANDS. Program commands either invoke MPE subsystems or run user programs. All program commands are breakable; however, while you may be able to break the commands themselves, the actual programs may disable the BREAK facility. Also, if you invoke a program with a NOBREAK UDC, **BREAK** will be disabled for the purposes of that program. Refer to Section III of the MPE V Commands Reference Manual (32033-90006).

When you press **BREAK** to interrupt a program command, MPE suspends the execution of that program and the Command Interpreter issues a prompt for a new MPE command. If you enter a non-program command (not including :HELLO, :BYE, :JOB, or :DATA), the Command Interpreter performs the requested operation and allows you to re-activate the suspended program by entering :RESUME. But when you enter another program command, such as :FORTRAN, :EDITOR, or :RUN, or when you enter :HELLO, :BYE, :JOB, or :DATA, the Command Interpreter prints the following message on your terminal:

```
ABORT? (YES/NO)
```

If you respond YES to the "ABORT?" message, the Command Interpreter aborts the current program and executes the command first entered, in the usual way.

If you respond NO to the "ABORT?" message, the Command Interpreter prints the message "NOT ALLOWED IN BREAK" and prompts you for another command. By entering :RESUME, you can now continue at the point where the suspended program was interrupted. Note that **BREAK**, :ABORT, and :RESUME are valid only in sessions, not in batch jobs.

ABORTING A PROGRAM. When a program contains logical errors, such as an infinite loop, you can abort it as follows:

1. Press **BREAK**. If it is enabled in your program, it immediately suspends its execution and MPE prompts you for a new command.
2. Type **ABORT** to terminate the program; it does not disrupt the session.
3. MPE confirms that your program has been terminated by displaying:

```
PROGRAM ABORTED PER USER REQUEST (CIERR 989)
```
4. MPE then prompts you for a new command.

You can also use the **BREAK**/ABORT sequence to abort certain MPE subsystem and command operations. The associated command specifications indicate the operations under the "Breakable?" entry in the "USE" matrix in Section III. (Some of the commands abort immediately when **BREAK** is pressed, without requiring the **:ABORT** command.)



COMMANDS

SECTION

III

The reference specifications for all MPE commands available to System Operators, System Supervisors, System Managers, and Account Managers appear in this section. For easy reference, they are presented alphabetically by command name.

For each command, the reference specifications present the following information:

- Command syntax.
- Parameter definitions, including meaning, constraints, and defaults.
- When and how the command may be used, such as: in jobs, sessions, during break, or programmatically.
- Whether the command is interruptable with the **BREAK** key.
- Capability required: System Supervisor (OP), System Manager (SM), or Account Manager (AM), or whether the command must be executed at the Console.
- Operation. A description of how to use the command, and any related special considerations.
- An example.
- Additional discussion, if any, in this or another manual.

In the reference specifications, the notation "Available in Break" in the "USE" matrix indicates that the command can be executed if the current operation is suspended by pressing the **BREAK** key on the terminal (or calling the CAUSEBREAK intrinsic). The notation "Available Programmatically" means that the command is available through the COMMAND intrinsic. The CAUSEBREAK and COMMAND intrinsics are explained in the MPE V Intrinsics Reference Manual (32033-90007).

The USE matrix also lists which capabilities, if any, are required to execute the command. (If the command can be executed by any user, such as :REPORT, the USE matrix will not contain a "Capability Required" entry.) In this section, the most frequently cited capabilities are OP, SM, and AM. CV capability, which entitles the user to create private volumes (and implies UV, or Use Volume, capability) is listed for a few commands. The capabilities required to execute each command are defined as follows:

- OP** System Supervisor. A user whose account and user name have been assigned OP capability. The System Supervisor is responsible for optimizing the performance of the system. He or she may execute commands like :TUNE and :ALLOCATE, and can log on with ;HIPRI. OP commands should not be confused with Operator commands, which are explained below.
- SM** System Manager. A user whose account and user name have been assigned SM capability. The System Manager creates the accounting structure and assigns to each account appropriate capabilities and initial security provisions. The System Manager also works with the Hewlett-Packard Systems Engineering (SE) and the System Supervisor to develop the MPE configuration which best suits the needs of the users at their installation.

Commands

- AM Account Manager. A user, selected by the System Manager, whose user name has been assigned AM capability. The Account Manager establishes the account's groups and users and assigns capabilities and attributes to each.
- CV Create Volumes capability. A capability assigned to accounts and user names which allows the user to create Private Volumes and access them.
- PS Programmatic Sessions capability allows programmatic creation of sessions on any terminal on the system. (G.01.00 release or later)

Two additional capabilities, NM (Node Manager) and NA (Network Administrator), have been added to MPE V. Although these are not required to execute the commands presented in this section, they are included in the complete capability list. Like SM, OP, and AM capability, NM and NA capability are assigned to selected users, allowing them to execute a special subset of data communications commands. For further information, refer to Table 3-2 and consult the Reference Manuals it lists.

Many of the commands in this section are listed as "Executable Only at Console" in the "Capability Required" portion of the USE matrix. These commands, which do not require any of the above capabilities, are also referred to as Operator commands since they are typically executed by the System Operator who is logged onto the session at the Console. With the exception of three such commands (=LOGON, =LOGOFF, and =SHUTDOWN) any of the commands listed as "Executable Only at the Console" may be executed by other MPE users from a standard terminal. This is possible, however, only if the Operator specifically allows a user or group of users access to the command(s).

Operator commands may be distributed to specific users, at the Operator's discretion, in two ways: with the :ALLOW command and the :ASSOCIATE command. The :ALLOW command, as the name implies, gives users the ability to execute specific Operator commands at their own terminals. Any command normally executed at the System Console may be allowed, except those which can only be entered at the "=" prompt. These commands include: =LOGON, =LOGOFF, =ABORTIO, =ABORTJOB, =REPLY, =RECALL, and =SHUTDOWN. (These commands are Console commands, since the System Console is the only device that will accept a A^C and display an "=" prompt in response.) :ALLOW should be used sparingly, because most Operator commands are powerful and their use implies a high level of responsibility.

The :ASSOCIATE command, the second way to distribute Operator capabilities, is more limited than the :ALLOW command. When a user is associated with a specific device class, he or she is granted operator control of any device belonging to that class. Before a user can be :ASSOCIATED, the user name must be entered into a device class/user association table. This table is created by the System Manager with the ASOCTABL.PUB.SYS utility (E/F.00.00 release of MPE V) or the ASOCTABLES.PUB.SYS utility (G.00.00 release of MPE V).

Another method used to distribute Operator responsibilities is to transfer Console capabilities to another logical device, or *ldev*. (This is considered "moving" the Console, although the Console is a logical designation rather than a physical device. Therefore, moving it requires only that the Console be assigned, using the :CONSOLE command, to a different *ldev*.) Moving the Console requires OP capability since the Console, and the capabilities implied by access to it, are a privileged resource. In this sense, moving the Console is not so much a distribution of responsibility as it is a reassignment of responsibility to another user. The System Console is typically configured as *ldev* 20, and should not, under normal circumstances, be moved to another logical device.

Table 3-1. Functional List of Commands Found in This Manual

FUNCTION	COMMAND	CAPABILITIES
Job/Session Commands	=ABORTJOB =LOGOFF =LOGON =SHUTDOWN	Executable Only at Console
Job/Session Commands	:ABORTJOB	AM, SM, or from Console
Job/Session Commands	:ACCEPT :ALLOW :ALTJOB :BREAKJOB :DISALLOW :JOBFENCE :JOBSECURITY :LIMIT :REFUSE :RESUMEJOB :LOG	Executable at Console and may be Distributed
Job/Session Commands	:STARTSESS	PS Capability G.01.00 release or later
Device and Device File Commands	=ABORTIO	Console Command
Device and Device File Commands	:ABORTIO :ALTPOOLFILE :CONSOLE :DELETESPOOLFILE :DOWN :DOWNLOAD :FOREIGN :GIVE :HEADOFF :HEADON :LDISMOUNT :LMOUNT :OPENQ :OUTFENCE :RESUMESPOOL :SHOWCOM :SHUTQ :STARTSPOOL :STOPSPool :STREAMS :SUSPENDSPOOL :TAKE :UP :VMOUNT	Executable at Console and may be Distributed

Table 3-1. Functional List of Commands Found in This Manual (Continued)

FUNCTION	COMMAND	CAPABILITIES
Creating Private Volumes	:VINIT	SM or OP
Message Commands	:REPLY/=REPLY :WARN :WELCOME	Executable at Console and may be Distributed
Managing Files	:NEWSET :ALTVSET :PURGEVSET :STORE :RESTORE	CV (Create Volumes) CV CV OP (Or PM for negative file codes) OP (Or PM for negative file codes)
Program/Procedure Allocation	:ALLOCATE :DEALLOCATE	OP OP
System Modification and Back-Up	:SYSDUMP	OP
System Back-Up	:PARTBACKUP :FULLBACKUP	Executable at Console and may be Distributed G.01.00 release or later
Job and System Performance Management	:DISCRPS :JOBPRI :SHOWCACHE :STARTCACHE :CACHECONTROL :STOPCACHE :TUNE	OP or SM OP No Capabilities Required OP or SM OP or SM OP or SM OP or SM
System Reports and Information Management	:RESUMELOG :SHOWLOG :SHOWQ :SWITCHLOG	OP or at Console OP or at Console OP or at Console OP or at Console
Account Management	:REPORT :NEWACCT :NEWGROUP :NEWUSER :ALTACCT :ALTGROUP :ALTUSER :LISTACCT :LISTGROUP :LISTUSER :PURGEACCT :PURGEGROUP :PURGEUSER :RESETACCT	AM or SM SM AM AM SM AM AM AM or SM AM or SM AM or SM SM AM AM SM

Table 3-2. Data Communications Subsystem Commands

SUBSYSTEMS	COMMAND	REFERENCE
Distributed System Communications	:DSCONTROL :DSCOPY :DSL INE :REMOTE :REMOTE HELLO	DS Reference Manual (32190-90001)
Interactive Mainframe Facility (IMF)	:IMF :IMFCONTROL :IMFMGR	IMF Reference Manual (32229-90001)
Distributed System Network/Synchronous Network Architecture (DSN/SNA)	:SNACONTROL :SHOWNMLOG :SWITCHNMLOG :RESUMENMLOG	SNA NRJE Reference Manual (30245-90001)
Network Remote Job Entry (NRJE) Communications Subsystem	:LINKCONTROL :NRJE :NRJECONTROL	SNA NRJE Reference Manual (30245-90001)
Multileaving Remote Job Entry (MRJE)	:MRJE :MRJECONTROL	MRJE Reference Manual (32192-90001)
Distributed Systems Network/Multipoint Terminal System (DSN/MTS)	:MPLINE	Fundamental Communications Handbook (5957-4634)
Distributed Systems Network/Remote Job Entry System (DSN/RJE)	:RJE	RJE 2780/3780 Emulator Reference Manual (30000-90047)

Table 3-3. Functional List of Commands
Found in the MPEV Commands Manual

FUNCTION	COMMAND
Running Sessions	: () COMMAND LOGON : HELLO : BYE : ABORT : RESUME : HELP : EOD : EOF :
Running Jobs	: JOB : EQJ : STREAM : COMMENT : CONTINUE : SET : SETJOW : SHOWJOW : IF : ELSE : ENDIF
Determining Job/Session Status and Resources	: REPORT : SHOWJOB : SHOWME
Managing Files	: FILE : RESET : BUILD : LISTEQ G.01.00 release or later : LISTF G.01.00 release or later : LISTFTEMP G.01.00 release or later : MOUNT : DISMOUNT : LISTVS : VSUSER : RENAME : PURGE : SAVE : STORE : RESTORE : ALTSEC : RELEASE : SECURE : DATA

Table 3-3. Functional List of Commands (Continued)

FUNCTION	COMMAND
<p>Running Subsystems and User Programs</p> <p>(Commands marked with an asterisk (*) are also discussed in pertinent subsystem manuals.)</p>	<p>:BASIC* :BASICOMP* :BASICGO* :BASICPREP* :COBOL* :COBOLGO* :COBOLPREP* :COBOLII* :COBOLII GO* :COBOLII PREP* :FORTRAN* :FORTPREP* :DEBUG* :FORTGO* :RPG*</p>
<p>Running Subsystems and User Programs (cont.)</p> <p>Commands marked with an asterisk (*) are also discussed in pertinent subsystem manuals.</p>	<p>:RPGGO* :RPGPREP* :SPL* :SPLGO* :SPLPREP* :PASCAL* :PASCALGO* :PASCALPREP* :PREP :PREPRUN :RUN :EDITOR* :FCOPY* :SEGMENTER* :SETDUMP* :RESETDUMP*</p>
<p>Device and Devicefile Status</p>	<p>:ASSOCIATE :CONSOLE :DISASSOCIATE :DSTAT :RECALL :SHOWALLOW :SHOWCACHE :SHOWDEV :SHOWIN :SHOWOUT</p>

Table 3-3. Functional List of Commands (Continued)

FUNCTION	COMMAND
Requesting Utility Operations	:TELL :TELLOP :SETMSG :SPEED :PTAPE :GETRIN :FREERIN :SHOWTIME :SETCATALOG :SHOWCATALOG :SHOWJOB :REDO
Resource Management	:ALTLOG :GETLOG :LISTLOG :RELLOG :SHOWLOGSTATUS

:ABORTIO/=ABORTIO

Aborts one pending I/O request for a device.

SYNTAX

```
:ABORTIO ldev
```

PARAMETERS

ldev The logical device number of the device for which an I/O is being aborted.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* :ABORTIO may also be distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

This command aborts all pending I/O operations on the specified *ldev*. To delete all queued I/O requests for a device, repeat the :ABORTIO command until the following message is printed on the \$STDLIST device:

```
NO I/O TO ABORT FOR DEVICE #ldev
```

Those devices which are :JOB or :DATA accepting always have outstanding read requests pending due to the auto-recognition feature of MPE. The :ABORTIO command is used to clear these pending input requests.

To completely clear spooled devices, several :ABORTIO commands may be necessary. Issue the :ABORTIO command until there are no queued I/O requests, and the message above appears on the \$STDLIST device.

Clearing all outstanding I/O requests is sometimes required to allow proper execution of other Console commands. In certain cases the :ABORTJOB, :TAKE, :DOWN, and :REFUSE commands will not correctly execute unless an :ABORTIO command is first issued to clear pending I/O operations on the appropriate device.

NOTE

In the event that :ABORTIO is not effective from the System Console, =ABORTIO may be used. The =ABORTIO command should be used only when the :ABORTIO command cannot be executed, or when the Console is busy.

EXAMPLES

To abort all pending I/O requests for logical device 53, enter:

```
:ABORTIO 53  
11:16/3/NO I/O TO ABORT FOR DEVICE 53
```

It is necessary to issue several :ABORTIO commands to abort all pending I/O operations on a spooled device as shown below:

```
:STOPSPool 5  
11:20/31/SP#5/STOPPED  
11:20/31/LDEV#5 NOT READY  
:REFUSE 5  
:ABORTIO 5  
:ABORTIO 5  
11.21/40/NO I/O TO ABORT FOR DEVICE 5
```

:ABORTJOB/=ABORTJOB

Aborts a job, scheduled job, or session.

SYNTAX

```
      {#Jnnn          }  
:ABORTJOB {#Snnn     }  
      {[jobname, user.acct]}
```

PARAMETERS

#Jnnn A job number.

#Snnn A session number.

jobname The name of the job, as identified by the :SHOWJOB command.

user A user name.

acct An account name.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	AM, SM, or from Console*	

* :ABORTJOB may also be distributed to users with the :ALLOW command, or with :JOBSECURITY set LOW.

OPERATION

This command terminates the designated job, scheduled job, or session, and displays the following message on the job/session list device:

```
SESSION ABORTED BY SYSTEM MANAGEMENT
```

If you use the "[jobname user.acct]" form of the command when there is more than one job or session executing under that name, MPE will randomly select which job/session to abort. Therefore, to exercise the most control when aborting jobs or sessions, use the *#Jnnn* or *#Snnn* form of the :ABORTJOB command.

Although the job/session is abnormally terminated, log records are issued and CPU and connect times are updated. Any I/O activity (i.e. printing, :STORE , etc.) will also be terminated.

The :ABORTJOB command can be applied to waiting and scheduled, as well as to executing jobs. If the spooler input file (\$STDIN) for a batch job has been created and not yet opened (i.e. the job is in the WAIT state), the entire file will be deleted. If the :ABORTJOB command is issued before the output spool file is complete, only that portion of the file already spooled and an error message indicating that the job was aborted will be printed.

If a request is pending at the System Console, it will be terminated automatically by the :ABORTJOB/=ABORTJOB command. The following message will appear on the system console:

```
time/#Snn/pin/REQUEST REQUIRING OPERATOR REPLY FOR PIN #nn HAS BEEN
ABORTED
```

When the :ABORTJOB command is successful, a logoff message indicating that the job being executed has been aborted is displayed, as shown below:

```
:ABORTJOB #S9
11:20/#S9/34/LOGOFF ON LDEV #77
```

Two messages will also be displayed on the user's terminal: The standard error message that appears when a request is manually terminated by a =REPLY of 0 or N and:

```
SESSION ABORTED BY SYSTEM MANAGEMENT
```

The =ABORTJOB command may be used in the event that :ABORTJOB is ineffective, or when the Console is busy.

EXAMPLES

To terminate session number 139 , enter:

```
:ABORTJOB #S139
17:10/#S139/34/LOGOFF ON LDEV #62
```

To terminate job number 9 , enter:

```
:ABORTJOB #J9
20:18/#J9/26/LOGOFF ON LDEV #10
```

Note that in both cases, the execution was successful, and a logoff message was printed.

To terminate session 6 , which has a pending device allocation message, enter:

```
?17:00/#S6/23/LDEV# FOR "SCRTAPE" ON TAPE (NUM)?
:ABORTJOB #S6
17:10/#S6/120/REQUEST REQUIRING OPERATOR REPLY FOR PIN 23
HAS BEEN ABORTED
17:10/#S6/120/LOGOFF ON LDEV #58
```

:ACCEPT

Permits a designated device to accept jobs/sessions and/or data.

SYNTAX

```
:ACCEPT [JOBS, ] ldev  
[DATA, ]
```

PARAMETERS

- JOBS** Specifies that :JOB and :HELLO commands will be recognized by the designated device. The device must be interactive to support sessions.
- DATA** Specifies that :DATA commands will be recognized by the designated device.
- ldev*** The logical device number of the device for which the :JOB, :HELLO, and/or :DATA commands are being enabled.

NOTE

If both the JOBS and the DATA parameters are omitted, then both the :JOB and :HELLO commands, as well as the :DATA command are allowed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

The Operator or System Supervisor uses this command to designate which devices can be used to initiate jobs or sessions (the :JOB or :HELLO commands respectively) and/or data (signified by the :DATA command). When a device is configured as an "accepting" device, MPE will automatically scan the first input record for a valid :JOB, :HELLO, or :DATA command. This feature, called "auto-recognition" allows users to access the device without specifically requesting use of the device via a message to the system console.

If the JOBS parameter is explicitly requested, the :ACCEPT command will not be executed unless the device has been configured with a default output device. (Refer to "RECONFIGURING THE SYSTEM" in Section V.)

EXAMPLES

To permit logical device 19 to accept jobs and data, enter:

```
:ACCEPT 19
:SHOWDEV 19
LDEV  AVAIL      OWNERSHIP  VOLID  ASSOCIATION

19 A AVAIL
```

To permit logical device 19 to accept jobs and data, and to allow the device to be spooled, enter:

```
:ACCEPT 19
:STARTSPOOL 19
11:12/31/SP#/SPOOLED IN
11:12/6/LDEV#19 NOT READY
:SHOWDEV 19
DEV  AVAIL      OWNERSHIP  VOLID  DEN  ASSOCIATION

19  SPOOLED     SPOOLER OUT
```

:ALLOCATE

Permanently loads a program or procedure into main memory.

SYNTAX

```
:ALLOCATE [PROCEDURE, ]  
          [PROGRAM,   ] name
```

PARAMETERS

PROCEDURE Specifies that the procedure in SL.PUB.SYS indicated by *name* is to be allocated. The default is PROGRAM.

PROGRAM Specifies that the program file indicated by *name* is to be allocated. Default.

name The name of the program file or procedure to be allocated.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?		NO
Capability Required		OP

OPERATION

A program or procedure is allocated by resolving external references and assigning Code Segment Table (CST) or Extended Code Segment Table (XCST) entries to the program's code segments. Table entries are also allocated for any procedures called by the allocated program or procedure. Allocating a program or procedure will not increase execution speed. However, it will reduce the time taken to load the program for execution. Since the number of CST and XCST table entries are limited, you should select which programs or procedures to :ALLOCATE carefully.

Segments remain loaded until they are deallocated with the :DEALLOCATE command, or until the system is shut down or a system failure occurs. Programs or procedures must be reallocated with the :ALLOCATE command following any start up.

The user issuing the :ALLOCATE command must have EXECUTE access for any file referenced in the *name* parameter of this command.

Any external procedures referenced by a program being allocated by this command must reside in SL.PUB.SYS .

EXAMPLE

To allocate a procedure identified as PROC1 , residing in SL.PUB.SYS , enter:

```
:ALLOCATE PROCEDURE,PROC1
```

NOTE

Program files residing in the non-system domain (a private volume) will not be allocated. Attempts to do so will result in a "LOAD ERR 92 " message.

ADDITIONAL DISCUSSION

Refer to the discussion of program allocation in "CHANGING OTHER SYSTEM PARAMETERS" in Section V.

:ALLOW

Grants a user access to a specific Operator command.

SYNTAX

```
:ALLOW FILE=formaldesignator [ ;SHOW ]
```

```
      { @.@      }  
:ALLOW { user.@    } ;COMMANDS=command [ ,command , ... ]  
      { @.acct   }  
      { user.acct }
```

PARAMETERS

formaldesignator A formal ASCII file name, which may consist of up to eight characters, beginning with an alphabetic character.

SHOW Lists input lines on \$STDLIST.

@.@ Grants access to all users whether logged on or not.

user.@ Grants access to a specific user in all accounts.

command Specifies the names of those commands to which the user is granted access.

@.acct Grants access to all users in a specific account.

user.acct Grants access to a specific user in a specific account.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW command.

OPERATION

The Operator uses the `:ALLOW` command to distribute specific Operator commands among system users. You indicate at the console which users may execute Operator command(s), followed by the names of each command they will be allowed to execute.

This command may also be executed in indirect and subsystem modes. To use the command in indirect mode, create a file that contains records identifying the user(s) and account(s) to whom you are allowing Operator commands, followed by the list of commands allowed, such as:

```
:EDITOR
HP32201A.7.16 EDIT/3000 TUE, MAY 29, 1984, 5:08 PM
(C) HEWLETT-PACKARD CO. 1984
/ADD
  1  SUSAN.PAYROLL;COMMANDS=ALTJOB,ALTSPoolFILE
  2  JOHN.ACCTNG;COMMANDS=ALTSPoolFILE,DELETESPoolFILE
  3  //
...
/KEEP ALLOWTMP
/E
```

Then issue the `:ALLOW` command, using the `:SHOW` parameter to display each command line as it is executed from the file.

```
:ALLOW FILE=ALLOWTMP;SHOW
```

In subsystem mode, enter "ALLOW", followed by `(RETURN)`. You will then be prompted with a ">". Command parameters are accepted until an EOF is received, or until you EXIT.

The Operator may only `:ALLOW` console capabilities to users who are currently logged on to the system, unless the `@.@` option of the `:ALLOW` command is used. In this case, all users are affected, whether or not they're logged on. Additional capabilities granted to a user last only for the duration of their current session: once the user logs off, any special capabilities previously assigned are no longer applicable.

The user command `:SHOWALLOW` indicates which Operator commands have been allowed to which users. (Refer to Section III of the MPE V Commands Reference Manual (32033-90006) for more information on `:SHOWALLOW`.)

EXAMPLE

To give the user `MAC.TECH` the ability to execute the `:REPLY` and `:ABORTIO` commands, you would enter the following on the system console:

```
:ALLOW MAC.TECH;COMMANDS=REPLY,ABORTIO
```

In subsystem mode, to give the user `MGR.MANUALS` the ability to execute the `BREAKJOB` command, you would enter the following on the system console:

```
:ALLOW
>MGR.MANUALS;COMMANDS=BREAKJOB
>EXIT
```

:ALTACCT

Changes the attributes of an existing account.

SYNTAX

```
:ALTACCT acctname
  [;PASS=[password]]
  [;FILES=[filespace]]
  [;CPU=[cpu]]
  [;CONNECT=[connect]]
  [;CAP=[capabilitylist]]
  [;ACCESS=[(fileaccess)]]
  [;MAXPRI=[subqueuename]]
  [;LOCATTR=[localattribute]]
  [;VS=volset: {ALT }
                {SPAN}
```

PARAMETERS

- acctname* The name of the account to be altered.
- password* Account password (used for verifying logon access only). If this parameter is omitted, no change is made. If the Operator enters ";PASS = **RETURN** ", then the existing password is removed.
- filespace* Disc storage limit, in sectors, for the permanent files in the account. The *filespace* limit cannot be less than the the number of sectors currently in use for the account. Default is unlimited file space.
- cpu* The limit on cumulative CPU time, in seconds, for the account. This limit is checked only when a job or session is initiated, and therefore never causes the job or session to abort. The maximum value allowed is 2,147,483,647 seconds. Default is unlimited CPU time.
- connect* The limit on total cumulative job or session connect time, in minutes, allowed the account. This limit is checked at logon and every time a process terminates. The maximum value allowed is 2,147,483,647 minutes. Default is unlimited connect time.

capabilitylist

List of capabilities, separated by commas, permitted the account. Each capability is denoted by a two-letter mnemonic, as follows.

- System Manager = SM
- Account Manager = AM
- Account Librarian = AL
- Group Librarian = GL
- Diagnostician = DI
- System Supervisor = OP
- Network Administrator = NA
- Node Manager = NM
- Permanent Files = SF
- Access of nonsharable I/O devices = ND
- Use Volumes = UV
- Create Volumes = CV
- Use Communications Subsystem = CS
- Programmatic Sessions = PS
- User Logging = LG
- Process Handling = PH
- Extra Data Segments = DS
- Multiple RINs = MR
- Privileged Mode = PM
- Interactive Access = IA
- Local Batch Access = BA

Default is "AM,AL,GL,SF,ND,IA,BA", except for the SYS account. This account has no true default: it is assigned the maximum account capabilities when the system is delivered and, under normal circumstances, should not be altered. Note that CV capability, which permits account members to create Private Volumes, automatically gives the account UV capability, allowing account members to use Private Volumes.

fileaccess

The restrictions on file access pertinent to this account. Default is R,A,L,W,X:AC, entered as follows:

```

{R}
{L}
({{A}[,...]:{ANY} }I[,...])
{W}
{X}

```

where R, L, A, W, and/or X specify modes of access by types of users (ANY and/or AC) as follows:

- R = Read
- L = Lock (allows exclusive access to file)
- A = Append (implicitly specifies L also)
- W = Write (implicitly specifies A and L also)
- X = Execute

The user types are specified as follows.

ANY = Any user
AC = Member of this account only

subqueuename Name of the highest priority subqueue that can be requested by any process of any job/session in the account, specified as AS, BS, CS, DS, or ES. Default is CS.

CAUTION

Processes executing in the AS or BS subqueues can deadlock the system. If you assign these subqueues to non-priority processes, other critical system and user processes may be prevented from executing. Therefore, exercise extreme caution when choosing subqueues.

localattribute Local attribute of the account, as defined at the installation site. This is a double-word bit map of arbitrary meaning which might be used to further classify accounts. While it is not involved in standard MPE security provisions, it is available to processes through the WHO intrinsic. A programmer may use *localattribute* in his or her own programs to provide security. Default is double-word 0 (null).

volset The volume set or class reference which, when fully qualified, is in the form *vcid.groupname.acctname* where *vcid* refers to a previously defined volume set or class definition.

SPAN Indicates that the *acctname* is to be inserted in the accounting directory of the specified volume set (*volset*). The specified volume set must have been previously mounted (via a :MOUNT command) for the SPAN operation to succeed.

ALT Directs the altering of an account or group entry on the specified volume set. This option is useful only if it is necessary to alter account and group file space limits for entries that have already been spanned.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		SM

OPERATION

The System Manager uses `:ALTACCT` to change the attributes of an existing account. Multiple keywords may be entered on a single command line as shown in "EXAMPLE". When you change one capability in a *capabilitylist* containing several nondefault values, you must respecify the entire new *capabilitylist*. When an entire keyword parameter group is omitted from the `:ALTACCT` command, that parameter remains unchanged for the account. When a keyword is included, but the corresponding parameter is omitted (as in "`;PASS=`"), the default value is assigned.

PARAMETER	DEFAULT VALUES
<i>password</i>	No password
<i>filespace</i>	Unlimited
<i>cpu</i>	Unlimited
<i>connect</i>	Unlimited
<i>capabilitylist</i>	AM,AL,GL,SF,ND,IA,BA (All accounts except SYS) SM,AM,AL,GL,DI,DP,SF,ND,PH,DS,MR,PM,IA,BA (SYS account only)
<i>fileaccess</i>	(R,A,W,L,X:AC) (All accounts except SYS) (R,X:ANY;A,W,L:AC) (SYS account only)
<i>subqueueuename</i>	CS subqueue
<i>localattribute</i>	Double-word 0 (null)

Any value changed with `:ALTACCT` will take effect the next time MPE is requested to check the value. If an attribute is removed from an account while users are logged on, they will not be affected until they end the job or session and log on again. Since MPE does not automatically generate a message informing them of the change, you should warn account members in advance. If you take a capability away from the account, all account members and groups within the account also lose the capability.

You cannot remove System Manager (SM) capability from the SYS account. You also cannot take AM capability away from any account. If more than one person is assigned AM capability within the account, you can remove AM capability from all but one (the last) user assigned it.

If you omit the *fileaccess* parameter from the SYS account, the following default security is assigned:
(R, X:ANY;A,W,L:AC)

EXAMPLE

To change an account named AC2 so that its *password* is GLOBALX, and its *filespace* is limited to 50,000 sectors, enter:

```
:ALTACCT AC2;PASS=GLOBALX;FILES=50000
```

:ALTGROUP

Changes one or more attributes of a group.

SYNTAX

```
:ALTGROUP groupname
  [;PASS=[password]]
  [;CAP=[capabilitylist]]
  [;FILES=[filespace]]
  [;CPU=[cpu]]
  [;CONNECT=[connect]]
  [;ACCESS=[(fileaccess)]]
  [;VS=volset: {ALT }
                {SPAN} [;...]]
```

PARAMETERS

- groupname* Specifies the name of the group whose attributes are to be changed.
- password* The new password to be assigned to the group (used to verify logon access only). If this parameter is omitted, no change is made. If the Operator enters ";PASS = RETURN" then the existing password is removed.
- capabilitylist* Specifies the list of capabilities permitted this group. Each capability is denoted by a two-letter mnemonic, as follows.
- | | | |
|---------------------|---|----|
| Process Handling | = | PH |
| Extra Data Segments | = | DS |
| Multiple RINs | = | MR |
| Privileged Mode | = | PM |
| Interactive Access | = | IA |
| Local Batch Access | = | BA |
- Two or more capabilities may be specified if they are separated by commas.
- Default is IA,BA except for the PUB group of the SYS account. This group has no true default; it is assigned the maximum group capabilities when the system is delivered and should not normally be changed.
- filespace* Disc storage limit, in sectors, for the permanent files of the group. A group's *filespace* cannot be specified as greater than the corresponding limits currently defined for the group's account. If an account's *filespace* is later changed, the group limits are automatically changed. Default is unlimited file space.

cpu

The limit on total cumulative CPU time, in seconds, for the group. This limit is checked only when a job or session is initiated; the limit never causes a job/session to abort. The maximum value you may specify with this command is 2,147,483,647 seconds. If the limit is exceeded, users with Account Manager capability will be warned when logging on; other users will be denied access.

The CPU limit for a group cannot be specified as greater than the corresponding limit currently defined for the account in which that group resides. If the CPU limit for an account is changed later, group limits are automatically changed. Default is unlimited CPU time.

connect

The limit on total cumulative job or session connect time, in minutes, that the group is allowed. This limit is checked at logon, and when the job or session initiates a new process. The maximum value you may specify with this command is 2,147,483,647 minutes. If the limit is exceeded, users with Account Manager capability will be warned when logging on; other users will be denied access.

A group's connect limit cannot be specified as greater than the corresponding limit currently defined for the account in which the group resides. However, if the connect limit of the account is changed later, its groups' limits will automatically be changed. Default is unlimited connect time.

fileaccess

The restriction on file access pertinent to this group. Default is R,X:ANY;A,W,L,S:AL,GU for the Public Group (PUB); and R,A,W,L,X,S:GU for all other groups.

{R}	{ANY}
{L}	{AC }
{A} [, ...]:	{GU } [, ...]
{W}	{AL }
{X}	{GL }
	{CR }

where R , L , A , W , and X specify modes of access by types of users (ANY , AC , GU , AL , GL , CR) as follows:

- R = Read
- L = Lock (allows exclusive access to the file)
- A = Append (implicitly specifies L also)
- W = Write (implicitly specifies A and L also)
- X = Execute
- S = Save

The user types are specified as follows:

- ANY = Any user
- AC = Member of this account only
- GU = Member of this group only
- AL = Account librarian user only
- GL = Group librarian user only
- CR = Creating user only

Two or more user or access types may be specified if they are separated by commas.

volset

A volume set or class reference which, when fully qualified, is in the following format:

vsid.groupname.acctname

where *vsid* refers to a previously defined volume set or class definition.

If *volset* is different from the old volume set, and the old volume set is the system set, then the old volume set must be examined for the presence of files belonging to *groupname*. If no such files are found, the command will succeed, and the group is reassigned to *volset* as its new home volume set.

If *volset* is omitted from the VS= parameter, the group will be reassigned to the system volume set. If the old volume set is already the system volume set, nothing will be altered.

It is permissible to reassign a group to a different volume set regardless of the presence of files belonging to *groupname*, so long as the old volume set is not the system volume set and the *groupname* is not currently bound to its home volume set, either explicitly via the :MDUNT command, or implicitly, via the FOPEN intrinsic.

SPAN

Indicates that the *groupname* is to be inserted in the accounting directory of the specified volume set (*volset*). The specified volume set must have been previously mounted, via the :MDUNT command, for the span operation to succeed.

ALT

Directs the altering of an account or group entry on the specified volume set. The ALT option is required to alter account and group file space limits for entries that have already been spanned. This option is also required for changing security specifications on a volume set.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

This command changes one or more attributes of a group; multiple parameters may be specified on a single command line as shown in "EXAMPLE". When an entire parameter is omitted from an :ALTGROUP command, the corresponding value for the group remains unchanged. When a keyword is included but the corresponding parameter is omitted (as in " ;PASS="), the default value is assigned as follows:

PARAMETERS	DEFAULT VALUES
<i>password</i>	Null (No password)
<i>capabilitylist</i>	IA,BA (except PUB.SYS) PH,DS,MR,PM,IA,BA (PUB.SYS only)
<i>filespace</i>	Unlimited
<i>cpu</i>	Unlimited
<i>connect</i>	Unlimited
<i>fileaccess</i>	R,A,W,L,X,S:GU (All groups except PUB) R,X:ANY;A,W,L,S:AL,G,U (PUB group only)

When a parameter is modified through the :ALTGROUP command, it immediately takes effect in the directory. It does not affect any active users with open files in the group, until they terminate their session and log on to that user name and group again. For this reason, it is a good idea to notify all group users of any planned changes in advance.

EXAMPLE

To assign a new password, PASS2 , to a group named GROUPX , enter:

```
:ALTGROUP GROUPX; PASS=PASS2
```

:ALTJOB

Alters the attributes of waiting or scheduled jobs.

SYNTAX

```
:ALTJOB {#Jnnn}
        {#Snnn}

        [;INPRI=inputpriority]

        [;OUTDEV={ldev
                  {devclass}}
```

PARAMETERS

- #Jnnn* A job number.
- #Snnn* A session number. (Although syntactically correct, this parameter is rarely used; sessions do not wait.)
- inputpriority* Specifies the new input priority (0 = lowest; 14 = highest).
- ldev* or *devclass* Specifies the logical device number or device class name of the destination device job's \$STDLIST.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW command, or if :JOBSECURITY is set LOW.

OPERATION

The :ALTJOB command, in conjunction with the :JOBFENCE command, allows you to control the flow of all non-HIPRI jobs on the system. It can only be used to alter jobs in the INTRO, WAIT, or SCHED state. Jobs with input priority less than or equal to the current JOBFENCE, which consists of a numerical value from 0 to 14, will be deferred.

EXAMPLE

Suppose that three jobs are submitted by a user and that all of these jobs have an INPRI value of 8. To change their INPRI values to ensure that JOB1 runs first, JOB2 runs last, and JOB3 runs second with LP allocated as the OUTDEV for JOB3, enter the following commands:

```
:JOBFENCE 14
15:11/#J1/24/DEFERRED JOB INTRODUCED ON LDEV #53
15:11/#J2/25/DEFERRED JOB INTRODUCED ON LDEV #53
15:13/#J3/26/DEFERRED JOB INTRODUCED ON LDEV #53
:SHOWJOB
```

JOBNUM	STATE	IPRI	JIN	JLIST	INTRODUCED	JOB NAME
#S23	EXEC		20	20	THU 2:15P	OPERATOR.SYS
#J1	WAIT	D 8	10S	12	THU 3:11P	JOB2, OPERATOR.SYS
#J2	WAIT	D 8	10S	12	THU 3:11P	JOB3, SARAH.PAYROLL
#J3	WAIT	D 8	10S	12	THU 3:13P	JOB1, JOHN.ACCTNG

```
4 JOBS:
  0 INTRO
  3 WAIT; INCL 3 DEFERRED
  1 EXEC; INCL 1 SESSIONS
  0 SUSP
JOBFENCE= 14; JLIMIT= 5; SLIMIT= 16
```

```
:ALTJOB #J1;INPRI=12
:ALTJOB #J3;INPRI=11;OUTDEV=LP
:ALTJOB #J2;INPRI=9
:SHOWJOB
```

JOBNUM	STATE	IPRI	JIN	JLIST	INTRODUCED	JOB NAME
#S23	EXEC		20	20	THU 2:15P	OPERATOR.SYS
#J6	WAIT	D12	10S	12	THU 3:13P	JOB1, JOHN.ACCTNG
#J5	WAIT	D11	10S	LP	THU 3:11P	JOB3, SARAH.PAYROLL
#J4	WAIT	D 9	10S	12	THU 3:11P	JOB2, OPERATOR.SYS

```
4 JOBS:
  0 INTRO
  3 WAIT; INCL 3 DEFERRED
  1 EXEC; INCL 1 SESSIONS
  0 SUSP
JOBFENCE= 14; JLIMIT= 5; SLIMIT=16
```


:ALTSPoolFILE

Alters the characteristics of an output spool file.

SYNTAX

```

        {;PRI=outputpriority}
        {;COPIES=numcopies }
:ALTSPoolFILE {#Onnn} {;DEV={ldev2 } }[;...]
               {ldev1} {devclass}
               {;DEFER      }
    
```

PARAMETERS

- #*Onnn*** The output devicefile identification of a spool file.
- ldev1*** The logical device number of the device where an ACTIVE spool file currently resides.
- outputpriority*** Specifies the output priority of the designated devicefile (0 = lowest; 14 = highest).
- numcopies*** Specifies the number of copies to be produced from the designated device file. Range is 1 through 127 ; default is 1 .
- ldev2* or *devclass*** Specifies the logical device number or device class name of the device file's destination device. If ACTIVE the file is returned to the READY state. It may immediately become ACTIVE on *ldev2* if all requirements are met.
- DEFER** Immediately changes the output priority of an ACTIVE or READY spool file to 0 . If ACTIVE, the file is returned to the READY state.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP, SM, or from Console*

* also may be distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

The Operator uses `:ALTSPoolFILE` to change the printing priority of a spool file, to increase or decrease the number of copies produced, and/or to change the destination device or class.

When altering an ACTIVE spool file, take the output device off line first. This allows you time to enter the command and determine that the ACTIVE spool file is the file being printed. When the `:ALTSPoolFILE` command has been sent to the spooler process, MPE returns the colon prompt (`:`). No change to the spool file will be made, however, until the output device is returned on line.

You may alter the *outputpriority* or the *numcopies* of an ACTIVE spool file without interrupting the printing process. If you alter the device or defer the ACTIVE spool file with the DEFER parameter, the printer will stop immediately. In both of these cases, the entire file will be printed when printing resumes. Note that deferring a spool file lowers its output priority to zero, the lowest priority possible. To print a deferred spool file, you must raise its priority above the current OUTFENCE using the `:ALTSPoolFILE` command.

If you intend to print a spool file on an HP 2680A Laser Page Printer, you may add an environment file to it before printing. Instructions for this procedure can be found in the MPE V System Utilities Reference Manual (32033-90008) in the discussion of the SPOOK subsystem `>COPY` command.

EXAMPLES

To defer the ACTIVE spool file (#086) on *ldev 6* take device 6 off line, then enter:

```
:ALTSPoolFILE #086;DEFER
```

or

```
:ALTSPoolFILE 6;DEFER
```

To change the priority of deferred spool file #0123 from 0 to 3 enter:

```
:ALTSPoolFILE #0123;PRI=3
```

:ALTUSER

Alters attributes currently defined for a user.

SYNTAX

```
:ALTUSER username  
  
  [ ;PASS=[password] ]  
  
  [ ;CAP=[capabilitylist] ]  
  
  [ ;MAXPRI=[subqueueuename] ]  
  
  [ ;LDCATTR=[localattribute] ]  
  
  [ ;HOME=[homegroupname] ]
```

PARAMETERS

- username* The name assigned to the user within his or her logon account.
- password* The new password to be assigned to the user. When "PASS = **RETURN**" is entered, any existing password is removed. If this parameter is omitted entirely, the password will remain unchanged.
- capabilitylist* The list of capabilities, separated by commas, permitted to this user. The capabilities assigned to the user cannot exceed those assigned to the account. Each capability is denoted by a two-letter mnemonic as follows:

System Manager	=	SM
Account Manager	=	AM
Account Librarian	=	AL
Group Librarian	=	GL
Diagnostician	=	DI
System Supervisor	=	QP
Network Administrator	=	NA
Node Manager	=	NM
Permanent Files	=	SF
Access to non-sharable I/O devices	=	ND
Use Volumes	=	UV
Create Volumes	=	CV
Use Communications Subsystem	=	CS
User Logging	=	LG
Process Handling	=	PH
Extra Data Segments	=	DS
Multiple RINs	=	MR
Privileged Mode	=	PM
Interactive Access	=	IA
Local Batch Access	=	BA
Programmatic Sessions	=	PS

Default is SF , ND , IA , and BA . Note that CV automatically gives the user UV capability.

*subqueue*name

The name of the highest-priority subqueue that can be requested by any process of any job/session initiated by the user. This parameter is specified as AS, BS, CS, DS, or ES, but cannot be greater than that specified with the :NEWACCT or :ALTACCT commands. The *subqueue*name defined for the user is checked against the *subqueue*name defined for the account at logon, and the lower priority of the two is used as the maximum priority restricting all processes of the job/session. Also, the priority requested by the user when he or she logs on is checked against the *subqueue*name defined for the user, and he or she is granted the lower of these two values. Default is CS.

CAUTION

Processes capable of executing in the AS or BS subqueues can deadlock the system. By assigning non-priority processes to these subqueues, you may prevent critical system and user processes from executing. Exercise extreme care when assigning processes to the AS or BS subqueue.

*local*attribute

Defined at the installation site, this is an arbitrary double-word bit map used to further classify users. When it is not part of standard MPE security provisions, programmers may define it (through the WHO intrinsic) to enhance the security of their own programs. The bit map for the user local attributes must be a subset of the bit map for the account local attributes. The :ALTUSER command checks the local attributes of the user with those of the account. Default is double-word 0 (null).

*home*groupname

The name of an existing group to be assigned as the home group for this user. If no home group is assigned, the user must always specify a group when logging on. Default is no home group.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

The `:ALTUSER` command allows the Account Manager to change the password, capabilities, processing subqueue, security checking, and home group currently defined for a user. More than one of these attributes may be changed at a time. To do so, enter multiple keyword parameters on a single command line.

To change an attribute, enter the keyword and its new value. If you enter the keyword and no corresponding parameter, the default value is assigned. When an entire keyword parameter group is omitted from the `:ALTUSER` command, the corresponding value for the user remains unchanged. When a keyword is included, but the corresponding parameter is omitted (as in `;PASS=`), a default value is assigned as follows:

PARAMETER	DEFAULT VALUES
<i>password</i>	Null (no password)
<i>capabilitylist</i>	SF , ND , IA , and BA (provided these capabilities have been specified for the account)
<i>subqueuename</i>	CS
<i>localattribute</i>	Null (double-word 0)
<i>homegroupname</i>	None (no home group). If a user has no homegroup assigned, he must specify a logon group when initiating a job or session.

When a parameter is modified with the `:ALTUSER` command, it is immediately registered in the directory. However, it will not affect users who are currently logged on to the system. They will be affected the next time they log on to the same user name and account. For this reason, you should warn users in advance of the intended changes.

You should avoid changing the *capabilitylist* or *homegroupname* of the user `MANAGER.SYS`. SM capability cannot be taken away from `MANAGER.SYS`.

If more than one user within an account is assigned AM capability, it can be removed from all but one (the last) user assigned it.

EXAMPLES

Suppose an account's capabilities are AM , AL , GL , SF , ND , PH , DS , MR , IA , and BA . To change the *capabilitylist* of the user JONES from IA , BA , SF , PH , DS to include Multiple RIN capability (MR), enter:

```
:ALTUSER JONES;CAP=IA,BA,SF,PH,DS,MR
```

To alter two attributes, *password* and *subqueuename*, for user JONES enter:

```
:ALTUSER JONES;PASS=JJ;MAXPRI=DS
```

:ALTVSET

Modifies volume set definitions.

SYNTAX

```
:ALTVSET vsname  
  
    [ ;ADDCLASS=vname :vname [ ,vname [ , ... ] ] ]  
  
    [ ;EXPANDCLASS=vname :vname [ ,vname [ , ... ] ] ]  
  
    [ ;EXPANDSET=vname :type [ ,vname :type [ , ... ] ] ]
```

PARAMETERS

vsname The existing volume set name. MPE will implicitly reference *vsname* as *vsname.groupname.acctname*, where *groupname* and *acctname* are the log-on group and account.

vname : *vname* The volume class name, consisting of up to eight alphanumeric characters, beginning with an alphabetic character. Each volume class definition consists of a volume class name and an associated list of volume names, *vname*. The list of volume names must be a subset of the volumes comprising the volume set. One of the volume names must be that of the volume set's master volume.

ADDCLASS Directs MPE to add a volume class and an associated list of volume names to an existing volume set. The list of volume names must be a subset of the volumes comprising the volume set. One of the volume names must be that of the volume set's master volume.

EXPANDCLASS Directs MPE to add the names of new members in the volume class to an existing volume set. These new members can only be members of the parent volume set.

EXPANDSET Directs MPE to add the names of new members in the volume set and types of devices required to accommodate the new members to an existing volume set. Total members in a volume set may not exceed eight. The type must be specified with each volume member name to define the type of disc drive. Types of disc drives that may be specified are:

HP 7902	HP 7920
HP 7905	HP 7925
HP 7906	HP 7933
HP 7911	HP 7935
HP 7912	HP 7945
HP 7914	HP 9895

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		CV

OPERATION

The :ALTVSET command is used to modify volume set definitions. Volume class names can be added, and the number of member volumes can be increased. The overall size of the volume set, however, cannot be decreased by deleting member volumes.

EXAMPLE

To add member volumes MEM3 and MEM4 to the existing volume set USERSET , enter:

```
:ALTVSET USERSET;EXPANDSET=MEM3:HP7920,MEM4:HP7920
```

ADDITIONAL DISCUSSION

Refer to the discussion of Private Volumes in Section X of this manual.

:BREAKJOB

Suspends an executing job.

SYNTAX

```
:BREAKJOB #Jnnn
```

PARAMETERS

#Jnnn A job number.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command, or if :JOBSECURITY is set LOW.

OPERATION

The Operator can use the :BREAKJOB command to suspend any executing job, including spooled and streamed jobs. A job using a critical system resource will not be suspended until it releases the resource.

When you issue :BREAKJOB for a job that owns a nonsharable device, a console message is displayed listing the device(s) that the job owns. (As many as ten devices may be listed.) You may then decide if the job should be allowed to run until it releases the device(s), or if it should be aborted.

All commands that normally affect executing jobs, such as :ABORTJOB, will operate on suspended jobs. The :SHOWJOB commands, which lists all jobs, will display "SUSP" for those in the suspended state. To list suspended jobs only, enter :SHOWJOB SUSP.

EXAMPLES

To suspend job number 68, enter:

```
:BREAKJOB #J68
```

To display suspended jobs, enter:

```
:SHOWJOB SUSP
```


:CACHECONTROL

Tunes disc caching performance. Disc caching software is not included with MPE's Fundamental Operating Software, and must be purchased separately.

SYNTAX

```
:CACHECONTROL  
  
[SEQUENTIAL=sequentr ]  
  
[RANDOM=randomn ]  
  
[BLOCKONWRITE={YES}  
                  {NO }]
```

PARAMETERS

- sequentr* Assigns the number of sectors read from a sequential access disc file if the information is not found in the cache. The disc read will stop at extent boundaries and will fetch at least the amount requested. The number of sectors must be greater than 1, but less than 96 (inclusive). Default is 96 sectors.
- randomn* Specifies the number of sectors read from a random access disc file if the information is not found in the cache. The disc read stops at extent boundaries, and will fetch at least the amount requested. The number of the sectors must be greater than 1, but less than 96 (inclusive). Default is 16 sectors.
- BLOCKONWRITE Specifies whether or not MPE will block the process until posting of cache buffers to the disc is complete. The BLOCKONWRITE must be equal to YES or NO. Default is NO.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or SM

OPERATION

The `:CACHECONTROL` command is used to tune the performance of disc caching on your system. This command requires SM or OP capabilities. At least one keyword must be specified. Any combination of two keywords, or all three, can be used in a single command, but each can be used only once. They can be entered in any order.

When an I/O read request attempts to find data that is not currently in memory (i.e. a read "miss"), the requested portion of the disc must be fetched into memory. Disc caching will use the information about the file extent size and access type (random or sequential) in its fetch strategy to maximize the "hit" ratio; that is, subsequent read requests may be satisfied by a disc domain fetched as a result of a miss.

The size of the fetch will always be limited by the extent size of the file. Within this limitation, the disc domain fetched will be equal to the greater of the following two sizes:

- The requested size.
- The largest integer multiple of the requested size that is smaller than the value specified by the *sequentn* or *randomn* parameters.

A high hit ratio on read requests will help maximize disc caching performance. A poor choice of values for either or both of the *sequentn* and *randomn* parameters can substantially decrease the ratio.

When disc caching is enabled on your system, data residing in the disc domain need only be transferred from the portion of memory reserved as the disc cache, and not from the disc itself. This way, I/Os complete at processor speed, and not disc speed.

When the I/O request is a write operation, physical posting to the disc will be initiated as a background task while the process continues. In this way, write requests look completed to the user process before the disc has been updated. By specifying the `BLOCKONWRITE=YES` parameter, all user write requests will not show complete until actually posted to the disc. This guarantees that the information is on disc when the request completes. However, it does eliminate one performance benefit disc caching normally provides: write operations will complete at disc access speed, instead of processor speed.

EXAMPLE

To set the fetch values for random access files to 24-sector reads, and the value for sequential access files to 48, enter:

```
:CACHECONTROL SEQUENTIAL=48,RANDOM=24
```

Note that in this example the default value of `BLOCKONWRITE`, which is `NO`, will be used.

:CONSOLE

Changes the System Console from its current device to another job-accepting terminal.

SYNTAX

```
:CONSOLE [ldev]
```

PARAMETERS

ldev The logical device number of the new Console terminal. If omitted, the :CONSOLE command displays the current logical device number of the Console.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		SM or from Console*

* also may be distributed to users with the :ALLOW command.

OPERATION

The :CONSOLE command is used for two purposes: To display the logical device number of the terminal currently being used as the System Console, and to move the Console to another logical device. Listing the location of the Console requires no special capabilities. Moving the Console, however, requires OP or SM capability.

The Console cannot be moved to a remote terminal, i.e., one that is connected to your system via a Distributed Systems (DS) communications line. Similarly, it should not be moved to a terminal using a Multipoint Terminal Software (MTS) line, or a PAD terminal over a modem.

When you switch the location of the Console with the :CONSOLE command, a message is printed on the former Console and on the logical device receiving the Console stating the new logical device number of the system. The old Console is now just another session device and all the Console capabilities are transferred to the newly designated terminal.

Without parameters, the :CONSOLE command will report the current logical device number of the Console. No capabilities are required to execute the command this way.

NOTE

Before you transfer the System Console to another terminal, you should give yourself the capability to take the Console back at any time by allowing yourself the :CONSOLE command with the :ALLOW command. Users assigned System Manager (SM) capability can retrieve the Console without having been allowed the use of the :CONSOLE command.

Since the System Console is a session device, a session must be logged on to the Console in order to execute Operator commands. Console messages will be printed even when the session is logged off.

Control and Maintenance Processor (CMP) and Diagnostic Control Unit (DCU) prompts and messages remain with the configured Console, e.g., Channel 1, Device 0. This feature cannot be moved to another terminal.

EXAMPLE

To determine the current location of the System Console, enter:

```
:CONSOLE  
CONSOLE IS CURRENTLY ASSIGNED TO LDEV 20
```

To transfer the Console to the terminal identified by MPE as logical device 31, enter:

```
:CONSOLE 31  
CONSOLE HAS BEEN SWITCHED FROM LDEV 20 TO LDEV 31
```

:DEALLOCATE

Deallocates a program or procedure previously loaded into memory with the :ALLOCATE command.

SYNTAX

```
:DEALLOCATE [PROGRAM, ]  
            [PROCEDURE, ] name
```

PARAMETERS

PROGRAM The program file indicated by *name* is deallocated. Default.

PROCEDURE The code segment containing the procedure specified by *name* in SL.PUB.SYS is deallocated. Default is PROGRAM.

name The name of the program file or procedure to be deallocated.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP

OPERATION

:DEALLOCATE will immediately release table entries belonging to a program file or procedure that has been permanently allocated, unless it is currently executing. Otherwise, the command will take effect once the program or procedure is no longer in use.

EXAMPLE

To deallocate a program file named PRDGEX, enter:

```
:DEALLOCATE PRDGEX
```

:DEALLOCATE does not give back memory, it gives back table entries.

:DEBUG

Invokes the MPE Debug Facility.

SYNTAX

:DEBUG

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	NO
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		PM

OPERATION

The :DEBUG command, which can only be executed by a user with Privileged Mode (PM) capability, is an extension of the MPE Debug Facility. It is used primarily by systems programmers to analyze code and trace errors in program logic. :DEBUG is fully explained in the MPE Debug/Stack Dump Reference Manual (30000-90012).

CAUTION

The normal checks and limitations that apply to standard MPE users are bypassed in Privileged Mode. It is possible for a Privileged Mode user to destroy the integrity of the system, including MPE operating system software itself. Hewlett-Packard will investigate and attempt to resolve the problems resulting from the use of Privileged Mode code. This service, which is not provided under the standard Service Contract, is available on a time and materials billing basis. However, Hewlett-Packard will not support, correct, or attend to any modification of the MPE operating system software.

:DELETESPOOLFILE

Deletes a spool file from disc.

SYNTAX

```
                {#Onnn}  
:DELETESPOOLFILE {#Innn}  
                {ldev }
```

PARAMETERS

- #Onnn* The identification of a READY or ACTIVE output spool file.
- #Innn* The identification of a READY, input spooled :DATA file.
- ldev* The logical device number on which the spool file is ACTIVE.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

Before deleting an ACTIVE spool file, you should first take the output device off line. This allows you time to enter the command and determine that the ACTIVE spool file corresponds to the correct output device. When MPE returns the colon prompt (:), you know that the :DELETESPOOLFILE instruction has been sent to the spooler process. It will not be executed, however, until the output device is put back on line.

You may not use the :DELETESPOOLFILE command on the following files:

- System-defined standard input spool files (\$STDIN). Delete them with the :ABORTJOB command.
- ACTIVE spool files with :DATA input, entered via the :STREAM command. You may delete these only when they are READY. You may also not delete these files when they are OPEN.

:DELETESPOOLFILE will delete ACTIVE :DATA input files which are submitted on a spooled device, such as a card reader. It cannot delete such files while they are being :STREAMED.

EXAMPLE

To delete the ACTIVE spool file being printed on *ldev 6*, first take the printer off line. This generates a "NOT READY" message, after which you may enter the :DELETESPOOLFILE command, as shown below:

```
11:21/7/LDEV#6 NOT READY
:DELETESPOOLFILE 6
```

When you put the device back on line, the trailer page will be printed, and the file deleted. If you have suppressed header/trailer output with the :HEADOFF command, no trailer is printed before the spool file is deleted, and after the device is put back on line. However, the printer will skip to the top of the next physical page. If the device is a page printer, the default environment is reloaded.

:DISALLOW

Prohibits access to a specific Operator command.

SYNTAX

```
:DISALLOW FILE=formaldesignator [ ;SHOW ]
```

```
:DISALLOW { @.@          }  
           { user.@      } ;COMMANDS=command [ ,command , ... ]  
           { @.acct     }  
           { user.acct }
```

PARAMETERS

formaldesignator A formal ASCII file name, which may consist of up to eight characters, beginning with a letter.

SHOW Lists input lines on \$STDLIST .

@.@ Prohibits access to all users whether logged on or not.

user.@ Prohibits access to a specific user in all accounts.

@.*acct* Prohibits access to all users in a specific account.

user.*acct* Prohibits access to a specific user in a specific account.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

The Operator uses the `:DISALLOW` command to prohibit a user from executing specific console commands previously allowed them via the `:ALLOW` command. One form of the command requires you to enter the list of prohibited commands directly at the console. The second form of `:DISALLOW` is indirect mode, in which you create a file with `EDIT/3000` that contains the user name and account of those users who will be prohibited from executing certain Operator commands, followed by the list of commands. The procedure is similar to the following example:

```
:EDITOR
HP322D1A.7.16 EDIT/3000 TUE, MAY 29, 1984, 5:08 PM
(C) HEWLETT-PACKARD CO. 1984
/ADD
  1  SUSAN.PAYROLL;COMMANDS=ALTJOB,ALTSPoolFILE
  2  JOHN.ACCTNG;COMMANDS=ALTSPoolFILE,DELETESPoolFILE
  3  //
...
/KEEP COMNDTMP
/E
```

Once this file is defined, command input is taken from it rather than from data entered at the console; no continued records are permitted. The `:DISALLOW` command is then executed by entering the following:

```
:DISALLOW FILE=COMNDTMP;SHOW
```

The `;SHOW` parameter directs MPE to display each command line as it is executed from the file.

A third form of the command is subsystem mode. In this case, you need only type the command name, `:DISALLOW`, followed by a `(RETURN)`. You will then be prompted with a `>`, after which you enter command parameters. Subsystem mode ends when an EOF is received, or until you `EXIT`.

EXAMPLE

To prohibit the user `MAC.TECH` from executing the `:REPLY` and `:ABORTIO` commands, enter the following on the System Console:

```
:DISALLOW MAC.TECH;COMMANDS=REPLY,ABORTIO
```

To use subsystem mode to prohibit the user `MGR.MANUALS` the ability to execute the `:BREAKJOB` command, enter the following on the System Console:

```
:DISALLOW
>MGR.MANUALS;COMMANDS=BREAKJOB
>EXIT
:
```

:DISCRPS

Enables or disables the Rotational Position Sensing (RPS) feature on a specified logical device. RPS is supported on Version G.00.00 or later of the operating system only, and requires a special firmware upgrade to the disc drives.

SYNTAX

```
:DISCRPS ldev {,ENABLE }  
           {,DISABLE }
```

PARAMETERS

ldev The logical device number of the specified CS-80 disc drive.

ENABLE Enables Rotational Position Sensing on the device.

DISABLE Disables Rotational Position Sensing on the device.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

The :DISCRPS command allows you to enable or disable the Rotational Position Sensing feature for CS-80 disc drives. With RPS enabled, the disc drive will signal its availability to do an I/O only when it is a small rotational distance away from the target data, which improves system performance when more than one drive is connected to the same HP-IB channel.

EXAMPLE

To enable the RPS feature on logical device 1, and then display the drive's status, enter:

```
:DISCRPS 1,ENABLE  
:SHOWDEV 1  
LDEV            AVAIL            OWNERSHIP       VOID    DEN ASSOCIATION  
1              DISC (RPS) 50 FILES
```

Removes a device from normal system use.

SYNTAX

```
:DOWN ldev
```

PARAMETERS

ldev The logical device number of the device being taken off line.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

When you issue the :DOWN command for a device in use, the request will be satisfied when the current owning process releases it.

Once you :DOWN a device corresponding to the master volume of a Nonsystem Domain disc drive, MPE will reject all further requests to use any volume in the set to which the master volume belongs.

The system console cannot be downed. Any attempt to do so will result in the following error message:

```
DOWN NOT PERFORMED ON CONSOLE DEVICE (CIERR 3150)
```

CAUTION

When any device is powered down without the use of the :DOWN command, subsequent access to that device can result in indefinite waiting, erroneous transfers, or other incorrect operation. Often these failures will occur with no indication to the System Operator or to the user. For this reason, it is very important that every device which is not fully operational (especially those which are powered down) be downed with the :DOWN command. A device that will be inoperable for more than a few hours can be temporarily removed from the I/O configuration at system start up.

EXAMPLE

To take logical device number 7 off line, enter:

```
:DOWN 7
```

To take logical device number 10 (an input-spooled, job-accepting magnetic tape) off line, enter:

```
:DOWN 10  
:STOPSPool 10  
11:16/31/SP#10/STOPPED  
11:16/31/LDEV#10 NOT READY
```

:DOWNLOAD

Downloads format information to a line printer.

SYNTAX

```
:DOWNLOAD ldev [,filename ] [,MARGIN=nn] [...]
```

PARAMETERS

- ldev* The logical device number of the output device. This device must be a HP2608 or HP2563 line printer. (The HP2563 printer is supported on the G.00.00 or later release of MPE V only.)
- filename* The fully qualified name of a file containing the download control information.
- nn* The print position that the first byte of data will assume. This number can be between 1 and 16, inclusive. Note that the HP 2608 Hardware documentation discusses a margin offset which varies from 0-15. This offset is not relevant to the margin parameter of the :DOWNLOAD command, as the software compensates for the hardware offset of *nn* -1.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

The Operator uses the :DOWNLOAD command to transmit format information to system printers only. It cannot be used with remote printers.

The Vertical Format Control (VFC) image file (*filename*) can define the margin setting as well as the VFC image on an HP 2608A or HP 2608S line printer. The number of print lines per form is limited to 127. Although the HP 2608S printer recognizes the :DOWNLOAD command, Hewlett-Packard recommends controlling the HP 2608S with an environment file rather than the :DOWNLOAD

command. You cannot download a VFC file to a HP 2631B printer; only the MARGIN=*mm* is allowed. (For a discussion of special hardware considerations, refer to Section VIII in this manual.)

If the MARGIN=*mm* parameter is specified on an HP 2608A or HP 2608S, and a MARGIN record has also been specified in the VFC file, the MARGIN record in the VFC file overrides the MARGIN parameter of the :DOWNLOAD command. This parameter should only be used in cases where there is no MARGIN record in the VFC file.

When a particular print job has requirements for forms and/or a VFC file, the user will supply you with this information via a FORMS message. (Refer to "EXAMPLE".)

CAUTION

DO NOT ISSUE A :DOWNLOAD COMMAND TO AN HP 2608S WHILE A SPOOL FILE IS ACTIVE. This will make the device UNAVAILABLE, and it will remain so until the system is restarted with a WARMSTART.

EXAMPLE

To respond to a forms message, enter:

```
10/15:46/22/FORMS: PLEASE MOUNT PAYCHECK FORMS. USE VFC=VFCPAY
10/15:46/22/SP#11/LDEV# FOR #S93;OUTFILE ON HP 2608 (1)
```

```
:DOWNLOAD 11,VFCPAY
```

To reset the VFC to its original state, you must reference a file that contains default specifications (such as VFC6 in this example) by entering:

```
:DOWNLOAD 11,VFC6.PUB.SYS
```

To set the left margin print position to column 4 (the installation-defined default) enter:

```
:DOWNLOAD 11,MARGIN=4
```

:FOREIGN

Directs MPE to treat the disc volume mounted on the specified *ldev* as foreign.

SYNTAX

```
:FOREIGN ldev
```

PARAMETERS

ldev The logical device number of a disc drive.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

This command forces MPE to treat the volume currently mounted on the logical device as a foreign disc. The device class associated with the logical device must be foreign and the drive must be on line, but the volume cannot be in use.

CAUTION

If the restrictions stated above are met, the system will treat the logical device as a foreign disc. As long as the volume is not a System Domain disc, MPE performs no security checking. Therefore, any disc (system, private volume, etc.) could be mounted and inadvertently treated as a foreign disc. Since the Foreign Disc Facility may write on the MPE label area, file labels could be destroyed and important information lost.

EXAMPLE

To direct MPE to treat the disc mounted on device 3 as foreign, first verify the status of the disc by entering:

:DSTAT 3

<u>LDEV-TYPE</u>	<u>STATUS</u>	<u>VOLUME (VOLUME SET-GEN)</u>
3-7902	SERIAL	*UNALLOCATED*

Then enter:

:FOREIGN 3

To verify the change, enter:

:DSTAT 3

<u>LDEV-TYPE</u>	<u>STATUS</u>	<u>VOLUME (VOLUME SET-GEN)</u>
3-7902	FOREIGN	*UNALLOCATED*

:FULLBACKUP

Performs a backup of MPE and all files on the system.

SYNTAX

```
:FULLBACKUP [dumtape][,auxlistfile]
```

PARAMETERS

dumtape Specifies the magnetic tape destination for the backup. If specified, this must be a back reference to a previous :FILE command or file equates to the formal designator DUMPTAPE. The default is TAPE. If there is not a device class TAPE, the device class CTAPE will be used.

auxlistfile File designator of the output file (device) to which all listings requested during the execution of the backup process are written. The default is \$STDLIST.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?	YES (Suspends)	
Capability Required	OP	

OPERATION

This command starts the backup process and copies MPE and all files on the system. :PARTBACKUP and :FULLBACKUP are provided as alternatives to going through the :SYSDUMP dialogue. The only user interaction required with these commands is to mount tapes or serial discs and reply to mount requests; even these replies are unnecessary if the devices are configured as auto-reply.

EXAMPLE

In the following example the first :FILE command specifies that DUMP is a magnetic tape file; the second :FILE command defines LIST as a line printer. The TAPE and LP parameters are device class names arbitrarily defined during the previous system configuration.

```
:FILE DUMP;DEV=TAPE
:FILE LIST;DEV=LP
:FULLBACKUP *DUMP,*LIST
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMP" ON TAPE (NUM)?
```

In the following example, if a file equation with the formal file designator of DUMPTAPE was previously entered (e.g., :FILE DUMPTAPE;DEV=SYSTAPE) then the user may omit the first parameter and the backup will go to the device class SYSTAPE.

```
:FULLBACKUP,*LIST
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMPTAPE" ON SYSTAPE (NUM)?
```

In the following example, if the DUMPTAPE is not specified and there is no file equation for DUMPTAPE, then a temporary file equation (:FILE DUMPTAPE;DEV=TAPE) will be used.

```
:FULLBACKUP
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMPTAPE" ON TAPE (LDEV)?
```

Assigns a downed device to diagnostics.

SYNTAX

```
:GIVE ldev
```

PARAMETERS

ldev The logical device number of the downed device.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

This command gives control of the device specified by *ldev* to diagnostics so that no other process can access the device while diagnostic tests are in progress. Before the device can be given to diagnostics, it must first be taken off line with the :DOWN command, as shown in the example below. (For further information on the :DOWN command, refer to the reference specification in this section.)

EXAMPLES

To assign a downed device with logical device number 81 to diagnostics, enter:

```
:DOWN 81  
:GIVE 81  
11:20/3/LDEV#81 IN USE BY DIAGNOSTICS
```

To assign a spooled job-accepting card reader to diagnostics, enter:

:STOPSPool 5

** Stops spooling
process for *ldev* 5. **

11:16/31SP#5/STOPPED
11:16/31/LDEV#5 NOT READY

:REFUSE 5

** Prevents jobs and
sessions on the device. **

:ABORTIO 5

** Aborts pending I/O
for the device. **

11:16/3/LDEV#5 NO I/O PENDING

:DOWN 5

** Takes *ldev*
5 off line. **

:GIVE 5

** Gives *ldev*
5 to diagnostics. **

11:16/3/LDEV#5 IN USE BY DIAGNOSTICS

:HEADOFF

Stops header/trailer output to a device.

SYNTAX

```
:HEADOFF ldev
```

PARAMETERS

ldev The logical device number of the printer or card punch affected by the command.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

Header and trailer information is the data which appears before and after a file, but which is not part of the file's text. It identifies the file by session number, output spool file number, session name (if any), user and account. It also lists the date and time the file was printed.

When the header/trailer facility is enabled and output is directed to a card punch, MPE automatically punches a header card and a trailer card identifying the job. If output is directed to a line printer, MPE automatically prints header and trailer pages identifying the job that produced the file.

If the device is in use and a header has already been printed when you issue the :HEADOFF command, your request to suppress header/trailer output will take effect after the corresponding trailer is printed.

EXAMPLE

To stop header/trailer output to logical device number 6, enter:

```
:HEADOFF 6
```

:HEADON

Resumes header/trailer output to a device.

SYNTAX

```
:HEADON ldev
```

PARAMETERS

ldev The logical device number of the printer or card punch affected by the command.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

Header and trailer information is the data which appears before and after a file, but which is not part of the file's text. It identifies the file by session number, output spool file number, session name (if any), user and account. It also lists the date and time the file was produced.

When the header/trailer facility is enabled and output is directed to a card punch, MPE automatically punches a header card and a trailer card identifying the job. If output is directed to a line printer, MPE automatically prints header and trailer pages identifying the job that produced the file.

If the device is in use, your request to resume header/trailer output will take effect after the the current output is complete.

The header/trailer facility is enabled on all cold loads.

EXAMPLE

To resume header/trailer output to logical device number 6 enter:

```
:HEADON 6
```

:JOBFENCE

Defines the minimum input priority that a job or session must have in order to execute.

SYNTAX

```
:JOBFENCE priorityfence
```

PARAMETERS

priorityfence A number between 0 and 14 , inclusive. Within this range, smaller numbers are less limiting, larger numbers more limiting.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

MPE will not dispatch jobs or sessions with an input priority less than or equal to the *priorityfence* until their input priority is raised with the :ALTJOB command, or until the JOBFENCE is lowered. System Managers and System Supervisors may override the JOBFENCE setting by logging on with the ;HIPRI parameter of the :JOB or :HELLO commands. Or, they may logon with an input priority greater than the JOBFENCE as reported by the :SHOWJOB command.

EXAMPLE

To defer all non-HIPRI jobs and sessions, first set the JOBFENCE to 14, as shown below.

```
:JOBFENCE 14
16:18/#J7/34/DEFERRED JOB INTRODUCED ON LDEV #10
16:18/#J8/35/DEFERRED JOB INTRODUCED ON LDEV #10
```


Then enter the :SHOWJOB command to display the effect of the new JOBFENCE.

:SHOWJOB

JOBNUM	STATE	IPRI	JIN	JLIST	INTRODUCED	JOB NAME
#26	EXEC		20	20	THU 4:17P	OPERATOR.SYS
#J7	WAIT	D 8	10S	12	THU 4:18P	JOB1, FIELD.SUPPORT
#J8	WAIT	D 8	10S	12	THU 4:18P	JOB2, FIELD.SUPPORT

3 JOBS:

0 INTRO
2 WAIT; INCL 2 DEFERRED
1 EXEC; INCL 1 SESSIONS
0 SUSP

JOBFENCE= 14; JLIMIT= 5; SLIMIT=16

Finally, reset the JOBFENCE to 0, which will allow waiting jobs to log on.

:JOBFENCE 0

16:21/#J7/34/LOGON FOR: JOB1, FIELD.SUPPORT ON LDEV #10
16:21/#J8/35/LOGON FOR: JOB2, FIELD.SUPPORT ON LDEV #10

:JOBPRI

Sets or changes the default execution priority for batch jobs and sets a maximum execution priority for jobs.

SYNTAX

```
:JOBPRI [maxsubqueue][,defaultsubqueue]
```

PARAMETERS

maxsubqueue The maximum priority at which batch jobs will be allowed to run. This is in spite of any job priority a user may have requested with the :JOB command. This parameter may be ES , DS , CS , or 0 . If 0 is specified, no limit is imposed on batch jobs. Default is no change in maximum priority.

defaultsubqueue The default execution priority for batch jobs, which may be ES , DS , or CS . This takes effect if a user does not specify an execution priority in the :JOB command. Default is no change in execution priority.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP

OPERATION

The *maxsubqueue* parameter specified in the :JOBPRI command takes precedence over *defaultsubqueue*. Therefore, selecting a default parameter greater than the value of *maxsubqueue* parameter will not affect job execution: jobs will still be initiated with the maximum priority parameter.

EXAMPLE

To raise the maximum execution priority so that batch jobs can run in any subqueue requested, enter:

```
:JOBPRI 0
```

:JOBSECURITY

Designates what level of user may request resources and control the execution of jobs.

SYNTAX

```
:JOBSECURITY {HIGH}  
{LOW }
```

PARAMETERS

HIGH Restricts access to job control commands to the Operator logged on at the console.

LOW Allows individual users to exercise control over their own jobs.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

:JOBSECURITY controls the use of the :ABORTJOB, :ALTJOB, BREAKJOB, and :RESUMEJOB commands. The HIGH parameter permits only the Operator to issue these commands. JOBSECURITY LOW allows any user to issue these commands for their own jobs; the job's user name and account must match that of the user. Account Managers do not need a matching user name, with the result that they may control the execution of any job in their account.

EXAMPLE

To give any user the capability to abort, alter, break or resume their own jobs, enter:

```
:JOBSECURITY LOW
```

:LDISMOUNT

Logically dismounts a private volume set or class.

SYNTAX

```
:LDISMOUNT vcname .group .account
```

PARAMETERS

vcname Volume class/set name for which you are requesting a logical dismount.

group .account The group and account under which the volume set was created.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW command.

OPERATION

:LDISMOUNT is used to dismount Nonsystem Domain discs while the system is on line. It informs MPE that the volume class/set is no longer needed and that member volumes should be logically dismounted, as a unit, from the drive(s) on which they reside. The dismount request will remain pending until any files being accessed on the disc volume are closed; at that point the command will execute. If the specified volume class/set is not mounted when you attempt to logically dismount it, you will receive an error message.

EXAMPLE

To dismount a private volume set named DATABASE, which was created in the PAYROLL group of the ACCTNG account, enter:

```
:LDISMOUNT DATABASE.PAYROLL.ACCTNG
```

ADDITIONAL DISCUSSION

Refer to the discussion of Private Volumes in Section X of this manual.

Limits the number of concurrently running jobs/sessions.

SYNTAX

```
:LIMIT {numberjobs }  
       {,numbersessions }  
       {numberjobs,numbersessions}
```

PARAMETERS

numberjobs The number of jobs.

numbersessions The number of sessions.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

Maximum job and session limits are established by the System Supervisor during system configuration. Within these limits, the Operator may redefine the job and session limit with the :LIMIT command. When the system is restarted from disc in a WARMSTART, the Operator-defined limits are retained. When any other startup option is used, the values configured by the Supervisor take effect.

At least one parameter must be included in the :LIMIT command. If you execute the :LIMIT command without parameters, the following message is displayed on the Console:

```
EXPECTED ONE OF JOB OR SESSION LIMIT. (CIERR 3071)
```

If you enter one parameter and omit the other, the omitted parameter's limit remains unchanged.

No new jobs or sessions will be dispatched that would cause either of these limits to be exceeded, unless they are initiated with the ;HIPRI parameter of the :JOB or :HELLO commands. Non-HIPRI jobs can still be introduced when the limit is achieved, but they will not execute.

If you attempt to log on to a non-HIPRI session after the limit has been reached, you will receive the message:

```
CAN'T INITIATE NEW SESSIONS NOW
```

The specified limits may be exceeded at the time the command is issued. This will not cause jobs or sessions executing at the time to abort. They will continue to execute, but no new jobs will be allowed to enter the executing state, and no new sessions will be initiated.

EXAMPLE

To limit the number of jobs to 2 and the number of sessions to 15, enter:

```
:LIMIT 2,15  
:SHOWJOB
```

JOBNUM	STATE	IPRI	JIN	JLIST	INTRODUCED	JOB NAME
#S24	EXEC		20	20	TUE 1:54A	OPERATOR.SYS
#S26	EXEC		177	177	TUE 5:01A	CHEWY,RSPOOL.SYS
#S36	EXEC	QUIET	35	35	TUE 8:31A	SLIDES.SIMON

```
3 JOBS:
```

```
0 INTRO  
0 WAIT; INCL 0 DEFERRED  
3 EXEC; INCL 3 SESSIONS  
0 SUSP
```

```
JOBFENCE= 6; JLIMIT= 2; SLIMIT= 15
```

To limit the number of sessions to 15, but retain the current job limit, enter:

```
:LIMIT ,15
```

:LISTACCT

Lists the attributes for one account (Account Manager capability) or any or all accounts (System Manager capability).

SYNTAX

```
:LISTACCT [ { @ } ] [ ,listfile ]
```

PARAMETERS

- @** Specifies all accounts. This is the default for users with SM capability, which is required to list all accounts.
- acct** The name of the account whose attributes are to be listed. Account Managers may specify only their own account. Default is the logon account.

Note that the characters @, #, and ? can be used as wild card characters, but will count toward the eight character limit. These wild card characters have the following meanings:

- @** Specifies zero or more alphanumeric characters and denotes all members of the set.
- #** Specifies one numeric character.
- ?** Specifies one alphanumeric character.

The characters can be used as follows:

- n@** List all accounts starting with the character "n".
- @n** Lists all accounts ending with the character "n".
- n@x** Lists all accounts starting with the character "n" and ending with the character "x".
- n#...#** Lists all accounts starting with the character "n" followed by up to seven digits.
- ?n@** Lists all accounts whose second character is "n".
- n?** List all two-character accounts starting with the character "n".
- ?n** List all two-character accounts ending with the character "n".

listfile Destination of the attribute listing. The default is \$STDLIST, but the output may be redirected with the :FILE command.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM or SM

OPERATION

This command lists the attributes for one account (AM capability) or for one or all accounts (SM capability). Also available is information on accounts spanned to private volumes, whether or not the volume set is mounted when the information is requested.

The listing appears as an octal dump of the account entry; each is headed by "A = " and the account name. When the dump contains alphanumeric data, a translation into ASCII appears to the right of each line. The following is a sample listing of an octal dump:

```
A = SYS
051531 051440 020040 020040 000006 000007 177607 000713 SYS.....
000000 000000 020040 020040 020040 020040 000010 052150 .....Th
077777 177777 000010 113257 077777 177777 000037 147337 .....
077777 177777 004551 140036 000123 000217 .....i...S..
```

Each octal word in the preceding listing is displayed in the following decimal representation of the dump. The table on the next page decodes the information.

```
--00-- --01-- --02-- --03-- --04-- --05-- --06-- --07--
--08-- --09-- --10-- --11-- --12-- --13-- --14-- --15--
--16-- --17-- --18-- --19-- --20-- --21-- --22-- --23--
--24-- --25-- --26-- --27-- --28-- --29--
```


WORDS	CONTENT
0-3	Account name.
4-5	Account's group and user index pointers.
6-7	Account attributes.
8-9	Local attributes.
10-13	Password.
14-15	Permanent file space usage count (in sectors).
16-17	Permanent file space limit (in sectors).
18-19	Central processor time usage count (in seconds).
20-21	Central processor time limit (in seconds).
22-23	Connect-time count (in minutes).
24-25	Connect-time limit (in minutes).
26	Purge and account-security flags.
27	Maximum job/session priority (numerical).
28	Command file location of account UDCs.
29	Command file location of SYS account UDCs.

EXAMPLE

To list the attributes of the account, SYS ,enter:

```

:LISTACCT SYS
A = SYS
051531 051440 020040 020040 000006 000007 177607 000713 SYS.....
000000 000000 020040 020040 020040 020040 000010 052150 .....Th
077777 177777 000010 113257 077777 177777 000037 147337 .....
077777 177777 004551 140036 000123 000217 .....i...S..
:

```

:LISTGROUP

Prints a list of attributes for groups.

SYNTAX

```
          {group.acct}
          {group      }
:LISTGROUP {@.acct   } [,listfile]
          {@          }
          {@.@       }
```

PARAMETERS

- @ Specifies that all groups in the logon account are to be listed. Default.
- @.@ Specifies that all groups in all accounts are to be listed. Only users with SM capability may specify this option. Default is @.
- group.acct* Specifies the group and account to be listed. Account Managers cannot specify an account other than their own.
- group* Specifies the group (in the logon account) to be listed. Default is @.
- @.acct* Specifies that all groups in the designated account are to be listed. If an Account Manager specifies an account, it must be his or her own account. Default is @.

Note that the characters @, #, and ? can be used as wild card characters, but will count toward the eight character limit. These wild card characters have the following meanings:

- @ Specifies one or more alphanumeric characters or denotes all members of the set.
- # Specifies one numeric character.
- ? Specifies one alphanumeric character.

The characters can be used as follows:

- n@ List all groups starting with the character "n".
- @n List all groups ending with the character "n".
- n@x List all groups starting with the character "n" and ending with the character "x".
- n##...# List all groups starting with the character "n" followed by up to seven digits.
- ?n@ List all groups whose second character is "n".
- n? List all two-character groups starting with the character "n".

?n List all two-character groups ending with the character "n".

listfile Destination of the attribute listing. The default is \$STDLIST, but the output may be redirected with the :FILE command.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	YES (Aborts)	
Capability Required	AM or SM	

OPERATION

This command lists the attributes for all groups in one account (AM capability) or all groups in all accounts (SM capability). Also available is information on groups spanned to private volumes, whether or not the volumes are mounted when the information is requested.

A sample octal dump appears below. The listing includes both group and system information, headed by "G = " and the group's name. A translation of those bytes that contain alphanumeric ASCII characters appears to the right of each line of the octal dump.

```
G = PUB
050125 041040 020040 020040 000514 020040 020040 020040 PUB.....L.....
020040 000000 001026 077777 177777 000000 046536 077777 .....M...
177777 000002 006457 077777 177777 020410 041010 000601 .....B...
000000 000516 020040 020040 020040 020040 020040 020040 ...N.....
020040 020040 020040 020040 020040 020040 000000 000000 .....
000000
```

Below is the octal listing translated into its decimal representation:

```
--00-- --01-- --02-- --03-- --04-- --05-- --06-- --07--
--08-- --09-- --10-- --11-- --12-- --13-- --14-- --15--
--16-- --17-- --18-- --19-- --20-- --21-- --22-- --23--
--24-- --25-- --26-- --27-- --28-- --29-- --30-- --31--
--32-- --33-- --34-- --35-- --36-- --37-- --38-- --39--
--40--
```

The information in the octal dump is decoded in the following table:

WORDS	CONTENT
0-3	Group name, in ASCII.
4	File index pointer.
5-8	Password.
9-10	Permanent file space usage count (in sectors).
11-12	Permanent file space limit (in sectors).
13-14	Central-processor time usage count (in seconds).
15-16	Central-processor time limit (in seconds).
17-18	Connect-time count (in minutes).
19-20	Connect-time limit (in minutes).
21-22	Purge and group-security flags.
23	Capability-class attributes.
24	Group directory base linkage.
25	Group volume set definition index.
26-29	Definition's account name.
30-33	Definition's group name.
34-37	Definition's volume set name.
38	GSAVEFIPNTR
39	GMDUNTRECNTNTR
40	GSPARE

Where:

- GSAVEFIPNTR contains the original Group File Index Pointer or an address relative to the base of the SYSVS (System Volume Set) directory.
- GMDUNTRECNTNTR is a counter which keeps track of the number of times a group's Home Volume Set has been bound.
- GSPARE is an MPE reserved word.
- The group name and password are eight-character names, right-padded with blanks.
- The double-word numeric quantities are double-word integers, with %17777777777 representing "unlimited".
- Group attributes duplicate the second word of the double-word capability returned by the WHO intrinsic. (Refer to the MPE V Intrinsic Reference Manual (32033-90007)).

EXAMPLE

To list the attributes of the PUB group in his or her own account, the Account Manager enters:

```
:LISTGROUP PUB
```

```
G = PUB
050125 041040 020040 020040 000514 020040 020040 020040 PUB.....L.....
020040 000000 001026 077777 177777 000000 046536 077777 .....M...
177777 000002 006457 077777 177777 020410 041010 000601 .....B...
000000 000516 020040 020040 020040 020040 020040 020040 ...N.....
020040 020040 020040 020040 020040 020040 000000 000000 .....
000000
```

:LISTUSER

Lists attributes currently assigned to users.

SYNTAX

```
      {user.acct}  
      {user      }  
:LISTUSER {@.acct } [,listfile]  
      {@        }  
      {@.@"     }
```

PARAMETERS

user.acct The specified user in the specified account. If Account Managers specify *acct*, it must be their own account.

user The specified user in the logon account.

@.acct All users in the specified account. Account Managers may specify their own account only.

@ All users in the logon account. Default.

@.@" All users in all accounts. (The attributes of the account are also listed.) This option can only be specified by users with System Manager (SM) capability.

Note that the characters *@*, *#*, and *?* can be used as wild card characters, but will count toward the the eight character limit. These wild card characters have the following meanings:

@ Specifies zero or more alphanumeric characters and denotes all members of the set.

Specifies one numeric character.

? Specifies one alphanumeric character.

The characters can be used as follows:

n@ List all users starting with the character "n".

@n List all users ending with the character "n".

n@x List all users starting with the character "n" and ending with the character "x".

n###...# List all users starting with the character "n" followed by up to seven digits.

?n@ List all users whose second character is "n".

- n? List all two-character users starting with the character "n".
- ?n List all two-character users ending with the character "n".

listfile

Destination of the attribute listing. The default is \$STDLIST, but the output may be redirected with the :FILE command.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		YES (Aborts)
Capability Required		AM or SM

OPERATION

This command generates an octal dump of the attributes currently assigned to users. Each entry is headed by a "U = " and the user's name; it contains both user and system information. A translation of those bytes containing ASCII data appears to the right of each line, as shown in the sample below. An Account Manager may only list users in his or her own account, while the System Manager may specify all users in all accounts on the system.

```
U = COMGRAMS
041517 046507 051101 046523 060003 000613 000000 000000 COMGRAMS.....
020040 020040 020040 020040 050125 041040 020040 020040 .....PUB.....
000000 040226 000121 .....Q
```

The octal information is translated into a decimal representation below.

```
--00-- --01-- --02-- --03-- --04-- --05-- --06-- --07--
--08-- --09-- --10-- --11-- --12-- --13-- --14-- --15--
--16-- --17-- --18--
```

Each word or group of words is decoded in the following table:

WORDS	CONTENT
0-3	User name.
4-5	Capability
6-7	Local attributes.
8-11	Password.
12-15	Home group.
16	Number of users logged-on.
17	Maximum job priority
18	User entry in COMMAND.PUB.SYS

- The user name, password, and home group are eight-character names, right-padded with blanks.
- Capability can be decoded by reference to the WHO intrinsic (as described in the MPE V Intrinsic Reference Manual (32033-90007)).
- The maximum job priority is a numerical quantity; 150 (%226) for example, represents the CS subqueue.

EXAMPLE

To list the attributes of the user MGR in the account SOPRM, enter:

```

:LISTUSER MGR.SOPRM
U = MGR
046507 051040 020040 020040 077607 000713 000000 000000 MGR.....
020040 020040 020040 020040 050125 041040 020040 020040 .....FUB.....
000002 040226 000466 .....6
:

```

:LMOUNT

Logically mounts a private volume set.

SYNTAX

```
:LMOUNT vcname.group.account [;GEN=genindex]
```

PARAMETERS

- vcname* Volume class/set name which specifies the mounting of a previously defined volume class or volume set.
- group.account* Specifies the group and account under which the volume set was created.
- genindex* A value from -1 to 32767 specifying which generation of the volume set is to be mounted (-1 allows any generation to be mounted). If omitted, the system does not check the generation version of the specified volume set.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW command.

OPERATION

When the :LMOUNT command executes, all disc drives containing members of the specified volume set become ASSIGNED. Each volume set is logically attached to the drive until a subsequent :LDISMOUNT command is executed, at which time the disc drive becomes AVAILABLE.

System users issue mount requests implicitly through their programs, or explicitly with a :MOUNT command. User-initiated mount requests cause the specified volume set to be linked into the system's accounting structure at the group level. This is called "binding". When the Console :LMOUNT command is executed, no such binding occurs.

If the Private Volumes Facility was enabled with ":VMOUNT ON,AUTO", MPE will automatically attempt to satisfy the mount request; the :LMOUNT will succeed if the specified volume class/set is physically connected to the system.

If the Private Volumes Facility was enabled with ":VMOUNT ON" (omitting the AUTO parameter), you

must reply to your own mount request even though the volume class/set may already be mounted and in use. If the specified volume class/set is not physically present, the system looks for available drives of the types required to satisfy the request. If sufficient drives are available, the system reserves them and prints a message for you to mount the volume class/set on one or more logical devices, and to reply "YES " or "NO ". If sufficient drives are not available, the system reserves those which will satisfy part of your request, and prints a message with the type and number of drives it requires. If you can free the required drive(s), reply "YES" after the drive is AVAILABLE. If you reply "NO", the original :LMOUNT request will be canceled.

EXAMPLE

To mount a private volume set named DATABASE , in the PAYROLL group of the ACCTNG account, enter:

```
:LMOUNT DATABASE.PAYROLL.ACCTNG
```

ADDITIONAL DISCUSSION

Refer to the discussion of Private Volumes in Section X of this manual.

Starts, restarts, or stops User Logging.

SYNTAX

```
                {RESTART}  
:LOG logid {START }  
                {STOP  }
```

PARAMETERS

logid Logging identifier previously established with a user :GETLOG command.

START Initiates a logging process.

RESTART Restarts a logging process.

STOP Terminates a logging process.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

OPERATION

This command allows you to start, restart, or stop User Logging. For further discussion of User Logging, refer to Section V of this manual, and Section III of the MPE V Intrinsic Reference Manual (32033-90007).

EXAMPLE

To start the logging process identified by *logid* LOGPROCX enter:

```
:LOG LOGPROCX,START
```

=LOGOFF

Aborts all executing jobs/sessions and prevents further logon.

SYNTAX

```
=LOGOFF
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console	

OPERATION

This command sets the job and session execution limits to 0 and aborts all jobs and sessions, including the session logged onto the system console. To enter subsequent console commands, you must log on to the console using =LOGON.

Execution of this command leaves the system in a job/session inactive state. However, since devices are still job/session accepting, job introduction is not disabled: System Managers and System Supervisors can still introduce and run HIPRI jobs. In addition, spoolers will remain operating, but unless a user is able to start a HIPRI session at the System Console, it is impossible to alter their operation.

Any pending requests that require a =REPLY from the System Console must be satisfied before issuing =LOGOFF, or MPE will abort the requests.

EXAMPLE

To abort all executing jobs/sessions, enter:

```
Ao  
=LOGOFF  
16.53/25/ALL JOBS LOGGED-OFF
```

=LOGON

Enables job/session processing following =LOGOFF .

SYNTAX

=LOGON

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console

OPERATION

This command enables the processing of jobs/sessions following the execution of the =LOGOFF command. =LOGON re-establishes the job/session limits in effect prior to a =LOGOFF command and allows non-HIPRI jobs/sessions to log on again.

EXAMPLE

To enable job/session processing, enter:

=LOGON

:NEWACCT

Creates a new account and an associated Account Manager and PUB Group.

SYNTAX

```
:NEWACCT acctname,mgrname  
  
  [;PASS=password]  
  
  [;FILES=filespace]  
  
  [;CPU=cpu]  
  
  [;CONNECT=connect]  
  
  [;CAP=capabilitylist]  
  
  [;ACCESS=fileaccess]  
  
  [;MAXPRI=subqueuename]  
  
  [;LQATTR=localattribute]  
  
  [;VS=volset:SPAN]
```

PARAMETERS

acctname Name to be assigned to the new account. This name must contain from one to eight alphanumeric characters, beginning with an alphabetic character.

mgrname Name of the Account Manager. This is always the first user created under the account. The manager receives the following attributes:

- User Password None.
- Capability List Same as the account capability list.
- Scheduling Priority Same as the account maximum priority.
- Local Attribute Same as account local attributes.
- Home Group PUB

The attributes of an Account Manager may be changed with the :ALTUSER command after *mgrname* is defined. In no case, however, is this user granted attributes greater than those assigned the account.

password Account password, used for verifying logon access only. This password must contain from one to eight alphanumeric characters beginning with an alphabetic character. Default is that no password is assigned.

filespace Disc storage limit, in sectors, for the permanent files of the account. The maximum value you may define is 2,147,483,647 sectors. Default is unlimited file space.

cpu Limit on total CPU time, in seconds, for this account. This limit is checked only when a job or session is initiated, thus, the limit never causes the job or session to abort. The maximum value you may define with :NEWACCT is 2,147,483,647 seconds. Default is that no limit is assigned.

connect Limit on total session connect time, in minutes, allowed the account. This limit is checked at log on, and when the job or session initiates a new process. The maximum value you may define is 2,147,483,647 minutes. Default is that no limit is assigned.

capabilitylist List of capabilities, separated by commas, permitted this account. Each capability is denoted by a two-letter mnemonic, as follows.

System Manager	=	SM
Account Manager	=	AM
Account Librarian	=	AL
Group Librarian	=	GL
Diagnostician	=	DI
System Supervisor	=	OP
Network Administrator	=	NA
Node Manager	=	NM
Permanent Files	=	SF
Access to non-sharable I/O devices	=	ND
Use Volumes	=	UV
Create Volumes	=	CV
Use Communications Subsystem	=	CS
Programmatic Sessions	=	PS
User Logging	=	LG
Process Handling	=	PH
Extra Data Segments	=	DS
Multiple RINS	=	MR
Privileged Mode	=	PM
Interactive Access	=	IA
Local Batch Access	=	BA

Default is AM,AL,GL,SF,ND,IA,BA. Note that CV automatically gives the account UV capability.

fileaccess

File access restrictions assigned the account. Default is R,A,L,W,X:AC.

```
{R}
{L}
({A}{, ...}: {ANY} |{; ...})
{W}
{X}
```

where R, L, A, W, and/or X specify modes of access by types of users (ANY and/or AC) as follows:

- R = Read
- L = Lock (allows exclusive access to file)
- A = Append (implicitly specifies L also)
- W = Write (implicitly specifies A and L also)
- X = Execute

The user types are specified as follows.

- ANY = Any user
- AC = Member of this account only

The default is no security restrictions at the account level. Two or more modes may be specified if they are separated by commas. Both user types may be specified if they are separated by commas.

subqueue name

The name of the subqueue of highest priority that can be requested by any process of any job/session in the account. This parameter is specified as AS, BS, CS, DS, or ES.

CAUTION

Processes capable of executing in the AS or BS subqueues can deadlock the system. Assigning non-priority system and user processes to these subqueues can prevent critical processes from executing. Exercise extreme caution when assigning processes to these subqueues.

localattribute

The local attribute of the account, as defined at the installation site. This is a double-word bit map used to further classify accounts. When it is not part of standard MPE security provisions, programmers may define local attributes (which will be checked by the WHO intrinsic) to enhance their software's security. Default is double-word 0.

volset

The volume set or class reference which, when fully qualified, is in the form *vcid.groupname.acctname*, where *vcid* refers to a previously defined volume set or class.

SPAN

Specifies that the *accountname* is to be inserted in the accounting directory of the specified volume set (*volset*). The specified volume set must have been physically mounted previously for the SPAN operation to succeed.

The associated Account Manager and PUB group are not created in the accounting directory of the specified volume set.

Once the account has been spanned to the volume set, it does not need to be spanned again (i.e., the *volset* parameter is not necessary) on another system which shares the volume set under the same account name.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		SM

OPERATION

The `:NEWACCT` command may only be executed by the System Manager, since he or she is solely responsible for establishing the accounting structure best suited to the computer installation.

When a keyword is specified, but its corresponding parameter is omitted (as in `;PASS=`), the default values for that keyword is assigned. The default is also assigned when an entire keyword parameter group (such as `;PASS=password`) is omitted.

After the System Manager creates an account and its PUB group, and designated the Account Manager for that account, the new Account Manager may log on and redefine his or her own attributes and those of the PUB group. The Account Manager also defines new users and groups. However, the capabilities and attributes the Account Manager assigns to groups and users cannot exceed those assigned to the account itself by the System Manager. For example, if the System Manager did not assign the account DS capability, no users in the account are permitted DS capability (which prohibits them from using extra data segments).

The PUB Group is initially assigned no password and the same capability-class attributes, permanent file space limit, CPU limit, and connect time limit as the account. Its initial security allows READ and EXECUTE access to all users who successfully log onto the account, and APPEND, LOCK, and SAVE access to Account Librarian (AL) and group users (GU) only. These access provisions are (R,X:ANY;A,W,L,S:AL,GU).

EXAMPLE

To create an account with the account name `ACI`, and the Account Manager name `MNGR`, with all other parameters assigned by default, enter:

```
:NEWACCT ACI,MNGR
```


:NEWGROUP

Creates a new group within an account.

SYNTAX

```
:NEWGROUP groupname  
  
  [;PASS=[password]]  
  
  [;FILES=[filespace]]  
  
  [;CPU=[cpu]]  
  
  [;CONNECT=[connect]]  
  
  [;CAP=[capabilitylist]]  
  
  [;ACCESS=[fileaccess]]  
  
  [;VS=[volset[:SPAN]]]
```

PARAMETERS

groupname The name of the new group, composed of up to eight alphanumeric characters, beginning with a letter.

password Group password, used for verifying logon access only. Default is that no password is assigned.

capabilitylist A list of capability-class attributes, consisting of any or all of the following: IA, BA, PM, MR, DS, or PH, where:

Process Handling	=	PH
Extra Data Segments	=	DS
Multiple RINS	=	MR
Privileged Mode	=	PM
Interactive Access	=	IA
Local Batch Access	=	BA

This list imposes a limit on program files belonging to the group. A capability cannot be assigned to the group if it has not been defined for the account in which the group resides. Default is IA, BA.

filespace Disc storage limit, in sectors, for the permanent files of the group. You cannot specify a *filespace* for a group that is greater than the limits currently defined for the group's account. If an account's *filespace* is changed later, group limits are automatically changed. Default is a storage limit equivalent to the account's *filespace*.

cpu Limit on total CPU time, in seconds, for the group. This limit is checked when a job or session logs on, and never causes a job or session to abort.

The maximum value you may define with this command is 2,147,483,647 seconds. You cannot specify a group's CPU limit that exceeds the limit defined for the account. If an account CPU limit is changed later, the groups' limits will be changed automatically. Default is the account CPU limit.

connect

Limit on total session connect time, in minutes, allowed the group. This limit is checked at logon, and when the job or session initiates a new process. The maximum value you may define is 2,147,483,647 minutes, and it cannot exceed the limit defined for the account. If the account connect is later changed, the group connect time is automatically changed. Default is the account connect limit.

fileaccess

The restriction on file access pertinent to this group. Default is R,X:ANY;A,W,L,S:AL,GU for the Public Group (PUB); and R,A,W,L,X,S:GU for all other groups.

{R}	{ANY}
{L}	{AC }
{A} [,...]:	{GU } [,...]
{W}	{AL }
{X}	{GL }
	{CR }

AL, GL, CR) as follows:

- R = Read
- L = Lock (exclusive file access)
- A = Append (implies L)
- W = Write (implies A and L)
- X = Execute
- S = Save

The user types are specified as follows:

- ANY = Any user
- AC = Member of this account only
- GU = Member of this group only
- AL = Account librarian user only
- GL = Group librarian user only
- CR = Creating user only

Two or more user or access types may be specified if they are separated by commas.

volset

The volume set or class reference which, when fully qualified, is in the form *vcid.groupname.accountname*, where *vcid* refers to a previously defined volume set or class.

SPAN

The SPAN option specifies that *groupname* is to be inserted in the accounting directory of the specified volume set (*volset*). The specified volume set must have been previously mounted physically for the SPAN operation to succeed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

The Account Manager uses the `:NEWGROUP` command to create groups within his or her account and assign attributes to each. The attributes assigned to the group may not exceed those permitted the account itself (defined when the System Manager created the account.) Within account limits, however, the Account Manager may redefine his or her own attributes and capabilities, as well as those of the PUB group.

The PUB group is initially assigned no password and the same capability-class attributes, permanent file space limit, and CPU time limit as the account. Its initial security grants READ (R) and EXECUTE (X) access to all users (ANY) who successfully log onto the account. APPEND (A), WRITE (W), LOCK (L), and SAVE (S) access is assigned to the Account Librarian (AL) and group users (GU) only.

When a keyword parameter (such as `;PASS=`) or keyword parameter group (such as `;PASS=password`) is omitted from the `:NEWGROUP` command, the default value corresponding to that parameter takes effect.

EXAMPLE

To create a new group named GROUP1 which will be assigned all default capabilities, enter:

```
:NEWGROUP GROUP1
```

:NEWUSER

Defines a new user.

SYNTAX

```
:NEWUSER username  
  
    [;PASS=[password]]  
  
    [;CAP=[capabilitylist]]  
  
    [;MAXPRI=[subqueue]]  
  
    [;LOCATTR=[localattribute]]  
  
    [;HOME=[homegroupname]]
```

PARAMETERS

- username* The name of the user. The name must be composed of up to eight alphanumeric characters, beginning with an alphabetic character.
- password* User password, used for verifying logon access only. The password must be composed of up to eight alphanumeric characters, beginning with an alphabetic character. Default is that no password is assigned.
- capabilitylist* List of capabilities, separated by commas, permitted this account. Each capability is denoted by a two-letter mnemonic, as follows:

System Manager	=	SM
Account Manager	=	AM
Account Librarian	=	AL
Group Librarian	=	GL
Diagnostician	=	DI
System Supervisor	=	QP
Network Administrator	=	NA
Node Manager	=	NM
Permanent Files	=	SF
Access to nonsharable		
I/O devices	=	ND
Use Volumes	=	UV
Create Volumes	=	CV
Use Communications		
Subsystems	=	CS
Programmatic Sessions	=	PS
User Logging	=	LG
Process Handling	=	PH
Extra Data Segments	=	DS
Multiple RINs	=	MR
Privileged Mode	=	PM
Interactive Access	=	IA
Local Batch Access	=	BA

Capabilities assigned to the user with the ;CAP= parameter cannot exceed those assigned the account. If the account's capabilities are altered, any capabilities removed from the account are also removed from the user. The user's capabilities are always verified to be a subset of the account's at log on, which prevents a user from being granted a capability not assigned the account. Note that CV capability, which allows users to define Private Volumes, also gives the user UV capability, so that they may use private volumes. Default is IA, BA, ND, SF.

subqueue name

The name of the highest-priority subqueue that any job or session in the account can request for executing processes. The *subqueue name* may be either AS, BS, CS, DS, or ES. The priority specified for the user in :NEWUSER cannot be greater than that specified for the account.

The *subqueue name* defined for the user is checked against the *subqueue name* defined for his account at logon, and the lower priority of the two is used as the maximum priority restricting all processes of the job/session. Also, the priority requested by the user at logon is checked against the *subqueue name* defined for that user, and the lower of these two values is granted. Default is CS.

CAUTION

Processes capable of executing in the AS or BS subqueues can deadlock the system. Assigning non-priority system and user processes to these subqueues can prevent the execution of critical system processes. Exercise extreme caution in assigning processes to these subqueues.

local attribute

The local attribute of the user, as defined at the installation site. This is a double-word bit map of arbitrary meaning which might be used to further classify users. While it is not involved in standard MPE security provisions, it is available to processes through the WHO intrinsic for use in the programmer's own security provisions. The :NEWUSER command checks the local attributes of the user with those of the account. Default is double-word 0 (null).

home group name

The name of an existing group to be assigned as the user's home group. If none is assigned, the user must always specify a group when logging on. Default is that no home group is assigned.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

The Account Manager uses the :NEWUSER command to define an account member. When the user is defined, the Account Manager may also assign the user a password, capabilities, and limit the user's use of system resources. Parameters defining these values may also be omitted from the command line; in this case, the defaults will be assigned the user.

EXAMPLE

To define a new user named LHSMITH, assign a password of SMITTY, and a homegroup of HOME GPX, enter:

```
:NEWUSER LHSMITH;PASS=SMITTY;HOME=HOME GPX
```

:NEWVSET

Defines private volume sets and classes.

SYNTAX

```
:NEWVSET vsname;MEMBERS=vname:type [,vname:type...]  
[;CLASS=vname:vname [,vname,...]]
```

PARAMETERS

vsname Volume set name, consisting of from one to eight alphanumeric characters, beginning with an alphabetic character. This name is also given to the master volume of the set. MPE references *vsname* as *vsname.groupname.acctname*, where *groupname* and *acctname* are the logon group and account.

vname:type Names of members of the volume set and the types of devices on which the members will reside. A maximum of eight volume names can be specified. The list of volume names must include the master volume set name. The type of disc to accommodate the volume must be specified with each *vsname*. The *type* can be HP 7902A, HP 7905, HP 7906, HP 7911, HP 7912, HP 7914, HP 7920, HP 7925, HP 7933, HP 7935, HP 7945, or HP 9895.

vname:vname Volume class name, consisting of up to eight alphanumeric characters, beginning with an alphabetic character. Each volume class consists of a volume class name and an associated list of volume names (*vname*). The list of volume names must be a subset of the volumes comprising the volume set, and one of the volume names must be that of the set's master volume.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required:		CV

OPERATION

The `:NEWVSET` command defines private volume sets and classes, making known to MPE the members of the volume set and the corresponding storage types. Once a volume set or volume class is defined, its definition is kept on disc in a volume set definition entry. A physical volume set is not created at the time the volume set is defined.

EXAMPLE

To define a volume set with *vname* `USERSET`; with members `USERSET` (master volume, and `MEM2`, of *type* `HP7920`; and class (*vname:vname*) `CLASS1:USERSET,MEM2`, enter:

```
:NEWVSET USERSET;MEMBERS=USERSET:HP7920,MEM2:HP7920; CLASS=CLASS1:USERSET,MEM2
```


:OPENQ

Opens the spool queue for a specified logical device or device class. This command is supported by the G.00.00 release and subsequent versions of MPE.

SYNTAX

```
:OPENQ {ldev }  
      {devclass}
```

PARAMETERS

ldev The logical device number of the spooled device.

devclass The device class name of the spooled device; *devclass* must begin with a letter and consist of eight or fewer alphanumeric characters.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

:OPENQ enables the Operator to control the spool queue of a specified device or device class without affecting the operation of the spooler process. It also allows access to spool queues for which no spooler or physical device exists.

Since spool files can be created faster than they are processed, you may want to issue a :SHUTQ command to clear the backlog of files in the queue, and then re-open it with an :OPENQ command when the queue is clear.

:OPENQ also exists as an option to the :STOPSPPOOL command. It, and the :SHUTQ command, are documented in this section.

EXAMPLE

To open the spool queue for logical device 6, enter:

```
:OPENQ 6
```

:OUTFENCE

Defines the minimum priority an output spool file needs in order to be printed.

SYNTAX

```
:OUTFENCE outputpriority [ ;LDEV=ldev ]
```

PARAMETERS

outputpriority A number between 1 and 14, inclusive. A larger number is more limiting.

ldev The logical device number of an output device.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

:OUTFENCE controls the processing of all output spool files by establishing a numerical limit, or "fence" that, along with each spool file's *outputpriority*, determines whether a file will be printed or deferred. Individual spool files which are READY will be printed only if their *outputpriority* is higher than the current outfence. To prevent any spool files from being printed, set the outfence to 14. To defer a subset of spool files, set the outfence higher than the *outputpriority* of any spool file in the group.

You may wish to alter the printing priority of a single file without affecting the entire system. If this is the case, change the *outputpriority* of the specific spool file with the :ALTSPoolFILE command. (Refer to discussion of :ALTSPoolFILE in this section.)

EXAMPLES

To defer all output spool files except those waiting to be printed by *ldev 6* (the system line printer), set the global outfence to 14 and the outfence of *ldev 6* to 7, as shown below.

```
:OUTFENCE 14  
:OUTFENCE 7;LDEV=6
```

To display the new global *outputpriority* and the *outputpriority* of logical device 6, execute the `:SHOWOUT` command, as in the example below. Note that the summary statistics at the bottom of the listing will immediately reflect the new `OUTFENCE`, but individual entries for each output spool file may not. Once the currently ACTIVE spool file is finished, however, no files directed towards a device other than *ldev 6* will become ACTIVE.

```
:SHOWOUT
```

DEV/CL	DFID	JOBNUM	FNAME	STATE	FRM	SPACE	RANK	PRI	#C
6	#0999	#J19	\$STDLIST	OPENED		512		8	1
6	#01030	#S77	EDLIST	OPENED		512		8	1
SLOWLP	#01029	#S71	OUT	READY		232	1	7	1
20	#01001	#S60	\$STDLIST	OPENED					
11	#01022	#S33	GALLIST	ACTIVE		768	1	7	1

```
11 FILES:
```

```
  1 ACTIVE  
  1 READY; INCLUDING 1 SPOOFLES, 0 DEFERRED  
  9 OPENED; INCLUDING 2 SPOOFLES  
  0 LOCKED; INCLUDING 0 SPOOFLES  
  4 SPOOFLES:  2024 SECTORS  
OUTFENCE = 14  
OUTFENCE = 7   FOR LDEV 6
```

To reset the outfence for all output spool files, enter:

```
:OUTFENCE 4
```

:PARTBACKUP

Performs a backup of MPE (G.01.00 release) and all files that have been modified since the last full backup.

SYNTAX

```
:PARTBACKUP [dumtape][,auxlistfile]
```

PARAMETERS

dumtape Specifies the magnetic tape destination for the backup. If specified, this must be a back reference to a previous :FILE command or file equates to the formal designator DUMPTAPE. The default is TAPE. If there is no device class TAPE, the device class CTAPE will be used.

auxlistfile File designator of the output file (device) to which all listings requested during the execution of the backup process are written. The default is \$STDLIST.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?	YES (Suspends)	
Capability Required	OP	

OPERATION

This command starts the backup process and copies MPE and all files that have been modified since the last full backup. :PARTBACKUP and :FULLBACKUP are provided as alternatives to going through the :SYSDUMP dialogue. The only user interaction required with these commands is to mount tapes or serial discs and reply to mount requests; even these replies are unnecessary if the devices are configured as auto-reply.

EXAMPLE

In the following example the first :FILE command specifies that DUMP is a magnetic tape file; the second :FILE command defines LIST as a line printer. The TAPE and LP parameters are device class names arbitrarily defined during the previous system configuration.

```
:FILE DUMP;DEV=TAPE
:FILE LIST;DEV=LP
:PARTBACKUP *DUMP,*LIST
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMP" ON TAPE (NUM)?
```

In the following example, if a file equation with the formal file designator of DUMPTAPE was previously entered (e.g., :FILE DUMPTAPE;DEV=SYSTAPE) then the user may omit the first parameter and the backup will go to the device class SYSTAPE.

```
:PARTBACKUP,*LIST
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMPTAPE" ON SYSTAPE (NUM)?
```

In the following example, if the dumptape is not specified and there is no file equation for DUMPTAPE, a temporary file equation (FILE DUMPTAPE;DEV=TAPE) will be used.

```
:PARTBACKUP
```

The following will be displayed at the Console:

```
?11:08/#S278/89/LDEV# FOR "DUMPTAPE" ON TAPE (LDEV)?
```

:PURGEACCT

Removes an account and its groups and users from either the system directory or from the specified volume set's directory.

SYNTAX

```
:PURGEACCT acctname [;VS=volset]
```

PARAMETERS

acctname Name of the account to be deleted. This name must contain from one to eight alphanumeric characters, beginning with an alphabetic character.

volset Volume set or volume class reference which, when fully qualified, is in the following form:

vcid.groupname.acctname

The *vcid* parameter refers to a previously defined volume set or volume class. When *volset* is specified, the volume set or volume class must be mounted, or the :PURGEACCT command will fail. When *volset* parameter is specified, the account will be removed from the volume set directory, and not the system directory.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		SM

OPERATION

The System Manager uses the :PURGEACCT command to eliminate an entire account from the system. When :PURGEACCT is executed during a session, MPE displays a verification request to ensure that the wrong account is not deleted accidentally. Respond "YES" or "NO" to the message:

ACCT *acctname* TO BE PURGED?

No verification message is printed when the :PURGEACCT is entered in a job.

The `:PURGEACCT` command removes every user not currently logged on and every group/file not in use. The order in which entries are purged is: users, volume set definitions, files, groups, and finally the account. If the command is executed while the account is in use, the account remains on the system, and any active users, groups, and files are not purged from the account. To completely purge an account, you must execute `:PURGEACCT` when the account is inactive.

CAUTION

The account `SYS` cannot be completely purged, but you can destroy critical files by attempting to do so. If you execute `:PURGEACCT SYS`, all groups except `PUB` will be purged, all users except the System Manager will be purged, and all inactive files and system files in the `PUB` group will be purged. **DO NOT ATTEMPT TO PURGE THE `SYS` ACCOUNT.**

EXAMPLE

To remove an account named `ACCT1`, enter:

```
:PURGEACCT ACCT1  
ACCT ACCT1 TO BE PURGED?YES
```

:PURGEGROUP

Removes a group (and all files belonging to it) from the system, or from the specified volume set directory.

SYNTAX

```
:PURGEGROUP groupname [;VS=volset]
```

PARAMETERS

groupname Name of the group in the logon account to be removed. This name must contain from one to eight alphanumeric characters, beginning with an alphabetic character.

volset Volume set or volume class reference which, when fully qualified, is in the form, *vcsid.groupname.acctname*, where *vcsid* refers to a previously defined volume set or volume class.

If *volset* is specified, the volume set or volume class must be mounted or the :PURGEGROUP command will fail. When the *volset* parameter is specified, the group will be removed from the volume set directory, and not the system directory.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

Account Managers use the :PURGEGROUP command to delete a group from their account. When the command is executed during a session, MPE displays a verification request. Respond YES or NO to the message:

GROUP *groupname* TO BE PURGED?

No verification message is printed if the :PURGEGROUP command is entered in a job.

If the group resides on a private volume, the command will succeed only if the group's home volume set is mounted.

The order in which entries are purged is: volume set definitions, files, and finally the group. If no files in the group are in use, and the group itself is not in use, the :PURGEGRDUP command will remove the entire group. Otherwise, only inactive files will be removed. To completely purge the group in this case, reenter the :PURGEGRDUP command when neither the group nor its files are in use.

CAUTION

The public group of the system account, PUB.SYS, cannot be completely purged. If you specify this group in the *groupname* parameter, all non-system and inactive files will be purged, which will seriously impair the proper functioning of the entire system. DO NOT ATTEMPT TO PURGE THE PUB GROUP OF THE SYS ACCOUNT.

EXAMPLE

To purge a group named GROUP1, enter:

```
:PURGEGRDUP GROUP1  
GROUP GROUP1 TO BE PURGED? YES
```

:PURGEUSER

Removes a user from an account.

SYNTAX

```
:PURGEUSER user
```

PARAMETERS

user Name of the user to be deleted.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		AM

OPERATION

Account Managers use the :PURGEUSER command to delete a user from their account. You are asked to verify the command only when it is executed during a session, and not from a job. To do so, respond "YES" or "NO" to the message:

```
USER user TO BE PURGED
```

An attempt to purge a user currently logged onto the system will fail, and an explanatory message will be displayed. This user will not be affected until the next logon. An attempt to purge MANAGER.SYS will always fail, since this user can never be purged.

If files created by a purged user remain after the user is purged from the system, the System Manager can remove them with the the :PURGEACCT command, or the Account Manager can eliminate them by executing :PURGEGROUP.

EXAMPLE

To remove a user named USER1 , enter:

```
:PURGEUSER USER1  
USER USER1 TO BE PURGED? YES
```

:PURGEVSET

Deletes an existing volume set.

SYNTAX

```
:PURGEVSET vsname
```

PARAMETERS

vsname Name of an existing volume set or volume class.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		CV

OPERATION

The :PURGEVSET command will not delete a volume set if it is currently in use; that is, if a mount, either explicit or implicit, has been issued. When you enter :PURGEVSET during a session, MPE displays the following verification message, to which you must respond "YES" or "NO".

```
VOLUME SET/CLASS DEFINITION vsname TO BE PURGED? (YES/NO)
```

EXAMPLE

To purge the volume set, USERSET, enter:

```
:PURGEVSET USERSET  
VOLUME SET/CLASS DEFINITION USERSET TO BE PURGED? (YES/NO) YES
```

:RECALL/=RECALL

Displays all pending Console REPLY messages.

SYNTAX

:RECALL

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* Any user may execute :RECALL. CONTROL A =RECALL may only be executed at the Console.

EXAMPLES

To display all pending System Console messages which require a :REPLY response, enter:

```
:RECALL  
REPLIES PENDING:  
10:05/#J19/15/LDEV # FOR "L00576" ON TAPE1600 (NUM)?
```

If there are replies pending, the text of the request(s) will be displayed on the Console as shown above. If there are no replies pending, the following message will appear on the Console:

```
:RECALL  
NO REPLIES PENDING (CIWARN 3020)
```

NOTE

The =RECALL command should be used in the event that the :RECALL command is ineffective, or when the Console is busy.

: REFUSE

Disallows jobs/sessions and/or data on a designated device.

SYNTAX

```
:REFUSE [JOBS,] [ldev]  
[DATA,]
```

PARAMETERS

JOBS Disallows the :JOB (or :HELLO) command from the designated device.

DATA Disallows the :DATA command from the designated device.

ldev The logical device number of the device for which :JOB (or HELLO) and :DATA commands are refused.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

:REFUSE prevents a device from automatically recognizing (and accepting) one or more of the three commands users execute to introduce jobs or sessions: :JOB, :HELLO, and :DATA. The JOBS parameter in the :REFUSE command refers to both jobs and sessions. If neither the JOBS or DATA parameter is supplied, both :JOB (or :HELLO) and :DATA commands are refused. To undo the effect of the :REFUSE command, use :ACCEPT.

EXAMPLES

To prevent logical device 35 from recognizing the :DATA command, enter:

```
:REFUSE DATA,35
```

To prevent both jobs and data recognition on logical device 35 enter:

```
:REFUSE 35
```

:REPLY/=REPLY

Replies to pending resource requests at the Console.

SYNTAX

```
:REPLY pin,reply
```

PARAMETERS

pin The Process Identification Number of the message sender. As part of the message requesting the REPLY, the *pin* always appears after the second slash mark ("/ "). In the following example, the *pin* is 43.

```
?16:15/#525/43/LDEV# FOR "T" ON TAPE (NUM)?
```

reply The reply type specified in parentheses in the message, defined by one of the following:

(NUM)	Reply must be a logical device number.
(Y/N)	Reply must be YES (or Y), or NO (or N).
(MAX CHARS. = <i>nn</i>)	Reply must be a string expression consisting of <i>nn</i> characters or less.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* :REPLY may be distributed to specific users with the :ALLOW or :ASSOCIATE commands.

OPERATION

User programs that have requested the use of a device and are waiting for your :REPLY remain suspended indefinitely, and cannot be aborted until :REPLY is issued. If for any reason you cannot reply as requested, such as the particular device is nonexistent or a special form is unavailable, then REPLY with "0" if type NUM is requested, and with "N" if type Y/N is requested. This returns an error code to the program and the :REPLY is aborted.

The reply will usually take the form "(NUM)" or "(Y/N)", since "(MAX CHARS.=nn)" is used only for labeled tapes.

If your reply is not of the type specified, the *pin* is incorrect, or the device you allocate is already allocated to someone else, the system displays the following error message:

NO REPLY OUTSTANDING FOR PROCESS

EXAMPLES

To reply to a message from the MPE system, enter:

10:05/#J19/15/LDEV# FOR "NAS" OF TAPE1600 (NUM)?
:REPLY 15,7

or

=REPLY 15,7

To reply to a FORMS message from the MPE system, enter:

15:46/#S93/22/FORMS: PLEASE MDUNT MAILING LABEL FORMS
?15:46/#S93/22/SP#12/LDEV# FOR #S93;OUTFILE ON LP (NUM)?

:REPLY 22,12
15:46/#S39/22/LDEV#12 FORMS ALIGNED OK (Y/N)?

:REPLY 22,NO
?15:48/#S93/22/LDEV#12 FORMS ALIGNED OK (Y/N)?

:REPLY 22,Y

When the next spool file becomes ACTIVE, you will be requested to mount the appropriate special or standard forms.

To reply to a standard forms request, enter:

16:00/#S95/22/STANDARD FORMS
?16:00/#S95/22/LDEV # FOR #S95;L ON LP (NUM)?

:REPLY 22,12

:REPORT

Displays accounting information for the logon account and group.

SYNTAX

```
:REPORT [groupset][,listfile][;VS=volset]
```

PARAMETERS

groupset

Specifies the accounts and groups for which information is to be listed. The permissible entries, some of which use "wildcard" characters, and their capability requirements (Account Manager (AM) and/or System Manager (SM)), are listed below.

<i>group</i>	Reports on the specified group in the logon account. This is the default for standard users, who may only specify their logon group.
@	Reports on all groups in the logon account. This is the default for Account Managers, but may be executed by users with AM or SM capability.
<i>group.acct</i>	Reports on the specified group in the specified account. This requires SM capability.
@.acct	Reports on all groups in the specified account. This requires AM capability (if it is the logon account) or SM capability for any account.
@.@	Reports on all groups in all accounts. This is the default for System Managers, and requires SM capability.
<i>group</i> .*	Reports on specified group in any account. This requires SM capability.

The characters @, #, and ? can be used as wild card characters, but will count toward the eight-character limit. These wild card characters have the following meanings.

@	Specifies zero or more alphanumeric characters and denotes all members of the set.
#	Specifies one numeric character.
?	Specifies one alphanumeric character.

The characters can be used as follows.

n@	Report on all groups starting with the character "n".
@n	Report on all groups ending with the character "n".

- n@x Report on all groups starting with the character "n" and ending with the character "x".
- n##...# Report on all groups starting with the character "n" followed by up to seven digits.
- ?n@ Report on all groups whose second character is "n".
- n? Report on all two-character groups starting with the character "n".
- ?n Report on all two-character groups ending with the character "n".

These characters, when placed appropriately in the *groupset* parameter, may also be used to report on accounts.

listfile

Actual file designator of output file to which information is to be written. The default is \$STDLIST, but output may be redirected with a :FILE equation as follows:

```
:FILE LIST1,DEV=LP
:REPORT, *LIST1
```

volset

Informs MPE to report accounting information for the specified volume set.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	YES (Aborts)	

OPERATION

The :REPORT command displays the total resource usage logged against accounts and groups, and the limits on those resources. For the standard user, data will be displayed for his or her own group only; an Account Manager may specify all groups in his or her account; the System Manager may specify any or all groups in any or all accounts.

The information includes usage counts and limits for permanent file space (in sectors), CPU time (in seconds), and session connect time (in minutes). The file space usage count reflects the number of sectors used at the time the :REPORT command is issued. CPU time and connect time usage, however, appear as they were immediately before the beginning of the current job.

EXAMPLE

To obtain accounting information for your group, enter the :REPORT command. Accounting information will be displayed similarly to REPORT of the SOPRM account shown below:

:REPORT @.SOPRM

ACCOUNT	FILESPLACE-SECTORS		CPU-SECONDS		CONNECT-MINUTES	
	COUNT	LIMIT	COUNT	LIMIT	COUNT	LIMIT
SOPRM	99004	**	99057	**	88407	**
/GLOSSARY	1068	**	542	**	656	**
/PUB	182	**	123	**	1155	**
/SECT1	180	**	85	**	429	**
/SECT10	11779	**	25271	**	9716	**
/SECT2	390	**	4123	**	5302	**
/SECT3	10675	**	8176	**	13116	**
/SECT4	2372	**	225	**	294	**
/SECT5	46579	**	27218	**	25744	**
/SECT6	6008	**	9324	**	6638	**
/SECT7	4748	**	8303	**	13263	**
/SECT8	1957	**	6348	**	3997	**
/SECT9	3195	**	4570	**	4213	**

:RESETACCT

Resets to zero the running counts of CPU time or connect time accumulated by an account, and all groups within that account.

SYNTAX

```
:RESETACCT [ [ @ ] [ CPU ] ] [ [ acct ] [ , [CONNECT] ] ]
```

PARAMETERS

- @** Specifies that the counters for all accounts, and all groups within the accounts, are to be reset. Default.
- acct** Specifies the name of a particular account, and all groups within the account, for which the CPU and connect time are to be reset. Default is @.
- CPU** Specifies that only the CPU usage counter is to be reset. Default is that both the CPU and connect time counters are reset.
- CONNECT** Specifies that only the connect time usage counter is to be reset. Default is that both the CPU and connect time counters are reset.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		SM

OPERATION

This command resets to zero the running counts of CPU or connect time accumulated by an account, and all groups within that account. If all parameters are omitted when you execute :RESETACCT, all counters (except File Space) for all groups in all accounts are reset.

EXAMPLE

To reset the CPU counter for all accounts in the system, enter:

```
:RESETACCT @,CPU
```

:RESTORE

Returns files that have been stored on magnetic tape or serial disc to the system. Several parameters are only supported on the G.00.00 release of MPE V. These parameters are noted by "(G.00.00)".

SYNTAX

```
:RESTORE [restorefile][;{fileset[-fileset][,fileset[-fileset]][,...]}]
      {!indirectfile}
      [;DEV=device]
      [;SHOW={showparm[,showparm[,...]]]
      [;FILES=maxfiles]
      [;{LOCAL }
      {GROUP=group }[;...]}
      {ACCT[oun]T=acct}[;...]}
      {GROUP }
      [;CREATE[={ACCT }[;...]]
      {CREATOR}
      [;CREATOR={user}]
      [;{KEEP }
      {NOKEEP}]
      [;{OLDDATE}
      {NEWDATE}]
      [;DNERR[or]={QUIT}
      {SKIP}]
```

PARAMETERS

restorefile

The name of magnetic tape or serial disc file which contains the files you want to restore to the system. If the device has been previously referenced in a file equation (with the :FILE command), it may be back-referenced by using an asterisk (*).

This is a required parameter for release E.00.00 and F.00.00 of MPE V. If you are using release G.00.00 of MPE V or later, and you choose not to specify *restorefile*, MPE will automatically designate TAPE as the source device, and assign it a default tape name equal to your logon identification.

fileset

Specifies the set(s) of files to be restored. The format of this parameter is:

filename[.*group*][.*acct*]

If you omit the group or account, MPE assumes the logon group and account. Default is @, which stores all files in the logon group.

You may use @, #, and ? as wildcard characters in the group, account, and file names included in the *fileset* parameter. Wildcard characters count toward the eight character limit and have the following meanings:

- @ Specifies one or more alphanumeric characters. When used by itself, @ denotes "all members of the set".
- # Specifies one numeric character.
- ? Specifies one alphanumeric character.

The characters can be used as follows:

- n@ Restores all items starting with the character "n".
- @n Restores all items ending with the character "n".
- n@x Restores all items starting with the character "n" and ending with the character "x".
- n##### Restores all items starting with the character "n" followed by seven digits.
- ?n@ Restores all items whose second character is "n".
- n? Restores all two-character items starting with the character "n".
- ?n Restores all two-character items ending with the character "n".

More than one *fileset* (and an associated *-fileset*) may be restored in a single execution of the command, within the following limitations: all files in up to 10 different accounts may be restored with a single :RESTORE command; files belonging to 15 different groups within the same account may be restored with a single :RESTORE command; and 20 different files within the same group and account may be restored with a single :RESTORE command.

-fileset
(G.00.00)

The name of a file set or sub-file set to be excluded from the :RESTORE procedure. "*fileset*" must be preceded by "-". It may only be specified once per *fileset* specified on the command line, and cannot be nested.

!indirectfile
(G.00.00)

The name of an ASCII file, preceded by an "!", containing :RESTORE parameters which you would otherwise enter directly on the command line. Each line of the *indirectfile* may contain *filesets* and keywords, and should duplicate the :RESTORE command syntax. This feature is useful when you frequently store the same files, or when the command input exceeds the 268-character limit imposed by MPE's command interpreter.

device

Specifies the destination of the stored files. You may name either the device class (*devclass*) or the logical device number (*ldev*). If *devclass* is specified, the file(s) will be restored to any device assigned that class name. If the logical device number (*ldev*) is specified, MPE will ;RESTORE the file(s) to the named device. In the latter case, the file's home volume must be currently mounted on the drive, or the file will not be restored. The default is that MPE attempts to restore the files on the same device class as specified in the file's label. If this fails, a second attempt is made to restore the file on a logical device compatible with the type/sub-type specified in the file's label. Should this fail, a third attempt is made to restore the file on any member of the volume set. If this fails, the file is not restored.

SHOW

Directs MPE to display the names of restored files. Default is a summary of the total number of all files restored and the total number of all files not restored. For those files not restored, the ;SHOW parameter also displays the file name(s) and the reason the file(s) were not restored. This listing is sent to job or session's standard list device (\$STDLIST, formal designator SYSLIST) unless the output is redirected to another device with the ;FILE command.

showparm
(G.00.00)

May be SHORT, LONG, DATES, SECURITY, or OFFLINE. You cannot specify both LONG and SHORT, but you may use more than one *showparm* if they are separated by commas. If neither SHORT nor LONG are selected, then the default is SHORT if \$STDLIST is less than 99 characters, and LONG otherwise.

SHORT

Displays the following information on the user's terminal (if executed from a session) for each file restored: file name, group name, account name, logical device number, reel numbers, file size (in sectors) and file code.

LONG

Displays the same information as SHORT, plus: record size, file type, EOF, file record limit, blocking factor, extents allocated and maximum extents of all files restored.

DATES

Causes SHOW to display the creation date, last access date, and last modification date of all files restored.

SECURITY

Causes SHOW to display the creator and file access matrix of all files restored.

OFFLINE

Prints information generated by the SHOW parameter on the system line printer as well as on the user's terminal. The output can be redirected to another output device by using a ;FILE command. (The formal file designator is OFFLINE.)

maxfiles

Maximum number of files on the tape. If you are restoring from a large tape or disc, such as a SYSDUMP tape, you must include this parameter or the file(s) will not be restored. The value of *maxfiles* should be at least as large as the maximum number of files on the device from which you are copying data. Default is 4000.

LOCAL,
group, or
acct
(G.00.00)

Restores files from different systems or directory structures. LOCAL restores all files to the user's creator identification, group, and account. To restore a file with the LOCAL option, the user must have READ access to the file on the tape. This is determined by checking the user's capabilities against the account, group and file securities of the tape file. Since the account and group may or may not exist in the directory, using :RESTORE with the LOCAL option requires SM capability to RESTORE from a nonexistent account or across an existing account. AM or SM capability is necessary to RESTORE from a nonexistent group of the logon account.

Entering *group* restores all files to the group identified by "*group*". Entering *acct* restores all files to the account identified by "*acct*".

GROUP, ACCOUNT, or
CREATOR
(G.00.00)

Builds groups, accounts, or creators which do not currently exist in the directory. If an entry is created, a message is sent to SYSLIST (default is \$STDLIST). GROUP creates the group specified in the file label and requires System Manager (SM) or Account Manager (AM) capability. ACCOUNT, which can be shortened to ACCT, creates the account specified in the file label and requires System Manager (SM) capability. CREATOR creates the creator specified in the file label and requires Account Manager (AM) capability. Default is that :RESTORE will create directory entries based on the user's capabilities.

CREATOR=
(G.00.00)

If the *user* parameter is not specified, the creator identification from the file label will be used. The creator must exist on the system or the file will not be restored.

user
(G.00.00)

All files will have their creator identifications changed to *user*. If it does not exist, the file will not be restored.

If "CREATOR=*user*" is omitted, the creator's identification is determined from one of the following sources:

1. The creator identification from the file label as it appears on the tape if that creator exists.
2. The user identification of the session performing the :RESTORE if the file is in the same account that the user is logged on to.
3. The string "RESTORE ". A blank must follow RESTORE.

KEEP or
NOKEEP
(G.00.00)

In cases where a tape file name duplicates an existing disc file name, you may choose whether or not the file to be restored from tape should replace the disc file. KEEP directs MPE to keep the disc file, and not restore the tape file. NOKEEP purges the file from disc and restores the file from tape unless it cannot be restored, in which case :RESTORE recovers the disc file. Default is NOKEEP on release G.00.00 of MPE V, but is not available on the E.00.00 and F.00.00 releases of MPE V.

NEWDATE or
(G.00.00)

MPE stores four dates in each file's file label: the creation date, modification date, last access date, and the allocation date. The allocation time is also stored in the label. NEWDATE, available on the G.00.00 release of MPE V, changes all dates and times to the date and time that :RESTORE was executed. OLDDATE retains the original modification and last access dates, but changes the creation and allocation dates to the date of the :RESTORE procedure.

OLDDATE

QUIT or SKIP
(G.00.00)

Directs :RESTORE to quit or continue when a tape error occurs. SKIP causes :RESTORE to do a file-skip-forward past the tape error, resynchronize, and begin reading again from the tape. One or more files may be lost during resynchronization. When QUIT is specified, :RESTORE will abort upon sensing a tape error. DNERRR can be shortened to DNERR. For unlabeled tapes, the default is SKIP, which cannot be used for labeled tapes. Default for labeled tapes is QUIT. These options are not available on the E.00.00 and F.00.00 releases of MPE V.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?	YES* (Aborts)	

* Note that if there is a reply pending, :RESTORE will enter a special BREAK mode in which only :REPLY, :RECALL, and :RESUME are allowed.

OPERATION

This command restores file(s) to the system which were previously stored offline using the :STORE or :SYSDUMP commands. When the :RESTORE command is issued, a message is generated on the System Console requesting the Operator to mount a tape or serial disc (specified with the *restorefile* parameter or by default) and allocate the device to the requesting user.

The :RESTORE command included in the G.00.00 release of MPE V resides in a program file (STORE.PUB.SYS). Since it is used by both the :STORE and :RESTORE commands, permanently loading STORE.PUB.SYS (with the :ALLOCATE command) will minimize program loading time and reduce the use of system resources.

Your capabilities determine which files you may restore. With one exception, the System Manager and System Supervisor may restore any file from a :STORE tape or serial disc, and Account Managers may restore any file in their logon account. The exception is files assigned a negative file code: these can only be restored by users with Privileged Mode (PM) capability.

Files stored on non-system domain discs cannot be restored unless the home volume set to which the file belongs is mounted in an available (i.e., on line) disc drive.

The G.00.00 release of MPE allows you to build groups, accounts, and creators which do not currently exist in the directory when you execute the :RESTORE command. This way, you may restore files to your system without first defining the account, group, and user with the :NEWACCT, :NEWGROUP, and :NEWUSER commands.

The System Manager and System Supervisor may restore lockword-protected files without specifying the lockword only when :RESTORE is executed during a session. Users without SM or OP capability must always supply the lockword. If the :RESTORE procedure is executed as a job, however, all users, regardless of capability, must supply file lockwords.

The :RESTORE command can be invoked by issuing ":RUN STORE.PUB.SYS". You may use the "INFO=" parameter of the :RUN command to specify the restore options, *filesets*, and keywords, so that no other user interaction is necessary. If the "INFO=" parameter is not specified, the "<--" prompt will appear. Acceptable responses are: a complete :STORE command, a complete :RESTORE command, an MPE command preceded by a colon (:), or :EXIT.

When the :RUN command is used, the system-defined JCW "CIERROR" will not reflect whether the :RESTORE procedure succeeded or failed. When you execute :RESTORE directly, however, you may check the CIERROR with the :SHOWJCW or :IF commands. If for any reason :RESTORE aborts, this value will be set to 1091.

The output generated by :RESTORE is sent to a file whose formal designator is SYSLIST. If a disc or directory error is encountered while updating the directory, updating the Disc Free Space Map, or while writing data to the disc file, the error is reported to SYSLIST, which defaults to \$STDLIST, and :RESTORE will continue.

EXAMPLE

To restore all files belonging to your logon group, enter:

```
:FILE T;DEV=TAPE  
:RESTORE *T;@;KEEP;SHOW
```

This will generate a mount request on the system console for the tape identified as "T". If a disc file on T already exists in the system, it will not be restored because the KEEP parameter was specified.

If you are using the G.00.00 release of MPE V you may restore file ABC without specifying a *restorefile*. For example:

```
:RESTORE;ABC.PUB.SYS;SHOW      ** Restores ABC.PUB.SYS. **  
STORE/RESTORE, VERSION 2      (C) 1981 HEWLETT-PACKARD CO.  
FRI, APR 13, 1984, 11:56 AM  
  
WILL RESTORE      1 FILES;  NUMBER OF FILES ON TAPE =      87  
  
FILENAME.GROUP   .ACCOUNT   LDN   ADDRESS REEL   SECTORS CODE  
ABC      .PUB      .SYS           2%00100217   2       4  
  
FILES RESTORED:      1  
FILES NOT RESTORED:  0  
:
```

If you are using release G.00.00 of MPE V, and you want to restore all files without specifying the *restorefile* parameter, a store or restore (S/R) warning is issued. It alerts you that all files, based on your capabilities, will be restored:

```
:RESTORE                ** Restores all files. **  
STORE/RESTORE, VERSION 2 (C) 1981 HEWLETT-PACKARD CO.  
FRI, APR 13, 1984, 11:39 AM
```

```
RESTORE
```

```
**** WARNING: AN 'EMPTY' FILESET WAS FOUND...BASED ON YOUR  
CAPABILITIES, '@.@.' WILL BE ASSUMED **** (S/R 6229)
```

To have the list of restored files printed on a line printer, enter:

```
:FILE SYSLIST;DEV=LP  
:FILE T;DEV=TAPE  
:RESTORE *T;@;SHOW
```

Release G.00.00 of the operating system also allows you to use the :RESTORE command to restore only a sub-set of the fileset. For example:

```
:RESTORE *T; @.@. -@.PUB.SYS      ** Restores all files except those in  
the PUB group of of the SYS account **
```

To use restore with the :RUN command, enter:

```
:RUN STORE.PUB.SYS; INFO="RESTORE *T;@.@.;SHOW"
```

ADDITIONAL DISCUSSION

Refer to the MPE V Commands Reference Manual (32033-90006).

:RESUMEJOB

Resumes a suspended job.

SYNTAX

```
:RESUMEJOB #Jmm
```

PARAMETERS

#Jmm A job number.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command, or if :JOBSECURITY is set LOW.

OPERATION

The System Operator uses the :RESUMEJOB command to direct MPE to resume the processing of a job suspended with the :BREAKJOB command. The job will continue execution from the point at which it was suspended; no message is issued.

EXAMPLE

To resume the processing of job 68 , enter:

```
:RESUMEJOB #J68
```

:RESUMELOG

Resumes system logging following suspension caused by an error.

SYNTAX

```
:RESUMELOG
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or from Console*

* unless distributed to users with the :ALLOW command.

OPERATION

When the Operator directs MPE to resume logging with :RESUMELOG, a special Log Record is displayed that denotes the number of log events and corresponding records that were not recorded while logging was suspended, the total number of unrecorded job initiation records, and the total number of unrecorded job/session termination records.

EXAMPLES

Assume the system is on line and running with logging enabled. An error of a recoverable type occurs, resulting in the following error message to the System Console:

```
ST/10:43/LOG FILE NUMBER 104 ERROR #46. LOGGING SUSPENDED
```

After the error is corrected, enter the :RESUMELOG command. A confirmation message will then appear at the System Console, as follows:

```
ST/10:45/LOGFILE NUMBER 104. LOGGING RESUMED.  
ST/10:45/LOG FILE NUMBER 104 ON.
```

ADDITIONAL DISCUSSION

Refer to the discussion of system logging in "MPE LOGGING FACILITIES" in Section V of this manual.

:RESUMESPOOL

Resumes suspended spooler output to a spooled device.

SYNTAX

```
:RESUMESPOOL ldev;BACK [nnn FILES]  
                [nnn PAGES]
```

```
:RESUMESPOOL ldev;FORWARD [nnn FILES]  
                [nnn PAGES]
```

```
:RESUMESPOOL ldev;BEGINNING
```

PARAMETERS

- ldev* The logical device number of a spooled device.
- BACK Instructs the spooler to backspace *nnn* files or *nnn* pages and resume printing at that point. (Refer to "OPERATION".)
- FORWARD Instructs the spooler to space forward *nnn* files or *nnn* pages and resume printing at that point. (Refer to "OPERATION".)
- BEGINNING Instructs the spooler to resume printing at the beginning of the file which had been previously suspended.
- nnn* The number of files or pages to which you wish to the spooler to backspace or space forward when printing resumes. (Must be an integer between 1 and 256, inclusive.)
- FILES or
PAGES Informs the spooler process which unit of measure to use when printing resumes. For the purposes of this command, FILE is defined as the text appearing between FOPEN intrinsic statements within the spool file. (Refer to "OPERATION".) Note that the use of the FILES parameter is not allowed on the HP 2680A page printer or an HP 2608S CIPER-protocol printer. PAGE is the literal page (usually 60 lines or skip to channel 1), as output by the spooler to the printer.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

If you specify only the *ldev* parameter, the printer will resume printing at the beginning of the highest-priority spool file. Otherwise, the printer will resume printing the previously ACTIVE spool file.

Always overestimate when using the BACK parameter or underestimate when using the FORWARD parameter, the number files or pages you need. This is the only way to assure that you get all the output you need, since partial pages and header pages affect the page count. However, if you instruct the spooler to go BACK further than the beginning of the file, MPE will display an error message on the System Console and printing will resume at the beginning of the file. Similarly, an error message is generated if you instruct the spooler to advance FORWARD beyond the point where files exist. In this case, printing will not resume until a new command is issued.

By using the SPOOK utility with mode control on, you can determine where each FOPEN intrinsic occurs within a spool file. This is useful, for example, when you are compiling, preparing, and running large programs and printing the entire output is unnecessary. For information about the SPOOK utility, refer to the MPE V System Utilities Reference Manual (32033-90008).

EXAMPLES

To resume output to logical device number 6 at the beginning of the file, enter:

```
:RESUMESPOOL 6;BEGINNING
```

To resume output to logical device number 6, and reprint the last two pages, enter:

```
:RESUMESPOOL 6;BACK 2 PAGES
```

To resume output to logical device number 6, and print the highest priority spool file, enter:

```
:RESUMESPOOL 6
```

:SETCATALOG

Directs MPE to search a catalog of user-defined commands and to establish a directory entry for each command in the file.

SYNTAX

```
:SETCATALOG [catfilename[,catfilename[,...]]][;SHOW]
                                     [;{SYSTEM }
                                     [;{ACCOUNT}]
                                     [;USER= user[.acct]]
```

PARAMETERS

- catfilename* UDC catalog file names. Normally, this file would be prepared using the EDIT/3000 subsystem or an equivalent. When more than one user-defined command resides in the catalog file, the commands must be separated from each other by one line, the first character of which must be an asterisk. If you omit this *catfilename*, all UDCs within the file will be reset at either the user, account, or system level.
- SHOW Lists catalog files and UDCs as the user-defined commands are initialized. This parameter is useful for listing additional information if there is an error in UDC initialization. SHOW lists each UDC as it is checked. If an error occurs, it is listed after the erroneous UDC.
- ACCOUNT Specifies that the catalog file being defined or reset is at the account level. Requires AM capability. Default is user level.
- SYSTEM Specifies that the catalog file being defined or reset is at the system level. Requires SM capability. Default is user level.
- USER= Specifies a particular user whose catalog file will be defined or reset. Requires AM capability
- user*[.*acct*] The user name.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	NO
Breakable?		NO

OPERATION

The `:SETCATALOG` command directs MPE to search a specially prepared disc file for user-defined commands and establish a directory entry for each. A user must have `READ` and `LOCK` access to the UDC file in order to use the `:SETCATALOG` command and to log on while that UDC file is in effect. Therefore, for account and system level UDCs, the account and group file security under which the files reside must allow `READ` and `LOCK` access to all users.

Entering `:SETCATALOG` with no parameters deactivates all UDC files at the specified level. The files are not purged, but merely deleted from the catalog. In order to purge or modify a particular UDC file, issue the `:SETCATALOG` command with a parameter list that does not include that UDC file name. Default is that user-level UDCs are deactivated. To deactivate system-level UDCs, use the `;SYSTEM` parameter. To deactivate account-level UDCs, use the `;ACCOUNT` parameter.

The type of UDC you create for users within a single account (if you are Account Manager) or all users on the system (as System Manager) should simplify tasks for the majority of users for whom they are intended. Tasks that are unique to one or only a few users can be incorporated into a user-level UDC file.

The `USER=` parameter permits account managers to assign or disable UDC catalogs for any user in their account; system managers can do the same for any user on the system.

EXAMPLES

Examples of common system- or account-level UDCs and how to create them, are shown below: In this example, "E" executes the `:EDITOR` command, and "S" executes the `:SHOWOUT SP` command, both of which will be useful for users who frequently use the computer to create, modify, and print text files.

```
:EDITOR
HP32291A.7.13 EDIT/3000 WED, FEB 2, 1983, 9:15AM
(C) HEWLETT-PACKARD CO. 1982

/ADD
  1 E                ** UDC name **
  2 EDITOR         ** MPE command **
  3 **              ** Separates UDCs **
  4 S              ** UDC name **
  5 SHOWOUT SP    ** MPE command **
  6 //

...
/KEEP NEWCMNDS
/E

END OF SUBSYSTEM
```

To establish a UDC directory entry for these two commands at the system level (which requires System Manager capability) enter:

:SETCATALOG NEWCMNDS;SYSTEM

If, as Account Manager, you want to establish directory entries in the UDC file for users within your own account enter:

:SETCATALOG NEWCMNDS;ACCOUNT

ADDITIONAL DISCUSSION

For a complete discussion of UDCs, refer to Section III of the MPE V Commands Reference Manual (32033-90006).



:SHOWALLOW

Displays which Operator commands have been allowed to users.

SYNTAX

```
          {user.acct}  
:SHOWALLOW [ {user.@  } ]  
           {@.acct  } ]  
           {@.@    } ]
```

PARAMETERS

user Defines a particular user.

acct Defines a particular account.

@ All users, if used in place of *user*, or all accounts, if substituted for *acct*.

Default is that the logged on user, account, and group is displayed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		YES

OPERATION

This command displays which Operator commands have been allowed to specific users if the *user.acct* form is entered. If the @.@ form is entered, the commands allowed to all users in all accounts are displayed. System Manager capability is required to specify @.@; Account Managers (AM capability) may specify all users in their own account. When :SHOWALLOW is executed from the system console, @ may be substituted for *user* and/or *acct*. In addition, :SHOWALLOW separately lists which Operator commands have been globally allowed.

EXAMPLE

To list the Operator commands allowed to the user MAC,PUB.SYS, enter:

```
:SHOWALLOW USER.SYS
#S1901 USER.SYS
:SHOWALLOW
#S86 MAC,USER.SYS
      USER HAS THE FOLLOWING COMMANDS ALLOWED:
ABORTIO          ACCEPT          DOWN          GIVE
THERE ARE NO GLOBAL ALLOWS DEFINED.
```

:SHOWCACHE

Displays a summary of disc caching performance. Disc caching software is not included in the Fundamental Operating Software, and must be purchased separately.

SYNTAX

```
:SHOWCACHE
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO

OPERATION

:SHOWCACHE summarizes the performance of disc caching on your system, displaying nine columns of information (shown below). Since it only allows you to look at disc caching performance, and prohibits the modification of caching parameters, any user may execute :SHOWCACHE.

```
:SHOWCACHE
```

DISC LDEV	CACHE REQUESTS	READ HIT%	WRITE HIT%	PROCESS READ%	PROCESS STOPS	K-BYTES	% OF MEMORY	CACHE DOMAINS
1	21529	93	85	82	1705	686	11	218
2	35093	77	59	69	6155	2760	45	675
Total	56622	83	65	74	7860	3446	57	893

62% of user I/Os eliminated.
Data overhead is 229K bytes.
Sequential fetch quantum is 96 sectors.
Random fetch quantum is 16 sectors.
Block on Write = NO.

Each column of information provides the following information:

DISC LDEV	Logical device number(s) of the disc(s) which is being cached. Read across the row to see the other entries on a per disc basis. The bottom row is a total across all discs.
CACHE REQUESTS	Tally of the number of logical disc I/O requests against caching. This is a double word counter, and will reset to zero automatically when caching is started on the disc or when the counter overflows.
READ HIT%	Cumulative percentage of logical disc I/O in the system for which the request was a read request, and the needed data was in a main memory cache domain when the read request occurred.
WRITE HIT%	Cumulative percentage of logical disc I/O in the system for which the request was a write request, and the needed data was a main memory cache domain when the write request occurred.
READ%	Percentage of logical disc I/Os in the system which were read requests.
PROCESS STOPS	Number of times a process was stopped in order for a cache I/O request to complete. Process Stops occur due to read misses, or due to write hits in which the cached region is currently being posted to disc. This is a double word counter which will reset to zero if it overflows.
K-BYTES	Count of the number of thousands of bytes (1024-byte groups) which are currently being used for main memory cache domains.
% OF MEMORY	Percentage of the total memory in the machine which is currently allocated for use by cache domains.
CACHE DOMAINS	Number of cache domains in memory.

In addition, the `:SHOWCACHE` command displays information about data overhead, which is the current dynamic data structure overhead used to support disc caching. The sequential fetch and random fetch quantum, established by default or selected with the `:CACHECONTROL` command, specify the number of sectors read from the disc for sequential and random access files respectively. `BLOCKONWRITE`, which is also set with the `:CACHECONTROL` command, determines whether or not MPE will block the process until posting of the cache buffers to disc is complete.

ADDITIONAL DISCUSSION

To change caching parameters, use the `:STARTCACHE`, `:STOPCACHE`, and `:CACHECONTROL` commands. Also, refer to the discussion of the `FSETMODE` intrinsic in the MPE V Intrinsic Reference Manual (32033-90007).

:SHOWCATALOG

Lists user-defined command (UDC) files.

SYNTAX

```
:SHOWCATALOG [listfile]  
              [user=targetuser]
```

PARAMETERS

listfile An arbitrary file name, used to identify the UDC file when the output of :SHOWCATALOG is sent to a printer or stored on disc. Default is that UDC files are displayed on your terminal (the \$STDLIST device).

targetuser Specifies a particular user whose UDC file names will be displayed on the screen or sent to a listfile; the contents of the files are not displayed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	NO
Breakable?	YES (Aborts)	

OPERATION

The :SHOWCATALOG command lists user-defined command (UDC) files. Unless the output is redirected to another device with the :FILE command as shown in "EXAMPLE", the listing appears on your terminal. It indicates at which level (user, account, or system) the files have been defined, so that you may display the current catalog before adding or deleting system-level UDCs (if you are the System Manager) or account-level UDCs (if you are Account Manager).

EXAMPLE

To list system-, account-, and user-level UDC files on your terminal enter:

```
:SHOWCATALOG
```

To store the current UDC file on disc as "LFILE" (which may also be printed) enter:

:BUILD LFILE
:FILE LFILE,OLD;DEV=DISC
:SHOWCATALOG *LFILE

ADDITIONAL DISCUSSION

Refer to the discussion of UDCs in Section III of the MPE V Commands Reference Manual (32033-90006)



:SHOWCOM

Displays status information about a communication device.

SYNTAX

```
:SHOWCOM ldev [ ;ERRORS ] [ ;RESET ]
```

PARAMETERS

- ldev* The logical device number of a communication system device.
- ERRORS A request for the full status list. If not specified, an abbreviated list is displayed.
- RESET A request to reset all status information to zero after it has been displayed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

The status information generated by this command can be used to determine communication line activity and quality. It includes:

- Number of messages sent and received.
- Last recoverable and irrecoverable errors.
- Number of recoverable and irrecoverable errors.
- Number of retransmissions, response timeouts, clear to send losses, and underruns.
- Number of check character (BCC/CRC) errors, receive timeouts, carrier losses, and overruns.
- Line state (closed, connected or disconnected).

Note that clear-to-send losses and carrier losses will only be valid for communication lines configured as full duplex.

When the line is OPEN, either connected or disconnected, the status information displayed is a duplicate of the statistics generated from the last opening of the line to the time when the :SHOWCOM command is invoked. When the line is CLOSED, the status information obtained at the close of the line reflects the statistics generated over the last open/close sequence.

EXAMPLES

To display the status of logical device 18, enter:

```
:SHOWCOM 18
```

```
                LDN - 18
MESSAGES SENT   0          MESSAGES RECVD 0
                LAST RECOVERABLE ERROR    0
                LAST IRRECOVERABLE ERROR   201
                LINE IS CLOSED
```

To display the full status of logical device 18, enter:

```
:SHOWCOM 18;ERRORS
```

```
    TRANSMIT                LDN - 18                RECEIVE
MESSAGES SENT              0          MESSAGES RECVD 0
RETRANSMISSIONS           0          BCC/CRC ERRORS 0
RESPONSE TIMEOUTS        0          RECV TIMEOUTS 0
UNDERRUNS                 0          OVERRUNS      0
CLR TO SEND LOSSES       0          CARRIER LOSSES 0
# OF RECOVERABLE ERRORS
LAST RECOVERABLE ERROR
# OF IRRECOVERABLE ERRORS
LAST IRRECOVERABLE ERROR
LINE IS CLOSED
```

NOTE

The "last irrecoverable" and "last recoverable" error codes are specified in the Communications Handbook (30000-90105).

:SHOWLOG

Displays the system current log file's number and the percentage of disc space used.

SYNTAX

```
:SHOWLOG
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or from Console*

* also may be distributed to users with the :ALLOW command.

OPERATION

The log file number, "xxxxxx", and percentage of file space used, "yy", is displayed in the format:

```
LOG FILE LOG xxxxxx IS yy% FULL
```

If the Logging System is disabled, MPE displays a "NO LOGGING" message. If logging is enabled but currently suspended due to an error, both messages appear.

EXAMPLE

To display the current log file status, enter:

```
:SHOWLOG
```

```
LOG FILE LOG2075 IS 20% FULL
```

ADDITIONAL DISCUSSION

Refer to the discussion of system logging in "MPE LOGGING FACILITIES" in Section V of this manual.

:SHOWQ

Displays process scheduling data and the contents of each subqueue.

SYNTAX

```
:SHOWQ
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	NO
Breakable?	YES (Aborts)	
Capability Required	OP	

OPERATION

Process scheduling and subqueue information is displayed in three major columns: "DORMANT", "WAITING", and "RUNNING". RUNNING processes currently require the CPU in order to continue, or will need it in the immediate future. CPU time is automatically allocated to the highest-priority process that is ready to run.

Processes listed in "DORMANT" and "WAITING" columns are waiting on longer-term events. DORMANT processes must wait a shorter amount of time than WAITING processes, for example, until a code segment moves into memory. WAITING processes wait for a longer event, such as an I/O completion. They will contend for the CPU once those events have occurred.

On occasion, a process will appear in more than one column. This indicates that the process was being moved to the right during the execution of :SHOWQ.

Below is a sample of the output listing produced by the :SHOWQ command. The symbols that appear (or may appear in such a listing) are explained in the remainder of the discussion.

DORMANT			WAITING			RUNNING		
Q	PIN	JOBNUM	Q	PIN	JOBNUM	Q	PIN	JOBNUM
L	1					C	M163	#S263
L	2					C	U215	#S256
L	3							
L	4							
D	U29	#J30						
C	M37	#S234						
C	M55	#S248						

Each entry in the three columns displays the following information for a single process:

```
{ L }
{ C } [ M ] pin [ #Jnnn ]
{ D } [ U ] pin [ #Snnn ]
{ E }
```

Where:

L	is a linearly scheduled process on the AS, BS, or master queue.
C	is a circularly scheduled process on the CS queue.
D	is a circularly scheduled process on the DS queue.
E	is a circularly scheduled process on the ES queue.
M	is a job main process.
U	is a user process.
<i>pin</i>	is the process identification number for this process.
J <i>mm</i>	is the process executing in a batch job.
S <i>mm</i>	is the process executing form a session.

Processes without an M or U label are system processes.

In addition to displaying the process queues, :SHOWQ prints the scheduling parameters currently in effect, and the minimum memory manager algorithm cycle value (*minclockcycle*).

```
CQ MINQUANTUM=0, MAXQUANTUM=300, BASEPRI=152, LIMITPRI=200
DQ MINQUANTUM=1000, MAXQUANTUM=1000, BASEPRI=202, LIMITPRI=238
EQ MINQUANTUM=1000, MAXQUANTUM=1000, BASEPRI=153, LIMITPRI=154
MINIMUM CLOCK CYCLE=1000
```

EXAMPLE

To display the queues of processes within MPE, enter:

```
:SHOWQ
```

In response, the system will display a listing of DORMANT, WAITING, and RUNNING processes similar to the sample explained in the preceding "OPERATION" section.

=SHUTDOWN

Initiates a shutdown of MPE.

SYNTAX

=SHUTDOWN

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	NO
Breakable?		NO
Capability Required		Executable Only at Console

OPERATION

The =SHUTDOWN command does an implicit =LOGOFF of all sessions, including the session logged at the system console. All system processes are stopped in an orderly fashion. This includes the completion of all pending system activity and any processing necessary to ensure that the integrity of all system tables and directories is maintained. Once these procedures are complete, "SHUT" is displayed on the console, the CPU halts, and console interrupt (A) is ineffective.

Device configuration changes which were made after the preceding load (:UP, :DOWN, :GIVE, :TAKE, :ACCEPT, :REFUSE and spooling commands) will not be retained. Configuration changes made during cold load are permanently recorded, and retained until the next tape cold load. Newly assigned or released global Resource Identification Numbers (RINs) are permanently recorded.

All communication lines must be closed before issuing a =SHUTDOWN command. Otherwise, a manual halt of the system may be necessary. Note that data will be lost if a transmission is in progress when the halt is performed. Also, if DSN/DS lines were left open before issuing the =SHUTDOWN, lines to the remote system will remain open and any remote sessions will be effectively "hung". In this case, the remote system's Operator may need to issue :ABORTIO commands for the hung sessions, and then abort the sessions themselves.

Spooled devices will stop operation immediately upon receiving a =SHUTDOWN command. A WARMSTART will keep spool files so that they may be printed when the system is returned on line.

EXAMPLES

To shut the system down, first issue a warning to all users, allow them time to log off, and then execute =SHUTDOWN as shown below:

```
:WARN @;SYSTEM WILL SHUT-DOWN IN FIVE MINUTES. PLS LOG OFF.
```

```
Ac
```

```
=SHUTDOWN
```

```
10:49/#540/25/LOGOFF
```

```
10:49/20/ALL JOBS LOGGED-OFF
```


:SHUTQ

Closes the spool queue for the specified logical device or device class. This command is available on the G.00.00 release and subsequent versions of the operating system.

SYNTAX

```
:SHUTQ {ldev }  
      {devclass}
```

PARAMETERS

ldev The logical device number of the spooled device.

devclass The device class name of the spooled device.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* also may be distributed to users with the :ALLOW command.

OPERATION

:SHUTQ closes the spool queue for a logical device or device class configured in the system. The spooler process, however, does not need to be running for the device. If the spooler process is running, the queue may be shut without affecting it.

This command also exists as an option to the :STARTSPOOL command, which is also documented in this section.

EXAMPLE

To shut the queue for device class LP, enter:

```
:SHUTQ LP
```

:STARTCACHE

Enables caching on a single disc. Disc caching software is not included with the Fundamental Operating Software, and must be purchased separately.

SYNTAX

```
:STARTCACHE ldev
```

PARAMETERS

ldev The logical device number of the disc to be used for caching.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or SM

OPERATION

The System Supervisor uses this command to enable caching on a single disc. When the system is first started, caching is disabled by default; each disc to be cached requires a separate invocation of the command.

EXAMPLE

To enable caching on *ldev 3*, enter:

```
:STARTCACHE 3  
CACHING STARTED ON LDEV 3.
```

NOTE

If caching is not installed, an error message will be displayed:

```
CIERR 4417 DISC CACHING NOT ENABLED ON  
THIS SYSTEM
```

:STARTSESS

Creates a session on the specified device, provided that the command's user has PS (Programmatic Sessions) capability. (G.01.00 release or later)

SYNTAX

```
:STARTSESS ldev[sessionname, user[/userpass] .acct[/acctpass]  
            [, group[/grouppass]]  
[;TERM={termtype}  
        {termname}]  
  
[;TIME=cpusecs ]  
  
        {BS}  
[;PRI={CS}  
        {DS}]  
        {ES}  
  
[{;INPRI=inputpriority  
  {;HIPRI          }]  
  
[;NOWAIT]
```

PARAMETERS

ldev

The logical device number of the target terminal. This terminal must be a real physical device and cannot be a virtual terminal or a DS pseudo terminal. The terminal must be configured as TYPE 16 and SUBTYPE 0 or 4.

NOTE

All required passwords must be specified in the command invocation; STARTSESS will not prompt either the caller or the *ldev* for passwords. A missing password, where one is required, will cause the command to fail.

sessionname

Arbitrary name used in conjunction with *user* and *acct* parameters to form a fully qualified session identity. The name must contain from one to eight alphanumeric characters, beginning with an alphabetic character. Default is that no session name is assigned.

user

User name, established by the Account Manager, that allows you to log on under this account. The name must contain from one to eight alphanumeric characters, beginning with an alphabetic character.

userpass

User password, optionally assigned by the Account Manager. The password must contain from one to eight alphanumeric characters, beginning with an alphabetic character.

acct Account name as established by the System Manager. The name must contain from one to eight alphanumeric characters, beginning with an alphabetic character. The *acct* parameter must be preceded by a period (.).

acctpass Account password, optionally assigned by the System Manager. The password must contain from one to eight alphanumeric characters, beginning with an alphabetic character. The *acctpass* must be preceded by a slash (/).

group Group name to be used for the local file domain and the CPU time charges as established by the Account Manager. The name must contain from one to eight alphanumeric characters, beginning with an alphabetic character. Default is the specified users home group if you are assigned one by the Account Manager. (Required if a home group is not assigned.)

grouppass Group password optionally assigned by the Account Manager. The password must contain from one to eight alphanumeric characters, beginning with an alphabetic character. The *grouppass* parameter is not needed when the log on is under the user's home group, but it is required if the password is assigned. The *grouppass* parameter must be preceded by a slash (/).

termtype or *termname* Determines terminal-type characteristics. The *termtype* parameter whose assigned value determines the type of terminal used for input. MPE uses this parameter to determine device-dependent characteristics such as delay factors for carriage returns. It must be a number from 0 to The default value for *termtype* is assigned by the System Supervisor during system configuration. This is a required parameter to ensure correct listings if your terminal is not the default *termtype*.

The *termname* parameter is the name of the file containing the desired terminal-type characteristics. The file cannot have a lockword or reside on a Private Volume.

Users of the Workstation Configurator are allowed to create terminal-type files. The proper and efficient operation of a specific device by a user-created terminal-type is the responsibility of the user. The Workstation Configurator utility allows the user to specify the following characteristics of your terminal: data flow control, block mode, read trigger, special characteristics, echo, line feed, parity, and printer control.

If group and/or account names are omitted, the proposed logon group and/or account name is substituted. For further information on the terminal-type characteristics, refer to the Communications Handbook (30000-90105) and the Workstation Configurator Reference Manual (30000-90001).

cpusecs Maximum CPU time that session can use, entered in seconds. When the limit is reached, session is aborted. It must be a value from 1 to 32767, but cannot exceed any limit imposed by the System or Account Manager. To specify no limit, enter a question mark (?), UNLIM, or omit the parameter. Default is no limit.

BS, CS, DS, or ES

The execution priority queue that the Command Interpreter uses for your session, and also the default priority for all programs executed within the session. BS is highest priority, ES is lowest. If you specify a priority that exceeds the highest permitted for your account or user name by the system, MPE assigns the highest priority possible below BS. DS and ES are intended primarily for batch jobs; their use for sessions is generally discouraged. Care should be use in assigning the BS queue because processes in this priority class may lock out other processes. For information on the guidelines for these priority queues, refer to the :TUNE command in this section. Default is CS.

inputpriority or
HIPRI

Determines the input priority of the job or session. The *inputpriority* option is the relative input priority used in checking against access restrictions imposed by the job fence. The *inputpriority* option takes effect at logon time and must be from 1 (lowest priority) to 13 (highest priority). If you supply a value less than or equal to current job fence set by System Operator, session is denied access. Default is 8.

The HIPRI option is used for two different purposes when logging on. It can be used to override the system job fence or it can be used to override the session limit. When using the HIPRI option to override the job fence, the system will first check to see if you have System Manager (SM) or System Operator (OP) capability. The user who has either of these capabilities, will be logged on and the INPRI will default to the system's job fence and execution limit. If you do not have either of these capabilities, the system will attempt to log you on using INPRI=13 and will succeed if the job fence is 12 or less, and the session limit is not exceeded. In attempting to override the session limit (to log on after the maximum number of sessions set by the operator has been reached), you can specify HIPRI, but in this case you must have either SM or OP capability. The system will not override the the session limit automatically. Use of the HIPRI option without SM or OP capability causes the following warning to be displayed:

MUST HAVE 'SM' OR 'OP' CAP. TO SPECIFY HIPRI,
MAXIMUM INPRI OF 13 IS USED (CIWARN 1460)

NOWAIT

Request that the session starts executing immediately without waiting for a RETURN on the terminal. If this parameter is specified and the target terminal is the System Console, System Manager (SM) capability is required.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required?		PS (Programmatic Sessions)

OPERATION

The MPE user employs this command to create a session at any terminal on the system. The effect will be the same as if a user had logged on at the target terminal.

NOTE

1. The target terminal must be available; no other user may be logged on, and the terminal must be turned on.
2. No speed sensing will be done for the target terminal, so it must be set at the configured baud rate.
3. When the session is created, nothing will be printed to the target terminal until its carriage return key is pressed unless NOWAIT was specified.

:STARTSPOOL

Initiates the spooler process for a device.

SYNTAX

```
:STARTSPOOL ldev [SHUTQ]
```

```
:STARTSPOOL devclass
```

PARAMETERS

- ldev* The logical device number of a spooled device. When the spooler gains control of the specified device, it controls spooling to it as well as to all device classes which reference the device.
- devclass* The device class specified in the I/O configuration. Only this device class becomes spooled; it will not affect other device classes or any devices in the class.
- SHUTQ The spooler will print files waiting in the queue for device *ldev*, but prevents the creation of new spoolfiles. The SHUTQ parameter is valid for *ldev* only.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console *	

* unless distributed to users with the :ALLOW or ASSOCIATE commands.

OPERATION

To start the spooling process for a specified device and any and all device classes associated with it, issue the :STARTSPOOL command with the *ldev* parameter. When *devclass* is used with :STARTSPOOL, only the specified device class will be controlled by the spooler. The logical device itself will not, unless a :STARTSPOOL has also been issued for the corresponding *ldev*.

The HP 2680A and HP 2688 Laser Printers operate only as a spooled device. If spooling is only enabled on the Laser Printer's *ldev*, and spooling stops as a result of an I/O error, no new spool files will be created. To avoid this, issue the `:STARTSPDOL` command twice for an HP 2680 Laser Printer: once for the *devclass* associated with the printer, and a second time for the *ldev* assigned to it.

NOTE

If the *ldev* referenced in a `:STARTSPDOL` command is an HP 2894 card reader/punch, the following message will be generated on the system console:

IS THIS AN INPUT OR OUTPUT SPOOLER
(IN/OUT)?

You must then enter the appropriate reply: "IN", if cards are to be read; "OUT", if cards are to be punched.

EXAMPLE

To start spooling all output to logical device 6 and all device classes that reference logical device 6, enter:

```
:STARTSPDOL 6
```

To start spooling all output to device class LP, enter:

```
:STARTSPDOL LP
```

To start spooling on logical device 6, and prevent the creation of any new spoolfiles, enter:

```
:STARTSPDOL 6;SHUTQ
```

ADDITIONAL DISCUSSION

Refer to the discussion of "SPOOLING" in Section IV of this manual.

:STOPCACHE

Disables caching on a single disc. Disc caching software is not included in the Fundamental Operating Software, and must be purchased separately.

SYNTAX

```
:STOPCACHE ldev
```

PARAMETERS

ldev The logical device number of the disc for which you intend to disable caching.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or SM

OPERATION

The System Supervisor uses this command to disable caching on a single disc. If your system uses more than one disc for caching, each *ldev* must be disabled with a separate invocation of :STOPCACHE.

EXAMPLE

To disable caching on *ldev* 3, enter:

```
:STOPCACHE 3
```

:STOPSPPOOL

Terminates spooling to a specified device or device class.

SYNTAX

<code>:STOPSPPOOL <i>ldev</i> [;<i>OPENQ</i>]</code>
<code>:STOPSPPOOL <i>devclass</i></code>

PARAMETERS

ldev The logical device number of a spooled device. The spooler process gives up ownership of the spooled device. If the *OPENQ* parameter is omitted, the device becomes available only for non-spoiled I/O. When a logical device is assigned to more than one device class, spooling may be restarted for a specific device class by issuing an explicit *:STARTSPPOOL* request for that class.

devclass The device class specified in system I/O configuration. Subsequent I/O directed to this device class will not take place to/from a spool file. I/O will go directly to/from a logical device if one is available within the device class. If none is available, the program will be unable to open the file.

OPENQ May be specified with the *ldev* parameter only. The spooler process will leave the queue *OPEN*, or will *OPEN* the queue if previously shut. Default is *SHUTQ*.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the *:ALLOW* or *:ASSOCIATE* commands.

OPERATION

You may use the `:STOPSPPOOL` command to stop spooling for a single logical device, or for all devices assigned a common device class. Using the *devclass* parameter in a `:STOPSPPOOL` command will shut the queue for that device class. When you specify *ldev*, however, you may either shut the spooling queue, or leave it open. Default is SHUTQ.

When spooling is stopped for a particular device without using OPENQ, that device is conversationally referred to as "hot", as in a "hot printer". In this case, one job has the device open exclusively, preventing other programs from accessing it.

EXAMPLES

To terminate spooling to logical device number 6 and cause the spooler process to relinquish control of that device, enter:

```
:STOPSPPOOL 6
```

Spooling will also terminate for any device class that references this device unless a `:STARTSPPOOL` has been issued for a specific device class.

To stop directing output for device class LP to a spool file (provided a `:STOPSPPOOL 6` has also been issued), enter:

```
:STOPSPPOOL LP
```

To terminate spooling on device 6 and leave the queue open, enter:

```
:STOPSPPOOL 6;OPENQ
```

ADDITIONAL DISCUSSION

Refer to the discussion of "SPOOLING" in Section IV of this manual.

:STORE

Stores disc files onto magnetic tape or serial disc in a manner that is recoverable by :RESTORE . Two parameters are only supported on the G.00.00 release of MPE. These parameters are noted by "(G.00.00)".

SYNTAX

```
:STORE [ {fileset[-fileset][,fileset[-fileset]][,...]} [;storefile]
        {!indirectfile}
        [;SHOW[=showparm[,showparm[,...]]]
        [;FILES=maxfiles]
        [;DATE[ {<=accdate}
               {>=moddate} ]
        [;ONERROR=[ {QUIT}
                   {REDO} ]
        [;PURGE]
        [;PROGRESS[=# minutes]]
```

PARAMETERS

fileset

A positional parameter which specifies the set(s) of files to be stored. Its format is:

filename[.group[.acct]]

You must have READ access to the files identified by *filename*. If you omit the group or account, MPE assumes the logon group and account. Default is @, which stores all files in the logon group.

You may use @, #, and ? as wildcard characters in the group, account, and file names included in the *fileset* parameter. Wildcard characters count toward the eight character limit, and have the following meanings:

- @ Specifies zero or more alphanumeric characters. When used by itself, @ denotes "all members of the set".
- # Specifies one numeric character.
- ? Specifies one alphanumeric character.

The characters can be used as follows:

- n@ Stores all items starting with the character "n".
- @n Stores all items ending with the character "n".

<code>n@x</code>	Stores all items starting with the character "n" and ending with the character "x".
<code>n#####</code>	Stores all items starting with the character "n" followed by seven digits.
<code>?n@</code>	Stores all items whose second character is "n".
<code>n?</code>	Stores all two-character items starting with the character "n".
<code>?n</code>	Stores all two-character items ending with the character "n".
<code>-fileset</code>	The name of a file set or sub-file set to be excluded from the :STORE procedure. "fileset" must be preceded by "-". It may only be specified once per fileset, and cannot be nested.
<code>!indirectfile</code>	The name of an ASCII file, preceded by an "!", containing :STORE parameters which you would otherwise enter directly on the command line. Each line of the indirectfile may contain filesets and keywords, and should duplicate the :STORE command syntax.
<code>storefile</code> (E/F.00.00)	The name of the tape or serial disc file to which the stored files will be written. This parameter is required for both the E.00.00 and F.00.00 release of MPE V. This storefile may be named in a :FILE command and backreferenced with an "*".
<code>storefile</code> (G.00.00) or later	If you are using the G.00.00 release of MPE V, you may omit storefile, in which case the :STORE command will supply your logon identification as the default tape name; the device will be "TAPE".
<code>SHOW</code>	Directs MPE to display the following information about each each file as it is stored: file name, group name, account name, logical device number, file size (in sectors) and file code. Error messages, if any, will also be displayed, so that you may elect to abort the :STORE procedure if a particular file is not stored due to its being "in use", a disc error, etc. If ;SHOW is omitted, the only information displayed is the names of the file(s) not stored, the number of file(s) stored, and the number of file(s) not stored. The information is sent to the \$STDLIST device (formal designator is SYSLIST), which is usually a terminal. You may, however, redirect the output to another device with a :FILE command.
<code>showparm</code>	May be SHORT, LONG, DATES, SECURITY, or OFFLINE. You cannot specify both LONG and SHORT, but you may use more than one showparm if they are separated by commas. If neither SHORT nor LONG are selected, then the default is SHORT if the record width of the output device is less than 99 characters, and LONG otherwise.
<code>SHORT</code>	Causes SHOW to display the file name, group name, account name, logical device number, sector address, reel number, and file size in sectors of all files stored.

LONG	Causes SHOW to display the same information as SHORT plus: record size, file type, end-of-file, file record limit, blocking factor, extents allocated and maximum extents of all files stored.
DATES	Causes SHOW to display the creation date, last access date and last modification date of all files stored.
SECURITY	Causes SHOW to display the creator and file access matrix of all files stored.
OFFLINE	Causes the output from the ;SHOW parameter to be sent to the system line printer as well as being displayed on the user's terminal. The line printer output can be redirected to another output device by using a :FILE command. (Formal designator is OFFLINE.)
<i>maxfiles</i>	Maximum number of files that may be stored. If more files than this maximum are found, :STORE will print an error message and quit. The absolute maximum number of files which may be stored is 32,767. Default is 4,000.
<= <i>accdate</i> or >= <i>moddate</i>	The <i>accdate</i> parameter stores only files not accessed since date specified. The <i>moddate</i> stores only files which have been modified on or after date specified. The date is expressed in the form <i>mm/dd/yy</i> . When no date is specified, files specified by the <i>filesets</i> will be stored.
QUIT or REDD	Directs :STORE to quit or continue when a tape error occurs. QUIT terminates the :STORE procedure; REDD closes the current tape reel, rewinds it, and marks it as bad. In the latter case, a message is displayed on the System Console informing the Operator that the current tape contains an error. Once the tape is rewound, a request for a new reel is generated on the Console. When it is mounted, :STORE begins copying at the point in the <i>fileset</i> list where the previous reel ended. REDD, which is the default option for unlabeled tapes, cannot be specified for labeled tapes. QUIT is the default for unlabeled tapes.
	You may shorten ONERROR to ONERR.
PURGE (G.00.00)	Directs :STORE to purge from the disc all files that were successfully stored. No files are purged until the entire :STORE procedure is complete. Files with a negative file code cannot be purged, regardless whether the user has Privileged Mode (PM) capability. Files that are not purged are noted by an error message; the specific text of the message varies with the type of error encountered.
PROGRESS (G.01.00)	Displays progress store message: STORE OPERATION IS ...% COMPLETE.
# <i>minutes</i> (G.01.00)	A positive number of minutes specifying the time interval when the progress messages are displayed. Default is one minute.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	YES
Breakable?		YES

OPERATION

The `:STORE` command copies one or more disc files onto magnetic tape or serial disc. It will store only those files whose home volume sets are mounted.

The System Manager and System Supervisor may store any file in the system. Account Managers may store any file in their account except files assigned a negative file code; these can only be stored by users with Privileged Mode (PM), OP, or SM capability.

Before executing `:STORE`, you may identify *storefile* as a magnetic tape or serial disc file with a `:FILE` command (referred to as a file equation). If you are using the G.00.00 release of MPE, and choose not to supply a *storefile*, then a default tape name, equal to your logon identification, will be used. For example, if the user is logged on as MAC.TECHPUES, then a tape request for "MAC" will be generated on the System Console.

The `:STORE` command can be invoked with the `:RUN` command. In this case you may use the "INFO=" parameter of the `:RUN` command to specify store options, *filesets*, and keywords. If no "INFO=" parameters are specified, a " <-- " prompt will appear. Acceptable responses are: a complete `:STORE` command, a complete `:RESTORE` command, an MPE command preceded by a colon, or `:EXIT`.

If `(BREAK)` is pressed during a store process, files will continue to be stored while you interact with the command interpreter. Both `:ABORT` and `:RESUME` are usable within `BREAK`.

All files that you intend to `:STORE` are locked when the command is executed. An individual file may be accessed once the `:STORE` for that file is complete, provided that `DNERR=QUIT`. Otherwise the files on a volume are unlocked at the end of each volume. Files currently being stored, or those for which the procedure is pending, will not be identified as "BUSY" when you execute the `:LISTF,1` command.

EXAMPLE

To copy all files from the group GP4X in your logon account, to a tape file named T, enter:

```
:FILE T;DEV=TAPE  
:STORE @.GP4X;*T;SHOW
```

The System Console will receive a request to mount the tape identified as T. A listing of the files stored will appear on your standard list device as each is stored. If a file is in use by the system, the file name will be displayed, along with the message "BUSY".

The following is a sample listing of the files stored:

```

FILENAME.GROUP .ACCOUNT LDN ADDRESS REEL SECTORS CODE
LABEL .MAC .TECHPUBS 3%01146363 1 257 FIG
MAIL .MAC .TECHPUBS 1%00120467 1 40
MANPLAN4.MAC .TECHPUBS 2%01546471 1 844 RASTR
MANPLAN5.MAC .TECHPUBS 3%01102561 1 544 RASTR
FILES STORED: 4
:

```

To store all files that have been modified on or after 1/30/84, with no error recovery, enter:

```
:STORE @.@.*T;DATE>=1/30/84;DNERRDR=QUIT
```

To store all files that are not in any PUB group, and show the information on the standard list device, enter:

```
:STORE @.@ - @.PUB.*T;SHOW
```

To store file ABC and show all possible information on both the line printer and \$STDLIST, enter:

```
:STORE ABC.GROUPX.TECHPUBS;*T;SHOW=LONG,DATES,SECURITY,OFFLINE
```

```

FILENAME.GROUP .ACCOUNT LDN ADDRESS REEL SECTORS CODE
ABC .GROUPX .TECHPUBS 3%00075371 1 610
(CR;ANY; A:ANY; W:ANY; L:ANY; X:ANY) RELEASED

```

```

SIZE TYP EOF LIMIT R/B #X/MX CREATED ACCESSED MODIFIED
88B FA 4 4 4 1/01 3/09/84 3/21/84 3/09/84

```

```

FILES STORED: 1
FILES NOT STORED: 0
:

```

To store using the specifications in the indirect file INDSTORE :

```
:STORE !INDSTORE;*T
```

where the file INDSTORE might contain:

```

@.PUB.SYS,@.@.TECHPUBS;FILES=32767
@.@.SUPPORT;SHOW=LONG,DATES

```


If you want to use the default tape name and you do not specify a *storefile* (which is optional for release G.00.00 of MPE), a store/restore (S/R) warning will appear alerting you that all files in the user's logon group and account (default) will be stored. Enter:

```
:STORE          ** Store all files in logon group. **

STORE/RESTORE, VERSION 2   (C) 1981  HEWLETT-PACKARD CO.
FRI, APR 13, 1984, 11:18 AM

STORE
^
**** WARNING: AN 'EMPTY' FILESET WAS FOUND... '@' ASSUMED ****
(S/R 6232)

FILES STORED:             87
FILES NOT STORED:        0
:
```

If you are using release G.00.00 of MPE, and you want to store files A, B, and C using the default tape name enter:

```
:STORE A,B,C          ** Stores files A, B, and C. **
```

To store files using the `:RUN` command, enter:

```
:RUN STORE.PUB.SYS

<--STORE ABC
STORE/RESTORE, VERSION 2   (C) 1981  HEWLETT-PACKARD CO.
MON, APR 16, 1984, 6:27 AM

FILES STORED:             1
FILES NOT STORED:        0
<--
```

You may use the `:RUN` command, passing information with the `;INFO` parameter:

```
:RUN STORE.PUB.SYS;INFO= "STORE @.@.*T;SHOW"
```

ADDITIONAL DISCUSSION

Refer to the MPE V Commands Reference Manual (32033-90006).

:STREAMS

Enables or disables the streams device, permitting users to submit job/data streams, or preventing them.

SYNTAX

```
:STREAMS {ldev}  
        {OFF }
```

PARAMETERS

ldev The logical device number of the STREAMS device. This device must also have an output device number or class which references logical devices of type 32. Any input device may be used providing that it was configured as job-accepting in the SYSDUMP dialogue.

OFF Disables the STREAMS facility.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

The Operator executes this command after a startup to enable the STREAMS facility. The :STREAMS device must be re-enabled each time the system is brought back on line to allow users "stream", jobs. (Streamed jobs are separately processed by MPE, allowing users to continue with other work at their terminal; or, if the streamed job is submitted on a tape drive rather than from a terminal, MPE will process it without requiring the user's attention.) Any attempt to stream a job when the :STREAMS facility is disabled generates the following message:

```
STREAM FACILITY NOT ENABLED: SEE OPERATOR. (CIERR 82)
```

The device normally configured as the streams device is *ldev* 10. However, *ldev* 10 may not correspond to an actual device, such as a tape drive or card reader, physically connected to the computer. If this is the case, then the STREAMS device is considered a "psuedo-device". Regardless whether the device physically exists or not, it must be entered into the I/O Configuration table as a legitimate logical device, and assigned the device class JOBTAPE.

EXAMPLES

To enable jobs and data streams on logical device number 10 , enter:

:STREAMS 10

To disable data streams, enter:

:STREAMS OFF

ADDITIONAL DISCUSSION

Refer to the discussion of jobs in Using Files (30000-90102); also, refer to the :STREAM command in the MPE V Commands Reference Manual (32033-90006).

:SUSPENDSPOOL

Suspends output to a spooled device.

SYNTAX

```
:SUSPENDSPOOL ldev [ ;FINISH ]
```

PARAMETERS

ldev The logical device number of a spooled device.

FINISH Directs the device to complete the ACTIVE spool file, then stop.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

When the spooler process is suspended, the message "SP# *ldev* SPOOLER SUSPENDED" is displayed on the console. You may also determine the spooler's status by entering ":SHOWOUT SP;JOB=@ ". If suspended, any spool files listed will be READY for printing; none will be ACTIVE, and a :SHOWDEV of the spooled device will indicate that it is still spooled. (Refer to :SHOWOUT in Section II of the MPE V Commands Reference Manual (32033-90006).)

When suspending an ACTIVE spool file, you should first take the output device off line. This allows you time to enter the command and determine that the ACTIVE file is the one being printed. If you issue :SUSPENDSPOOL without taking the device off line, that file may finish printing while you enter the command and another file may start.

When your instruction has been sent to the spooler process, MPE will return a colon prompt (:). The command will not be executed, however, until the output device is returned on line, at which point you will receive the "SPOOLER SUSPENDED" message.

EXAMPLES

To suspend printing on logical device 6 (the line printer), enter:

:SUSPENDSPOOL 6

To suspend printing on logical device 6 once the ACTIVE spool file is completely printed, enter:

:SUSPENDSPOOL 6;FINISH

:SWITCHLOG

Closes the current system log file, then creates and opens a new one.

SYNTAX

```
:SWITCHLOG
```

PARAMETERS

None.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		OP or from Console*

* also may be distributed to users with the :ALLOW command.

OPERATION

When the :SWITCHLOG command is executed, MPE displays the previous system log file number (*xxxxx*), the percentage of file space used (*yy*), and the current open log file (*zzzz*), as shown in the following example:

```
LOGFILE LOG xxxxx IS yy% FULL  
LOG FILE NUMBER zzzz ON
```

If logging is enabled but currently suspended, MPE displays the following message:

```
NO LOGGING  
LOG FILE xxxxx IS yy% FULL
```

NOTE

You should not :BUILD new log files, since MPE creates them automatically. If you do so, and then attempt to switch the current log file to the file just created, user logging will suspend in an error state, and the following message will be displayed:

LOG FILE NUMBER ~~xxxxxx~~ ERROR #100.
LOGGING SUSPENDED.

EXAMPLE

To switch logging to a new Log File, enter:

:SWITCHLOG

ADDITIONAL DISCUSSION

Refer to :RESUMELOG in this section and to the discussion of "MPE LOGGING FACILITIES" in Section V of this manual.

:SYSDUMP

Starts the Configurator dialogue, and copies system and user files to magnetic tape or serial disc to create a backup of your system and user files and configuration data.

SYNTAX

```
:SYSDUMP { $NULL }  
         { dumpfile } [ , auxlistfile ]
```

PARAMETERS

dumpfile The destination file of the modified or duplicate system, previously defined with the :FILE command. The *dumpfile* must back reference a magnetic tape or serial disc file.

\$NULL Allows the operator to step through the configuration dialogue and alter system parameters without actually changing the system.

auxlistfile File designator of the output file (device) to which all listings requested during the Configurator/User dialogue are written. The formal file designator used by the MPE SEGMENTER for this file (when it is invoked to add or replace SL segments) is SEGLIST. Default is \$STDLIST. May back reference a magnetic tape or serial disc file.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	NO
Breakable?	YES (Suspends)	
Capability Required	OP	

OPERATION

When the :SYSDUMP command is executed, you must direct MPE to write the output to a specific device. To do so, precede the :SYSDUMP command line with two file equations, and then back-reference these files by preceding the *dumpfile* parameter and the *auxlistfile* parameter with an asterisk ("*") on the :SYSDUMP command line. To associate *dumpfile* with a tape drive, for example, enter:

:FILE DUMP;DEV=TAPE

Similarly, to produce the output listing from the SYSDUMP command on a line printer, enter:

:FILE LIST;DEV=LP

In general, use the following format for the :FILE command.

:FILE *formal designator* [= *file reference*] ;DEV=*device* [;REC=*recsize* [DEN=*density*]]

Where:

- *device* is the device class name or *ldev* number of a tape drive or serial disc.
- *recsize* determines the size of the blocks on the store tape. Record size may be any multiple of 256 words, with a maximum record size of 8192 words for tape or serial discs.
- *density* specifies the tape density in characters-per-inch (CPI). This parameter is only used for variable-density tape drives. The values allowed for tape drives are: HP 7976A - 1600, 6250; HP 7974 - 800, 1600; HP 7978 - 1600, 6250.

Once you have designated the peripheral devices that *dumpfile* and *auxlistfile* refer to, issue the :SYSDUMP command, preceding each file name with an asterisk (*) to indicate a back reference to the definitions in the :FILE commands.

NOTE

To initiate the Configurator dialogue without copying data to tape, use the system-defined file \$NULL as the *dumpfile*. MPE will accept this file specification, and open the file as though it were a standard file, but will perform no corresponding write operation. :SYSDUMP \$NULL allows you to examine the current configuration, and even make "changes" to it, without affecting the system in any way. It will terminate with an error message, which you may ignore.

EXAMPLE

Enter :SYSDUMP to begin dialogue with the MPE Configurator. Once the dialogue is complete, configuration changes are copied to the "DUMP" file, and any listings requested during the dialogue are output to the file named LIST. In the example below, the first file equation directs the output of the :SYSDUMP command to a tape drive. The second file equation will send any listings generated during the Configuration dialogue to a line printer.

:FILE DUMP;DEV=TAPE
:FILE LIST;DEV=LP
:SYSDUMP*DUMP, *LIST

ADDITIONAL DISCUSSION

Refer to the discussion of "THE SYSDUMP COMMAND" in Section V of this manual. The complete SYSDUMP/INITIATOR dialogue is documented in Section VII.

:TAKE

Releases a device previously assigned to diagnostics so that it may be brought on line.

SYNTAX

```
:TAKE ldev
```

PARAMETERS

ldev The logical device number of the device taken from diagnostics.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

After a logical device has undergone diagnostic testing, the :TAKE command must be issued to release the device from diagnostic control. Only then can it be brought on line with the :UP command.

EXAMPLE

To take logical device number 35 from diagnostics and bring it back on line enter:

```
:TAKE 35  
:UP 35  
:SHOWDEV 35
```

```
LDEV  AVAIL  OWNERSHIP  VOLID  ASSOCIATION  
35  A  AVAIL  UP
```

:TUNE

Changes the filter and/or priority limits of circular subqueues; also changes the value of the memory manager algorithm threshold.

SYNTAX

```
                                {CQ}  
:TUNE minlockcycle; {DQ}=[base[,limit[,min[,max[;...]]]]  
                                {EQ}
```

CAUTION

Misuse of this command can significantly degrade system operating efficiency.

PARAMETERS

- minlockcycle* Minimum number of milliseconds allotted for the replacement algorithm to cycle through memory. If it cycles through memory in less time, memory allocation is delayed, which prevents disc thrashing.
- base* Priority at which processes which execute in the CS, DS, and ES begin in their respective queues. These processing queues, also referred to as "circular subqueues", are used by MPE to differentiate processes according to (among other things) the amount of CPU processing time allotted to each. A process executing in the ES subqueue, for example, will only be launched if all higher-priority processes are not ready to run. with the result that it may execute more slowly. In general, the more critical the process, the higher the subqueue it should be assigned.
- limit* Highest priority which processes executing in the CS, DS, or ES subqueues can attain.
- min* The minimum number of milliseconds (filter value) that a process may use the CPU before its priority is reduced.
- max* The maximum number of milliseconds (filter value) that a process may use the CPU before its priority is reduced. Note that the value of *max* must be greater than or equal to the value of *min*.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	NO
Breakable?	YES (Aborts)	
Capability Required	OP or SM	

OPERATION

The System Supervisor uses the `:TUNE` command to change the filter or priority limits of a circular subqueue and/or the memory manager algorithm threshold value. It is used primarily in online tuning so that the system can manage the current processing load efficiently.

For processes executing in the CS subqueue, the parameters *min* and *max* refer to the absolute limits of the "average short transaction time", or filter. This filter is recomputed after every transaction is complete, and then compared against the CPU time of each process to determine whether or not the priority of the process should be decreased. By contrast, processes executing in the DS or ES subqueues use a fixed value rather than an average. The same value is used for both queues and is specified by setting *min* and *max* equal to the desired value. Both *min* and *max* must be specified, but if they are not given the same value, the value of *max* is used.

At least one of the parameters (*minclockcycle*, *base*, *limit*, *min*, or *max*) must be specified. The values for *base* and *limit* may range from 150 to 255. Parameters are positional: If *min* is changed without specifying *base* and *limit*, it must be preceded by two commas. If *minclockcycle* is omitted, the queue specification (CQ, DQ, or EQ) must be preceded by a semicolon (;).

When a process begins executing in the CS subqueue, it is given a priority of CBASE. When a process stops (for disc I/O, terminal I/O, preemption, etc.), its new priority is determined so that it may be requeued for the CPU. If the process has completed a transaction, defined as the time between terminal reads, its priority becomes CBASE, and the value of an "average short transaction" is recalculated. If the CS process has not completed a transaction, and if the process has exceeded the filter value since its priority was last reduced, the priority is decreased (but will not exceed the CLIMIT).

DS and ES processes begin at DBASE and EBASE respectively, and are rescheduled according to the same criteria used for CS process, with the exception that a fixed value (the value of *max*, specified for the subqueue) is used in place of the average short transaction value, which is used for CS processes only. If the values specified for *max* in the CS, DS, and ES queues are too large, system response may become erratic. If they are too small, excessive memory management may result because process-swapping occurs too frequently. In either case, system performance is degraded. Recommended settings for *min* and *max* for the CS subqueue are 0 and 300 respectively, since short transactions are favored in most cases. A value for *min* and *max* of 1000 usually produces efficient system operation for the DS and ES subqueues.

The values assigned for *limit* specify the lowest priority (largest number) that the system can assign to a process in a particular queue.

The *minclockcycle* parameter is used by the memory manager to determine when thrashing (excessive memory management activity) is occurring. Making this value smaller increases the probability of thrashing. The recommended value for this parameter is 1000 .

The following default settings take effect when the system is cold loaded from the system disc (a WARMSTART or COOLSTART).

minclockcycle: 1000

<i>CQ base:</i>	152	<i>DQ base:</i>	202	<i>EQ base:</i>	240
<i>limit:</i>	200	<i>limit:</i>	238	<i>limit:</i>	253
<i>min:</i>	0	<i>min:</i>	1000	<i>min:</i>	1000
<i>max:</i>	300	<i>max:</i>	1000	<i>max:</i>	1000

EXAMPLE

To set the minimum clock cycle to 1000 , *CQ base* to 152 , *limit* to 200 , and *CQ* maximum filter to 300 ; and *DQ base* to 202 , *DQ limit* to 238 , *DQ* (and *EQ*) minimum and maximum filter to 1000 , enter:

:TUNE 1000;CQ=152,200,0,300;DQ=202,238,1000,1000

ADDITIONAL DISCUSSION

For additional information about process scheduling, refer to the discussion of "PROCESS SCHEDULING" in Section III of the MPE V Intrinsic Reference Manual (32033-90007).

Allows a downed device to function again.

SYNTAX

```
:UP ldev
```

PARAMETERS

ldev The logical device number of the device being placed on line.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW or :ASSOCIATE commands.

OPERATION

This command makes available to users a device previously taken off line with the :DOWN command. Ownership of the device is not affected by the :UP command: If a device is owned by the system at the time it is downed, the system will retain ownership even after the :UP command is executed.

EXAMPLE

To allow logical device number 10 to function again, enter:

```
:UP 10
:SHOWDEV 10
LDEV  AVAIL  OWNERSHIP  VOLID  ASSOCIATION

10  A AVAIL
```


:VINIT

Accesses the VINIT subsystem to format, initialize, and label private volumes, serial discs, and foreign discs.

SYNTAX

```
:VINIT [listdevice]
```

PARAMETERS

listdevice Name of the device to receive output generated by the VINIT subsystem. This parameter must back-reference a :FILE command that names the device. Default is \$STDLIST.

FUNCTIONS

- >COND *ldev* [*;RECOVER*]
Condenses free disc space and recovers lost disc space for private volumes.
- >COPY *fromldev,toldev* [*;GEN=[genindex]*]
[*;VER[1fy]*]
[*;BUF=size*]
Copies the contents of one volume to another.
- >DSTAT [*ldev*] [ALL] [@]
Displays status of disc drives.
- >DTRACK *ldev*
Processes suspect tracks in the Defective Track Table and defective sectors in the Defective Sectors Table. In doing so, you can either recover (i.e. ignore), delete, or reassign the defective tracks.
- >EXIT
Exits the VINIT subsystem.
- >FOREIGN *ldev*
Makes a disc volume foreign by filling the label area of a volume with zeros.
- >FORMAT *ldev* [*;IBM[:volid]*]
Allows online formatting of disc packs.
- >HELP
Prints a listing of the VINIT commands, including syntax and descriptions.
- >INIT *vname,ldev* [*,vsname,group,acct*]
[*;GEN=genindex*]
Completes the conditioning of a private volume previously formatted by the SLEUTHSM program or the >FORMAT command.

>PDEFN [* ,group.account] [vname.group.account]	Lists the specified volume set.
>PDTRACK <i>ldev</i>	Prints the contents from the Defective Tracks Table or the Defective Sectors Table.
>PFSPACE { <i>ldev</i> [;ADDR]} {ALL }	Prints the Disc Free Space Map.
>PLABEL <i>ldev</i>	Prints the disc label.
>SCRATCH <i>ldev</i> [;RESET]	Writes (resets) a scratch-type label.
>SERIAL <i>ldev</i>	Writes a serial disc-type label.
>VERIFY <i>ldev</i> [;DTT]	Verifies (reads) data.

Each of the parameters referenced in the above :VINIT functions is defined below, and discussed in detail under the heading "PRIVATE VOLUMES" in Section X of this manual.

<i>ldev</i>	The logical device number of the disc drive on which the volume is mounted.
<i>fromldn</i>	The logical device number of the disc from which data will be copied. Unless the device is a system domain disc, it must be in the DOWN state.
<i>toldn</i>	The logical device number of the disc volume to which data will be copied. The device must be in the DOWN state.
<i>genindex</i>	A value from 0 to 32767 indicating the generation index of the disc volume. If not specified, the <i>genindex</i> of <i>toldn</i> will be one greater than the <i>genindex</i> of <i>fromldn</i> . This parameter is valid only for private volumes.
VER[ify]	Checks the readability of data on the destination drive. If an error is detected, VER[ify] directs the :VINIT subsystem to attempt to recover the track. If it is unrecoverable, the track is reassigned and :VINIT will attempt to copy data once again.
<i>size</i>	The internal buffer size, which may be a value from 1 to 32, inclusive.
IBM[: <i>valid</i>]	Indicates that the disc is a single-sided IBM-formatted diskette. If <i>valid</i> is specified, it denotes an IBM volume identifier other than the default <i>valid</i> of IBMIRD.
<i>vname</i>	The name of the disc volume which is a member of the volume set.
<i>vname.group.acct</i>	The name of the volume set.
ADDR	Displays the Disc Free Space entries for the specified logical device.
ALL	Displays the Disc Free Space Map in table format for all systems and private volumes which are physically mounted.

RESET Resets a volume from scratch to non-scratch.

DTT Directs :VINIT to verify only suspect sectors/tracks as recorded in the Defective Sectors/Tracks Table. This option is not applicable to serial or foreign discs or cartridge tapes.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	NO
	Programmatically?	NO
Breakable?		YES (Aborts)
Capability Required		SM or OP

OPERATION

The :VINIT command accesses the VINIT subsystem, which includes commands for on-line initialization, labeling, and formatting of Private Volumes. Refer to Section X of this manual for a full discussion of Private Volumes, including complete information on the :VINIT subsystem.

EXAMPLE

```
:FILE LIST;DEV=LP
:VINIT *LIST
```

NOTE

In JOB mode, the VINIT subsystem can only be invoked as follows:

```
!RUN PVINIT.PUB.SYS
```

ADDITIONAL DISCUSSION

Refer to Section X of this manual.

:VMOUNT

Enables or disables MPE's Private Volumes Facility.

SYNTAX

```
:VMOUNT {ON[,AUTO]}  
        {OFF} [;ALL]
```

PARAMETERS

ON or ON,AUTO Enables the Private Volume Facility so that all valid user :MOUNT and Operator :LDMOUNT requests are allowed. When "ON " is specified without "AUTO ", the Operator must reply to all :MOUNT requests. When ON,AUTO is used, MPE attempts to satisfy user :MOUNT and Operator :LDMOUNT requests without Operator intervention.

OFF Requests to use the Private Volumes Facility will be rejected.

ALL Causes all Private Volumes mount-related console messages, including those not requiring Operator intervention, to be printed on the Console.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

If the Private Volumes Facility is enabled when you issue a :VMOUNT OFF command, users with mounted volume sets will be unaffected; the command will be satisfied when the last access is complete.

Once the Private Volumes facility has been enabled, use the :DSTAT command to determine which volumes are actually mounted, and the :VSUSER command to determine which users are using particular volume sets.

The Private Volumes Facility is disabled immediately following a system startup (the setting is equivalent to :VMOUNT OFF;ALL). However, you will still receive Console messages concerning private volume requests.

:VMOUNT ON;ALL gives the Operator the most interaction with and control over the use of private volumes. The command that least interrupts the Operator when users are accessing private volumes is :VMOUNT ON,AUTO.

EXAMPLES

To disable the Private Volumes Facility such that no messages will be sent to the Console when users attempt to mount private volumes (the default condition) enter:

:VMOUNT OFF

To disable the Private Volumes Facility, yet generate messages that will be displayed on the Console when users attempt to mount private volumes enter:

:VMOUNT OFF;ALL

ADDITIONAL DISCUSSION

Refer to the discussion of Private Volumes in Section X of this manual.

:WARN

Sends an urgent message to jobs/sessions.

SYNTAX

```
      { @                }  
      { [#]Jnnn         }  
:WARN { [#]Snnn         } [;message]  
      { {jsname, user.acct}
```

PARAMETERS

- @** Requests the message be sent to all sessions (QUIET and nonquiet).
- #Jnn** A job number (as assigned by MPE) for the job that is to receive the message. Only jobs submitted on interactive devices can receive messages.
- #Snnn** A session number (as assigned by MPE) of the session that is to receive the message.
- jsname** The name of the job or session to which the message is sent.
- user** The name of the user to receive the message.
- acct** The name of the account to receive the message.
- message** The message text, consisting of any string of ASCII characters no greater than 67 characters. The message is terminated by a **RETURN**. Default is that no message is printed.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?	NO	
Capability Required	Executable Only at Console*	

* unless distributed to users with the :ALLOW command.

OPERATION

An urgent message, interrupting any current pending read or write in progress, will appear on the list devices of all sessions (even those that are QUIET) as:

OPERATOR WARNING: *message*

Messages sent via the :WARN command will be received by jobs only if the job was submitted on an interactive device.

The user has the option of running his session in QUIET mode, wherein :TELL messages from other users will be suppressed. :WARN messages generated at the system console, however, override QUIET mode.

NOTE

Use some caution when sending a warning to users. The :WARN command overrides a block mode screen.

EXAMPLE

To send a WARN message to all sessions, followed by a WARN message to session #S51, enter:

```
:WARN @;THE SYSTEM WILL SHUTDOWN IN 5 MINUTES. PLS LOG OFF.  
:WARN #S51;LAST CHANCE TO LOG OFF GRACEFULLY.
```

:WELCOME

Defines the welcome message.

SYNTAX

```
:WELCOME [welcfile]
```

PARAMETERS

welcfile An editor file containing the new welcome message.

USE

Available	In Session?	YES
	In Job?	YES
	In Break?	YES
	Programmatically?	YES
Breakable?		NO
Capability Required		Executable Only at Console*

* unless distributed to users with the :ALLOW command.

OPERATION

The Operator uses the :WELCOME command to define the message that will be transmitted to users when they initiate jobs and sessions. The message is retained when you WARMSTART or COOLSTART the system, or choose the UPDATE restart option.

To define the welcome message, enter ":WELCOME" and press "RETURN". When the "#" prompt is displayed, begin entering the text of the message. Any number of lines may be used, but the length of each line cannot exceed 72 characters. To terminate the message and complete the command, enter "RETURN" at the "#" prompt.

To define the welcome message from an editor file merely specify the *welcfile* parameter. Subsequent changes to the editor file will not affect the welcome message until another :WELCOME command is issued with the file name specified.

NOTE

If no parameter is specified, you are prompted to enter the new message interactively.

To delete the old welcome message, issue the :WELCOME command and enter **RETURN** at the # prompt.

EXAMPLE

To create a multi-line welcome message, enter:

```
:WELCOME  
# WELCOME TO THE HP3000 COMPUTER SYSTEM.  
# FILES WILL BE STORED EACH DAY BETWEEN 6AM AND 7AM.  
# RETURN
```

THE SYSTEM OPERATOR

SECTION

IV

THE SYSTEM OPERATOR'S ROLE

The System Operator, also referred to as the Console Operator, or just Operator, is responsible for daily operational control of the HP 3000. The Operator logs onto the Console with the user name and account OPERATOR.SYS, which may or may not be assigned special capabilities. Unlike the System Manager, who is assigned SM capability, or the System Supervisor, who is assigned OP capability, no "System Operator" mnemonic exists which entitles the Operator to execute a special subset of commands. Instead, the Operator's role and responsibilities are derived from his or her control of the Console, since the commands the Operator uses may only be entered at the Console (or be specifically permitted to users at the Operator's discretion). For this reason, the Console is considered a privileged resource: the Operator must carefully monitor the Console and prevent unauthorized access to it.

Operator Tasks

Just as the System Manager's and System Supervisor's roles are clearly defined (with some overlap that requires consultation and the coordination of their efforts), the Operator's job consists of clearly defined tasks. To perform these tasks, the Operator should be familiar with the Operator commands listed in Table 4-1, and should have a thorough technical knowledge of system operation. Although the specific responsibilities will vary according to the needs of each installation, the Operator typically performs the following functions:

1. Starts the system with one of five load options. The System Manager can specify the system startup state for each option using System Startup State Configurator, which is described in Section VI.

When a Series 37 processor first runs MPE, a Time of Century (TOC) clock is set. Just before the system comes up, the date and time are displayed on the Console for the Operator to verify. The Time of Century clock is described in this section in "Starting the System".

2. Monitors the execution of jobs and sessions, including:
 - Establishing job/session limits (within the maximums imposed by the System Supervisor during system configuration).
 - Displaying the status of sessions and jobs.
 - Aborting and/or suspending jobs when necessary.
3. Controls the use of peripheral devices, including:
 - Setting peripheral devices on line, and taking them off line.
 - Designating which devices (within the class of "accepting" devices initially configured by the System Supervisor) will accept the :JOB, :HELLO, and :DATA commands.
 - Responding to users' requests for Operator-assigned devices.
4. Controls the spooling of input and output files.
5. Distributes Operator capabilities among standard MPE users with the :ALLOW, :ASSOCIATE, and :JOBSECURITY commands.

The System Operator

6. Backs up user and system files.
7. Shuts down the system.
8. Opens and closes communications lines, and uses data communications equipment.

Each of these tasks will be discussed in this section. In cases where a subject cannot be covered in complete detail, you will be referred to the appropriate sections of this and other manuals. Since, as Operator, you will work with your System Supervisor, you may wish to read Section V, "THE SYSTEM SUPERVISOR", (which follows this section) to familiarize yourself with the System Supervisor's role.

Operator Commands

Operator commands, a subset of MPE commands, are listed in Table 4-1. They are executed by the user logged onto the System Console, although Operator commands may be permitted to standard users and executed from other terminals.

It is important to distinguish between Operator, Console, and System Supervisor (OP) commands. The System Supervisor, who is assigned OP capability, uses a subset of MPE commands to optimize the performance of the system. They are not Operator commands as the name might suggest, but instead require that the user have OP capability in order to execute them.

Operator commands do not require OP capability. They are used primarily to allocate and manage system resources, not to tune the computer, and are executed at the standard MPE colon prompt (:). Unless a specific Operator command is permitted to a user, Operator commands are only executable from the session running on the Console.

Console commands can never be permitted to users. They are only executable at the device currently designated as the System Console, since it is the only terminal which produces the "=" prompt, generated by simultaneously pressing the **CONTROL** key and the A key (A^C). (This prompt can be generated even when no session is running on the Console.) Three commands entered by the Operator, =LOGON, =LOGOFF and =SHUTDOWN, may only be executed at this prompt. At the Operator's discretion, the commands =ABORTIO, =ABORTJOB, =RECALL, or =REPLY may also be executed in this manner. Therefore, any command executed at the "=" prompt is considered a Console command, not an Operator command, even though they are normally executed by Operators.

The Operator commands listed in Table 4-1 are fully documented in Section III, "COMMAND DEFINITIONS", of this manual. Arranged alphabetically, Section III also contains System Supervisor, System Manager, and Account Manager commands.

Table 4-1. Commands Issued by the Operator

COMMAND NAME	DESCRIPTION
:ABORTIO/=ABORTIO	Aborts pending I/O requests for a device.
:ABORTJOB/=ABORTJOB	Aborts a job a scheduled job, or session.
:ACCEPT	Permits a device to accept job, sessions, and/or data.
:ALLOW	Grants a user access to specified Operator commands.

Table 4-1. Commands Issued by the Operator (continued)

COMMAND NAME	DESCRIPTION
:ALTJOB	Alters attributes of a waiting job or session.
:ALTSPoolFILE	Alters attributes of spool files.
:BREAKJOB	Suspends an executing job.
:CONSOLE	Moves the System Console to another logical device.
:DELETESPoolFILE	Deletes a spool file.
:DISALLOW	Prevents a user from executing specified Operator commands.
:DOWN	Removes a device from normal system use.
:DOWNLOAD	Downloads margins and VFC to a line printer.
:FOREIGN	Creates a foreign disc.
:GIVE	Assigns a downed device for diagnostic program use.
:HEADOFF	Stops header/trailer output to a line printer.
:HEADON	Resumes header/trailer output to a line printer.
:JOBFENCE	Defines input priorities for executing jobs and sessions.
:JOBSECURITY	Controls the availability of certain job commands to a user.
:LDISMOUNT	Logically dismounts a private volume set/class.
:LIMIT	Limits the number of concurrently running jobs/sessions.
:LMDUNT	Logically mounts a private volume
=LOGOFF	Aborts all jobs/sessions and prevents any non-HIPRI job/sessions from logging on.
=LOGON	Allows jobs and sessions to logon to the system again following a =LOGOFF.
:OPENQ	Opens spooling queues.
:OUTFENCE	Defines the minimum output priority for ACTIVE spool files.
:RECALL/=RECALL	Displays all pending Console request messages.
:REFUSE	Disallows jobs/sessions and/or data on a designated device.
:REPLY/=REPLY	Replies to a pending Console request.

Table 4-1. Commands Issued by the Operator (continued)

COMMAND NAME	DESCRIPTION
:RESUMEJOB	Resumes a job suspended with :BREAKJOB.
:RESUMESPOOL	Resumes operation of a spooled device.
:SHOWALLOW	Displays which Operator commands have been allowed the user.
:SHOWCOM	Displays the status of a communications device.
=SHUTDOWN	Aborts any remaining jobs or sessions and closes down the operating system.
:SHUTQ	Closes spooling queues.
:STARTSPOOL	Initiates spooling of a device or device class.
:STOPSPPOOL	Terminates spooling of a device.
:STREAMS	Enables or disables the STREAMS device to allow or prohibit batch processing of jobs.
:SUSPENDSPOOL	Suspends spooling to a device.
:TAKE	Releases a device that was assigned for diagnostic use.
:UP	Allows a downed device to function again.
:VMOUNT	Allows or prevents users from accessing private volumes.
:WARN	Sends an urgent message to jobs and sessions.
:WELCOME	Defines the message users receive when they log on.

STARTING THE SYSTEM

There are five different methods of starting MPE. Three methods are referred to as "cold load" operations, so that starting (or restarting) the system is often referred to as "cold loading". Cold load methods use tapes or serial devices as the data source. These are UPDATE, COLDSTART, and RELOAD. The other two startup options, WARMSTART and COOLSTART, restart the system from the system disc and, therefore, require no tape or serial device.

Restarting MPE by executing one of these five startup procedures is the Operator's responsibility. A standalone program known as INITIAL, or the MPE Initiator, is used to guide you through the restart procedure. The process of engaging INITIAL will vary depending upon which model of the HP 3000 you use. Once begun, INITIAL prompts you to choose one of the five options.

The discussion of INITIAL contains:

- An overview of INITIAL and how to engage it to restart different models of the HP 3000.
- A summary of the five startup options: WARMSTART, COOLSTART, COLDSTART, UPDATE, and RELOAD.

Also included is a discussion of three additional procedures that Operators typically perform when they first start the system: enabling the Private Volumes facility, enabling the :STREAMS device, and starting the spooler for devices which are not automatically spooled.

Additional information about the SYSDUMP/INITIAL dialogue is available in Sections VII and IX in this manual.

The Time of Century Clock (Series 37 Only)

The HP 3000 Series 37 Processor contains a Time of Century (TOC) clock which is set when the system first runs MPE, and continues running even after the system is shut down or powered off.

This clock allows MPE to determine the date and time as it is starting up, thus simplifying the startup procedure by eliminating the need for operator intervention. Intervention is required only if the given date and time are unacceptable.

The Time of Century clock is accurate to the nearest second, whereas other system clocks are accurate to within milliseconds. However, the Time of Century clock has its own battery backup, so it will survive powerfails and any kind of extended shutdown.

NOTE

MPE clocks are not reset after a powerfail recovery. If power is OFF for 15 minutes, the clock will also be off by 15 minutes. This is done to ensure consistency in session accounting information for all HP 3000 series. The correct time can be reset by doing a WARMSTART.

In order to correct the clock for inaccuracies, shipment to other time zones, or failure of the internal battery, the Operator will be given an opportunity to reset the date and time. Just before the system comes up, the date and time will be displayed on the Console for the Operator to verify:

WED, SEP 5, 1984, 8:45 AM? (Y/N)

When this message is displayed, the Operator has three options:

1. The Operator can accept the given date and time by responding "YES" (or "Y", "y", or "yes") or a RETURN. The system will start up with the given date and time.
2. The Operator can ignore the prompt. After sixty seconds the system will automatically start up with the given date and time.
3. The Operator can reject the given date and time and enter "NO" (or " N", "n", or "no"). The standard dialogue for specifying the date and time will then be displayed. The Time of Century clock will be updated and the system will start up with the corrected time.

NOTE

The Time of Century clock is a hardware feature. Microcode has been written to allow MPE to communicate with this clock which will not be accessible to user programs or other system code.

Starting The System With INITIAL

Anyone can turn the system power on and off, start MPE, alter the current I/O configuration, or shut down the system. No special capability is required, nor must the person be logged onto the system. This is possible because starting the system is accomplished with the help of a standalone program called INITIAL. It prompts the user with a series of questions and, based upon the response, INITIAL will load MPE, subsystems, utility programs, and user files from either tape or disc, recover spool files, and handle disc errors.

INITIAL may also be used to alter the system configuration. The procedure for entering the INITIAL dialogue depends on the computer hardware used in the installation. The following comments review the major differences. Complete instructions for starting a particular HP 3000 can be found in Section XI, "QUICK REFERENCE GUIDE". Refer also to Section VII, "CONFIGURING THE SYSTEM", which steps through the complete SYSDUMP/INITIAL dialogue.

NOTE

To restart the system after a system failure, or in some cases after a system halt, Hewlett-Packard recommends that you take a shift string dump (Series 64/68 only) and a memory dump **BEFORE YOU RESTART THE SYSTEM**. Instructions for both of these procedures are available in Appendix A of this manual.

STARTING THE SERIES 37. The Series 37 front panel contains indicator lights which display which power configuration is active, and a keyswitch which indicates the mode in which the system is running. A single-digit LED in the lower lefthand corner displays MPE status codes when MPE is running. The Series 37 has a four-position keyswitch located on the front panel which must be set to bring up the system (see Figure 4-1).

When the keyswitch is turned to 1, 2 or 3, microcode performs a 30-second series of self tests. The LED on the front panel of the Series 37 displays the self test in progress. The user can change the key position any time before the LED displays "C" for "Card Test".

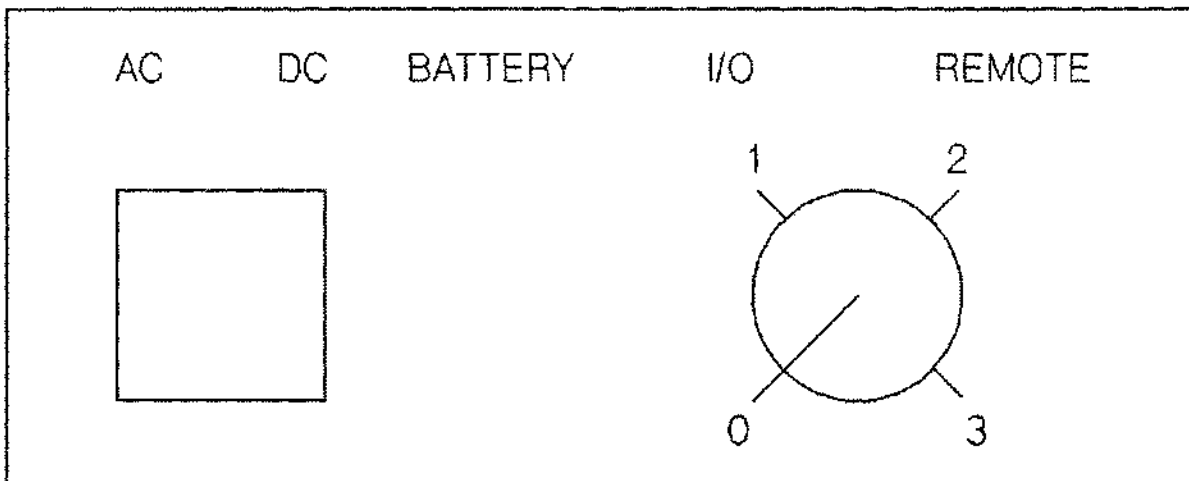


Figure 4-1. Series 37 Front Panel

Table 4-2 defines the keyswitch positions and their associated meanings.

Table 4-2. Series 37 Keyswitch

Keyswitch Position	Function	Meaning
0	Off	Power off
1	Normal	Local mode Console, Control B disabled.
2	Control/Local	Local mode Console, Control B enabled. Control B commands can be used.
3	Control/Remote	Remote Mode Console, Control B enabled. User can switch to a remote Console connected through the modem port. Commands and responses will be echoed to the "host" Console as well as to the remote Console.

NOTE

When the keyswitch is set at 3, a regular terminal will be disconnected to accommodate a modem. This modem port may be used as a regular terminal port with the keyswitch set at 1 or 2.

Automatic WARMSTART (Series 37)

Automatic WARMSTART is available on the Series 37. To enable auto WARMSTART in all keyswitch positions, the Control B command EW (Enable WARMSTART) must be entered. A prompt, "WARMSTART? (Y/N)" appears when the system is powered on. The user has 15 seconds to enter "Y" **RETURN**, **RETURN** or nothing for the system to WARMSTART automatically. To abort the Auto WARMSTART, the user must enter a "N" **RETURN** or anything besides a **RETURN** within 15 seconds after the prompt appears.

Auto WARMSTART is disabled by entering DW (Disable WARMSTART). When Auto WARMSTART is disabled, ->H for >HELP will be displayed when the system is turned on.

NOTE

The Auto WARMSTART feature is independent of the keyswitch position.

Control B Mode (Series 37)

Control B mode is used to access maintenance commands available when the keyswitch is set at 2 or 3:

Table 4-3. Control B Mode Commands

COMMAND	FUNCTION
AR	Re-attempt Auto Restart.
COL[dstart]	Perform COLDSTART with no dialogue.
COO[istart]	Perform COOLSTART with no dialogue.
DI[sc]	Start from Disc. Same as Start with no parameters.
DU[mp]	[chan,dev] performs a dump to the specified device.
DW	Disable auto warmstart.
EW	Enable auto warmstart.
H[elp]	Display the available commands, parameters, and effects.
L[oad]	[chan,dev[, {P[erm]}], C[hange]]
NEW[system]	Asks, "WHICH OPTION <COLDSTART/RELOAD/UPDATE> ?" and enters INITIAL dialogue. Perform a RELOAD, option SPREAD, with no dialogue. This command assigns a volume name and virtual memory to the system disc. It is valid only for initial software installations on new systems.
PA[nel]	Enters the soft panel to allow debugging of the system.
REL[oad]	Perform a RELOAD, option SPREAD, with no dialogue.
RUN	Run system after B ^C halt.
SP[eed]	Allow System Operator to change Console speed.
ST[art]	[chan,dev[, {P[erm]}], C[hange]]
TA[pe]	Asks, "WHICH OPTION <WARMSTART/COOLSTART>?" and enters INITIAL dialogue.
TE[st]	LOAD from tape. Same as Load with no parameters.
UPD[ate]	Go to Self Test Mode.
WAR[mstart]	Perform UPDATE with no dialogue.
	Perform WARMSTART using Start device with no dialogue.

It is recommended that you check the default addresses of the ST[art], L[oad] and DU[mp] devices before you boot or dump the system using the above commands. The default chan(nel) and dev(ice) can be obtained by entering **CONTROL** B mode and entering TE[st] followed by ID[map]. This will show the channel and device for the connected ST[art] L[oad] and DU[mp] devices. The addresses listed are stored in memory and will be used by INITIAL for booting the system. If the address is specified with ST[art], L[oad] or DU[mp], it is temporary unless P[erm] or C[hange] is also specified as described below for L[oad].

There are four possible ways to enter the L[oad] or ST[art] command. The L[oad] command is used for purposes of illustration here. Remember that the first two examples would also apply to DU[mp].

LOAD	Loads the system from the current system default load device.
LOAD chan, dev	Loads from the specified load device; does not change the system default. The next load is not affected by this command.
LOAD chan, dev,C	Changes the system default load device by writing the given channel, device and unit to the memory. This command does not invoke a load; the next LOAD command, used without parameters, will load from this device.
LOAD chan, dev,P	Changes the system default load device by writing the given channel, device and unit to the CPU memory, and loads from this device.

NOTE

The operator can specify a DU[mp] device other than the default, but cannot selectively change the default DU[mp] device. The default DU[mp] device will always be the same as the ST[art] device thus, changing the channel and device for the ST[art] device will also change the channel and device for the DU[mp] device.

STARTING THE SERIES 39/40/42/44/48. To start the system from magnetic tape or serial disc on these models of the HP 3000, you must first set the LOAD thumbwheel switch on the front panel to the DRT number of the device on which the SYSDUMP tape or disc is mounted. The next step is to press the LOAD key, which will read INITIAL into main memory.

The System Operator

To start the system from the system disc, set the START thumbwheel switch on the front control panel to the DRT number of the system disc (*udev 1*) and press the START key. This loads INITIAL into main memory.

If no message appears on the System Console after you have pressed either the LOAD key or the START key, press **RETURN**. This causes the system hardware to speed-sense the Console, after which INITIAL displays your current version of MPE, update level number, and fix level number, in the form "HP 32033V.UU.FF". Your copy of MPE V/E, for example, might appear as "G.00.00".

STARTING THE SERIES 64/68. The major difference in the restart procedure for the Series 64/68 is that no "START" or "LOAD" key is pressed to load INITIAL. Instead, you will enter the LOAD command at the Diagnostics Control Unit (DCU) prompt. To generate the DCU prompt on a running system, simultaneously press the **CONTROL** key and B (**B**). If the system is not running, press **RETURN**. When you see the DCU prompt (**M**), enter "LOAD" on the System Console.

INITIAL begins the Initiator dialogue on the Series 64/68 in the same way it does on the Series 39/40/42/44/48. Your installation's version of MPE, update and fix level numbers are displayed in a message of the form "HP 32033V.UU.FF".

The Five Startup Procedures

The startup procedure you choose depends upon a few key factors: whether the system is being restarted from a planned shutdown, or if it is being brought up after a system failure; if a system failure occurred, whether it was catastrophic or not; and, whether you will be restarting the current configuration again, or you have made changes to the system which must be installed.

The five Startup options available to you are described in the following discussion. For a comparative overview of startup operations, refer to Table 4-4. Table 4-5 illustrates which parts of the system are loaded from disc or tape during the various startups.

CAUTION

Do not halt INITIAL before it is complete, i.e., before the request for "DATE?" appears. This stops the loading procedure in an intermediate stage, and will require you to RELOAD the entire system from tape.

WARMSTART. This option loads the operating system from the system disc. Use WARMSTART to recover scheduled jobs and incompletely processed spooled jobs and spooled files; any other startup deletes any spooled files found in the system. You may not WARMSTART the system if a COOLSTART, COLDSTART, UPDATE, or RELOAD has failed. If you attempt to do so, an error message will be displayed on the System Console and the system will halt.

COOLSTART. This option also loads the system from the system disc. Use COOLSTART as the standard operating procedure when a system is routinely shut down at night and brought up the next day. This operation saves all permanent user files (including programs that run on MPE subsystems such as FORTRAN/3000, COBOL/3000, SPL/3000, and EDIT/3000). It does not retain the operational environment present prior to the last shutdown. Therefore, all jobs and sessions in progress at the time the system is shut down are logged off or terminated, and all spool files and scheduled jobs are lost.

UPDATE. This option cold loads the system from magnetic tape or serial disc. System files are loaded from the backup medium; the I/O device configuration, directory, accounting information, and assigned global RINs come from the system disc; the user files remain undisturbed. Use UPDATE as the standard operating procedure when starting the system with either an updated MPE tape from Hewlett-Packard or an MPE tape prepared for a different HP 3000 Computer System. If for any reason an UPDATE is unsuccessful, you must restart the system with either a COLDSTART, UPDATE, or a RELOAD. If you attempt another type of cold load option, the system will halt, and an error message will be displayed on the Console.

Table 4-4. System Startup of the HP 3000

TYPE OF STARTUP	SUBSET OF INITIATION PROGRAM LOADED FROM	PRIMARY USE	ALLOWS ALTERATION OF I/O CONFIGURATION	SPOOLFILE RECOVERY	PERMANENT USER FILES	INFORMATION THAT COMES FROM SYSTEM DISC	INFORMATION THAT COMES FROM BACKUP MEDIUM (MAGNETIC TAPE OR SERIAL DISC)
WARMSTART	System Disc	Standard procedure if spoolfiles & restartable jobs must be saved.	NO	YES	Retained	All	None
COOLSTART	System Disc	To bring up system after overnight shutdown.	YES	NO	Retained	All	None
UPDATE	Magnetic Tape or Serial Disc	For updated MPE tape or MPE tape for different HP 3000 system.	YES	NO	Retained	I/O & System Configuration, Directory, Accounting Info, Global RINs	System Files
COLDSTART	Magnetic Tape or Serial Disc	To change I/O configuration permanently.	YES	NO	Retained	Directory, Accounting Information, Global RINs	System Files, I/O & System Configuration
RELOAD	Magnetic Tape or Serial Disc	To install first MPE tape or after disc crash.	YES	NO	Reloaded (if Dumped on Backup Medium) or purged	None	All (including Users' Files if Dumped on Backup Medium)

COLDSTART. This option cold loads the system from magnetic tape or serial disc. System files and the I/O device configuration are loaded from the backup medium. User files, the file directory, accounting information, and assigned global RINs remain unchanged, and are loaded from the system disc. COLDSTART is used to keep multiple system configurations available, each one stored on its own cold load tape or disc. This way, a COLDSTART allows system modification while retaining user data. If a COLDSTART fails, you should attempt another COLDSTART, followed by an UPDATE or RELOAD. Attempting to start the system with another startup procedure results in a Console error message and a system halt.

Table 4-5. Source of MPE System Components

MPE COMPONENT	WARMSTART	COOLSTART	UPDATE	COLDSTART	RELOAD*
MPE Programs, System Library	Disc	Disc	Serial Storage Device	Serial Storage Device	Serial Storage Device
I/O & System Configurations	Disc	Disc	Disc	Serial Storage Device	Serial Storage Device
Accounting Info, File Directory, Volume Table & User Files	Disc	Disc	Disc	Disc	Serial Storage Device
Spoolfiles & Jobs	Disc	--	--	--	--

*Certain information which may reside on the disc is checked for validity.

RELOAD. This option cold loads the entire system, including all system and user files, I/O configuration information, from the backup tape. RELOAD assumes that there is no information on the system disc: if the backup tape contains user files, then the file directory, accounting structure, assigned global RINs and user files are restored to the system disc from the backup copy. If the accounting structure was not copied to tape, a default directory is created with the SYS account, PUB group, and MANAGER user.

The RELOAD option is normally used when the System Supervisor or System Manager installs the first MPE system supplied by Hewlett-Packard. RELOAD is also used when restoring the complete system from a SYSDUMP tape following a catastrophic system failure, such as a crash of the system disc. Always consult the System Manager in the event of such a failure: he or she will authorize the RELOAD procedure. (Consultation is critical. The RELOAD procedure completely rebuilds the system, and it is a time-consuming task. It should only be selected if all other startup options have failed. Furthermore, if for any reason a RELOAD of the system fails, you must attempt another RELOAD.)

When reloading from multiple tape volumes or serial discs that were created by the :SYSDUMP command, begin with the first volume of the most recent backup copy. It contains the current file directory and accounting information, which must first be entered into the system before files belonging to those accounts and groups may be copied. If all of the system files are not contained in the first volume, MPE will request that you mount the next volume.

Files belonging to non-system domain volume sets, specifically private volumes, are not restored during RELOAD.

Enabling Other Devices and Processes During a Restart

Three additional procedures may be necessary when you restart the system. They are discussed briefly below.

ENABLING THE PRIVATE VOLUMES FACILITY. If your system uses Private Volumes, you must execute the :VMOUNT command to allow users to access them. To enable the Private Volumes facility so that users' :MOUNT requests are displayed on the Console and you are required to respond, enter:

```
:VMOUNT ON
```

If you would like to minimize the number of times you must respond to :MOUNT requests, specify the AUTO parameter of the :VMOUNT command, such as:

```
:VMOUNT ON,AUTO
```

MPE will then attempt to satisfy :MOUNT requests automatically. (For complete information about Private Volumes, refer to "PRIVATE VOLUMES" in Section X of this manual.)

ENABLING THE STREAMS FACILITY. As part of the I/O configuration process, the System Supervisor designates one device to accept jobs which MPE will process in batch mode. You control whether or not users are able to submit jobs for batch processing by issuing the `:STREAMS` command for the configured device. In the example below, logical device 10 was selected to accept streamed jobs. Though used only as an example here, *ldev 10* is frequently configured as the STREAMS device:

```
:STREAMS 10
```

To prevent users from streaming jobs, enter:

```
:STREAMS OFF
```

STARTING A SPOOLER PROCESS FOR NON-SPOOLED DEVICES. When the System Supervisor configures the system, he or she determines which devices will be controlled by a spooler process. Although most of these devices will be started as spooled devices automatically, some may not. In such cases, you must issue an explicit `:STARTSPOOL` command for each device you wish to be controlled by a spooler process. For example, to start spooling for the device class "LP", enter:

```
:STARTSPOOL LP
```

This allows the user to create spool files in class LP.

Or, to start spooling for logical device 9, enter:

```
:STARTSPOOL 9
```

In the second example, the spooler process for *ldev 9* will control all output device files directed specifically to *ldev 9*, and any and all device class names associated with that *ldev*.

MONITORING THE EXECUTION OF JOBS AND SESSIONS

As Operator, your job is to keep the system running smoothly at all times. To do so, you must monitor all jobs and sessions, and alter their status (which includes aborting a job or session) when necessary. The discussion below will familiarize you with how MPE processes jobs and sessions. It also explains and illustrates the commands you will use to manage job/session processing. They include:

<code>:ACCEPT</code>	<code>:BREAKJOB</code>	<code>:LIMIT</code>	<code>:SHOWJOB</code>
<code>:REFUSE</code>	<code>:RESUMEJOB</code>	<code>:JOBFENCE</code>	<code>:ALTJOB</code>

The Introduction of Jobs and Sessions

Jobs and sessions, initiated with the `:JOB` and `:HELLO` commands, may be introduced to MPE only on devices designated for that purpose by the System Supervisor. When the system is first configured, tape drives are typically designated as "job accepting" devices. Terminals, because they are used to initiate sessions, comprise the other general category of "accepting" devices. When such a device is not being used to process a job or session, it is controlled by the MPE Device Recognition process. This process automatically issues a read instruction after a user enters a `(RETURN)` on a terminal or when the tape drive is loaded and on line. This allows users to log onto the system without Operator assistance when they enter a legitimate `:JOB` or `:HELLO` command.

If the user enters an incorrect `:JOB` or `:DATA` command, the remainder of the job tape is "flushed", or read rapidly, while MPE searches for a legitimate `:JOB` image. An incorrect `:HELLO` command causes an error message, such as the one below, to be printed on the terminal, after which the colon prompt (`:`) is repeated:

```
EXPECTED HELLO, :JOB, :DATA, OR (CMD) AS LOGON. (CIERR 1402)
```

The user may again attempt to enter a legitimate `:JOB` or `:HELLO` command without Operator assistance or intervention; MPE's Device Recognition process controls interaction between the user and the device.

Operator Control of Accepting Devices

Of the devices that the System Supervisor initially configured as accepting devices, you may designate which will accept jobs, sessions, and data. The `:REFUSE` command allows you to temporarily prevent an accepting device from validating the `:JOB` and `:HELLO`, and/or the `:DATA` commands. For example, to prevent job, session, and data recognition on the terminal MPE identifies as logical device `58`, enter:

```
:REFUSE 58
```

To prevent only data recognition, enter:

```
:REFUSE DATA,58
```

The `:REFUSE` command is frequently used when you need to take an accepting device off line. Before the device can be "downed" (using the `:DOWN` command) you must prevent it from any further job/session or data processing.

To restart the Device Recognition process on an accepting device for which you have issued the `:REFUSE` command, enter:

```
:ACCEPT 58
```

This will allow all three commands users execute to introduce jobs and sessions: `:HELLO`, `:JOB`, and `:DATA`.

Limiting the Execution of Jobs and Sessions

After the Device Recognition process has validated the `:HELLO` or `:JOB` command, the new job or session is considered a candidate for dispatching. (Dispatching, in this context, implies that MPE allocates the resources the job or session needs, and that it will begin executing.) Before processing may begin, MPE's Job Scheduler determines which among the group of jobs/sessions should be selected for execution. The decision to dispatch a job or session is based upon a set of simple rules and whether or not the necessary system resources are available. In general:

- A session is dispatched before a job.
- The job/session with a higher input priority is dispatched before one with a lower priority.
- A job/session introduced earlier is chosen over one more recently introduced.

The System Operator

System resources which cannot be controlled by the Operator affect the dispatching of jobs and sessions. When one of these resources is unavailable, a job will wait until it is available. If a resource is unavailable for a session, the message "CAN'T INITIATE NEW SESSIONS NOW" is displayed on the standard list device. Potentially limiting resources include:

- The size of MPE tables. An insufficient number of table entries will prevent the execution of a job or session since MPE will be unable to monitor and manage the process.
- The availability of a list device, whether that device is spooled or dedicated to a single process. If the device is unavailable, the job remains in a WAIT state.

In these cases, a "JOB OVERLOAD" message specifying the critical resource(s) appears on the Console. Table 9-2 contains a listing of these messages. Several of these would suggest the need to configure more of the critical system resource. If this is the case, consult your System Supervisor.

Limiting the Number of Jobs and Sessions

The Operator can control the number of executing jobs and sessions with two commands: :LIMIT and :JOBFENCE. The :LIMIT command limits the number of jobs or sessions which execute concurrently. To limit the number of jobs to 12 and the number of sessions to 20, enter:

```
:LIMIT 12,20
```

The limits you set with the :LIMIT command cannot exceed the maximum job/session limit determined by the System Supervisor when he or she initially configured the system.

To list the current job and session limits, as well as a summary of current job/session status, enter:

```
:SHOWJOB STATUS
```

```
12 JOBS:
  0 INTRO; 0 SCHEDULED
  0 WAIT; INCL 0 DEFERRED
 12 EXEC; INCL 9 SESSIONS
  0 SUSP
JOBFENCE= 2; JLIMIT= 5; SLIMIT= 40

CURRENT: 11/ 5/84 13:49

JOBNUM STATE IPRI JIN JLIST SCHEDULED-INTRO JOB NAME
#J519 SCHED 15 10S PP 11/ 5/84 13:48 SEESPOOL, RSPool.SYS

1 SCHEDULED JOB(S)
```

In this example, "JLIMIT" is the current limit on the number of scheduled jobs that MPE will execute, and "SLIMIT" is current session limit. "WAIT", "EXEC", "SUSP", "INTRO", "SCHEDULED", and "DEFERRED" are job states. These, and "JOBFENCE= 2" are explained in the next subsection, "DISPLAYING THE STATUS OF JOBS AND SESSIONS."

The second command available to you to control the execution of jobs and sessions is :JOBFENCE. With it, you choose the priority fence, which is a number between 0 and 14, inclusive. Each session or job logs onto the system with an input priority between 1 and 13, inclusive; the default input

priority for standard MPE users is 8. In order for MPE to execute a session or job, the input priority of the job or session must exceed the current job fence.

When you set the job fence high, jobs with an input priority less than or equal to the fence enter the WAIT state (explained below). When a user attempts to initiate a session with an input priority that does not exceed the current fence, it will be refused with the following message:

CAN'T INITIATE NEW SESSIONS NOW.

If you set the JOBFENCE to its highest possible value, 14, only users assigned SM or OP capability will be able to log on. This is because System Managers and System Supervisors are the only users who are allowed to log on with the ;HIPRI parameter of the ;HELLO and ;JOB commands. In effect, this prevents all other users from gaining access to the system during a critical situation, or when the System Supervisor or System Manager needs exclusive access to MPE, subsystems, and utility programs.

Displaying the Status of Jobs and Sessions

Once the job/session candidate is selected for dispatching, MPE's Command Interpreter program gains control of the process. As the name implies, its function is to interpret commands (entered by the user during a session or included in a ;JOB file) and to transfer control to the named program. While MPE is processing the job or session, it passes through three or four job states: INTRO, EXEC, SUSP, and WAIT. (Not all jobs/sessions will pass through each of these states.) To determine the current status of all jobs and sessions known to MPE, execute the ;SHOWJOB command. It will produce a listing similar to the sample below, with a summary of job/session status at the end of the listing:

;SHOWJOB

JOBNUM	STATE	IPRI	JIN	JLIST	INTRODUCED	JOB NAME
#S5534	EXEC		20	20	THU 5:33P	OPERATOR.SYS
#S5559	WAIT		42	42	FRI 7:12A	JOHN,ACCT3.ACCTNG
#J643	EXEC		10S	PP	THU 11:38P	MANAGER,MAILMAN.HPOFFICE
#S5467	EXEC	QUIET	32	32	THU 2:47P	BECKY.ANDERSON
#J640	EXEC		10S	PP	THU 11:38P	MAILROOM.HPOFFICE
#S5216	EXEC		64	64	WED 5:22P	A.KELLY
#S5572	EXEC	QUIET	30	30	FRI 8:43A	LURIE.JED
#S5326	EXEC		45	45	THU 8:26A	TODD,CHECKS.PAYROLL

8 JOBS:

0 INTRO

1 WAIT; INCL 0 DEFERRED

7 EXEC; INCL 5 SESSIONS

0 SUSP

JOBFENCE= 2; JLIMIT= 5; SLIMIT= 40

CURRENT: 11/ 5/84 13:49

JOBNUM	STATE	IPRI	JIN	JLIST	SCHEDULED-INTRO	JOB NAME
#J519	SCHED	15	10S	PP	11/ 5/84 13:48	SEESPOOL,RSPDOL.SYS

1 SCHEDULED JOB(S)

The System Operator

JOBNUM identifies the session or job by the number MPE assigned to it. Jobs are listed as *Jnnn*, while sessions are listed as *Snnn*. The second column of the listing, STATE, indicates the processing state of the job or session, which may be one of the following:

- INTRO** The state of a job/session while it is being introduced. This state is typically displayed for batch jobs input on a spooled device. In this case the Spooler, and not the Device Recognition process, validates the :JOB command. If legitimate, the job's input records are copied to disc, at which point the job's state changes from INTRO to WAIT.
- WAIT** Waiting jobs are those that cannot execute until critical system resources become available, or because their input priority is less than or equal to the current job fence. Jobs which would cause the current job limit to be exceeded will also enter the WAIT state. Sessions, which are only initiated at a terminal and are by definition interactive, enter the WAIT state briefly.
- DEFERRED** Deferred jobs are those whose input priority is a value less than or equal to the current JOBFENCE. The term also applies to jobs which were introduced to MPE with an input priority less than or equal to the current job fence. It is not a true job state in the sense that the term "Deferred" will appear in the STATE column. Instead, a D will appear in the third column of the :SHOWJOB listing for jobs in the INTRO or WAIT state only.
- EXEC** This indicates that the job or session has all needed resources, and its own Command Interpreter process is executing. EXEC is the normal state for all sessions, whereas only those jobs currently being processed by MPE will be listed as EXEC. :SHOWJOB will report a job or session being initialized as EXEC*. The summary of executing jobs and sessions will reflect the jobs/sessions that are listed as EXEC and EXEC*.
- SUSP** Suspended jobs are those for which the Operator has issued a :BREAKJOB command. Any executing job may be suspended; sessions cannot. To produce a listing of suspended jobs, enter ":SHOWJOB SUSP". MPE will respond by displaying a list of suspended jobs, or print "NO SUCH JOBS(S)".
- SCHEDULED
JOBS** Scheduled jobs are batch jobs scheduled to execute on the system at a time specified by the user.

The third column of the :SHOWJOB listing, IPRI, displays the input priority for jobs in the WAIT state. It also informs you whether or not an EXEC session is running "quietly". If it is, :TELL messages will not be displayed on the user's terminal. Therefore, any important messages that you need to transmit to all users should be sent via the :WARN command. (Or, in the :TELL message text, you can request users who receive your message to pass the information along to their "quiet" co-workers.)

The fourth and fifth columns (JIN and JLIST, respectively) list the input and output devices used by the job/session. The number listed is the logical device number of a terminal, tape drive, card punch, or printer. Note that for sessions, the number listed in each column is the same. This is because sessions use a single terminal as both the \$STDIN and \$STDLIST device. Jobs, however, are usually submitted on the STREAMS device, or logically "streamed" on it, with output directed to a printer. In the sample :SHOWJOB listing on the preceding page, both jobs are submitted on logical device 10, which is used to stream jobs, and their output is sent to PP, which is a device class name for the HP 2680 Laser Printer.

"INTRODUCED", the sixth column, tells you when the job or session last changed state. The last column, "JOB NAME", displays the user name and account of the person who initiated the session or submitted the job. If a session name is used, it will precede the user name and account in the listing so that the job name will appear similar to "TODD,CHECKS.PAYROLL". (Session names are optional. The name itself can be chosen arbitrarily, and they are used primarily as a convenient means for two users who are logged onto the same user name and account to uniquely identify their session or job.)

Aborting Jobs and Sessions

There are occasions when you may need to abort a job or session. This usually occurs when a user receives no response from a terminal (called a "hung" terminal), and any attempt to free the terminal is ineffective. Another instance in which aborting a job or session may be necessary is during system shutdown. After warning users of the pending shutdown, any sessions or jobs which have not been terminated will be aborted when you issue the =SHUTDOWN command. You may, however, want to selectively abort individual sessions or jobs with the :ABORTJOB command before executing =SHUTDOWN. (The procedure for shutting down the system is explained in the subsection "SYSTEM SHUTDOWN", below.)

Use the :ABORTJOB command to terminate a session or a job. If you don't receive the standard MPE colon prompt (:), enter A^o to produce the "=" prompt and enter "ABORTJOB". For example, to abort session number 3556 (the unique session number displayed with the :SHOWJOB command) enter:

```
:ABORTJOB #S3556
```

You may also execute :ABORTJOB to abort a job, by specifying the *username.acctname* of the job or session you wish to abort. If more than one person is logged onto the system under the same user name and account, MPE will abort one of the qualifying jobs or sessions. You, as Operator, cannot choose which will be aborted in this case. Therefore, the preferred method is to abort a job or session by referencing its unique job or session number.

One other command, =LOGOFF, will log off all jobs and sessions on the system. Since this affects all users, it should be preceded by a :TELL or :WARN message so that they may prepare for the logoff.

MANAGING PERIPHERAL DEVICES

To ensure that the computer system functions smoothly, you must know when and how to allocate peripheral devices and be able to monitor their use. Device files, and the :SHOWIN, :SHOWOUT, and :SHOWDEV commands, are explained, as well as the following Operator commands:

```
:UP           :HEADON      :GIVE         :DOWNLOAD
:DOWN        :HEADOFF     :TAKE
```

The information presented below is intended to be a basic introduction to the care and management of disc drives, including System Domain discs, private volumes, serial and foreign discs; tape drives and cartridge tapes; and printers. Since an exhaustive discussion is beyond the scope of this manual, refer to the documentation supplied with the equipment for detailed information about each device.

Device Files

Many operating systems use the term "file" to describe a group of records on a disc or tape. They can be either program files or data files, and are created by users or supplied with the system software.

The identity of such files, their location, and other pertinent information is normally kept in a file directory. One function of an operating system is to provide a convenient, systematic means to create and manage disc and tape files.

Another equally important operating system function is the management of peripheral devices such as magnetic tapes, flexible discs, terminals, card readers, line printers, card punches, plotters, and paper tape equipment. Since each device has unique operating characteristics, which include both physical and logical considerations for data manipulation, many operating systems choose to separate device I/O handling into two mutually exclusive operations: one, a file system for handling disc files; and two, a standard software interface for all other devices. This requires users to learn two methods of performing input/output operations and inhibits device-independent programming.

MPE enlarges the concept of a file so that it encompasses the control of physical devices as well as data and program files. This way, MPE users treat all input/output operations as if they were reading or writing to a file, whether that file is actually a group of records residing on disc, or the disc drive itself. In general, data stored on disc is a disc file, while files used for I/O operations to or from a device (any non-disc file) are by definition device files.

MPE provides users with a selection of commands to manage and monitor device files and the input/output (or peripheral) devices themselves. Each input/output device known to the system has a unique logical device number (*ldev*). In addition, each device is assigned one or more device class names. A class name can be unique to a device, or it may be associated with more than one *ldev*.

DEVICE CLASSES. With few exceptions, device class names are arbitrarily selected by the System Supervisor. (Exceptions include SYSDISC, which is always assigned to *ldev* 1, the system disc; the device class SPOOL, which must be assigned to disc drives used by the spooling process; and JOBTAPE, which is the device class name required for the STREAMS device, usually configured as *ldev* 10; and DUMPTAPE.) Since more than one device may be assigned the same class name (i.e. two disc drives can both be assigned the class name "DISC"), referencing a device by its class name is always less specific than referring to its logical device number.

ACTIVE DEVICE FILES. An idle device is known by its *ldev* or unique device class name only. By contrast, an active device file is assigned a unique value known as the device file ID. The device file ID for an input device is of the form #*Inmmn*; an output device is represented as #*Omnnn*. For both input and output device files, *mmnn* is a unique identification number.

The device file ID and additional information about the device file is listed when you execute the :SHOWIN command (for input device files) and :SHOWOUT command (for output device files) as shown in the following partial examples:

:SHOWIN

DEV/CL	DFID	JOBNUM	FNAME	STATE	FRM	SPACE	RANK	PRI	#C
58	#12520	#52224	\$STDIN	OPENED		8			
43	#12438	#51223	\$STDIN	OPENED		8			

:SHOWOUT

DEV/CL	DFID	JOBNUM	FNAME	STATE	FRM	SPACE	RANK	PRI	#C
58	#010587	#52224	\$STDLIST	OPENED		128	D	1	1
40	#012222	#51211	\$STDLIST	OPENED		2048	1	8	1
21	#056675	#51009	SLP	WAIT		2048	1	8	2
56	#034456	#51224	PP	ACTIVE		36000	1	8	1

The information displayed in these commands is defined as follows:

DEV/CL	The logical device number or device class of the device file.
DFID	The device file ID number, which MPE uses to uniquely identify the input or output data.
JOBNUM	The number of the job or session which generated the data. This is the same number that identifies each job/session currently executing, listed when you issue the :SHOWJOB command.
FNAME	The name assigned to the device file.
STATE	The job state, which can be either ACTIVE, OPENED, READY, or LOCKED (for output device files).
FRM	Forms message indicator. The letter "F" will appear only if a forms alignment message applies to the device file.
SPACE	The amount of disc space, in sectors, used by the device file.
RANK	The order in which the READY file is output with respect to other files of the same output priority and class name or logical device.
D	Deferred file indicator, which applies only to spooled device files.
PRI	The output priority of the device file, requested by the user or adjusted by the Operator. Specified for spooled output device files only.
#C	The number of copies needed, specified for spooled output device files only.

INPUT DEVICE FILES. Input devices that accept :JOB or :DATA commands automatically attempt to read the first input record as part of the Device Recognition and validation process. (Refer to the preceding discussion of job/session evolution in this section.) There are three types of input device files, each of which is defined below: job/session input device files, data device files, and Operator-assigned device files.

Job/Session Input Device Files. When users enter the :JOB or :HELLO command on a job- or session-accepting device, MPE creates a device file on behalf of the job or session. This file always assumes the system-defined name \$STDIN.

Data Device Files. The :DATA command provides the user with a method of associating a data device file with a specific user name and account, and optionally a file name. In a manner similar to :JOB command processing, the data-accepting device (whether spooled or unspooled) reads and validates the first input record. If the :DATA command is syntactically correct, and the specified user and account exist, the device file is created. Only the specified user, however, may access the device file without Operator intervention. This restriction provides a measure of file security, and simplifies the Operator's job of monitoring data sets.

If the data-accepting device is spooled, the entire device file is spooled to disc. It will remain on the disc until accessed by the user who created it or until it is deleted by the Operator.

The System Operator

Operator-Assigned Device Files. Input devices that do not accept :JOB, :HELLO, or :DATA commands will not automatically recognize or validate the job, session, or file. Instead, the user must request the use of a non-accepting device. You, the Operator, respond by assigning the device to that user exclusively, or informing the user that the device is unavailable. Such devices are known as Operator-assigned device files.

User programs gain access to input data by "opening" an input device file. Since you normally control the device, and the user (who is located at a remote terminal) controls the device file opening program, some coordination between user and Operator is required. If the device to be used is configured as a data-accepting device, the appropriate :DATA command and :EOD command are embedded within the data file as the first and last records respectively. MPE will read the :DATA command automatically, recognize the device file, and make it available to the user program.

Listing Input Device Files. The :SHOWIN command will list all input device files "known" to MPE. For example:

```
:SHOWIN

DEV/CL  DFIN  JOBNUM  FNAME    STATE  FRM SPACE RANK PRI #C
25      #I16  #S14   $STDIN   OPENED
43      #I14  #S13   $STDIN   OPENED
5       #I15                GOODFILE  READY          4
                                FIELD.SUPPORT

3 FILES:
0 ACTIVE
1 READY; INCLUDING 1 SPOOFLES, 0 DEFERRED
2 OPENED; INCLUDING 0 SPOOFLES
0 LOCKED; INCLUDING 0 SPOOFLES
1 SPOOFLES: 4 SECTORS
```

Device files #I16 and #I14 are session input device files on logical device 25 and 43 respectively. Device file #I15 is a :DATA device file that was spooled from logical device 5. It was created by the user FIELD under the account SUPPORT, and assigned the file name GOODFILE.

OUTPUT DEVICE FILES. An output device file contains data from a user program which is directed to devices such as line printers or tape drives. Like input device files, output device files fall into three categories: standard list device files used by jobs and sessions, non-standard output device files created by job and sessions, and Operator-assigned device files.

Job/Session List Device Files. When the system is first configured, each job or session accepting device is assigned a corresponding standard output device. There is exactly one such output device file assigned to each executing job and session, which assumes the system-defined file name \$STDLIST. For example, the standard output device for sessions is a terminal. (Since sessions are interactive, the standard input device file, \$STDIN, and standard output device file, \$STDLIST are always the same logical device.) The standard list device for jobs is more likely to be a printer, since users submit jobs to be separately processed by MPE, and would not want output results to appear on their terminal while they are working.

Redirecting Output to Another Device. Users may redirect output, which would normally appear on the \$STDLIST device, to another logical device or device class. This is done with file equations, which use the :FILE command to equate a file name with a device, or a system-defined file name (representing a device) with a user-defined file. For example, the LISTEQ5 utility lists the file equations and temporary files in use during the current session. By default, the information is displayed on your terminal, identified by the formal file designator "LIST". To redirect the output to device class LP, enter:

```
:FILE LIST;DEV=LP
:RUN LISTEQ5.PUB.SYS
```

Operator-Assigned Output Device Files. If users select a magnetic tape or serial disc as the output device file for their job or session, you must :REPLY to the request. Until you respond, their program (which needs the device for output) will remain suspended. Since you may either allow the user use of the device, or deny access to it, devices assigned with a :REPLY are known as "Operator-assigned device files."

A user's device class request will generate a Console message similar to the following:

```
?8:32/#55889/192/LDEV# FOR "T" ON TAPE (NUM)?
```

In this example, Session #5889 (#55889) is requesting the use of a tape drive in device class TAPE. To respond, send a message (via the :REPLY command) to the user's process, identified by the process identification number, or *pin*. (The *pin* is always the number which follows the second slash mark ("/") in the request. In the example, the *pin* is 192.) Your reply may either grant the user access to a device in the class identified by the device class name, or inform the user that no device is available. For example, to respond to the request by assigning logical device 7 to *pin* 192, enter:

```
:REPLY 192,7
```

To tell the user that no device is available, respond:

```
:REPLY 192,0
```

This way, the user can request the device at a later time, rather than remain suspended indefinitely.

Note that if the user has requested a device class you may assign any available logical device in the class. However, if the request is for a specific disc or tape drive, identified by its logical device number, you may assign the device if or when it becomes available.

Listing Output Device Files. To list the output device files known to MPE, issue the `:SHOWOUT` command, illustrated below:

:SHOWOUT

DEV/CL	DFID	JOBNUM	FNAME	STATE	FRM	SPACE	RANK	PRI	#C
PP	#012	#J4	\$STDLIST	OPENED		2048		8	1
PP	#024	#S11	BASLIST	OPENED		2048	D 0		1
PP	#080	#S24	PP	READY		2048	D 0		1
19	#0131	#S21	SLP	ACTIVE		1408		8	1

.
. .
.

41 FILES:

1 ACTIVE
3 READY; INCLUDING 3 SPOOFLES, 3 DEFERRED
37 OPENED; INCLUDING 7 SPOOFLES
0 LOCKED; INCLUDING 0 SPOOFLES
11 SPOOFLES: 19948 SECTORS
OUTFENCE = 6

Controlling Device Availability

As Operator, you can control which peripheral devices are on line and available to users, and which are not. The `:DOWN` command takes a device off line (called "downing" a device), while the `:UP` command brings it back on line. Any device, except the System Console or system domain disc drive, can be downed.

For example, to take a tape drive (identified as logical device 7) off line, enter:

:DOWN 7

The most common reason for taking a device off line is to perform diagnostic tests on the device. In this case, after downing the device, you would give the device to diagnostics by executing the `:GIVE` command. For example, to take logical device 81 off line so that diagnostic tests can be performed on the device, enter:

:DOWN 81
:GIVE 81

12:53/3/LDEV#81 IN USE BY DIAGNOSTICS

To release *ldev* 81 from diagnostics control, so that it can be brought back on line, enter:

:TAKE 81

To bring a device back on line, enter:

:UP 81

To determine that the device is again available, check its status with the `:SHOWDEV` command. If it is, "AVAIL" will be displayed in the third column of the `:SHOWDEV` listing.

```
:showdev 81
LDEV  AVAIL      OWNERSHIP      VOLID      DEN      ASSOCIATION
81    AVAIL
```

1

2

3

4

5

Using Disc Volumes

Disc files are the principal means of permanent data storage on the HP 3000. The majority of disc storage is shared among all users on the system and stored on devices known as System Domain discs. Non-system domain discs, the other category of disc device, consist of foreign (non-MPE formatted) disc volumes, private volumes, and serial discs.

Since system domain and private volume disc drives are used as shared devices, and therefore are not assigned to users as are tape drives, accessing disc files requires little Operator intervention. Your primary interaction with disc drives will be in manipulating private volumes. This entails enabling the Private Volumes facility and mounting and dismounting private disc volumes using three Operator commands: :VMOUNT, :LMOUNT, and :LDISMOUNT. (For detailed information, refer to "PRIVATE VOLUMES" in Section X of this manual.)

The following information is an introduction to the care and handling of disc drives. It includes general information about disc conditioning, the Private Volumes facility, the Foreign Disc Facility, disc pack storage requirements, and maintenance of flexible discs, or diskettes. Specific hardware information about different models and types of disc drives is available in the hardware documentation supplied with the peripheral device.

DISC CONDITIONING. Discs must be "conditioned" before users can access them. Normally done by the System Supervisor or System Manager, disc conditioning includes the following three procedures, performed in the listed order:

- **Formatting:** writing address and timing information on the disc.
- **Initializing:** configuring the Free Space and Defective Tracks Tables on the disc (system domain and private volumes only).
- **Labeling:** assigning a name to the disc volume.

System Volume Conditioning. System domain discs are always formatted off line (when the operating system is shut down) by the stand-alone program SLEUTHSM. They are initialized during a RELOAD of the operating system when the Initiator dialogue creates a Defective Tracks Table. You may label discs during a COOLSTART, COLDSTART, UPDATE, or RELOAD by responding to INITIAL's prompt for a volume name.

Private Volume Conditioning. Unlike System domain discs, non-system domain discs (which include Private Volumes, serial discs, and foreign discs) may be conditioned while MPE is operational. Online disc conditioning may be done only by users with OP capability since access to MPE's VINIT subsystem, which is used to condition non-system discs, is restricted to such users. VINIT includes an array of commands to format, initialize, label, and verify non-system domain discs. (For more information about non-system domain discs, refer to "PRIVATE VOLUMES" in Section X of this manual.)

CONTROLLING THE USE OF PRIVATE VOLUMES. You, as Operator, control the use of private volumes on your system with three Operator commands: :LMDUNT, :LDISMOUNT, and :VMDUNT. The first two commands, :LMDUNT and :LDISMOUNT, let you control which private volume sets are online and available to users. Unless a volume set is logically mounted, users will be unable to use the files stored on the disc, because MPE will have no means to access the disc. (A disc volume, whether private or shared, must be "known" to MPE through a logical mount operation. Unlike System domain discs, which are mounted when the system is started, private volumes require Operator intervention in the form of an explicit :LMDUNT command.)

The third command, :VMDUNT, enables or disables the entire Private Volumes facility. To enable the Private Volumes facility enter:

:VMDUNT ON

This allows users to access private volumes. In this case, users' :MDUNT requests will be displayed on the Console and you must respond to their request. If you would like to enable the Private Volumes facility so that :MDUNT requests do not interrupt you, enter:

:VMDUNT ON;AUTO

In this case, MPE will attempt to satisfy users' :MDUNT requests automatically.

To disable the Private Volumes facility without suppressing the display of :MDUNT request messages on the Console, enter:

:VMDUNT OFF;ALL

To prevent users from accessing private disc volumes, and suppress the display of Console messages, enter:

:VMDUNT OFF

THE FOREIGN DISC FACILITY. The Foreign Disc Facility (FDF) allows standard MPE users to access and alter data on disc volumes that do not conform to the standard MPE format. MPE considers a disc "foreign" if it lacks a standard MPE volume label. Volume labels which MPE recognizes as standard include:

- Valid private volume labels.
- Scratch volume labels.
- System volume labels.
- Serial disc volume labels.

Since the format of a foreign disc is completely arbitrary, it is conceivable that a foreign disc's format could duplicate a Private Volume, serial disc, or other MPE-recognized format. In this case, the foreign volume might be treated as a standard MPE disc, which would require Operator intervention. To inform MPE that a particular disc volume is in fact a foreign disc, enter:

:FOREIGN *ldev*

In this example, *ldev* is the logical device number of the device on which the disc volume is mounted. `:FOREIGN` forces the system to treat the volume currently mounted on the specified device as a foreign disc. For this command to succeed, the mounted device must be in a foreign device class, the device must be UP, and the volume cannot be in use.

CAUTION

If the restrictions stated above are met, the system will treat any volume mounted on the logical device as a foreign disc. As long as the volume is not a System Domain disc, no security checking is done. Therefore, any disc (System, Private Volume, etc.) could be accidentally mounted and used as a foreign disc. Since one characteristic of the Foreign Disc Facility is the ability to write on the MPE label area, volume labels could be destroyed and important information lost.

Foreign discs, like serial discs and private volumes, are not considered part of the System Domain and are not identified by entries into the System Volume Table. Standard MPE users may access and alter data residing on a foreign disc if two conditions are met: one, the Operator must allow them access to the device which contains the foreign disc. Two, users must be able to access the data on the disc in a form which is meaningful to MPE. The second condition is accomplished by using a program to interpret (read) the disc format and also write data which is compatible with the foreign disc's file and record structure. For example, provided you (or your program) know the disc format, you could treat a foreign disc as an HP 250-, HP 300-, or IBM 3741-formatted diskette.

You may designate a device class to be "foreign" during the SYSDUMP/INITIAL dialogue (which is explained later in this section). Once the device class is designated as foreign, you may mount a disc in the drive (*ldev*) corresponding to that device class and access any and all information on that disc. If you want to treat another type of disc (such a serial disc) as foreign, it must first be conditioned as a foreign disc using FOREIGN or the VINIT subsystem.

To create a foreign disc on logical device 3 (which must be a non-system domain disc drive in the down state), mount a disc pack on the drive and enter the following command in the VINIT subsystem:

```
>FOREIGN 3
```

This command will fill in the MPE volume label with zeros, regardless of its previous contents, since MPE does not acknowledge zeros as a valid disc label. (Any other unrecognizable character sequence would suffice.) MPE will then treat the volume as a foreign disc for all subsequent accesses.

The DSTAT command of the VINIT subsystem will display the status of the foreign disc on *ldev* 3. The user command `:DSTAT` will also indicate that MPE considers a disc as foreign; it uses the same format as the VINIT DSTAT command.

THE CARE AND HANDLING OF DISC DEVICES. Disc drives and disc volumes, like all media used to store computer data, require careful handling and proper environmental conditions. Following the guidelines listed below will extend the life of your disc storage equipment and help maintain the integrity of data stored on disc packs and diskettes.

Disc Packs. Temperature and cleanliness of the storage area affect the interchangeability of disc packs between drives. Disc packs should be stored in environmental surroundings that are nearly identical to those of the operating area. To ensure optimum performance, the temperature of the disc drive and disc pack must be within +3 degrees C (+5.4 degrees F) of each other. If the disc packs are stored separately from the disc drives, the temperature of the storage area should be maintained between -15 degrees C and 60 degrees C (5 degrees F and 140 degrees F) with the relative humidity between 0 and 95 percent (non-condensing). When the temperature and relative humidity of the storage area are different than the disc drives' operational requirements, allow a minimum of two hours for environmental stabilization before using the disc packs.

Store disc packs in a clean, dust-free area. Do not allow them to come into contact with any magnetic material. Steel storage cabinets protect the packs, and allow easy access since you can adjust the shelf height. Always store disc packs flat, not more than two high, with the top cover of the storage case resting on the gasket of the bottom cover. It is also a good idea to wipe the outside of the disc pack storage case with a liquid anti-static plastic cleaner periodically; this will minimize the possibility of introducing dust and dirt into the disc pack.

Other general precautions for handling disc packs include:

- Replace covers that are cracked, distorted or damaged.
- Do not touch the surface of the disc with any object, including your hands. The disc surfaces can be distorted or damaged through impact, excessive pressure, or abrasion.
- Keep beverages off the disc drive and away from the disc pack storage area. If spilled, they will leave a residue on the recording surface, which may require reconditioning of the disc.
- Keep all smoking materials away from the disc drives. Smoke will contaminate the disc packs and interfere with the reliable operation of the drives.

Flexible Discs. The flexible disc is enclosed in a plastic jacket which is lined with a wiping material that cleans the disc of foreign matter. When not in use, the disc should always be stored in its protective envelope. To ensure error-free disc drive operation, the following additional precautions should be observed:

- Use only Hewlett-Packard-approved flexible discs. Use of any others can result in damage to the drive mechanism, high maintenance costs, and data loss. Hewlett-Packard warranty does not cover damage caused by the use of flexible discs not approved by Hewlett-Packard.
- Return the disc to its storage envelope whenever it is removed from the disc drive.
- Replace storage envelopes when they become worn, cracked, or distorted.
- Do not touch or attempt to clean the surface of the disc. Abrasions may cause loss of data.
- Do not write on the plastic jacket of the disc with a lead pencil or ballpoint pen. Use a felt-tip pen and write only on the label.
- Do not expose the disc to extremes of temperature and/or humidity.
- Keep the flexible discs away from magnetic fields and ferromagnetic materials that may become magnetized. Strong magnetic fields can distort the data recorded on a disc.

Using Magnetic Tapes

Tape drives, unlike most disc drives, are nonsharable devices, and users cannot access them without your assistance. As a result, you will be called upon to manage tape devices far more frequently than disc drives. When a user (or a user's program) requests the use of a tape drive, you will :REPLY to the request at the Console, either granting access to the device, or telling the user that the device is unavailable. If the device is available, you will mount and load the tape, put the tape drive on line, and assign that logical device to the user.

OPERATOR TASKS REQUIRING TAPES. In addition to responding to users' tape requests, you will use tapes to perform specific Operator functions. These functions include:

- Backing up the system.
- Restarting the system from tape (the COLDSTART, UPDATE, or RELOAD options of the Initiator dialogue).
- Storing files to tape, using the :STORE command.
- Restoring files from tape with the :RESTORE command.

As you can see from this summary, it is important for you to be familiar with the tape drives used with your system. Some of the pertinent information is discussed below. Other information, such as using the :STORE and :RESTORE commands, and using tapes during the SYSDUMP/INITIAL dialogue is discussed in subsequent parts of this section. Additional information about peripheral devices is also available in Section VIII, entitled "SPECIAL CONSIDERATIONS FOR PERIPHERAL DEVICES".

THE CARE AND HANDLING OF TAPES. An important part of using tapes correctly is to follow the maintenance procedures outlined in the documentation supplied with the equipment. Tape drives, like disc storage devices, should be handled with care and used under the proper environmental conditions. Guidelines for the use of magnetic tapes and cartridge tapes are discussed below.

Magnetic Tapes. The reliability of data stored on magnetic tapes is affected by environmental conditions. Tape heads, since they are exposed to particles of dust and smoke in the air most of the time, should be cleaned after every eight hours of use. Like disc packs, it is a good idea to store magnetic tapes in cabinets. They should be stored vertically, away from operating disc drives because of the magnetic field a disc drive generates. Arrange the storage area so that the tapes do not contact any magnetic material (even magnetic latches on cabinets), since any magnetic field greater than 50 oersteds can destroy information on the tape.

To reduce read errors, plan the storage area so that extremes of temperature and humidity are avoided. If this cannot be done, you must bring tapes to computer-room temperature 4 to 16 hours before use. An exception applies to the handling of acetate and polyester tapes: they must always be maintained at the same temperature as the computer system room.

Cartridge Tapes. The cartridge intended for use in the HP 7911/12/14 integrated cartridge tape drive is a 4-inch by 6-inch DC600 preformatted data cartridge. It is available in either a 67-megabyte, 600-foot size (HP 88140L) or a 16.7-megabyte, 150-foot size (HP 88140S). The formatted blocks include space for 1K bytes of data, error correction, block addresses, and other data used internally by MPE. A mechanical write protect key is built into the cartridge. Data on a cartridge can be protected against accidental overwriting by turning the safe arrow in the upper left corner of the cartridge to the "SAFE" position. However, if you insert such a cartridge and writing is required, you will have to remove and reinsert it after turning the save arrow to allow writing. These steps can take up to 5 minutes.

The following is a list of general procedures for the correct use of cartridge tapes:

1. Do not touch or attempt to clean the tape or tape guide within the cartridge.
2. Do not attempt to remove a tape cartridge while the "BUSY" indicator is lit. Wait until the tape cartridge unloading sequence is complete.
3. Do not use excessive force on the tape eject lever. It will not operate when the power is off (unless the tape was properly unloaded) or when the "BUSY" indicator is lit.
4. When not in use, tape cartridges should be removed from the drive and stored in the protective plastic case. If cartridges are left in the tape drive, they can deform the rubber capstan and collect excessive amounts of dust and dirt.
5. Tape cartridges should not be left in excessively warm, dry, or humid areas; they should be stored away from magnetic fields and direct sunlight.
6. Tape cartridges should only operate between temperatures of 10 degrees C (50 degrees F) and 40 degrees C (104 degrees F); they should be stored at temperatures in the range of -40 degrees C (-40 degrees F) to 65 degrees C (149 degrees F).
7. Do not drop tape cartridges or subject them to rough handling.
8. To protect data stored on the cartridge, turn the safe arrow in the corner of the tape cartridge to "SAFE".
9. NEVER erase a cartridge tape with a bulk erase! It is preformatted at the factory and you will not be able to use it again.

Using Printers

Printers are the principal output device used by jobs, and they are frequently used for output during sessions. As Operator you are responsible for monitoring the printer, which consists of three main tasks:

- Controlling the operation of the spooler.
- Replacing paper, preventing (or fixing) paper jams, and unloading finished printouts.
- Responding to users' forms requests by mounting and adjusting new forms.

In addition, you may also determine whether to print header or trailer data, controlled with two MPE commands: :HEADOFF and :HEADON. Controlling the operation of the spooler is a major task

requiring you to know several MPE spooler commands. Because of its magnitude, spooling is treated in a separate discussion immediately following this subsection. For complete instructions, for replacing paper and fixing paper jams, refer to the documentation supplied with your system's printers. Information about peripheral devices used with the HP 3000 is also included in Section VIII of this manual, entitled "SPECIAL CONSIDERATIONS FOR PERIPHERAL DEVICES".

FORMS MESSAGE. When a user opens an output device file, the program generating the output may request special forms (using the *formsmsg* parameter of the FOPEN intrinsic). In this case, a request to mount the forms will be displayed on the Console. If the request for special forms is for an HP 2608A, HP 2608S, or HP 2563 Line Printer, you can send the special format information to the printer with the :DOWNLOAD command.

CAUTION

Do not issue a :DOWNLOAD command to an HP 2608S or HP 2563 printer while a spool file is printing. This will disable the device and it will remain so until the system is restarted with a WARMSTART. HP recommends that an environment file be used to transmit the required information to these printers.

If the user has requested a device class, you are asked to mount the forms on any free device in the class. If the user has requested a specific *Idev*, the form must be mounted only on the requested device, if it is available. If special forms are mounted on a device, and the user's program does not need them, MPE will automatically request that you mount standard forms.

When the user has requested special forms on a line printer (other than the HP 2608S or HP 2563), MPE will initiate a dialogue with you to align the forms. A standard record of the following form is output to the line printer:

```

0                               1/  /2                               3
..... / / .....
      / /
  
```

In addition, a message will be displayed on the Console asking if the forms are aligned. This dialogue is repeated until they are correct, at which point the file can begin printing at the proper user-defined position.

Forms alignment on an HP 2608S or HP 2563 printer is an exception to this procedure. Press the "PRINT ONE LINE" switch on the printer shown in Figure 4-2 to produce a test line and then make any necessary adjustments to the form. The printer must be offline. For more detailed information, refer to the HP 2608S Operator's Manual (02608-90911).

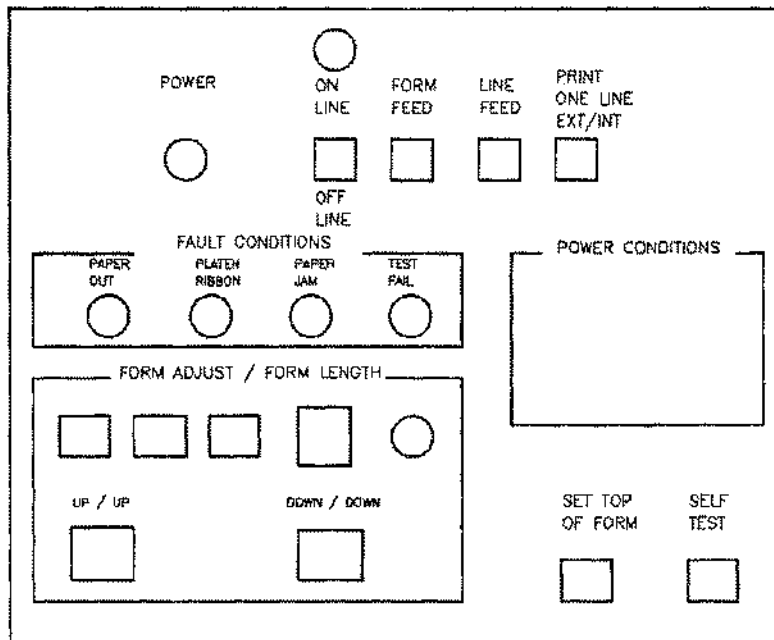


Figure 4-2. Control Panel on the HP 2608S Line Printer

CONTROLLING HEADER/TRAILER OUTPUT. Header/trailer output is the page of data which precedes and follows the text file. It identifies the file by session (or job) number, output spool file number, session name (if any), user name, and account. If you want to suppress the printing of header/trailer output, enter:

:HEADOFF 6

This will prevent the printing of header/trailer data on logical device 6. If this command is issued while a file is being printed, the request to suppress header/trailer output will take effect after the ACTIVE file's trailer page is printed.

To resume the printing of header/trailer data for logical device 6, enter:

:HEADON 6

SPOOLING

MPE is equipped with a spooling facility to assist the operation of certain nonsharable devices. When a spooler process controls a device such as a line printer, the device appears to be shared among several users, when in fact it can only process one file at a time. This is done by temporarily storing data on disc, instead of sending it directly to the spooled device. The disc essentially becomes a staging area, while the spooler manages the collection of input data (usually from a terminal or tape drive) and the selection of an output spool file destined for the printer.

A simplified diagram illustrating the input/output spooling process is shown in Figure 4-3. As the figure illustrates, MPE's spooling facility actually consists of two separate parts: an input spooler and

an output spooler. The following discussion, separated into two subsections, explains each part of the process in detail.

Input Spooling

When a nonsharable job- or data-accepting input device is "spooled", the device (spooler) is controlled by a spooling process. It collects data from the input device and writes the data to a disc file. When there is no input data to be collected, the spooler enters a suspended state.

The input spooling operation continues until the logical end-of-file indicator (:EDJ for job files :EDD for data files) is encountered. At that point, the spool file is complete (the READY state) and is available for access by a program or MPE. A data file states changes from READY to OPEN once a program opens it with a valid FOPEN intrinsic. Once the program no longer needs the file (and issues an FCLOSE), the file will be deleted from the disc. To summarize, the three states of an input spool file are:

ACTIVE	The input spool file is being created, but is not yet complete.
READY	The file is available for program access; it also may be deleted by the Operator.
OPEN	The file is currently being read by a user program or MPE.

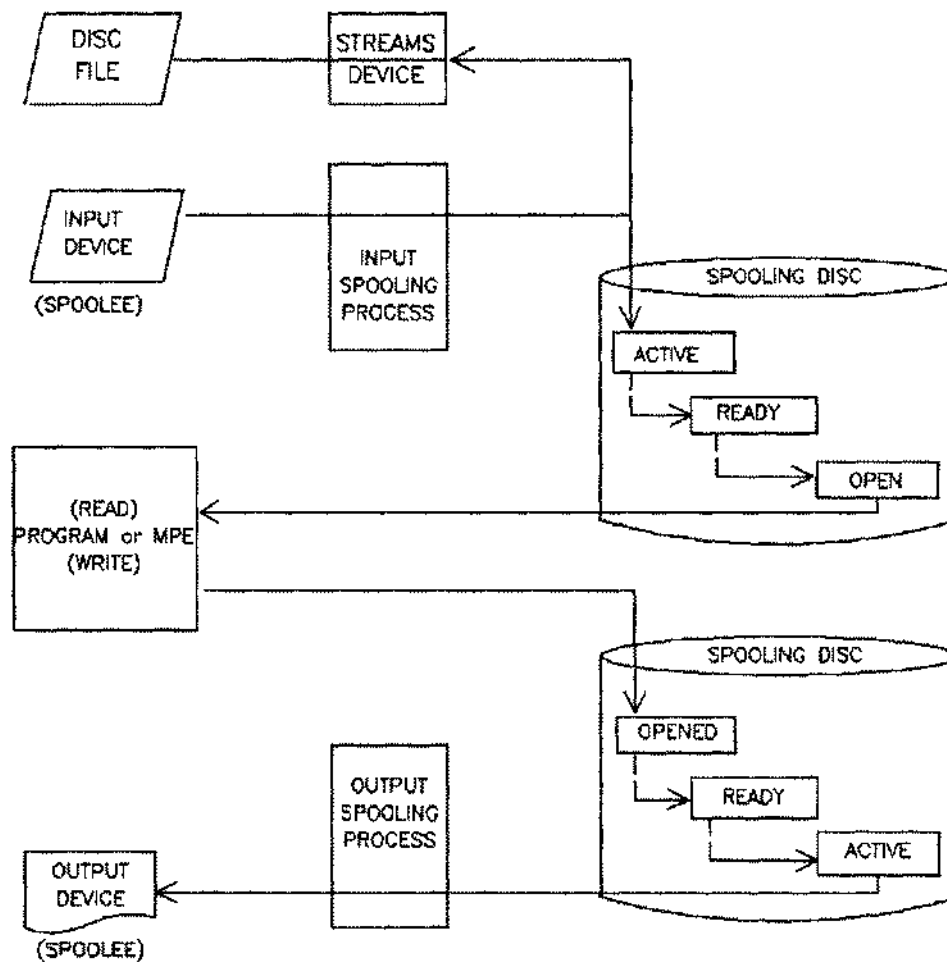


Figure 4-3. Simplified I/O Spooling Diagram

OPERATOR CONTROL OF INPUT SPOOLING. There are three ways in which you can control the processing of input spool files. First, you may stop the input spooling process with the `:STOPSPPOOL` command. Second, you may issue the `:STARTSPPOOL` command to start or restart the spooling process for an input device. And third, you may delete a **READY** spool file from disc with the `:DELETESPOOLFILE` command.

Peripheral devices that the System Supervisor configures as spooled devices (during the `SYSDUMP` dialogue) are automatically activated when the system is started. Devices which are not automatically spooled must be allocated to a spooler process by issuing a `:STARTSPPOOL` for each device. To deallocate the input device, enter the `:STOPSPPOOL` command. This action will immediately stop the spooler and delete the currently **ACTIVE** spool file.

An exception to this occurs when a `:DELETESPOOLFILE` command is issued in combination with the `:STOPSPPOOL` command. In this case, the spooler is not stopped until the currently ACTIVE spool file is deleted from the system. When issued by itself, `:DELETESPOOLFILE` deletes the ACTIVE file but the device remains allocated to the spooler process. Note that `$STDIN` files cannot be deleted with the `:DELETESPOOLFILE` command; you must use `:ABORTJOB` on such files.

MAINTAINING JOB SEQUENCE. Normally, every job in a sequence of jobs is independent of the others, and may be submitted and executed in any order. In certain exceptional cases, the order in which jobs are executed is critical. When such a job sequence is submitted on an unspooled device, this order is implicitly maintained, because each command is executed when MPE reads it.

When a job-accepting device is spooled, this order may not be maintained for two reasons: first, jobs are accepted by the spooler program before preceding jobs have been completely executed; and second, the spooler allows jobs to execute concurrently. Therefore, a sequence of jobs which must be executed in a specific order should be submitted on an unspooled device since the order in which they are submitted is the exact order in which they will be processed. An example will illustrate this: when the System Manager establishes an account, he or she will typically create the account with just one user and one group as a single job. A second job establishes all of the remaining users and groups. If this two-job sequence were submitted on a spooled device, the first job would probably not be complete before the spooler attempted to validate the second job. That is, the user, group, and account needed to successfully execute the second job would not yet exist when the spooler attempted to validate the job.

ABNORMAL TERMINATION OF THE SPOOLER PROCESS. When the spooled input device is a tape drive, the I/O system automatically issues a rewind command whenever spooling is stopped. In normal operation, this feature ensures that the tape may be unloaded properly. However, when a power failure or overtemperature shutdown occurs, spooling is stopped abnormally, which leaves a rewind request outstanding when the system is restarted. If no tape is mounted on the tape drive assigned as the input spooling device when the system is restarted, one of the following I/O messages will be displayed on the Console:

```
SP#ldev/STOPPED
SPOOLEE IO ERROR
LDEV#ldev OFFLINE
LDEV#ldev NOT READY
```

Therefore, as a standard power fail or overtemperature recovery procedure, mount an expendable tape on the input spooling device.

Output Spooling

You can exercise more control over output spool files than input spool files. In addition to the `:STARTSPPOOL`, `:STOPSPPOOL`, and `:DELETESPOOLFILE` commands discussed above, you may also suspend and resume a spooling process using the `:SUSPENDSPPOOL` and `:RESUMESPOOL` commands, and alter the status or destination of an output spool file with the `:ALTSPPOOLFILE` command. Two other Operator commands, `:OPENQ` and `:SHUTQ`, are available on the G.00.00 release of MPE V. They are used to open and close spool queues, which allow or prohibit spooled files to be stored on disc to await printing.

OUTPUT SPOOL FILE STATES. When a nonsharable device is spooled, a spooling process controls the device, which is referred to as the "spooler". A user program writing data to a spooled output device actually writes output records to an OPEN spooled device file instead of the device itself. This spool file is stored on disc until it is complete, at which point the file's status changes from OPEN to READY.

In addition to building output spool files on disc, the output spooler also searches continuously for READY device files. When the output device (usually a printer) is available, the spooler process selects a READY file. The file selected changes from the READY state to ACTIVE, and printing begins. Below is a summary of the sequence of output spool file states:

- OPEN An output spool file currently being created by MPE.
- READY A complete file, available and waiting to be processed by an output device. READY or ACTIVE files may be deleted with the :DELETESPOOLFILE command.
- ACTIVE The file currently being output to the device.

A spooled output device file may also be LOCKED, which means that the file is READY but cannot be selected as the next ACTIVE file. Typically, a spool file will be locked when a user is accessing it through the SPOOK utility. (For a discussion of SPOOK, refer to the MPE V System Utilities Reference Manual (32033-90008)).

LISTING OUTPUT SPOOL FILES. The :SHOWOUT SP command lists all spooled output device files known to MPE, and a summary of spooler statistics, as shown in the example below.

:SHOWOUT SP

DEV/CL	DFID	JOBNUM	FNAME	STATE	FRM	SPACE	RANK	PRI	#C
PP	#03162	#J66	\$STDLIST	OPENED		2048		13	1
PP	#03164	#J67	\$STDLIST	OPENED		2048		13	1
PP	#01182	#J27	\$STDLIST	READY		756	D 3		1
PP	#01370	#J33	SYSADGID	READY		1520	D 1		1
PP	#01787	#S531	SLP	READY		2740	D 1		1
PP	#02631	#S711	STDLIST	OPENED		2048	D 0		1
PP	#03364	#S863	SLP	OPENED		2048		13	1
LP	#03327	#S'293	MAILLOG	READY		48	1 8		1
LP	#03339	#S'299	MAILLOG	READY		48	2 8		1
LP	#096	#S'246	LP	READY		1200	D 1		1
LP	#03359	#S868	WPHDUMP	READY		660	D 1		1
6	#03325	#S'296	MAILLOG	ACTIVE		48		8	1

12 FILES (DISPLAYED):

- 1 ACTIVE
- 7 READY; INCLUDING 7 SPOOFLES, 6 DEFERRED
- 4 OPENED; INCLUDING 4 SPOOFLES
- 0 LOCKED; INCLUDING 0 SPOOFLES
- 12 SPOOFLES: 15212 SECTORS

OUTFENCE = 6

CONTROLLING SPOOLED DEVICES AND DEVICE CLASSES. You may use a combination of the `:STARTSPOOL` and `:STOPSPPOOL` commands to control spooled devices (identified by their logical device numbers) separately from spooled device classes. For example, suppose you want the system's line printer (*ldev 6*) to be an unspooled "hot" device, yet you also want any users directing output to device class LP (which is assigned to more than one device) to be able to build spool files while *ldev 6* is unavailable. To do so, start spooling for device class LP, and stop spooling on *ldev 6*, as shown below.

```
:STARTSPOOL LP
:STOPSPPOOL 6
```

When *ldev 6* can again be shared (spooled), and you wish to print the spool files which have accumulated, enter:

```
:STARTSPOOL 6
```

Note that starting the spooling process for a particular device can activate spooling for all device classes associated with the device.

SUSPENDING THE SPOOLER. Another frequently used output spooling command is `:SUSPENDSPOOL`. It temporarily suspends the spooler process without deallocating the device. If the "`:SUSPENDSPOOL ldev;FINISH`" form of the command is used, the output device will finish printing the currently ACTIVE file before the process is suspended. If FINISH is not specified, spooling stops immediately and any ACTIVE file is returned to the READY state in its original queue and at its current output priority.

RESUMING THE SPOOLER. To resume the spooler after it has been suspended, use `:RESUMESPOOL`. With this command you may backspace or advance a specified number of files or pages, or resume printing at the beginning of the ACTIVE file that was interrupted when the spooler was suspended. (This is possible because the entire spool file remains intact until printing is complete, even though it may consist of up to 32 distinct sections, or "extents". Printers capable of recovering from a malfunction run "silently" from the beginning of the spool file to the point of interruption, then resume printing.)

The "`BACK nnn PAGES`" parameter of the `:RESUMESPOOL` command is particularly helpful when the paper jams after printing most of a large job. If only the last few pages are damaged, simply resume printing two or three pages before the jam occurred. (A page in this context is a literal page, which is usually 60 lines of output.) Because the spooler uses literal pages, and also because partial and header pages affect the count, it is difficult to determine where the spooler was interrupted. Therefore, when resuming the spooler, overestimate the number of pages you will need. For example, if you need to reprint the last three pages, resume printing "`BACK 5 PAGES`".

NOTE

You cannot use the "FILES" parameter of the :RESUMESPOOL command to go BACK or FORWARD in the spool file when using the HP 2680A Laser Page Printer and the HP 2608S printer. Even on printers which do support the "FILES" parameter, using it properly is extremely complex. For the purpose of the :RESUMESPOOL command, individual files within a complete output spool file are defined as data separated by the FOPEN intrinsic. In order to go back or forward *nnn* number of files, you must first identify individual "files" by examining the spool file with the SPOOK utility for "FOPEN " statements.

SETTING THE OUTPUT FENCE. To control output spooling for all devices on the system, or optionally, for individual logical devices, use the :OUTFENCE command. Output device files with a priority less than or equal to the current system or device output fence are not selected for printing by an output spooler process. Such files remain deferred until the output fence is lowered, or until their output priority is raised. When the spooler fails to find a READY spool file, the output device will wait. It will be reactivated automatically when a spool file with high enough priority is READY for printing.

ALTERING A SINGLE SPOOL FILE. If you want to print a particular file without affecting others, you may change the output priority of the spool file with the :ALTSPoolFILE command. :ALTSPoolFILE is also used to change the destination of an OPEN, READY or ACTIVE file, or to direct the printer to produce multiple copies of a file. For example, to raise the output priority of a spool file to 10 and print 4 copies of the document, enter:

```
:ALTSPoolFILE #0116;PRI=10;COPIES=4
```

In this example "#0116" is the MPE-assigned output spool file number, displayed when you issue the :SHOWOUT SP command.

CONTROLLING SPOOL QUEUES. Two new Operator commands have been included in the G.00.00 release of MPE V: :OPENQ and :SHUTQ. The first command, :OPENQ, allows users to create output spool files on disc even while the printer spooler is stopped or suspended. The spool queue also need not correspond to a particular logical device; files will continue to be collected in the queue until no more disc space is available or until you shut the spool queue by issuing a :SHUTQ command. (Spool files which accumulate in the queue may be stored off on tape with the SPOOK utility for later printing. Refer to the discussion of SPOOK in the MPE V Utilities Reference Manual, (32033-90008).)

If the spool queues become full, a Console message will be issued, MPE shuts the spool queues and no more spool files can be created. In this case, you must shut the spool queue, and allow the spooler time to print some of the files. Other options include storing some of the less-important files on tape (with SPOOK, mentioned above) or deleting some of the accumulated spool files from the system.

BACKING UP SYSTEM AND USER FILES

If a system failure occurs, the amount of data you lose directly depends upon two factors: how recently you performed a backup, and the level of system activity since files were stored off line. The System Supervisor creates a backup schedule that best meets the needs of system users. This may include saving all files in a particular account every day, or copying only those files which have been added or modified since files were last stored off line. Or, the System Supervisor may ask you to remove infrequently used files from the disc completely, and store them in a tape library.

Regardless of the schedule or method, system backups must be done regularly. Backup tapes should contain all of the software your installation uses because you may have to rely on your backup copy to restore the system to its previous condition. Also, it is a good idea to save the last few backup copies of your system in case the most recent backup tape is bad.

NOTE

It is possible to acquire another copy of the system software from Hewlett-Packard. Restarting the system with a new Installation Tape should only be considered as a "last resort", since it contains no user files or programs, nor will it contain any of the configuration information unique to your system.

A complete backup tape should contain three types of data:

- All system files should be copied to tape. The vast majority of such files are owned by the PUB group of the SYS account; the largest of these is the Segmented Library, or SL. The SL is a collection of procedures supporting the majority of command programs, subsystems, and utilities that make up MPE.
- The current system configuration. This includes system tables, queues, device I/O attachments, and other parameters.
- User files are the most critical part of a backup tape. They cannot otherwise be duplicated, and since they are the product of several months or years of labor, user files comprise the most important element of your computer system.

Because the process of storing files off line interrupts work, it is important to maintain a backup schedule that is both convenient for users and frequent enough to preserve your data. Files that users are accessing cannot be stored, unless they are executable program files or files opened for read only. These two cases are exceptional because even though the files are open, their contents cannot be altered, and they may be written safely to tape. In every other case, however, files opened by a user or program cannot be copied to tape. Similarly, a file being dumped to tape is not available to users.

:SYSDUMP Versus :STORE

MPE provides you with two methods to store files off line so that your backup procedure will interrupt users as little as possible: :SYSDUMP and :STORE. They are both MPE commands which you enter at the colon prompt (:), but their scope and purpose varies. :SYSDUMP is used to copy files as well as system parameters and configuration data, the accounting structure, and file directory. With :SYSDUMP, you may copy all, or only selected subsets, of files. The information saved with the :SYSDUMP command is re-entered into the system via one of the three cold load options which use magnetic tape as the data source: COLDSTART, UPDATE, or RELOAD.

The scope of the `:STORE` command is less comprehensive than the `:SYSDUMP` command. It is primarily used to copy selected files within a group or groups, or all files belonging to one or more accounts. Although it does save file directory information, `:STORE` will not save the accounting structure, configuration data, or any other system tables, queues, or parameters.

Files dumped to tape with the `:STORE` command are re-entered into the system via the `:RESTORE` command. For a `:RESTORE` to succeed on either the E.00.00 or F.00.00 versions of MPE V, the user name, group, and account to which the files belong must already exist on the destination system. If they do, `:STORE` and `:RESTORE` can be used to easily exchange files between two systems. On the G.00.00 version of MPE V, the user, group, and account need not exist on the destination system to successfully `:RESTORE` files, assuming the user has adequate capabilities.

The following discussion is an overview of the `:SYSDUMP`, `:STORE`, and `:RESTORE` commands. (Each of these commands is documented in Section III of this manual, entitled "COMMAND DEFINITIONS".) Since the storage medium typically used for system backups is magnetic tape, all examples below use the device class TAPE as the destination device. Also included is a brief overview of magnetic tape format and file structure.

File Backup With the `:STORE` Command

The `:STORE` command is available to standard MPE users as well as the Operator, the System Manager, and the System Supervisor. Standard MPE users may `:STORE` only those files to which they have read access. The System Supervisor and the System Manager have the added ability to `:STORE` all files in the system.

Backups produced by `:SYSDUMP` and `:STORE` are compatible, but the `:STORE` command cannot be used to copy the accounting structure or the current system configuration. As a result, `:STORE` is recommended when files belonging to one or more groups or accounts, rather than the entire system, must be saved on tape.

STORE TAPES. Store tapes are any tapes generated using the `:STORE` command. They are often created when a user wishes to purge infrequently accessed files from the disc, yet retain a copy of the files off line for future modification or printing. STORE tapes are both economical and efficient since tape storage is less expensive than disc, and the `:RESTORE` command simplifies re-entering the files into the system. (For the full reference specification for the `:STORE` and `:RESTORE` commands, refer to Section III, "COMMAND DEFINITIONS".)

FILE ELIGIBILITY FOR STORAGE. The `:STORE` command cannot save files which have been opened for output or update. It can save executing program files or read-only files, since their contents cannot be altered. While a file is being stored off line, MPE locks it so that it cannot be altered or deleted until safely copied to tape or serial disc. If the `:STORE` operation is processed as a job and you abort the job before it is complete, the abort will unlock those files not yet stored.

The flow chart in Figure 4-3 shows the checks performed against a file to ensure its eligibility for dumping.

DISPLAYING THE RESULTS OF `:STORE`. The results of the `:STORE` command are displayed on the standard list device (`$STDLIST`). If `:STORE` is executed from a session, the listing will appear on the session's terminal. If executed as a job, `$STDLIST` is usually the system line printer.

If you are using the G.00.00 release of MPE V, and are executing the :STORE command from a session, you may produce printed results in addition to the terminal display. To do so, specify ";SHOW=OFFLINE" on the :STORE command line. You can also redirect the output to a file other than the standard list device file. To do so, issue a :FILE command that equates SYSLIST to another file. For example, to direct output to an HP 2680 Laser Printer (device class PP), enter:

```
:FILE SYSLIST;DEV=PP
```

Note, however, that this method will suppress the listing to the standard list device. To display output on both the standard list device as well as the designated offline device, reference the formal file designator "OFFLINE" as follows:

```
:FILE OFFLINE;DEV=PP
```

If you omit the SHOW parameter from the :STORE command, the only information output will be the total number of files stored, a list of files not stored, and a count of files not stored. If ";SHOW" is included you can choose the amount of information displayed by specifying one or more of the following parameters: SHORT or LONG, DATES, and SECURITY. (For complete information about :STORE command options, refer to Section III.)

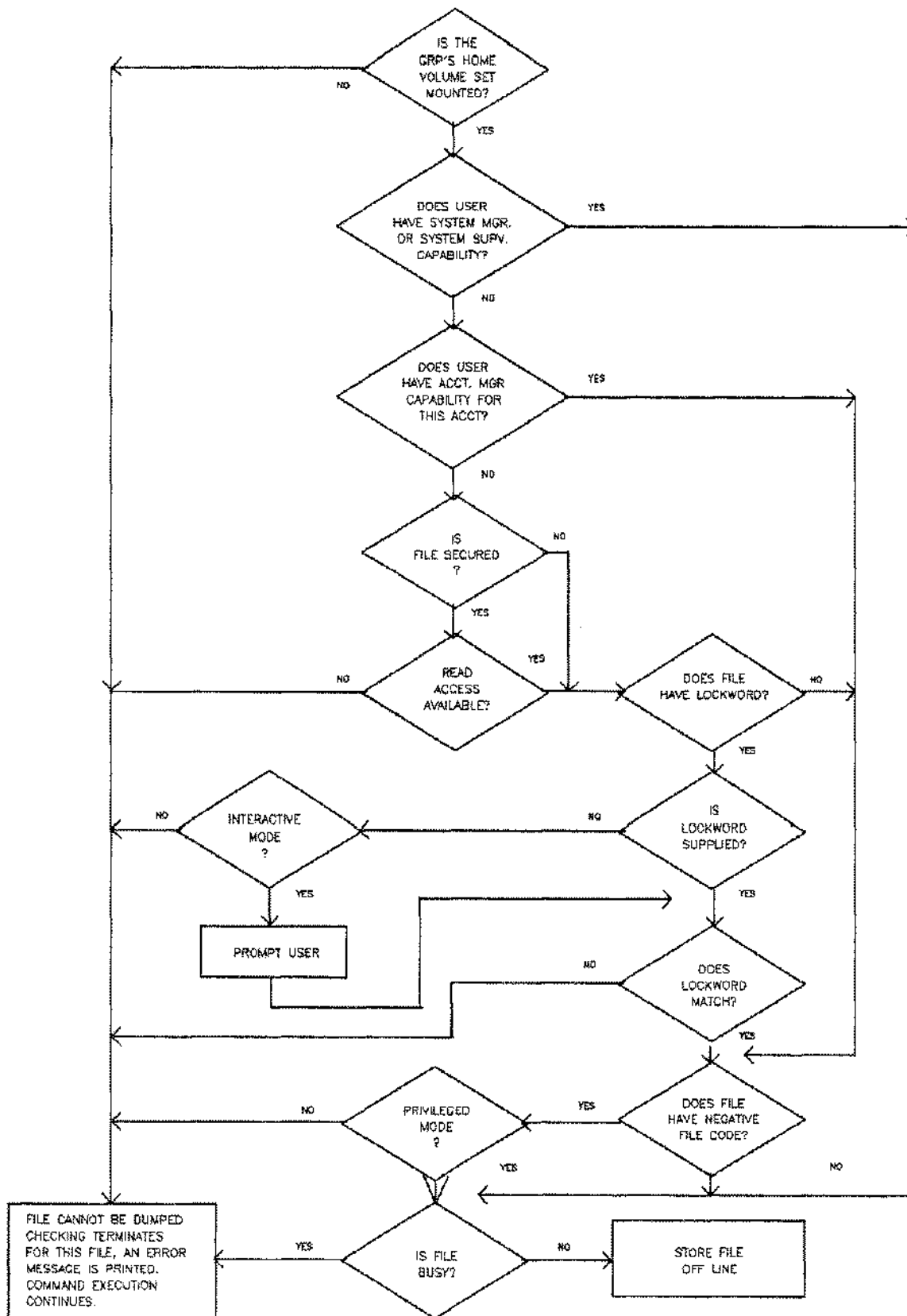


Figure 4-4. File Eligibility for Dumping to Tape

ERROR RECOVERY DURING STORE. The following errors will cause the :STORE operation to abort:

- A command syntax error.
- A file directory error.
- A file system error on the tape file (TAPE), list file (SYSLIST), or the temporary disc files (GOOD, ERROR) used by the :STORE command.

Disc/Directory Errors. If :STORE encounters a disc or directory error while storing a file, it will skip the remainder of that file and send an error message and the file's disc sector address to the user's standard list device. The :STORE operation will not be aborted. Files bypassed in this manner cannot be restored with the :RESTORE command.

Tape Error Recovery. The ONERROR option of the :STORE command allows you to specify the tape error recovery procedure when invoking the :STORE command. For example: ";ONERROR=QUIT" or ";ONERROR=REDO".

If ONERROR is not specified, the default error recovery procedure for unlabeled tapes is REDD. In this case, :STORE will rewind the tape reel, mark it as bad, and request a new reel. Once the new tape is mounted and on line, the :STORE process will continue from the point of interruption. If the error occurs while a file is being copied to tape, :STORE will resume writing to the new tape at the beginning of the interrupted file; the tape will contain no partial files. In addition, a message will be displayed on the Console informing the Operator that the previous tape contains a tape error.

If the tape is labeled, the default error recovery option is QUIT. This causes the :STORE operation to abort when it encounters a tape error. "ONERROR=REDO" cannot be specified for labeled tapes.

Retrieving Stored Files

Any file or set of files you can input to the system (onto disc) that has been stored off line with the :STORE or :SYSDUMP command. Files are restored into their appropriate groups and accounts; previous account names, group names, and lockwords are all reinstated. On the E.00.00 and F.00.00 releases of MPE V, the :RESTORE command does not create any new accounts or groups. Therefore, files will only be restored if the account name, group name, and the name of the file's creator exist on disc in the system directory. The G.00.00 release of MPE V, however, does allow you to :RESTORE files whose account, group, and user identification do not exist on your system. To do so, specify the ";CREATE=" parameter on the :RESTORE command line. (For complete information about :RESTORE command parameters, refer to Section III.)

If no destination device is specified in the :RESTORE command, MPE will attempt to write files to a device of the same class as the device on which the files were originally stored. If one cannot be found because of insufficient disc space, :RESTORE will attempt to write them to a device of the same type. Otherwise, files are restored to any device assigned the device class DISC.

FILE ELIGIBILITY FOR RESTORE. To ensure a file's eligibility for retrieval, the :RESTORE command performs the same checking as the :STORE command. The SHOW parameter of the :STORE command also performs the same function in the :RESTORE command, producing a listing of the files restored. If the SHOW parameter is not supplied, a count of the files restored, and a listing and a count of files not restored are supplied.

DISPLAYING THE RESULTS OF :RESTORE. The listing produced by the :RESTORE command is written to the file SYSLIST. If output is not redirected to another device with a file equation, the file will be displayed on the standard list device \$STDLIST. When :RESTORE is executed during a session, \$STDLIST is the terminal the session is logged onto. If executed as a job, \$STDLIST is typically a line printer.

RESTORE ERROR HANDLING. The :RESTORE message explains why the specified file was not restored. Such errors do not abort the RESTORE process. The following errors, however, will cause the :RESTORE process to abort:

- A command syntax error.
- A disc input/output error (in the system).
- A file directory error.
- A file system error on the tape file (TAPE), list file (SYSLIST), or any of the three temporary files (GOOD, ERROR, and CANDIDAT) used by the :RESTORE command.
- An incorrectly formatted :STORE tape.
- No continuation reel; the Operator could not find a continuation reel for a multireel tape set.
- A device reference error; either the specification for the device parameter is illegal or the device requested is not available.

The :SYSDUMP Command

The :SYSDUMP command is used for two purposes: to create complete or partial backup copies of the current system software, or to modify it by altering the I/O configuration and other critical system parameters. For either purpose, :SYSDUMP is executed in session mode, and requires OP capability. Its use is restricted because :SYSDUMP is an extremely powerful command. At a minimum, it permits users to copy the entire contents of the system to tape. When used to alter system parameters, it gives the user power to change any or all files, programs, tables, and other components of the system software.

The :SYSDUMP command starts the Configurator dialogue. The response to the dialogue determines how many, and which, files will be copied to tape or serial disc. You will use one or more of these tapes to start the system when, during INITIAL, you choose the COLDSTART, UPDATE, or RELOAD option since each of these cold load methods use tape as a data source. A WARMSTART or COOLSTART, (or :RESTORE for users' files), which load the system from the system disc, require no tape.

A :SYSDUMP is typically performed by your System Supervisor; the procedure is explained in Section V, "THE SYSTEM SUPERVISOR". Each step of the SYSDUMP/INITIAL dialogue is documented in Section VII, "CONFIGURING THE SYSTEM". Refer to either of these sections for detailed information about :SYSDUMP.

SYSTEM SHUTDOWN

Shutting down the system is a simple procedure which involves some or all of the following steps.

- Warning users of the impending shut down.
- Closing any open communications lines.
- Storing off spool files with the SPOOK utility.
- Issuing the =SHUTDOWN command.

The procedures necessary to shut down the system will vary greatly from installation to installation. For example, your system may not support any communication links to another remote computer. Or, you may perform a system backup each night before the shut down so that warning users to log off and aborting any remaining jobs or sessions may have been done already. Regardless of variations, however, there are a few key points to remember:

1. Inform users well in advance of a planned system shutdown. If you shut the system down every night at the same time, include a reminder of this fact in the :WELCOME message that users see when they log onto the system. Also remember that the :TELL command will not be transmitted to users who are working in quiet mode. Therefore, it is a good idea to issue a :WARN command, which will be displayed on "QUIET" terminals to allow users to save their files before the system is shut down.

NOTE

The :WARN command writes over VPLUS screens and should be used when there is no other practical means of notifying users of a shutdown.

2. Display the current system status with the :SHOWJOB command before you abort any sessions or jobs. Continue to use the :SHOWJOB command to monitor which sessions and jobs have logged off, and which are still executing.
3. Close all communications lines in an orderly manner, using the SHUT parameter of the :DSCONTROL command.

One additional step may be necessary: if there are any output spool files remaining that have not yet been printed, they should be stored off onto tape using the SPOOK utility. Refer to the discussion of SPOOK in the MPE V Utilities Reference Manual (32033-90008). This is necessary unless you plan to restart the system with a WARMSTART, which is the only startup option which preserves spool files.

The System Operator

Once all users have logged off, all DS communications lines are closed, and spool files either printed or stored, you may shut down MPE by issuing:

```
AC  
=SHUTDOWN
```

DISTRIBUTING OPERATOR CAPABILITIES

As System Operator, you may choose to distribute some of your capabilities and responsibilities to standard MPE users. The four ways to do so are explained below. Briefly, they are:

- Using the :ASSOCIATE and :DISASSOCIATE commands to permit users Operator control over a specific device.
- Controlling the use of specific Operator commands with the :ALLOW and :DISALLOW commands.
- Setting :JOBSECURITY high or low, which allows or restricts users from using job control commands on their own jobs.
- Transferring the Console to another logical device, allowing the user logged onto a session at that device access to Console commands.

The :ASSOCIATE and :DISASSOCIATE Commands

These commands allow or prohibit users' capability to control devices in a device class. The System Manager determines what associations are allowed with the utility ASDCTABL.PUB.SYS (E/F.00.00) or ASDCTBL5.PUB.SYS (G.00.00). It creates a device class/user association table, permitting specific users to execute the :ASSOCIATE command for the specified device class(es). While the device class remains in the user's control, status messages for the devices in the class are displayed on the user's \$STDLIST device, rather than the System Console. Associations remain in effect until the user or Operator explicitly disassociates the device with the :DISASSOCIATE command, or until the user logs off.

When a user associates or disassociates a device class, you will be notified by a message to the System Console. Additionally, when you issue a command to control an associated device, you will be notified that the device is associated and asked to verify your action, as shown below. A "Y" response directs MPE to execute your command. If you respond "N", your command will be ignored.

```
time/#50000/pin/USER.ACCT IS ASSOCIATED TO LDEV ldev.  
CONTINUE (Y/N)?
```

Use the `SHOWDEV` command to determine which devices are associated with whom, as in the following example:

```

:SHOWDEV
LDEV  AVAIL      OWNERSHIP      VOLID  DEN  ASSOCIATION
-----
1     DISC        1 FILES
2     DISC        0 FILES
3     DISC        15 FILES
5     DISC        58 FILES
6     SPOOLED    DOWN           #S48-LP
7     AVAIL      #S18-TAPE
8     AVAIL      #S18-TAPE
9     AVAIL      #S18-TAPE
10 A  AVAIL
11   SPOOLED    SPOOLER OUT   #S38-LP
12   AVAIL      #S18-TAPE
13   AVAIL      #S18-TAPE
14   AVAIL      #S18-TAPE
15   AVAIL      #S18-TAPE
16   AVAIL
17   AVAIL
18 A  AVAIL

```

Allowing Users Operator Commands

The `:ALLOW` command permits the Operator to allow specific commands to users, including those used to manage devices (such as `:ASSOCIATE` and `:CONSOLE`). Any Operator command may be allowed to non-Console users via `:ALLOW`. Its effect then, is much broader than the `:ASSOCIATE` command, which only permits a user Operator control of a single device.

CAUTION

Standard MPE users should never be allowed the `:ALLOW` command. It will enable them to `:ALLOW` themselves any Operator command, thereby bypassing normal system security.

Allowing Users Control Over Their Own Jobs

The `:JOBSECURITY` command allows you to control whether or not users may execute four Operator commands to manage their own jobs. When you set the job security high (by entering `:JOBSECURITY HIGH` at the Console), only you are permitted to abort, alter, suspend, or resume any or all jobs running on the system.

When you issue the command "`:JOBSECURITY LOW`", users can execute the following commands for their own jobs: `:ABORTJOB`, `:BREAKJOB`, `:ALTJOB`, and `:RESUMEJOB`.

Moving the Console

The `:CONSOLE` command moves the System Console from its current device (usually *ldev 20*) to another job-accepting terminal. Only users with `OP` and `SM` capability can move the Console. Standard MPE users, however, may execute the `:CONSOLE` command with no parameters to determine the current location of the Console.

Although not recommended, you may `:ALLOW` users the `:CONSOLE` command, and with it all of the privileges that access to the Console implies. If you do so, a user other than `OPERATOR.SYS` will have Operator control of the system when he or she switches the Console to their own terminal. At best, this will create confusion, since two Operators, each taking a turn with the Console, would be attempting to manage devices, jobs, and sessions. At worst, allowing a standard user the Console will cause a serious breach of system security.

Using the Console for non-Operator activities increases the chance that it will lock up. If this happens, the system may have to be halted and restarted. For example, executing `:STORE` at the Console prevents the use of all Console commands except those which can be entered with the `AC` prompt. Or, if for any reason the display of messages on the Console is blocked, the system could hang. Moving the MPE Console does not transfer the ability to `LOAD`, `START`, or `DUMP` the system. Hardware-detected `BC` (Control B) remains on the same terminal port.

DATA COMMUNICATIONS OVERVIEW

The following discussion is an overview of MPE's data communications subsystems. It is intended to provide you with a working understanding of data communications, and to familiarize you with terms and equipment you will encounter as an Operator. More detailed information about data communications is available in Section III of this manual ("COMMAND DEFINITIONS"), in the Communications Handbook (5957-4634), and the following Communications Reference Manuals:

- SNA NRJE Reference Manual (30245-90001)
- DS Reference Manual (32190-90001)
- DSN/IMF Reference Manual (32229-90001)
- DSN/MRJE Reference Manual (32192-90001)
- DSN/MTS Reference Manual (32193-90002)
- Point-To-Point Workstation I/O Reference Manual (30000-90250)
- Workstation Configurator Reference Manual (30239-90001)
- DSN X.25 for the HP 3000 (32191-90001)

What is Data Communications?

Data communications refers to the exchange of data between computers, or between a remote user and a single computer system. The data is transmitted via telecommunications equipment, which eliminates geographical distance and time as major factors prohibiting the collection and manipulation of data. Virtually 90% of all computer applications can be performed in a distributed data processing environment using data communications hardware and software.

NETWORKS. A data communications network is a combination of hardware components and software programs. Networking is an economical and efficient use of resources since several users can share a single computer as well as peripheral hardware such as printers, plotters, disc and tape drives. It is also possible to use a number of computers in a single network, with each dedicated to a specific type of data processing.

A distributed data communications network consists of a series of computers, each of which operates independently of the others. Each computer is capable of collecting, processing, and storing data, as well as transferring data from one system to another. The network relies on a host system to manage the orderly transfer of data between computers. The host's operating system controls processing, data base management, and peripheral I/O; it may also contain communications control software for network activity.

Hewlett-Packard's Distributed System software allows terminals on one HP 3000 to appear as terminals on another HP 3000 within the network. If alongside one another, the computers may be directly connected, or "hard wired". If not, data may be transferred via modems using dialup or leased (dedicated) telephone lines. Regardless of the method of connecting the two systems, the Distributed Systems software permits users to access another computer exactly as though they were logged onto their own system.

Minicomputers can be used in a number of ways in a distributed network. A large network could consist of a host computer in a central location being accessed by other minicomputers at satellite locations. These satellite stations, which would do their own data processing, could be the host to local and remote terminals. A small network might consist of a number of remote terminals connected to a single minicomputer. This type of network allows users in remote locations data processing power not available locally.

When a large computer is used in the network, there are other roles a minicomputer can play. As the number of terminals and data links in a network increase, some form of "traffic management" is needed. An efficient way to do this is to use a minicomputer as a front end processor or remote concentrator. This eliminates the need for a link to each terminal and reduces link usage time.

CLUSTER AND DISTRIBUTED NETWORKS. A distributed network is dispersed geographically. It processes and stores information in two or more sites. In this case, network traffic consists of communication from computer to computer, as well as computer to terminal and vice versa. Networks which concentrate all resources in a single location lack two benefits offered by distributed networks: first, a distributed network is less vulnerable to loss by fire or other major disaster; and second, when computer facilities are distributed throughout the country, peak loading periods will occur at different hours for each time zone and loads can be shifted for better equipment utilization.

When all the elements of a network reside in one geographic location, they are considered "clustered". (On a smaller scale, when the individual elements are microcomputers, this type of clustering is referred to as a Local Area Network, or LAN. This term is generally not used when minicomputers are clustered.) In a cluster network, all application processing and information files are kept in a single center. The network traffic consists exclusively of the communications between remote terminals and the host processor.

Telecommunications and Network Components

To understand the role of telecommunications in data communications, you must have an understanding of the basic components used to generate and transmit data on the communications link. When a computer interacts with a remote terminal over a voice telephone line, two general classifications of equipment are used:

- Data Communications Equipment (DCE), which transmits information between locations.
- Data Terminal Equipment (DTE), which is the remote terminal serving as the user's access point to the data link.

TERMINALS. Data communications networks use terminals for the same purpose as a non-networked computer system: they are the primary input/output device for users accessing the system. A remote terminal, which is physically located away from the host computer, can be either a stand-alone device directly connected to the data link, a controller device regulating other nearby terminals, or a minicomputer-based intelligent terminal. Typically, a remote terminal is connected to a computer via a voice telephone line.

There are two ways of connecting remote terminals to the HP 3000. The most common configuration is "point-to-point", in which each terminal has a dedicated line and port. Point-to-point terminals usually operate asynchronously with very little error checking. Point-to-point terminals require no special software, and may be connected directly (hard-wired) to the computer, or they may transfer information via modem.

Multipoint configurations connect several terminals to a single line. Such networks require a special Multipoint Terminal software product called MTS/3000 and an Intelligent Network Processor (INP). Multipoint networks can either use hard-wired terminals, or transmit data via modem. They use a bisynchronous communications protocol, in which data is transferred in blocks of several hundred characters. Each time a block of data is received, it is checked for errors. If none have occurred, the data block is acknowledged. When an error does occur, the data is retransmitted and verified again.

MODEMS. The most familiar piece of communications equipment used in distributed data processing systems is a modem. Although a variety of modems are used with computers, they all perform the same essential function: MODulation and DEModulation of electronic computer signals (hence the term "modem") to permit transmission of digital data via telecommunications lines. Modems are used at both the originating and receiving end of the communications link. At its origin, digital information is converted into the analog format used by the telephone system. This conversion impresses, or modulates, the signal onto a carrier wave. The receiving modem demodulates the signal, converting it from analog back to its original digital form.

The types of modems most commonly used in data communications require some System Operator intervention. The MRJE subsystem, for example, requires you to dial the phone number of the host computer's modem. Other types of modems dial the phone number electronically, called "auto-dial" modems, since dialing is done automatically, while still others use a leased or private line so that the connection always exists and no System Operator intervention is necessary.

COMMUNICATION LINKS. A communications link may be either a line or a channel. A line consists of wire pair connecting the telecommunications equipment which originates and receives the signal. Other, additional equipment may be used along the line.

A channel is another type of communications link, best described as an electronic path within a line. The type of channel identifies the mode of message flow; the grade refers to the capacity of the channel in bits per second, or BPS.

TRANSMISSION MODES. The three main types of transmission modes used in data communication are: simplex, half duplex, and full duplex. Simplex channels are restricted to unidirectional message flow, meaning that an input terminal can only receive, and an output terminal can only transmit. A half duplex channel, the most commonly used mode, can transmit and receive, but not simultaneously. Information traveling over a full duplex channel can be sent and received between two locations simultaneously. Full duplex is faster than half duplex, since the turnaround time (50 to 250 milliseconds required to halt and reverse the direction of the transmission) is eliminated.

CIRCUITS. Telephone circuits are described as "Two Wire", "Four Wire", "Switched" (Public), and "Leased" (Private) circuits. Two and four wire circuits refer to half and full duplex transmission modes, respectively. The voice telephone network is a switched network.

Leased or private circuits are not part of the switched network. They are permanent circuits intended for private use, consisting of a direct line between the two locations routed through a central telephone office. Although a leased line is more expensive than using a switched network, they are also more convenient: setup time, dialing, call routing, ringing, and obtaining billing information is eliminated.

GRADES. Transmission speed is the most important characteristic of a communication channel. Speed is determined by bandwidth, or the frequency range of the channel. The three grades of channels are Sub Voice (or Narrow Band), Voice Band, and Wideband. A sub-voice channel has the narrowest bandwidth and slowest speed of the three grades. Normal transmission speeds range from 45 to 150 BPS. Voice grade, also called Type 3002, allows data to be transmitted along the entire bandwidth, generally operating at 60 to 4800 BPS. It provides a flexible and economical method to transmit data of good quality. Wideband grade is used when large volumes of data must be transmitted at high speed. Speeds up to 500,000 BPS and higher are possible for special applications.

THE SYSTEM SUPERVISOR'S ROLE

The term "System Supervisor" refers to both an MPE capability (OP) and the person who assumes the responsibilities of System Supervisor. The user name and account that the System Supervisor logs onto is assigned OP capability, entitling the System Supervisor to execute the commands needed to supervise the operation of MPE. With Programmatic Session (PS) capability the user can create sessions at any terminal on the system using the MPE :STARTSESS command. These commands are listed in Table 5-1. In this respect, the System Supervisor is similar to the System Manager: both are assigned special capabilities which allow them to issue MPE commands and interact with the system to fulfill their designated role.

The System Supervisor's principal task is to tune the system and ensure its continued good performance and reliability. He or she works with the System Manager to design a system configuration that best meets the demand for computer resources, altering the configuration as necessary to accommodate changing resource usage.

The task of "fine-tuning" the computer requires the System Supervisor to thoroughly understand the effect of changing various system parameters, such as the size of system tables or the amount of disc space reserved for virtual memory. Although the Supervisor does not operate the computer on a daily basis (this is the Operator's role, discussed in Section IV), many of the System Supervisor's responsibilities require familiarity with Operator tasks. Specifically, the System Supervisor must be able to:

1. Create backup copies of the complete system (including user files), particularly when modifications to the operating system, utility programs, subsystems, or system configuration are necessary.
2. Understand the different procedures used to restart the system.
3. Reconfigure MPE with the Configurator dialogue.
4. Display performance data and tune the system, which includes:
 - Scheduling processes and setting resource-use limits for each.
 - Allocating and deallocating programs.
 - Managing the disc caching facility.
5. Manage the system logging facility and limit the number of user logging processes and the number of users per logging process.
6. Manage communications subsystems. Refer to Section IV for a general discussion of data communications concepts and a reference to additional, more specific, sources of information about data communications products available to HP 3000 users.

The System Startup State Configurator allows the System Manager to specify the expected System Startup State for each possible startup (WARMSTART, COOLSTART, COLDSTART, UPDATE, RELOAD). The system values are stored in an ASCII file, SYSSTART.PUB.SYS. This feature is explained in Section VI.

This section discusses the role and responsibilities of the System Supervisor in detail. In addition to explaining each major functional area and the corresponding commands that make up the System

Supervisor's job, it explains background information you will need, such as the structure of a disc pack or data contained in the Code Segment Table. Other complex subjects can only be introduced here. In such cases, you will be referred to appropriate additional sources.

Table 5-1. System Supervisor Commands

COMMAND NAME	DESCRIPTION
:ALLOCATE	Permanently loads a program or procedure into memory.
:CACHECONTROL	Controls disc caching on a single logical device.
:CONSOLE	Moves the Console to another logical device, or displays the current location (logical device number) of the Console.
:DEALLOCATE	Unloads a program or procedure from memory previously allocated with the :ALLOCATE command.
:FULLBACKUP	Performs a backup of MPE and all files on the system.
:JOBPRI	Sets or changes the default execution priority for batch jobs and the maximum execution priority for jobs.
:PARTBACKUP	Performs a backup of MPE and all files that have been modified since the last full backup.
:RESUMELOG	Resumes system logging following suspension caused by an error.
:RESTORE *	Restores files to the system previously saved with the :STORE command.
:SHOWCACHE *	Displays disc caching performance statistics.
:SHOWLOG	Displays the current system log file number and percentage of available file space used.
:SHOWQ	Displays process scheduling data and the contents of each subqueue.
:STARTCACHE	Starts disc caching on a single logical device.
:STARTSESS	Allows creation of sessions on any terminal on the system.
:STOPCACHE	Stops disc caching on a single logical device.
:STORE *	Copies disc files to another storage media to be saved off line.
:SWITCHLOG	Closes the current system log file and creates and opens a new one.
:SYSDUMP	Starts the Configurator dialogue and copies system and/or user files to tape or serial disc.
:TUNE	Manipulates circular subqueues and the memory manager algorithm to improve system performance.

* These commands may also be executed by users without OP capability.

SYSTEM BACKUP

As System Supervisor, you are ultimately responsible for data integrity and system performance. One of your first tasks is to create a copy of the complete system on magnetic tape, serial disc, or cartridge tape. This procedure, called "backing up" the system, is an ongoing responsibility whether the backup copy is intended to preserve the system as is, or to change it. The following discussion will familiarize you with the commands and procedures you must know to back up the system, restore files, and restart MPE from the backup tape. It covers the following topics:

- The Installation Tape.
- Scheduling Backups.
- A brief comparative overview of the :SYSDUMP and :STORE commands.
- A summary of the :FULLBACKUP and :PARTBACKUP commands.
- Performing five types of SYSDUMP procedures.

The Installation Tape

Hewlett-Packard furnishes MPE as a set of prepared program files on magnetic tape. This initial configuration is built at the factory and optimized for your computer system. It includes a skeletal accounting structure to store MPE, subsystems, and utilities, and provides a means for your Software Engineer (SE) to bring the system on line and perform initial diagnostic testing. The Fundamental Operating Software (FOS) contains the following accounts, groups, and users, which remain on the system thereafter:

- Two accounts, SYS and SUPPORT. The SYS account contains all MPE files, including any and all programs delivered as part of the Fundamental Operating Software for your system. The SUPPORT account is used by your Customer Engineer (CE) and SE when they first install the system, and thereafter for diagnostic and update purposes.
- One user associated with the SYS account, identified to MPE as MANAGER, who is assigned SM and OP capabilities in addition to all other standard user capabilities.
- One user associated with the SUPPORT account, identified to MPE as FIELD, who is assigned SM and OP capabilities in addition to all other standard user capabilities.
- One public group, PUB, belonging to the SYS account.
- Numerous groups associated with the SUPPORT account.

In addition to the Fundamental Operating Software containing MPE, your SE may also deliver (on magnetic or cartridge tape) any optional subsystems you have ordered (i.e., data communications software, manufacturing application programs, etc.). The SE will also supply whatever diagnostic programs are needed to start the system initially and to solve future problems.

Once the system is first brought on line, the System Manager will create the user name and account which identifies the System Supervisor to MPE. The System Manager will also establish the basic organizational structure of the system by creating accounts and assigning to each an Account Manager.

For further information on the System Manager's role, consult Section VI, "THE SYSTEM MANAGER".

Scheduling Backups

If a system failure occurs, the amount of data you lose directly depends upon two factors: how recently you performed a backup, and the level of system activity since files were stored off line. You determine the backup schedule that best meets the needs of system users. This may include saving all files in a particular account every day, or copying only those files which have been added or modified since files were last stored off line. Or, you may remove infrequently used files from the disc completely, and store them in a tape library.

Regardless of the schedule or method, system backups must be done regularly. Backup tapes should contain all of the software your installation uses because you may have to rely on your backup copy to restore the system to its previous condition. It is also a good precaution to archive more than one set of backup tapes in case the most recent backup set is bad.

NOTE

It is possible to acquire another copy of the system software from Hewlett-Packard. Restarting the system with a new Installation Tape should only be considered as a "last resort", since it contains no user files or programs, nor will it contain any of the configuration information unique to your system.

A complete backup tape will contain three types of data:

- All system files should be copied to tape. The vast majority of such files are owned by the PUB group of the SYS account; the largest of these is the Segmented Library, or SL. The SL is a collection of procedures supporting the majority of command programs, subsystems, and utilities that make up MPE.
- The second type of data copied to tape during a complete backup is the current system configuration. This includes system tables, queues, device I/O attachments, and other parameters.
- User files are the third, and most critical part of a backup tape. They cannot otherwise be duplicated. Since they are the product of several months or, in some cases, years of labor, user files comprise the most important element of your computer system.

Because the process of storing files off line interrupts work, it is important to maintain a backup schedule that is both convenient for users and frequent enough to preserve your data. Files that users are accessing cannot be stored, unless they are executable program files or files opened for update only. These two cases are exceptional because even though the files are open, their contents cannot be altered, and they may be safely written to tape. In every other case, however, files opened by a user or program cannot be copied to tape. Similarly, a file being dumped to tape is not available to users.

A Choice of Backup Methods

MPE provides you with several methods to store files off line so that your backup procedure will interrupt users as little as possible: :SYSDUMP and :STORE. They are both MPE commands which you enter at the colon prompt (:), but their scope and purpose varies. :SYSDUMP is used to copy files as

well as system parameters and configuration data, the accounting structure, and file directory. With `:SYSDUMP`, you may copy all, or only selected subsets, of files. The information saved with the `:SYSDUMP` command is re-entered into the system via one of the three coldload options, which use a serial device such as tape as the data source: `COLDSTART`, `UPDATE`, or `RELOAD`.

The scope of the `:STORE` command is less comprehensive than `:SYSDUMP`. It is primarily used to copy selected files within a group or groups, or all files belonging to one or more accounts. Although it does save file directory information, `:STORE` will not save the accounting structure, configuration data, or any other system tables, queues, or parameters. Files dumped to tape with the `:STORE` command are re-entered into the system via the `:RESTORE` command. For a `:RESTORE` to succeed on the E/F.00.00 release of MPE V, the user name, group, and account to which the files belong must already exist on the destination system. If they do, `:STORE` and `:RESTORE` can be used to easily exchange files between two systems. On the G.00.00 release of MPE V, the account, group, and user need not exist on the destination system to successfully `:RESTORE` files.

In general, you will use `:SYSDUMP` to create a backup copy of your system and user files. It allows you to save as much information as you need, including critical system information that cannot be copied with `:STORE`. Another reason that the `:SYSDUMP` command is used for regularly scheduled backups is that it begins an interactive dialogue with the user designed to simplify the selection of files. Beginning with the G.01.00 software release, `:FULLBACKUP` and `:PARTBACKUP` can also be used to back up the system. Refer to Section 3 for syntax and operation.

At most installations, the backup procedure will be one of the following.

1. A full backup, usually done once a week, that copies all the information on your system. When the `SYSDUMP` dialogue prompts you to enter the dump date, enter "0". This way, all files will be saved.
2. A partial backup, usually done every day, which saves only those files that have been added or modified since the last full backup or last partial backup. When the `SYSDUMP` dialogue prompts you to enter the dump date, enter the date that the last full `SYSDUMP` was performed, or the date of the last partial dump. Only files added or modified since that date will be copied to the dump tape.

Your installation's backup schedule should reflect the amount of system activity and accommodate users during peak loading hours. It is of paramount importance that whatever schedule you choose, you or your System Operator make backup copies of your system regularly.

The `:SYSDUMP` Command

The `:SYSDUMP` command is used for two purposes: To create full or partial backup copies of the current system software, or to modify it by altering the I/O configuration and other critical system parameters. For either purpose, `:SYSDUMP` requires `OP` capability. Its use is restricted to selected users because `:SYSDUMP` is an extremely powerful command. At a minimum, it permits users to copy the entire contents of the system to tape. When used to alter system parameters, it gives the user power to change any or all files, programs, tables, and other components of the system software.

The `:SYSDUMP` command starts the Configurator dialogue. Your response to the dialogue determines how many, and which, files will be copied to tape. (Files may also be copied to another type of storage media, such as serial disc. For the purposes of this discussion, a magnetic tape is assumed to be the files' destination, since tape is the most commonly used destination device.) The following discussion explains how to execute the `:SYSDUMP` command.

Before you initiate the Configurator dialogue, precede the :SYSDUMP command with one or two file equations. One informs MPE where to send the output of the :SYSDUMP command. For example:

```
:FILE T;DEV=TAPE
```

The second file equation is used to direct the listing of the :SYSDUMP dialogue to a line printer or terminal. For example:

```
:FILE L;DEV=LP
```

One or both of these file equations are then back-referenced when the :SYSDUMP command is entered. Both back references, "*T" and "*L" are optional:

```
:SYSDUMP *T,*L
```

Five types of SYSDUMP tapes are explained below, along with portions of the Configurator dialogue illustrating how to create each one. To familiarize yourself with the Configurator dialogue before the actual SYSDUMP, and to execute :SYSDUMP without saving any output or starting a real dump, enter:

```
:SYSDUMP $NULL
```

"\$NULL" is a system-defined file that is opened for input by MPE, but with no corresponding write operation performed to the storage media. This lets you harmlessly respond to the Configurator dialogue. Any "changes" you make will be sent to the \$NULL file (also referred to as the "bit bucket", or "never-never land") instead of a tape file. This command is frequently used to display system table I/O configuration parameters. The Configurator dialogue is explained in this section, and appears in its complete form in the following section. You may also refer to Section III of this manual for the command specification for :SYSDUMP.

Most installations rely on a backup schedule that uses a combination of full and partial SYSDUMP procedures. The most frequently used SYSDUMP procedures are Cold Load, Partial, and Full. These are detailed below:

COLD LOAD SYSDUMP. This copies the entire PUB group of the SYS account, which contains all of MPE, and most, if not all, utilities and subsystems. To create a Cold Load tape, enter:

```
:FILE T;DEV=TAPE  
:FILE L; DEV=LP  
:SYSDUMP *T,*L
```

```
ANY CHANGES? (RETURN)  
ENTER DUMPDATE? 0  
ENTER DUMP FILE SUBSET(S) @.PUB.SYS  
LIST FILES DUMPED? YES
```

```
END OF SUBSYSTEM
```

The dump file subset (in this case @.PUB.SYS) informs the :SYSDUMP program which files to copy. The two file equations which precede the :SYSDUMP command direct MPE to dump the files to tape and send the listing (requested with the YES response to "LIST FILES DUMPED?") to the line printer.

PARTIAL SYSDUMP. This copies MPE, the Directory, and all files which are new or were modified since the last full SYSDUMP. To create a partial SYSDUMP tape, enter:

```
:FILE T;DEV=TAPE
:FILE L;DEV=LP
:SYSDUMP *T,*L

ANY CHANGES? N
ENTER DUMPDATE? date of last full dump
ENTER DUMP FILE SUBSET(S) @.@@
LIST FILES DUMPED? YES

END OF SUBSYSTEM
```

Like the Cold Load dump, the partial SYSDUMP will copy files to tape and send the listing to the printer. Entering @.@@ as the dumpfile subset or using the :PARTBACKUP command will create a backup tape containing all files since the last full dump was taken. This way, you can restore the most complete system possible using only two tapes: a partial SYSDUMP tape, and a full SYSDUMP tape, which is explained next. This is equivalent to the :PARTBACKUP command which is explained in detail in Section 3 of this manual.

FULL SYSDUMP. This copies the complete system, including all system and user files, the I/O configuration and system parameters, and the directory. Most installations perform a full SYSDUMP weekly, and supplement the full dump with daily partial SYSDUMPs. To create a full SYSDUMP tape, enter:

```
:FILE T;DEV=TAPE
:FILE L;DEV=LP
:SYSDUMP *T,*L

ANY CHANGES? N
ENTER DUMPDATE? 0
ENTER DUMP FILE SUBSET(S) @.PUB.SYS, @.@.important accounts,@.@@
LIST FILES DUMPED? YES

END OF SUBSYSTEM
```

You now have a complete copy of the system, in which files are stored in their order of importance. If you had simply entered @.@@ as the dump file subset, the system would have been restored in the alphabetical order of the accounts. Storing files in this order during a SYSDUMP will cause these files to be unlocked earlier, allowing users to log on and access these files before the SYSDUMP has completed. This is equivalent to the :FULLBACKUP command except FULLBACKUP does not allow storing files in order of importance. For example:

```
:FILE T;DEV=TAPE
:FILE L;DEV=LP
:FULLBACKUP
```

NOTE

The full backup will be generated without requiring any :SYSDUMP dialogue.

This command is explained in detail in Section 3 of this manual. Two other types of SYSDUMP tapes are used, though infrequently:

"CARRIAGE RETURN" SYSDUMP. This contains no files, directory, or accounting structure. It only creates a copy of MPE with the current I/O Configuration and system parameters. It is referred to as a "Carriage Return" SYSDUMP because you respond with RETURN to the questions "ANY CHANGES?" and "ENTER DUMPDATE?" during the SYSDUMP dialogue.

FUTURE DATE SYSDUMP. This is referred to as a "Future Date" SYSDUMP because you choose a future dump date, such as 12/31/99. Since no files will have been modified since this date, no files will be copied. What will be copied by the SYSDUMP program is MPE (with I/O and System Parameters) and the current directory and accounting structure.

STARTING THE SYSTEM

With one exception, the same basic procedure is used to start (or restart) the system following a planned shutdown or system failure: after a system failure, you or your Operator should always dump the contents of memory so that your SE can analyze it and determine the cause of failure. Once you have taken a memory dump, you will use the same program to restart the system, and choose among the same five restart options, regardless of whether the system halted normally or abnormally.

Your choices to restart the system may be limited by the cause of the system failure. A crash of the system disc, for example, would prohibit you from performing either a WARMSTART or COOLSTART, since these two startups use the disc as the data source. This is explained fully below.

Restarting the system is also necessary to permanently load any modifications you have made to the system software, such as enlarging MPE tables, buffers, or virtual memory. Refer to the discussion of "RECONFIGURING YOUR SYSTEM", which immediately follows this subsection. Either you or your System Operator will restart the system in this case. In general, a normal restart following a planned system shutdown, or a restart after a non-catastrophic system failure will be the Operator's responsibility. In case of a catastrophic system failure, when a complete reload of system and user files is necessary, you or your Operator should always consult the System Manager, who may in turn phone Hewlett-Packard for advice and assistance.

Using INITIAL

Starting the system is accomplished with the help of a standalone program called INITIAL, or the MPE Initiator. INITIAL prompts you with a series of questions, and based upon the restart procedure you choose, INITIAL will load MPE, subsystems, utility programs, and user files from either tape or disc, recover spool files, and handle disc errors.

Five restart options are available. Three of the five options use tapes as the data source. These are UPDATE, COLDSTART, and RELOAD. The other two options, WARMSTART and COOLSTART, restart the system from the system disc and therefore require no tape.

INITIAL may also be used to alter the system configuration. However, any changes made during INITIAL are permanent only for those startups or for UPDATES for which no changes are entered. They remain in effect only until the system is shut down or fails, unless the Operator or System Supervisor creates a backup copy of the modified configuration, and starts the system with the duplicate.

Although restarting MPE with INITIAL is the Operator's responsibility, you should be familiar with the process since you may need to install changes recorded on tape during the SYSDUMP dialogue. The process of engaging INITIAL varies with the model of the HP 3000 you use. For information about this process, and additional information about the SYSDUMP dialogue see Section VII.

Five Restart Options

The startup procedure you choose depends upon a few key factors: whether the system is being restarted from a planned shutdown, or if it is being brought up after a system failure; if a system failure occurred, whether it was catastrophic or not; and whether you will be restarting the current configuration again, or if you have made changes to the system which must be installed.

The five options available to you are described in the following discussion. For a comparative overview of startup operations, refer to Table 4-1 in Section IV's discussion of "THE FIVE STARTUP PROCEDURES". A second table adjacent to Table 4-1 in Section IV, Table 4-2, illustrates which parts of the system are loaded from disc or tape during the various load options.

CAUTION

Do not halt INITIAL before it is complete, i.e., before the request for "DATE?" appears. This stops the loading procedure in an intermediate stage, requiring you to RELOAD the entire system from your backup medium.

WARMSTART. Restarts the system from the system disc. Use WARMSTART to recover incompletely processed spooled jobs and spooled files; any other load option deletes spool files. You may not WARMSTART the system if a COOLSTART, COLDSTART, UPDATE, or RELOAD has failed. If you attempt to do so, an error message will be displayed on the System Console and the system will halt.

COOLSTART. Restarts the system from the system disc (*ldev 1*). Use COOLSTART as the standard operating procedure when a system is routinely shut down at night and brought up the next day. This operation saves all permanent user files (including programs that run on MPE subsystems, such as FORTRAN/3000, COBOL/3000, SPL/3000, and EDIT/3000).

UPDATE. Uses magnetic tape or serial disc to restart the system. System files are loaded from the backup medium; the I/O device configuration, directory, accounting information, and assigned global RINs come from the system disc; the user files remain undisturbed. Use UPDATE as the standard operating procedure when starting the system with either an updated MPE tape from Hewlett-Packard or an MPE tape prepared for a different HP 3000 Computer System. If for any reason an UPDATE is unsuccessful, you must restart the system with either a COLDSTART, attempt another UPDATE with a known, good tape, or perform a RELOAD. If you attempt another type of coldload option, the system will halt, and an error message will be displayed on the Console.

COLDSTART. Restarts the system from magnetic tape or serial disc. System files, the I/O device configuration, and system table sizes are loaded from the backup medium. User files, the file directory, accounting information, and assigned global RINs remain unchanged, and are loaded from the system disc. COLDSTART is used to keep multiple system configurations available, each one stored on its own cold load tape. This way, a COLDSTART allows system modification while retaining user data. If a COLDSTART fails, attempt another COLDSTART from a previous tape that is known to be good. If that fails, RELOAD. Attempting to startup the system with another coldload procedure results in a Console error message and a system halt.

RELOAD. Loads the entire system, including all system files and I/O configuration information, from the backup tape. RELOAD assumes that there is no information on the system disc: if the backup tape contains user files, then the file directory, accounting structure, assigned global RINs and user files are restored to the system disc from the backup copy. If the accounting structure was not copied to tape, a directory is created with the SYS account, PUB group, and MANAGER user.

The RELOAD option is normally used when you or the System Manager installs the first MPE system supplied by Hewlett-Packard. RELOAD is also used when restoring the complete system from a :SYSDUMP tape following a catastrophic system failure, such as a crash of the system disc. Always consult the System Manager in the event of such a failure: he or she will authorize the RELOAD procedure. (Consultation is critical. The RELOAD procedure completely builds the system. It is a time consuming task, and should only be selected if all other coldload options have failed. Furthermore, if a RELOAD of the system fails for any reason, you must attempt another RELOAD.)

When reloading from multiple tape volumes or serial discs that were created by the :SYSDUMP command, begin with the first volume of the most recent backup copy. It contains the current file directory and accounting information, which must first be entered into the system before files belonging to those accounts and groups may be copied. If all of the system files are not contained in the first volume, MPE will request that you mount the next volume.

Files belonging to private volumes are not restored during RELOAD.

RECONFIGURING THE SYSTEM

The :SYSDUMP command, in addition to being used to create backup copies of the system, also permits a user with OP capability to change the system configuration. Entering the :SYSDUMP command begins the Configurator dialogue, which you use to define, in terms meaningful to MPE, any or all of the peripheral devices attached to the computer for the input (entering) or output (storage) of data. Such devices include terminals, line printers, disc and tape drives, and card readers.

The System Supervisor also uses the Configurator dialogue to define or modify system parameters other than the I/O device configuration. These include system tables and queues, buffers, the size of virtual memory, the message catalog, user logging processes, and system logging events. The discussion below explains the I/O Configuration process. Each of the remaining subjects is treated in a separate discussion following this subsection.

NOTE

If you alter system parameters during the SYSDUMP dialogue, any changes that you make will not affect the system immediately. Instead, the new parameters are copied to the SYSDUMP tape, and will only take effect after you start the system with the modified tape.

The I/O Configuration Table

When you respond YES to the question "I/O CONFIGURATION CHANGES", the Configurator will ask if you want the current I/O Configuration displayed. Whether you are adding a device, or modifying

one already defined for MPE, you should respond YES. The configuration will be displayed as thirteen columns of information, as shown below:

LOG DEV	DRT #	U N	C H	T Y	SUB TYPE	TERMINAL TYPE	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASSES
#		I	A	P		SPEED					
		T	N	E							

These columns of information define, for each I/O device known to MPE, the following information:

- Logical device number
- Device Reference Table (DRT) number
- Device Unit Number
- Device Hardware Channel Number
- Device Type
- Device Sub Type
- Terminal Type
- Terminal Speed
- Record Width
- Corresponding Output Device
- Device Mode
- Device Driver Name
- Device Classes

Input/output configuration is the process of assigning to each peripheral device values for these categories. In some cases, these values will be determined by the characteristics of the device itself or by system architecture. For example, the Device Reference Table (DRT) entry number and the device Unit number are dictated by which computer hardware is used at your installation and its physical layout. Other values may be assigned arbitrarily by the System Supervisor. Examples of these include device mode (whether it is duplicative or interactive), if the device can accept jobs and sessions, and the device class or classes to which it belongs. When you add a new device to the system, consider both its hardware characteristics (that defines data entered into the table for you), and choose optional characteristics with care.

The following discussion explains device characteristics and configuration values. Refer to Section VII in this manual for a step-by-step explanation of the complete Configurator dialogue.

LOGICAL DEVICE NUMBER. The logical device number is the value by which MPE recognizes a particular device. Each device has its own unique logical device number, abbreviated "*ldev*". (In conversation and in written material, *ldev* is often used as a shorthand term for the logical device.) You may assign logical device numbers in any way you choose with one exception: The system disc must be logical device 1. Although other values for *ldev* are arbitrary, numbering conventions have developed which are followed in many HP 3000 installations. They are:

- Logical device numbers 2 through 5 are typically reserved for disc drives other than the system disc, unless the system is configured with more than one system disc.
- The system line printer is assigned logical device 6.
- Logical device numbers 7 through 9 are typically assigned to tape drives.
- Logical device 10 is a pseudo-device. Although it is often the case that no physical device corresponds to *ldev* 10, it must be entered in the Configuration table as though it were an actual device. Otherwise, users will be unable to stream jobs via MPE's streaming facility. Logical device 10 is enabled with the :STREAMS command, which is executed by the Operator when the system is started.
- Logical device 19 usually corresponds to the system's HP 2680 Laser Printer.

- Logical device 20 is assigned to the System Console, although it may be temporarily associated with another terminal (via the `:CONSOLE` command) after the system is started.

Users will reference the device by either the logical device number assigned to it in the I/O Configuration table, or by the device class associated with it. (DEVICE CLASSES, the last column in the table, is explained below.) Note that in Section III, command specifications generally offer you a choice of specifying either the *ldev* or *devclass* when the command references a device. *Ldev* is always a more precise specification, since multiple devices may be assigned the same device class, but no two devices will have the same logical device number.

DEVICE REFERENCE TABLE (DRT) ENTRY NUMBER. The Device Reference Table, like other MPE tables, resides in main memory. It contains hardware-dependent information for each peripheral device known to MPE. The DRT values for each device are system-defined, and not arbitrarily selected by the Supervisor.

Every device on the system is connected to a device controller, which may serve more than one device of the same type. The Device Reference Table contains, for each device, the address of the controller to which the device is connected. Devices of the same type connected to the same controller will have the same DRT number. DRT numbers are based upon a combination of jumpers and switches on the device controller board. DRT entry numbers 0, 1, and 2 do not exist, but MPE uses the memory locations where they would normally be located. DRT 3 is always the system clock, and is never configured into the system I/O configuration table.

When reconfiguring the system, the highest DRT entry number that can be assigned to a device is 127 for the Series 39/40/42/44/48 of the HP 3000, and 511 for the Series 64/68, and Series 37.

UNIT NUMBERS. The Unit Number is a hardware-dependent characteristic determined by the physical connection of a device to its controller. Each controller supports a particular type of device. A disc controller, for example, cannot be used to connect a line printer to the computer. Similarly, a printer controller cannot be used to control disc drives. Similarly, each type of controller board will support a different number of devices. A disc controller can generally support up to eight separate disc drives; a tape controller will support four tape drives, whereas each printer uses its own dedicated controller board.

When a controller services only one device, that device is assigned a Unit number of 0. When the controller serves more than one device, each device is assigned a consecutive Unit number to distinguish it from the other devices connected to the controller. To illustrate, assume that four disc drives are connected to the system through a single controller board. The first disc drive, identified as Unit 0, is commonly referred to as the Master device. The second, third, and fourth disc drives connected to it are assigned Unit number 1, 2, and 3, respectively. They are referred to as Slave devices.

SOFTWARE CHANNEL NUMBER. To deal with special configuration problems, a software channel number may be defined in the I/O Configuration table. Generally, no software channel number need be assigned to a device, and a zero will be entered in the table under the Channel column heading ("CH").

TYPE/SUBTYPE. Each device is assigned a whole number designating its device type, and a second number which indicates the device subtype. These numbers are determined by Hewlett-Packard, which are not assigned by the System Supervisor. In general, they classify a device according to the means MPE uses to access it and the features the device supports.

TERMINAL TYPE/SPEED. When configuring a terminal or a line printer you must specify the terminal type number that corresponds to that device. This number, ranging from 0 to 30, informs MPE the exact model of the device you are defining in the Configuration Table. If the device is a terminal, you must also specify its speed in characters per second (CPS), or enter a zero. For example, to configure a terminal that operates at 9600 baud, enter 960 in the SPEED column of the Configuration table for this terminal since CPS is equivalent to the baud rate divided by 10. (Each character consists of 10 bits: the 8-bit ASCII character, plus a start bit and a stop bit.) If you enter a zero, which will be indicated by two question marks (??) in the "TERMINAL SPEED" column, MPE will "speed sense" the transmission rate of the terminal.

TERMINAL TYPE DESCRIPTOR FILES. Each terminal type descriptor file supplies device dependent information for the device being configured. It is only valid for terminals and RS232 printers.

RECORD WIDTH. The record width for a device is a decimal value specified in words, rather than bytes. For most devices, record width may be arbitrarily chosen as long as the value entered in the "RECORD WIDTH" column does not exceed the maximum for the device. However, certain standard and recommended values have evolved, which are listed below. For discs, the default record widths referenced in Section VII should be used.

Device	Record Width (in words)
Disc Drives	128
Tape Drives	128
Line Printers	66
Laser Printers	66
STREAMS device	128
Terminals	40

CORRESPONDING OUTPUT DEVICE. If a device will be used to initiate jobs and/or sessions, you must specify a corresponding output (list) device. This specification may either be the logical device number of the corresponding device, or a device class name. Note, however, that if you specify a class name, all data from the input device will be listed on each *ldev* assigned that class name, which may be one or several logical devices. If the device is a disc, or if it is configured as an output-only device (such as a line printer), enter 0 in the "CORRESPONDING OUTPUT DEVICE" column.

MODE. During the configuration process, the System Supervisor may specify six modes, or options, for a device. Explained below, these are:

- Job/Session Accepting (J)
- Data Accepting (A)
- Interactive (I)
- Duplicative (D)
- Spooled (S)
- Auto Reply (R)

Job/Session Accepting Devices. A "J" entry in the "MODE" column specifies that the device can accept the :JOB or :HELLO commands, thereby functioning as a job/session input device. This option causes MPE to automatically read the first input record, which must be a valid :JOB or :HELLO command. This way, users may gain access to the device without requiring the Operator to :REPLY to their request to use it, which is necessary for nonaccepting devices. You will see this feature referred to as "auto-recognition". Note that sessions cannot be started on job/session accepting devices unless the interactive option is also specified.

Data-Accepting Devices. An "A" entry in the "MODE" column allows a job or session to acquire, without Operator intervention, an auxiliary input device in addition to its \$STDIN device. The auxiliary device must be configured as a data-accepting device via the :DATA command. For example, a session (which uses a terminal as its \$STDIN device) could read data from a card reader, if the reader is configured as a data-accepting device and the user entered the appropriate data record.

The A option, like the J option, instructs MPE to automatically recognize the device by reading the first input record. If the device is also spooled, the data will be immediately input to a spooled device file.

Interactive Option. This option, designated by an I in the "MODE" column, indicates that the device is used for sessions. Such devices are called interactive because the user interacts with MPE (and utilities, subsystems, and application programs) by entering instructions to the computer through a terminal, and receiving an immediate response in the form of program results or system messages.

An interactive device supports both jobs and sessions. When it is used to submit a job (defined via the :JOB command), MPE assumes that the instructions for processing the job have been predefined and that errors will only be corrected after the job is complete or aborts. If the input is not predefined, but instead entered interactively during a session, any errors that occur while the user is entering the instructions will cause MPE to terminate the job immediately.

Duplicative Option. A device is configured as duplicative (D) when all input operations can be echoed to a corresponding display without intervention by MPE. In general, terminals, which are interactive devices, are also duplicative: all input from the terminal's keyboard is echoed back to the display portion of the terminal. This enables users to see the instructions they have sent to MPE. A device is nonduplicative when it does not automatically echo user input. In this case, MPE's command interpreter must intervene to "echo" the input, as is done with a card reader.

Echoing capability is generally handled by the terminal controller board, rather than the terminal itself. Some nonstandard terminals, however, have a self-contained echo feature. If there is no switch on the terminal to turn off this capability, the terminal controller will echo user input to the terminal while the terminal is echoing to itself, which will garble the display. To avoid this, press the escape key and a semicolon (ESCAPE ;) after logging on. This will suppress the terminal controller's echoing feature, so that only the echo capability built into the terminal itself will operate. To restart the hardware echo feature, press the escape key and a colon (ESCAPE :).

In general, the duplicative option should be specified if the device is both a job/session accepting device and an interactive device.

Spooling Option. When MPE is brought on line, devices which contain an "S" in the "MODE" column of the Configuration display will be automatically controlled by the spooling facility. Job-and/or data-accepting card readers and magnetic tape units may be designated as either input spooling devices or output spooling devices, but not as both simultaneously. Line printers and plotters may only be used for output spooling.

Auto Reply Option. This configuration option allows automatic allocation of tape drives and serial disc drives.

DRIVER NAME. This entry designates the name of the driver associated with the device's controller. It is the program that serves as an interface between the device and MPE. Each unique device requires a separate driver program. A list of drivers, corresponding to standard Hewlett-Packard supported, devices can be found in Section VII's discussion of "PERIPHERAL CONFIGURATION INFORMATION". When the device is nonstandard and not supported by Hewlett-Packard, the driver name duplicates the name of the program file which contains the driver. Like all MPE file names, it must begin with a letter and consist of one to eight alphanumeric characters. If the driver name is preceded by an asterisk (*), the driver program permanently resides in main memory.

DEVICE CLASSES. Device class names, which are arbitrarily selected by the System Supervisor, are one of two ways in which users may reference a device. The other method, discussed previously, is the logical device number, or *ldev*. Requesting a particular device class is less specific than a reference to logical device number. Unlike the *ldev*, which is a unique number assigned to each device, the same class name may be assigned to more than one device. Also, the same device may have more than one device class name. In this case, users can reference the device by any one of its class names.

Device class names must begin with an alphabetic character and consist of one to eight alphanumeric characters. MPE reserves certain class names for a specific function. For example, to use the spooling facility with a particular disc drive, the disc must be assigned two class names: DISC and SPOOL. Standard device classes recognized by MPE are defined as follows:

DISC	The default device class for files created with the :BUILD command.
SPOOL	The device class that designates a spooling disc. If the device is not assigned the class name SPOOL, it will not be used by the spooler program to create and store spool files. Discs used by the spooler are also used to store standard user files.
JOBTAPE	The device class name that may be included in the system configuration for use with the streaming facility. This usually refers to a pseudo-device, rather than an actual device physically connected to the computer.
TAPE	The device class name assigned to magnetic tape drives.
DDUMP	The device class name assigned to the tape or serial disc device which receives the output of the SOFTDUMP facility.
LP	The class name assigned to the system line printer. The other commonly used class name for line printers is simply PRINTER.
PP	An acronym for Page Printer, and one of several class names commonly associated with the HP 2680 Laser Printer. Other class names used to designate a laser printer are FASTLP, LASER, and EPOC.

To use the user logging facility with devices in a class other than DISC, MPE specifically requires that the following classes be included:

TAPE	The class name which refers to magnetic tapes.
SDISC or CTAPE	The class name assigned to serial disc devices.

Repeated Class Names. When you list the system configuration, you may notice that a single disc drive has been assigned the same class name (usually "DISC") more than once. There is a simple explanation: when your system uses two or more disc drives, MPE attempts to distribute file extents among them so that each disc has approximately the same number of file extents and a similar disc search sequence time. MPE does this by writing files to each device assigned the class name "DISC" in a round-robin distribution scheme.

It is not uncommon to have multiple disc drives of different storage capacity connected to a single computer. If this is the case, and each *ldev* were assigned the class name DISC once, the smaller disc drives would become full at a proportionally faster rate than the larger drives. To accommodate this difference, the device class name "DISC" is often assigned to a single device more than once. For example, if a 100-megabyte drive is assigned the class name DISC once, a 300-megabyte drive should be assigned the class DISC three times. This way, MPE will store one file extents on the smaller disc drive for every three file extents it writes to the larger drive.

DEVICE ACCESS TYPE. In addition to categorizing input/output devices by type and subtype, and assigning to each device one or more class names, devices are also classified by access type. MPE recognizes seven I/O device access categories. By convention, each device supported by MPE is assigned to one of the seven categories based upon information about the device you as System Supervisor (or your SE) enters into the Configuration table.

Examples of Device Access Type. Suppose, for example, you are adding an HP 7976 Tape Drive to your system and are entering information about the device in the I/O Configuration Table. Its device type, 24, is determined by system convention; you do not choose it arbitrarily. Also determined by system convention is the corresponding Device Access Type (DAT) for device type 24. Since MPE "knows" the physical properties of a tape drive, it confines the mode of access to operations that are consistent with these properties. In this case, your HP 7976 Tape Drive is within the classification of types 24 through 30, with an access type of "I/O,NC", meaning a nonconcurrent input/output device. These devices are used for data input and output (I/O). Nonconcurrent refers to the fact that such devices cannot perform I/O operations concurrently. A tape drive can either be used for input or for output, but not both. (Note that this excludes the automatic read-after-write process which verifies the data copied by the tape drive.) By contrast, terminals are concurrent I/O devices because it is the combination of input and output processes to a terminal which allows sessions to be conducted interactively.

Another example further explains device access type. Discs are direct access storage media (unless specifically limited to serial access) because the drive's read/write heads can position themselves at any track on the disc without the need to read preceding tracks. Yet MPE distinguishes between MPE-formatted discs and foreign discs. The former are assigned device access types 0 through 6, whereas foreign discs are assigned a device access type of 7. Although both are direct access devices, MPE cannot access a Type 7 disc in the same way it can read data on an MPE-formatted disc because the data storage format is different.

Below is a table listing device types and their corresponding Device Access Types:

Device Types	Access Type
0-7	Direct access (DA)
8-15	Serial input (IN)
16-23	Concurrent input/output (I/O, C)
24-31	Nonconcurrent input/output (I/O, NC)
32-39	Serial output (OUT)
Special Note:	A device type 7 defines foreign disc (FD) in the direct access type domain.
	A device type 31 defines a serial disc (SD) in the nonconcurrent input/output domain.

Definition of Device Access Types. Device Access Types are defined as follows:

Direct Access	(DA) Allows data stored on the device to be directly accessed by positioning the read/write mechanism at a precise location. Direct Access mode is limited to disc drives. Other devices, such as tape drives, terminals, and printers treat data sequentially.
Foreign Disc	(FD) The access mode that informs MPE that data stored on the device does not conform to MPE's standard disc format.
Serial Input	(IN) Serial Input access mode limits the device to input operations only. Data is entered sequentially.
Concurrent Input/Output	(I/O,C) Concurrent Input/Output Access mode allows input and output operations to and from the device in any order. Terminals are typically assigned this access mode.
Nonconcurrent Input/Output	(I/O,NC) Nonconcurrent Input/Output, the access mode assigned to tape drives, allows input and output operations to the device, but restricts the order. For example, you may not read what you have just written to a magnetic tape unless you backspace over the record and then read it.
Serial Disc	(SD) Restricts disc access to serial (sequential) read and write operations.
Serial Output	(OUT) Serial Output access designates that the device may only be used for output (data storage) operations.

To display access types associated with each device class name and their associated logical devices, respond YES to the questions "CLASS CHANGES?" and "LIST CLASSES?" during the Configurator dialogue. Occasionally, a device type number (instead of the access type) will be specified for a device class name. You may use this table to cross reference device classes, and see all of the devices (designated by their logical device numbers) that belong to any given device class. The order in which logical devices appears in this table represents the order of device allocation within the class. This is configurable for each installation by either you or your SE.

Device Class Access Types. The standard Device Access Types determined by MPE may be augmented by a further classification which you, as Supervisor, may determine. When you respond YES to the Configurator dialogue questions "CLASS CHANGES?" and "LIST CLASSES?", you have the

opportunity to enter a new device class name and its corresponding access types, or modify an existing class name. You can then assign the new or modified class name to the device. You may not, however, define Device Class Access Types (DCAT) in a completely arbitrary manner. The access mode must be a subset of the MPE-determined Device Access Type for the *ldev* to which you are assigning a class name.

The Device Class Access Type you define for a device redefines how it will be used. Since the purpose of creating a Device Class Access Type, in addition to the MPE-defined Device Access Type, is to provide a choice of access modes, you must be able to open the device in either mode. To use the device as MPE has defined it (according to the device type), open the device by referencing its logical device number. To use it as you have defined it, open the device by referencing the restricted-access device class name.

Choosing Device Class Access Type. When you are assigning devices to a class, use the following rules.

- Assign a DCAT of direct access (DA) or serial disc (SD) to a class containing only removable, moving-head discs, depending on its specification when it is initially defined. Classes containing only direct access devices with one or more nonremovable discs are automatically assigned a Direct Access DCAT. The class name DISC is always assigned a Direct Access DCAT.
- Assign a class containing one or more serial input access type-devices a DCAT of serial input (IN), regardless if other devices within the the class are either concurrent or nonconcurrent input/output access devices, or both.
- Assign a class containing one or more serial output access types a serial output (OUT) DCAT, even though the remainder of the devices in the class are assigned either a concurrent or nonconcurrent input/output access type, or both. For example, a card punch is always a serial output device (OUT) and a magnetic tape is a nonconcurrent input/output device (I/O,NC). If a class PUNCH is assigned to both the card punch and the magnetic tape, then it will have a DCAT of serial output (OUT) only.
- You may choose the DCAT for a class containing only concurrent input/output access types. The Configurator prompts you to choose among serial input (IN), serial output (OUT), concurrent input/output (I/O,C), or nonconcurrent input/output (I/O,NC).
- You may also choose the DCAT for a class containing only nonconcurrent input/output access types. The Configurator asks you to choose a DCAT of serial input (IN), serial output (OUT), or nonconcurrent input/output (I/O,NC).
- When a class contains a combination of concurrent and input/output access types, the Configurator prompts you to choose a DCAT of serial input (IN), serial output (OUT), or nonconcurrent input/output (I/O,NC).
- A class containing any combination of access types other than those mentioned above is illegal. For example, a line printer, which is an output device (OUT) and a card reader, which is an input device (IN) cannot belong to the same device class since their access types are incompatible.
- A class containing devices of a single type is assigned the DCAT for that device type.

The Default Configuration Table

When you respond YES to the the question "I/O configuration changes", the configuration will ask if you want to "LIST DEVICE DEFAULTS". If you are adding a device, or modifying one already defined for MPE, you may respond YES to list the default specification values for all HP supported devices. The table will be displayed as twelve columns of information, as shown in Table 5-2.

Table 5-2. Device Defaults (DEFDATA.PUB.SYS)

DEVICE NAME	ID CODE	C H A N	T Y P E	SUB TYPE	REC WIDTH	OUTPUT DEV	DRIVER MODE NAME	DEVICE CLASS
				TERMINAL TYPE SPEED				
HP2563A	!2101	0	32	9	66	0	S	HIDCIPR0 LP
HP2565	!2101	0	32	9	66	0	S	HIDCIPR0 LP
HP2566	!2101	0	32	9	66	0	S	HIDCIPR0 LP
HP2608A	!2001	0	32	4	66	0	S	HIDLPR0 LP
HP2608S	!2101	0	32	9	66	0	S	HIDCIPR0 LP
HP2613	!200A	0	32	2	66	0	S	HIDLPR2 LP
HP2617	!200A	0	32	2	66	0	S	HIDLPR2 LP
HP2619	!200A	0	32	2	66	0	S	HIDLPR2 LP
HP2680A	!2004	0	32	8	66	0	S	HIOPPR0 LP
HP2688A	!2004	0	32	8	66	0	S	HIOPPR0 LP
HP2893A	!0101	0	8	0	40	0		HIOCRDR0 CARDRDR
HP7902	!0081	0	2	0	128	0		HIOFLOP0 FLOP
HP7906BP	!FF02	0	0	12	128	0		HIOMDSC1 DISC
HP7906FP	!FF02	0	0	11	128	0		HIOMDSC1 DISC
HP7906RP	!FF02	0	0	10	128	0		HIOMDSC1 DISC
HP7911	!0204	0	3	1	128	0		HIOMDSC2 DISC
HP7912	!0208	0	3	2	128	0		HIOMDSC2 DISC
HP7914	!020A	0	3	4	128	0		HIOMDSC2 DISC
HP7920	!FF03	0	0	8	128	0		HIOMDSC1 DISC
HP7925	!FF04	0	0	9	128	0		HIOMDSC1 DISC
HP7933	!0212	0	3	8	128	0		HIOMDSC2 DISC
HP7935	!0212	0	3	8	128	0		HIOMDSC2 DISC
HP7945	!0220	0	3	5	128	0		HIOMDSC2 DISC
HP7970E	!0183	0	24	0	128	0		HIO TAPE0 TA
HP7974	!0174	0	24	3	128	0		HIO TAPE2 TA
HP7976A	!0176	0	24	1	128	0		HIO TAPE1 TA
HP7978	!0178	0	24	2	128	0		HIO TAPE2 TA
HP9140	!0240	0	3	0	128	0		HIOCTAP0 CTAPE
HP9144	!0260	0	3	3	128	0		HIOCTAP1 CTAPE
HP9895	!0081	0	2	0	128	0		HIOFLOP0 FLOP
HPLPADCC	!0010	0	32	14	19 240	66	0	S HIOASLP2 LP
HPLPATP	!000F	0	32	14	19 240	66	0	S HIOASLP0 LP
HPPCLADCC	!0010	0	32	14	??* 960	66	0	S HIOASLP2 LP
HPPCLATP	!000F	0	32	14	??* 960	66	0	S HIOASLP0 LP
HPTERMADCC	!0010	0	16	0	10 960	40	& JAID	HIOTERM2 TERM
HPTERMATP	!000F	0	16	0	10 960	40	& JAID	HIDTERM1 TERM

Configuring The MPE Streaming Facility

The MPE streaming facility allows users to batch process jobs or data so that they can continue with other work while MPE processes them. Users designate such jobs by executing the `:STREAM` or `:JOB` command, but before they can do so, MPE's streaming facility must first be enabled with the `:STREAMS` command. (For a complete description of the `:STREAM` and `:JOB` commands refer to the MPE-V Commands Reference Manual (32033-90006); for a description of the Operator command `:STREAMS`, refer to Section III in this manual.)

Before users or the Operator can execute any of these commands, you must define a pseudo device in the I/O Configuration table which will appear to be a tape drive or a card reader. The device itself is usually not connected to the computer, hence the term "pseudo device". In fact, if the tape drive is physically present, it can only be used to introduce jobs.

The pseudo device used by the streaming facility must have the following:

- A unique logical device number, usually 10.
- A DRT number, which can be the number of an existing card reader or tape device. If no such device is physically present, the DRT number can be the number that such a device would have had if it did exist.
- A unit number, determined by how many other devices are configured on the same controller.
- A software channel, type number, subtype number, and record width value, which duplicate the values for an actual card reader or tape drive.
- An output device, which should be a printer.
- Mode, which must be job and data accepting.
- The name of the driver which would correspond to an actual card reader or tape drive.
- The class name `JOBTAPE`. This may be included regardless of what additional class names are specified for other purposes.

The following example illustrates the result of configuring `ldev 10` to accept spooled or batched data from a session or job. Note that it is not apparent from the I/O Configuration table whether the device is physically connected to the system, or whether it is a pseudo device. Once the Operator enables the streaming facility with the `:STREAMS` command, users will be able to execute the `:STREAM` command to process jobs.

The System Supervisor

LOG DEV #	DRT #	U N I	C H A	T Y P	SUB TYPE	TERMINAL TYPE	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASSES	
1	89	0	0	0	9		128	0		HIOMDSC1	SYSDISC	
2	90	0	0	3	8		128	0		HIOMDSC2	DISC SPOOL	
3	91	0	0	3	8		128	0		HIOMDSC2	DISC SPOOL	
6	82	0	0	32	4		66	0	S	HIOLPRT0	LP LP08	
7	73	0	0	24	0		128	0		HIOTAPE0	TAPE DDUMP	
8	73	1	0	24	0		128	0		HIOTAPE0	TAPE	
9	73	2	0	24	0		128	0		HIOTAPE0	TAPE	
10	73	3	0	24	0		128	PP	JA	HIOTAPE0	JOBTAPE	
19	83	0	0	32	8		66	0	S	HIOPRTO	EPOC PP FASTLP PP	
20	8	0	0	16	0	10	240	40	20	JAID	HIOTERM0	CONSOL

As you can see from this example, *ldev 10* has been defined with the following characteristics: the DRT number of the tape drives actually connected to the system (*ldev 7, 8, and 9*); Unit number 3, indicating that the streams device is the fourth tape drive on the tape controller; the same type, subtype, and record width as the tape drives; an HP 2680 Laser Printer ("PP") as an output device (*ldev 19*); job and data accepting mode (J and A, respectively); the driver HIOTAPE0, identical to the system's tape drives; and the class name JOBTAPE.

Changing System Tables and Queue Parameters

In addition to configuring I/O devices, you may use the Configurator dialogue to change MPE system tables, queues, and other data structures by responding YES to the question "SYSTEM TABLE CHANGES?". The factory or your SE defines the appropriate parameters for your particular system configuration when the system is installed, and changes are not generally necessary. However, as the needs and resource demands of your users change over time, or as you add or upgrade your hardware or software, you may need to alter these values to ensure the ongoing efficiency of your system.

To guide you when you experiment with system tables, queues, buffers, and lists, the following discussion explains their function. The requirements for each HP 3000 configuration can be quite different. For this reason, no specific values are presented here, although some general guidelines are provided. Do exercise caution when altering system parameters. Any changes will directly influence MPE's operation.

The following discussion explains the purpose of:

- MPE tables used to control system and user processes.
- Other tables, queues, and lists not directly intended to control processes.

- System buffers, terminal buffers, message tables, and the message catalog.

SYSTEM AND USER PROCESS CONTROL TABLES. MPE is a table-driven operating system, which means that it uses several tables to manage and monitor system activity. There are four principle memory-resident tables MPE uses to control all system processes, whether they be MPE functions, subsystem or utility programs, or user programs. These tables, explained below, are:

- The Code Segment Table, or CST
- The Extended Code Segment Table, or XCST
- The Data Segment Table, or DST
- The Process Control Block Table, or PCB Table

Code Segment Table (CST). The Code Segment Table, or CST, keeps track of all allocated MPE and subsystem code segments and all code segments that are contained in a segmented library. Each CST entry, which is 4 words long, contains information about a single code segment. When a program is loaded, the code itself is not usually resident in memory, unless that portion of the code is currently executing. Instead, information (including the following data) is entered into the CST or XCST so that the code segment can be immediately accessed when necessary: current location (disc or memory address), segment length, whether the code was prepared with Privileged Mode (PM), etc.

The Code Segment Table used in the E/F.00.00 release of MPE V contains both permanently and temporarily allocated code segments. The total number of CST entries available is 192.

The Code Segment Table used in the G.00.00 and later release of MPE V allocates a maximum of 2048 entries for temporarily allocated programs. Of these, 192 entries are reserved for MPE segments.

If the CST is underconfigured, programs will not run when the system is heavily loaded. If overconfigured, main memory space is wasted. The number you select for your particular configuration will depend upon which version of the operating system you have, the amount of main memory, and average (and maximum) system load.

Extended Code Segment Table (XCST). The Extended Code Segment Table, or XCST, functions similarly to the CST. The difference is that entries in the XCST contain information about code segments that come from user's program files and those segments which are assigned by running a program (with the :RUN command).

If the Extended Code Segment Table is underconfigured, programs will not run when the system is heavily loaded. If overconfigured, main memory is wasted. In general, if your users run large programs with many code segments, or if your installation is involved in program development, the size of the XCST should be larger than it would otherwise be at sites not involved in either of these activities. The maximum size is 8191 entries.

Data Segment Table (DST). The Data Segment Table monitors all data segments, including those used by MPE and user's data stacks. Like the CST and XCST, each entry in the DST represents a single data segment. To roughly determine the appropriate size of the DST (in number of entries) for your installation, use the following formula:

$$\# \text{ of DST entries} = [8 * \text{max \# of users}] + 64$$

If underconfigured, programs may not run when the system is heavily loaded. If overconfigured, main memory is wasted. The maximum DST size for the E/F.00.00 release of MPE V is 1024 entries. The maximum for the G.00.00 or later release is 4096 entries.

Process Control Block (PCB) Table. The Process Control Block (PCB) Table contains the status of each process on the system. A single entry corresponds to one process. Use extreme care when reducing the size of this table: If it is too small, the system will crash. But, since the PCB Table is main-memory resident like the CST, XCST, and DST, main memory space is wasted when it is too large. A guideline to use for selecting the size of the PCB Table is:

$$(3 * \text{max \# of users}) + 32$$

The maximum PCB table size for the E/F.00.00 release of MPE V is 256 entries. The maximum size for the G.00.00 release or later is 1024 entries.

OTHER SYSTEM TABLES, QUEUES, AND LISTS. Few system resources are truly sharable. Those that are include System Domain discs, used to store user and program files, and main memory, which is subdivided among executing processes. Other resources, including peripheral devices such as terminals, printers, and tape drives, are only serially reusable. MPE relies upon queues, lists, and other tables to monitor requests for such devices and manage the competing demands for them. These structures share a similar function: each maintains the order of resource requests to ensure the systematic allocation of nonsharable devices. The following discussion explains the purpose of various queues, tables, and lists used by MPE to manage resource allocation.

Input/Output Queue (IOQ). The I/O Queue resides in main memory. It contains requests from any process running on the system for all non-disc I/O devices. In general, the total number of I/O entries you allocate will reflect the number of non-disc devices your system supports. Note, however, that spooled devices must be treated as an exception: allocate at least 10 entries in the I/O queue for each spooled input device and 15 entries for each spooled output device.

The absolute minimum number of recommended entries is 20, regardless of the configuration. The maximum number for the E/F.00.00 release of MPE V is 256. The maximum number for the G.00.00 release of MPE V has been expanded to 1300 entries. If the I/O Queue is underconfigured, system response time will be degraded. Overconfiguring the I/O queue will waste main memory.

User Controller Process (UCOP) Request Queue. The UCOP request queue resides on disc in virtual memory, and is only loaded into main memory when needed by the system. It limits the number of jobs and sessions which can be terminated simultaneously. The maximum size for the E/F.00.00 release of MPE V is 256 entries. The maximum for the G.00.00 or later release of MPE V is 1024 entries.

Disc Request Table. The Disc Request Table holds request parameters and queries for pending disc I/O requests. It is functionally and structurally similar to the I/O queue for non-disc devices. Like the I/O Queue, it resides in main memory. The minimum recommended number of entries needed for the Disc Request Table is 16. The maximum number for the E/F.00.00 release of MPE V is 256. The maximum number of entries for the G.00.00 release of MPE V is 900. Allocating too few entries will result in a System Failure 601.

Swap Table. The Swap Table is a memory-resident table that monitors data segments referenced by every process executing on the system. This table is needed to inform MPE whether a process's data stack or extra data segment is currently stored in main memory or has been swapped out to disc to allow space for another process's stack. One five-word entry is used per data segment. The recommended total number of entries is 5 times the maximum number of configured PCB entries. The maximum setting for the E/F.00.00 release of MPE V is 2048 entries. The maximum for the G.00.00 release of MPE V is 5400 entries. If the Swap Table is underconfigured, it may cause a System Failure 602.

Interrupt Control Stack (ICS). The Interrupt Control Stack resides in main memory. It is used by the System Dispatcher and for input/output processing. The maximum size of the ICS for the E/F.00.00 release of MPE V is 2048 words. The maximum size for the G.00.00 release of MPE V is 4096 words. Exercise extreme care when experimenting with the size of the ICS. If it is too small, the operating system will fail.

Timer Request List (TRL). The Timer Request List is used to store requests to delay a process or a function for a specified amount of time. The maximum size of the TRL for the E/F.00.00 release of MPE V is 128 words. The maximum size for the G.00.00 release of MPE V is 1024 entries. Use care when altering the size of this list, since reducing the number of TRL entries too much will cause the operating system to fail.

Breakpoint Table. Unlike other tables, each entry in the Breakpoint Table may vary in length. It is used by the DEBUG facility to save the addresses of program breakpoints selected by users when they are debugging code. If you anticipate very little program development (and therefore debugging) on your system, you may reduce the table size to a minimum value. The absolute minimum number of entries recommended for any system configuration is 1024.

SYSTEM, MESSAGE, AND TERMINAL BUFFERS. MPE also uses buffers to coordinate communication and data transfer between system resources. Although some of these are referred to as tables, their primary purpose is to buffer data transmitted between processes running on the system. Buffers, like tables, queues, and lists, facilitate the use of peripheral devices such as disc and tape drives, terminals, and printers and other system resources (memory and CPU time) in a multitasking environment. The following discussion describes the buffers used by MPE, along with general size guidelines to follow when you alter the system configuration.

System Buffers. System buffers are used by MPE's message system (the :LOGON, :LOGOFF, :WARN, and :TELL commands) and by Multipoint Terminal Software (MTS) lines. Each buffer consumes 128 words of memory. The minimum number of system buffers is 8; the maximum is 253 for both the E/F.00.00 and G.00.00 releases of MPE V, and the average range is 18 to 25 buffers. If your system has many interactive users and a large number of streamed jobs, you will need a larger number of buffers to handle the logon and logoff processes. The result of underconfiguring the number of system buffers is very slow system response time, particularly during peak loading periods when a number of users are logging on or off, or submitting jobs.

Primary Message Table. The Primary message table, which resides in main memory, is used to buffer messages transmitted between system processes during the execution of critical areas of system code. The suggested number of entries is 25. The maximum setting for the E/F.00.00 release of MPE V is 255. The maximum for the G.00.00 release of MPE V is 1024. If underconfigured, it may cause a System Failure 620.

Secondary Message Table. The Secondary Message Table also resides in main memory. It is used to buffer the content of pending messages that are transmitted between system processes using the low-level message system. The suggested number of entries is 25. The maximum setting for the E/F.00.00 release of MPE V is 255. The maximum for the G.00.00 release of MPE V is 1023. Failure to allocate enough entries impedes the table and degrades system performance until more entries become available.

Special Request Table. The Special Request Table is used for two purposes: To temporarily buffer the parameters for segment expansions, and to form the queue for devices waiting for the segment. The suggested number of entries is 25. The maximum setting for the E/F.00.00 release of MPE V is 255. The maximum for the G.00.00 release of MPE V is 2048. If too few entries are allocated, it may cause a System Failure 600.

Terminal Buffers. Terminal buffers are used to buffer all input to and output from terminals. The number of buffers needed on your system depends on the number of concurrent terminal users supported on the system. A larger number of terminal buffers must also be allocated if users are working in block (page) mode, since block mode causes a larger amount of data to be transferred to and from the terminal at one time. For example, if your installation consists almost entirely of V/3000 users, configure the maximum number of terminal buffers, since each of these users will be working in block mode. If you are using the E/F.00.00 release of MPE V, the number of terminal buffers cannot exceed 256. For the G.00.00 release of the operating system, the maximum number is 99 buffers.

If you configure too few terminal buffers, terminal response time will be slow and the cursor movement will be erratic when writing data to the screen. However, since terminal buffers are memory-resident, overconfiguring the number of buffers will waste main memory.

THE MESSAGE CATALOG. The system and error messages which MPE displays on users' terminals (during sessions), or prints on their job's standard list device, are contained in a single file. Known as the message catalog, MPE uses it to store both standard system messages and error messages. Its source file is CATALOG in the group PUE of the SYS account. Like any other text file, you may examine the Message Catalog, and even modify it. Since messages contained in the catalog inform users of their current status though, exercise caution when altering any of the text. For a description of the MPE message system, refer to Section IX of this manual, entitled "MPE MESSAGE SYSTEM".

CHANGING OTHER SYSTEM PARAMETERS

The System Supervisor's primary responsibility is to ensure that the system consistently meets the needs of its users. As demands upon the system change due to more or fewer users or a change in the type of work performed on the computer, you will need to re-evaluate the original system configuration. As you know from reading the preceding discussion, configuration covers a broad range of topics. Most of the system parameters you can modify are part of the Configurator dialogue. Some

others, however, are not. Elements of the Configurator dialogue which have not yet been discussed, and other means available to you to tune the system are the subjects of the following discussion. These include:

- Modifying miscellaneous system parameters such as:
 - The maximum number of Resource Identification Numbers, or RINs, in the RIN pool.
 - Logon recognition time.
 - The maximum number of concurrently executing jobs and sessions.
 - The default CPU time limit for job processing.
- Changing segment limits.
- Modifying the Segmented Library (SL) or system programs.
- Modifying scheduling queues.
- Permanently allocating programs with the `:ALLOCATE` command.
- Enabling the disc caching facility and tuning caching performance with the `:CACHECONTROL` command.
- Changing the `V.UU.FF`.

Changing Miscellaneous Values

In addition to I/O configuration changes and system table changes, SYSDUMP prompts you for "MISC CONFIGURATION CHANGES". If you respond YES, you may change RIN usage, logon recognition time, the maximum number of concurrent jobs and session, and the default CPU time limit. These miscellaneous elements, explained below, are system resources in the same sense that a disc drive or an entry in the Code Segment Table is a resource. Just as changes to the I/O configuration or system tables affect MPE users, modifying any of these miscellaneous parameters will also affect system performance and usage.

ALLOCATING RESOURCE IDENTIFICATION NUMBERS. Resource Identification Numbers, or RINs, are used by application programs to coordinate the use of system resources between sessions or jobs, or between processes within a job. A RIN is not a physical entity, nor is it logically associated with a particular resource. It is an abstract concept supported by MPE. Programmers define the scope and purpose of one or more RINs within their program code. It is this definition, and only this definition, which gives RINs meaning.

As System Supervisor, you will not define RINs. You are, however, responsible for configuring the maximum number of local, file, and global RINs available to programmers and deleting global RINs previously defined by programmers. SYSDUMP asks you four RIN-related questions. These are shown in the partial sample of the SYSDUMP dialogue below, and are explained in the following discussion.

```
ANY CHANGES? Y
.
.
.
MISC CONFIGURATION CHANGES? Y
LIST GLOBAL RINS? Y
RIN #  USERNAME.ACCTNAME
   4   JOE      .SMITH
   6   MANAGER .ACCTNG
  10   MGR     .PROGTEAM
  23   SARAH   .G
DELETE GLOBAL RIN? N
# OF RINS MIN = 23, MAX = 48.?
# OF GLOBAL RINS USED = 4, MAX = 16.?
.
.
.
```

The list of global RINs identifies each RIN by the RIN number (RIN#) and the user name and account of the person who defined the RIN. RINs are acquired with the GETRIN intrinsic, and assigned a number by MPE. For further information about RIN definition and usage from the programmer's perspective, refer to Section III of the MPE V Intrinsic Reference Manual (32033-90007) under the heading "RESOURCE MANAGEMENT".

Once you have listed the currently defined global RINs, SYSDUMP asks if you want to delete any of them. There is no way for you to determine from the listing if any of the listed RINs are still being used by the programmer, or if they are obsolete. Therefore, before you delete a global RIN, consult the programmer to find out if the RIN can safely be deleted from the RIN table.

The next question, "# OF RINS MIN = 23, MAX = 48.?", allows you to change the maximum number of RINs in the RIN table. This maximum applies to all three types of RINs which are available to programmers: global RINs, local RINs, and file RINs. Local RINs and file RINs are considered temporary, and do not appear in the RIN listing described above. As a general rule, the maximum number of RINs should be roughly equal to the jobs/session limit established by your System Operator with the :LIMIT command. For example, if the job limit is 5 and the session limit is 45, you should allocate approximately 50 RINs.

Although it is confusing from the phrasing of this question, you cannot choose the minimum number of RINs. The numerical value included in the statement "# OF RINS MIN = 23" is the highest RIN assigned by MPE. If none of these RINs have been released, the minimum size of the RIN table is 23, and the next RIN assigned will be a minimum of 23. If, on the other hand, one or more RINs have been released, and the user requests a free RIN, a free RIN between 1 and 23 may be assigned to the user.

The MIN number will usually, but not always, be equivalent to the highest-number RIN listed in the global RIN listing. (Note that in the sample dialogue above, the user SARAH.G owns RIN number 23, the largest RIN number listed.) If these two numbers are not equal, then MPE has assigned the highest RIN number to a temporary RIN, which will not be listed with the global RINs. For the G.01.00 release # OF RINS = nn (MIN=YY, MAX=1024, USED=yy) MIN is equal to used/nn currently configured/MAX is 1024.

The next question, "# OF GLOBAL RINS USED = 4, MAX = 16.?", tells you the number of global RINs in use (which is also apparent from the RIN listing). It prompts you to define the maximum number of global RINs available to programmers. As a general rule, this maximum should be approximately 30% of the total number of RINs allocated. To reiterate, RINs are defined and used by applications programmers: if the maximum number of RINs you allow them is too small, they should

ask you to modify the number. To increase the number of available global RINs, you must reload the system from the backup tape. For the G.01.00 release # OF GLOBAL RINS = nn (MIN=YY, MAX=1024, USED=yy)?

SETTING LOGON RECOGNITION TIME. The next in the series of miscellaneous configuration questions is "# OF SECONDS TO LOGON = ?". This prompts you to select the maximum amount of time, in seconds, users are allowed to enter a legitimate :HELLO or :JOB command when logging onto the system. The standard amount of time used in most installations is 120 seconds. For the G.01.00 release # OF SECONDS TO LOGON=120 (MIN=10, MAX=600)?

There are three factors which affect the selection of this value. The first is security. In this case, you may shorten the logon time limit, allowing users less time to attempt to access a password-protected account. The second factor, heavy system usage, and the third, allowing a number of users to access the system via modems, both dictate an extended amount of time to validate users' :HELLO or :JOB commands. Loading the system slows down MPE's response to logon attempts because many more processes compete for the operating system's attention. Supporting remote users requires a longer logon recognition time, since they interact with MPE at a slower data transmission rate than do local users.

LIMITING CONCURRENT JOBS AND SESSIONS. There are two ways in which the total number of concurrently executing jobs and sessions may be controlled. One way is to set the job and session limit with the Operator command :LIMIT. This provides the Operator with moment-by-moment control of the mix of jobs and sessions permitted to execute on the system. (For a description of the :LIMIT command, refer to Section III.) The Operator is, in turn, limited by the job/session limits which you, as System Supervisor, initially configure during the SYSDUMP dialogue. SYSDUMP prompts you with the following questions:

```
MAX # OF CONCURRENT SESSIONS = (MIN=1, MAX=500)? (G.01.00)
MAX # OF CONCURRENT RUNNING JOBS = (MIN=1, MAX=500)? (G.01.00)
```

The values you choose depend upon the model of the HP 3000 you use in your installation and the amount of peripheral equipment it supports. In general, you will choose these values after consulting your Customer Engineer and Systems Engineer when the system is first installed. Similarly, these values will normally only be changed when your HP representative upgrades your hardware and/or your software.

ESTABLISHING THE CPU PROCESSING TIME LIMIT. The next question asked during the SYSDUMP dialogue is "DEFAULT JOB CPU TIME LIMIT = (MIN=0, MAX=32767)?". If you enter 0, there is no limit on the amount of time the CPU will process a job. The CPU time limit is usually set at zero.

Within the limit you establish, users can limit the processing time allowed their own jobs or sessions when they enter the :JOB or :HELLO commands. (For a full description of these commands, refer to the MPE V Commands Reference Manual (32033-90006)). Furthermore, a maximum CPU processing limit can be set for accounts (by the System Manager) and groups (by the Account Manager) with the :NEWACCT and :NEWGROUP commands. If users do not limit the processing of their own jobs or sessions, and if no limits are imposed at the account and group level, the default CPU processing time limit is used.

Changing Segment Limits

During the Configurator dialogue, responding YES to the question "SEGMENT LIMIT CHANGES?" allows you to change the following code and data segment limits:

The System Supervisor

- The maximum number of concurrently running programs.
- The maximum number of words allowed in any code segment. A useful rule of thumb is to set this value to 5 percent of the available words in memory, but in no case less than 4096 words.
- The maximum number of code segments per program file.
- The maximum size, in words, of a user stack. A smaller stack size increases multiprogramming performance. The maximum stack size depends on the data processing environment. Appropriate stack sizes for three types of installations are as follows:

Recommended Max Stack Size (words)	Environment
7000-8000	School/Students
12000-16000	Scientific/Engineers
26000-313232	Commercial

- The maximum number of words allowed in any extra data segment. A useful guideline is to set this value to 20 percent of the maximum number of words allowed in the user process stack.
- The maximum number of data segments per process.
- The default number of words initially assigned to the Z-Q area of the user process stack, when the user specified no value at program execution time. Hewlett-Packard recommends that this value be kept to a minimum. If the program is prepared from a User Subprogram Library file via the :PREP command with the *maxdata* parameter, the operating system will allow for dynamic increases in the stack size. The minimum recommended for any configuration is 1200 words.

Section VII provides you with values that are generally recommended for the initial configuration. Over time, and through experimentation, you will develop guidelines best suited to your installation.

Modifying the Segmented Library

The Segmented Library (SL), contains the code segments, which, together, make up the MPE Operating System. You may list all code segments currently in the system library: the complete file specification is SL.PUB.SYS. This is useful for finding the physical segment number of the code segment that returned an error to a user's program. You also need access to the SL when adding, deleting, or replacing code segments. This generally occurs during operating system updates, such as when your CE installs a new version of MPE, but the need to examine the SL may arise at other times, too.

Changing Scheduling Queues

All competing processes access the central processor through MPE's Scheduling Queues. You may change the base, limits, or minimum and maximum values of the C, D, and E queues via the :TUNE command. Because changing these queues directly affects system performance, and also because the system attempts to tune itself, exercise caution when you make any changes. For a description of the :TUNE command and scheduling queues, refer to Section III of this manual.

Permanently Allocating Programs and Procedures

You can enhance the efficiency of the system by permanently allocating a program file or procedure with the `:ALLOCATE` command. Whether or not such programs and procedures are currently being accessed, entries in the Code Segment Table and Extended Code Segment Table are assigned to them. This reduces the drain on system resources that otherwise may occur when programs or procedures are loaded each time they are used.

The Code Segment Table (CST) contains a list of code segments that have been allocated, including system code segments. The length of the CST is determined when the system is first configured. Each entry in the CST consumes four words of memory and contains control information about the segment as well as its length and starting address. Since entries are dynamically allocated by MPE as segments are loaded and unloaded, the actual number of entries in use at any time varies, limited only by the length of the table.

In your decision to `:ALLOCATE` a program, consider two things. One, how many users need the program and how frequently is it used; and two, how large is the program in terms of the total number of CST and CSTX entries it will consume. Some programs use only one or a few table entries, while others comprised of multiple code segments referencing many SL procedures, use a large number of entries both in the CST and CSTX.

Any programs or procedures that you allocate with the `:ALLOCATE` command must be able to resolve all its external references in `SL.PUB.SYS`. Most Hewlett-Packard supplied software does so. Applications programs supplied by other vendors must assign externally referenced code segments to `SL.PUB.SYS` before you may `:ALLOCATE` them.

To deallocate a program or procedure previously loaded with the `:ALLOCATE` command, issue the `:DEALLOCATE` command. The program file or procedure segment will be immediately deallocated if it is not being used by a process. Otherwise, it is deallocated as soon as it is no longer in use.

Disc Caching

Disc caching is an optional subsystem that uses main memory to store portions of disc files, or "disc domains". The disc caching subsystem locates, moves, and replaces disc domains in main memory so that frequently referenced code is quickly available. This happens without incurring the delays caused by the physical disc access which would otherwise be necessary to complete a read operation. Cached writes need only to be moved into cached memory, rather than waiting for the physical disc updates to complete. This allows programs to continue running while physical disc updates occur. For I/O-bound systems with available memory, caching noticeably improves response time by enabling processes to execute at processor speed. CPU utilization increases, and disc utilization decreases in a cached system.

To control disc caching, four new commands have been added to the System Supervisor's command set. Explained briefly below, and documented in Section III, they are: `:STARTCACHE`, `:STOPCACHE`, `:CACHECONTROL`, and `:SHOWCACHE`.

<code>:STARTCACHE</code>	Starts caching on a single logical device.
<code>:STOPCACHE</code>	Stops caching on a single logical device.
<code>:CACHECONTROL</code>	Tunes the performance of caching on your system. You will use this command to determine the number of sectors fetched from disc when a read "miss" occurs. (A "miss" occurs when the needed data is not currently stored in the disc cache.) <code>:CACHECONTROL</code> is also used to specify whether processing continues before posting of the cache buffers to disc is complete.

The System Supervisor

:SHOWCACHE This command requires no special capabilities. It provides a brief summary of disc caching performance on your system.

In addition to these new commands, the **FSETMODE** intrinsic has been extended to allow control over disc caching on a file-by-file basis, as opposed to a system-wide basis. For information about **FSETMODE**, refer to the MPE V Ininsics Reference Manual (32033-90007).

THE SYSTEM DISC

Since MPE is a disc-based operating system, the allocation of disc space, particularly on the system disc, noticeably affects system performance. This section provides you with information pertinent to the system disc, prefaced with with a discussion of disc volume conditioning, disc drive structure, and disc platter format that applies to all hard discs used with the HP 3000. These topics are addressed in the following sequence.

- Disc structure and format.
- Disc volume conditioning, including system domain discs and private volumes.
- Disc error recovery procedures.
- The layout of the system disc, including the organization of MPE, the file directory, virtual memory, and disc formatting data on the system disc.
- Modifying the system disc layout.

Disc Structure and Format

MPE always addresses a disc by its logically ascending sector addresses. A disc pack, however, consists of three or more platters and a top and bottom cover mounted on a center spindle. It is physically divided into cylinders, tracks, and sectors. Onto this physical structure, MPE imposes its own logical format through the process of disc conditioning.

DISC STRUCTURE. Figure 5-1 illustrates the disc drive structure of a typical moving-head disc. For this example, the HP 7920 disc drive is used. Each inner platter of the disc pack has two surfaces for data storage, except the servo platter, which has one data surface. A cylinder is the area of a pack where all five heads can access a particular area of a platter surface. The head mechanism moves the entire group of heads anywhere from cylinder 0 to 822, depending upon the cylinder requested by the disc driver program.

The area under one head on one surface is a track, and each track is divided into sectors. Because the read/write heads access information in an entire cylinder, the disc can read or write to any of the sectors on all five tracks of a single cylinder before moving the head mechanism to a new cylinder.

DISC PLATTER FORMAT. Each disc platter conforms to the same format. The two ways in which data is organized on a disc platter are illustrated in Figure 5-2. The left side of the platter surface shows that tracks are concentric rings of data, numbered 000 through 822. Note that tracks and cylinders are identically numbered: cylinder 0 contains the data stored on track 0 of each of three platters. The right side of the figure shows the division of sectors on a particular track.

The sector size of a disc is the amount of data that can be stored in a single sector of one track, which Hewlett-Packard defines to be 128 words, or 256 bytes. This is also the smallest amount of data which can be transferred to and from the disc at one time. Although the sector size and structure of the disc pack will vary from manufacturer to manufacturer, this type of disc head/cylinder, track/sector addressing is common for most moving-head discs.

Disc Volume Conditioning

A newly manufactured disc pack contains no formatting information or user data. Before it can be used, it must be "conditioned". This process consists of three separate steps, formatting, initializing, and labeling, as summarized below.

DISC FORMATTING. This first step of the conditioning process places addressing information on the disc so that the hardware controller can locate each track and sector.

DISC INITIALIZATION. Initializing creates the Free Space Map and Defective Tracks Table on the disc. MPE uses the Free Space Map to determine which portions of the disc currently contain user data, and which are available for file storage. The Defective Tracks Table monitors bad disc tracks and sectors, so that logically contiguous data can be stored on alternate tracks if the next physically contiguous track is bad.

Track Verification. Verifying the integrity of the disc before MPE attempts to write files to it provides an orderly method to anticipate and manage disc errors. For this reason, the second step of the initialization process creates the Defective Tracks Table by performing a track-by-track read of the disc volume before any user files are stored on the disc. Any tracks found to be defective during the initialization procedure may be reassigned to alternate tracks or deleted. If the bad track is deleted, it will not be listed in the Free Space Map, and will be inaccessible by MPE.

Track Reassignment. If the track is not deleted, it will be assigned an alternate, verifiable track. This way, when MPE cannot read from or write to a track or sector after a specified number of attempts, the file is stored on an alternate area of the disc selected from the the spare tracks originally reserved for that purpose. The information that the disc driver program needs to manage defective tracks is stored in MPE's Defective Tracks Table, and the entire process is transparent to the user.

DISC LABELING. Labeling assigns a name to the disc volume. All disc packs used by the MPE will have a disc label at track 0, sector 0. The volume name is part of the label. For each disc pack, the name must be a unique ASCII character string of up to eight alphanumeric characters beginning with a letter. Volume names are added to a disc pack when you are starting the system with INITIAL.

When INITIAL encounters a foreign disc (one that does not have a disc label which MPE recognizes) you are asked whether the volume should be added to the system volume set, and if so, what volume name it should be assigned. If it is a type 0 disc, you are also requested to define the logical pack size of the disc in cylinders; your answer is the amount of space available for use by system and user files. The remaining portion of the the disc will be reserved for alternate, or spare, tracks.

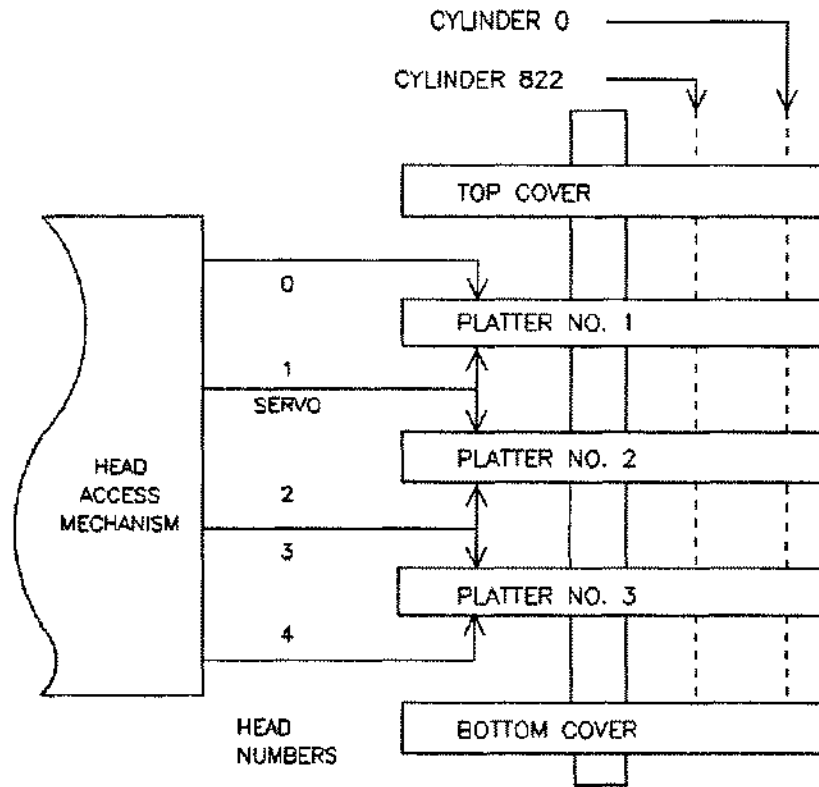


Figure 5-1. Disc Drive Structure

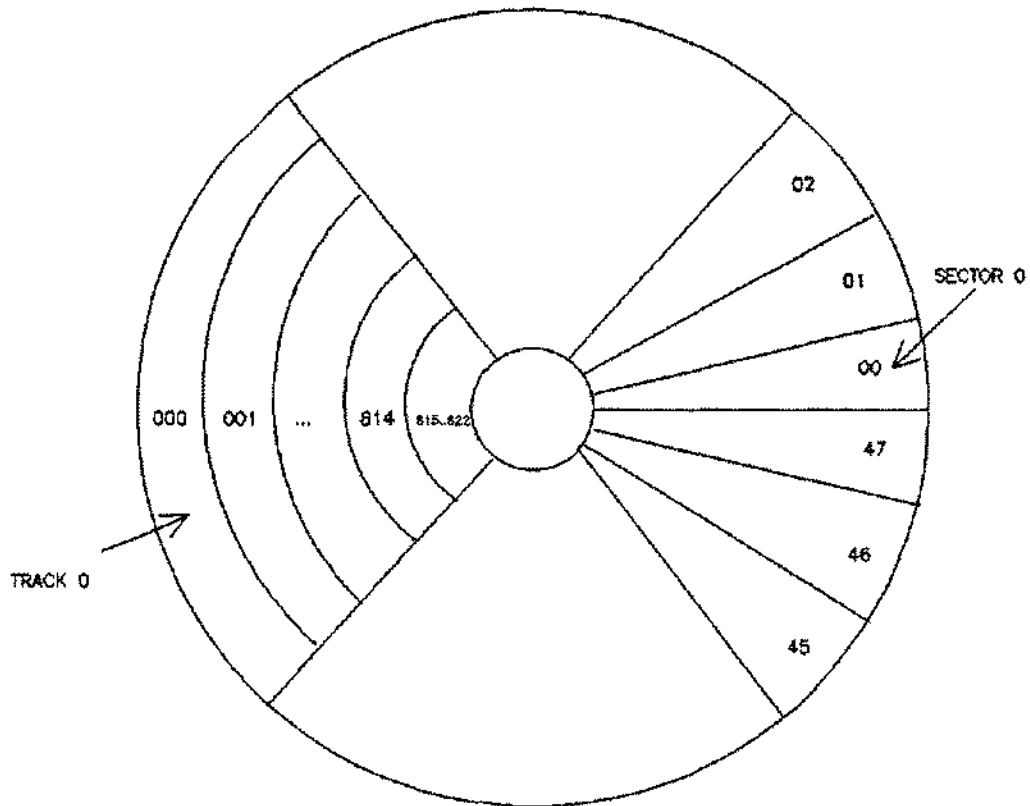


Figure 5-2. Disc Platter Format

The System Supervisor

Disc diagnostics and conditioning is normally done by your SE when the system is first installed. If you need to format your own discs, we recommend that you contact HP for assistance. You may also refer to "FORMATTING SYSTEM PACKS" in Appendix A, and the discussion of Private Volumes in Section X.

THE SYSTEM VOLUME TABLE. A list of volume names, called the System Volume Table, is stored on the system disc. It maps each volume name into the logical device number of the disc drive on which the volume is mounted. This enables you to mount disc packs of similar type on any disc drive so that you may, for example, switch disc packs between drives before a cold load.

CHECKING VOLUME TABLES DURING A STARTUP. The System Directory stores the volume and sector addresses of files. When the system is restarted with a WARMSTART, COOLSTART, COLDSTART, or UPDATE, the volume table that resides on the disc is used. INITIAL checks to see that all previously defined volumes are indeed mounted; doing so ensures that all files contained in the file directory are still there. A volume may be added but not deleted, since files defined in the directory may reside on one of the volumes.

When the system is cold loaded with the RELOAD option, the volume table on the cold load tape is used. Discs are checked for the validity of both the volume label and the Defective Tracks Table. If the label and the table are not corrupt, INITIAL will use the information on the disc without rebuilding a volume label or Defective Tracks Table over the existing information. This time, volumes may be added or deleted, since all of the user files defined in the directory (on the tape) will be reloaded onto one of the available volumes. INITIAL automatically assigns sector 1 of track 0 as the Defective Tracks Table on a newly formatted pack.

Disc Error Recovery

MPE expects bootstrap procedures, system tables, the accounting structure and file directory, files, and system programs to be in the same logically ascending order on the system disc each time MPE is restarted. Therefore, it is critically important to detect and compensate for disc errors on logical device 1 which might otherwise obstruct the reliable operation of MPE. If disc errors are discovered during a cold load, INITIAL assists you or your Operator to work around the errors before the system is brought on line.

ERROR RECOVERY DURING INITIAL. INITIAL will automatically reassign any defective tracks it encounters in the Defective Tracks Table. To handle track errors during a restart of the system, you or the Operator may choose one of the following four courses of action:

1. **Delete.** Causes INITIAL to set a permanent defective code within the track entry of the Defective Tracks Table, which cannot be removed from the Table. INITIAL then alters the disc Free Space Map so that all sectors on the bad track are inaccessible by MPE. If the cold load procedure being executed is not a RELOAD, INITIAL will purge the file or files stored on the defective track.
2. **Reassign.** Causes INITIAL to write a special alternate track address on the defective track. The alternate track will then be used in place of the defective one. During a track reassignment, INITIAL also modifies the Defective Tracks Table. If the system is not undergoing a RELOAD, MPE will purge the file or files that were stored before and after the defective track was found. If you are performing a RELOAD, files can be stored preceding and following the defective track.

The System Supervisor

3. **Recover.** Causes INITIAL to remove an entry in the Defective Tracks Table, enabling you to attempt to access the track again. There are several valid reasons for choosing to ignore the suspect-track report: if, for example, a dust particle had caused the error, and no permanent damage to the disc surface occurred, another access will have a good chance of succeeding.
4. **"Carriage Return".** This will leave the entry in the Defective Tracks Table. During the next cold load, INITIAL will again request the disposition of both the specified track and any new entries that may have been added to the table.

SPECIAL CONSIDERATIONS IN DISC ERROR HANDLING. Disc errors which occur in certain physical areas of the disc must be handled in light of the following considerations:

- You may not use the Delete or Reassign options for tracks in the Directory area of the system disc except during a RELOAD. In this case, the entire directory will be moved to a single physically contiguous area on the disc. No defective tracks are allowed in the Directory.
- You may not use the Reassign option for tracks in the alternate track area of the moving-head disc pack. This restriction accommodates those hardware controllers which can handle only one level of defective tracks for a given disc access.
- You may not use the Delete or Reassign options for tracks in the reserved areas of any disc, whether it be *ldev 1* (the system disc) or another logical device. For fast access and chaining of input/output operations, the system software must have contiguous access to certain positions of the disc. The Volume Label and Defective Tracks Table, for example, must always occupy sectors 0 and 1 of track 0 on any disc.
- During a COOLSTART, you may not use the Delete or Reassign options for tracks in the system area of the disc. Because a COOLSTART loads the system from the system disc rather than from magnetic tape or serial disc, a track error and subsequent Delete or Reassign option would be equivalent to destroying a portion of the system software.

The Layout of the System Disc

The System disc, *ldev 1*, typically stores all system files, the majority of which reside in the Segmented Library, the file directory, accounting structure, and subsystem and utility programs. A portion of the system disc may also be used to store spool files. Since your installation's resource requirements directly affect, and are affected by, the utilization of space on the system disc, it will be important for you to monitor disc usage.

Figure 5-3 is a block diagram illustrating how the operating system, the directory, and virtual memory are typically arranged on the system disc. Sectors 0 through 399 are reserved for the disc volume label, the bootstrap program, and the Defective Tracks Table.

The disc Free Space Map, the directory, and virtual memory do not reside at a fixed, predetermined location. Their location will change when you alter the configuration or when you update or install a new version of system software. The disc address of the directory and virtual memory, and as a consequence, the starting address of user files, will also shift when you enlarge the directory or virtual memory. Although it is possible to reduce the size of the directory and virtual memory, their size usually grows over time, reflecting increasing, rather than decreasing demand for system resources.

Changing the System Disc Layout

During the Configurator dialogue you may change the disc layout by modifying the following parameters:

- The amount of space reserved for virtual memory on the System disc (*udev 1*).
- The size of the system directory.

ALTERING THE SIZE OF VIRTUAL MEMORY. Virtual memory is an area on disc used to temporarily store data segments needed by executing processes. Moving data segments to main memory from virtual memory, and swapping those stored in main memory out to disc, is known as "disc swapping". Like track reassignment, disc swapping is transparent to the user. However, it is of considerable significance to the overall performance of the system. By reserving a portion of the system disc as a supplemental data storage area, many more processes can execute "simultaneously" than would otherwise be possible.

The size of virtual memory determines the amount of data which can be temporarily transferred to disc. This will in turn affect processing speed and system response time. If an executing job or program runs out of virtual memory, it will abort.

How Virtual Memory is Allocated. Virtual memory is allocated in 4-sector blocks. Each data segment using virtual memory will require approximately 250 sectors of disc space. To determine the amount of virtual memory you will need in your installation, estimate the following parameters: the average number of concurrent users, the average stack size, the average number of buffered files open for every user, and the number of users who will be simultaneously loading programs. Use these figures in conjunction with the values listed below to calculate the amount of disc space you should reserve for virtual memory:

- 32 sectors for the Command Interpreter stack.
- Approximately 8 sectors for all unbuffered files, depending upon the buffer size.
- 4 sectors for every open buffered file.
- 16 sectors for the system area in the user's stack, plus 4 sectors for every 512 words in the DL/Z area of the stack.
- 40 sectors for each program being loaded in the system.

Enlarging Virtual Memory During INITIAL. When you attempt to increase the amount of disc space reserved for virtual memory during a restart of the system, INITIAL tries to locate a contiguous, defect-free area. If no such area exists, INITIAL will search for an area containing deleted tracks. If it is again unable to locate space for virtual memory, INITIAL will consider an area which contains both reassigned and deleted tracks. If none of these search options is successful, all of the space previously reserved for virtual memory is released from that volume.

The System Supervisor

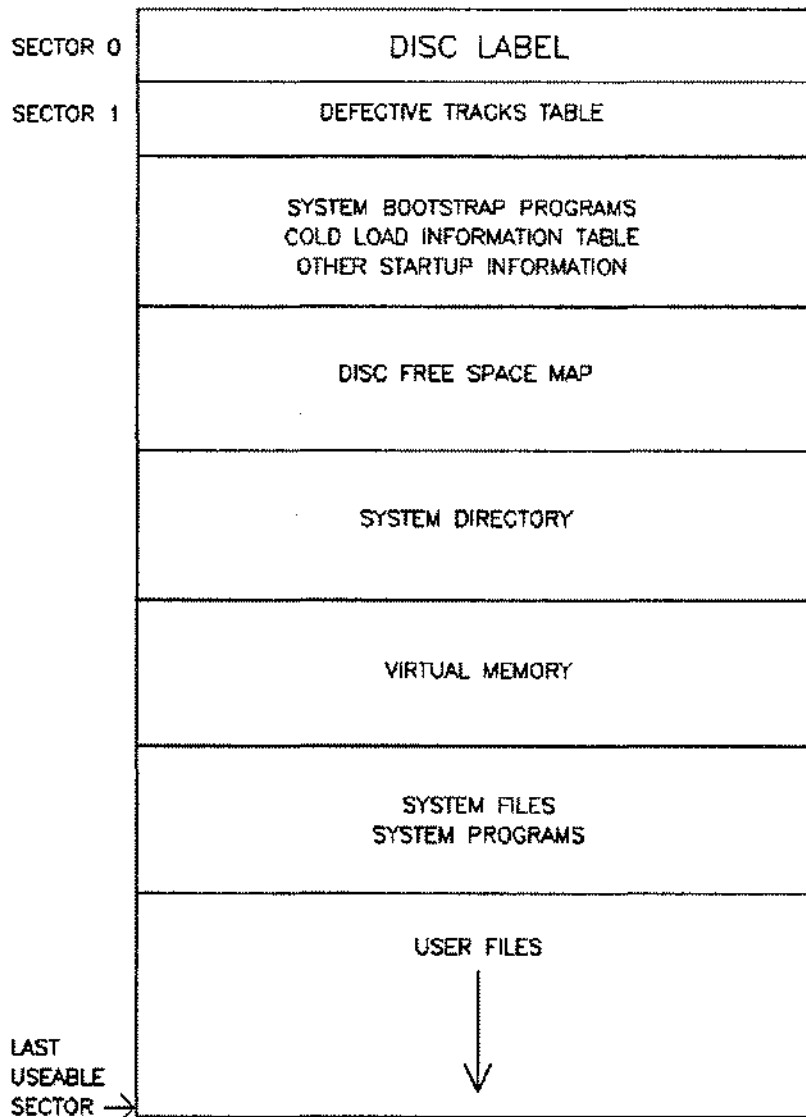


Figure 5-3. Typical System Disc Layout

At this point, three courses of action are available to you:

1. Repack the discs to recover lost disc space. This involves creating a SYSDUMP tape and cold loading system and user files with the RELOAD process using either the SPREAD or COMPACT options. All discs, not just the system disc, will be affected by the reduction in fragmentation.
2. Transfer any user files stored on the system disc to another disc volume. This will make more space available for critical files, tables, and programs which must be stored on logical device 1.
3. Use the amount of virtual memory previously allocated until you can exercise options 1 or 2.

CHANGING THE SIZE OF THE SYSTEM DIRECTORY. You also can change the maximum number of disc sectors available for the system directory, which contains the file and accounting

structure addresses for all accounts, groups, and users in the system. To determine the approximate number of sectors needed for the disc directory, use the following formula:

$$\text{SECTORS} = 6 + 6 * A + (5.4 * G) + (0.15 * U) + (0.05 * F) + (0.5 * VS) + (0.5 * VC)$$

where:

- A = Total number of accounts in system (maximum value = 632).
- G = Total number of groups in system (maximum value per account = 96).
- U = Total number of users in system (maximum value per account = 200).
- F = Total number of files in system (maximum value per group = 1385).
- VS = Total number of volume sets in the system (maximum value per group = 32).
- VC = Total number of volume classes in the system (maximum value per group = 32).

CHANGING THE MAXIMUM SPOOL FILE SIZE. When, during the SYSDUMP dialogue, you respond YES to the question "DISC ALLOCATION CHANGES?", you are prompted to change the maximum number of spool file kilosectors and the extent sizes with the following questions:

```
MAX # OF SPOOLFILES KILOSECTORS = ? MIN = 0 MAX = 77777 (G.01.00)
# OF SECTORS PER SPOOLFILE EXTENT = ? MIN = 128 MAX = 32764 (G.01.00)
```

The first question allows you to determine the maximum amount of disc space that the spoolers can use to build and store spool files. However, spoolers compete with other processes for file space, so the number of sectors you specify does not guarantee that the amount will be available for spool files.

Your response to the second question determines two things: the size of spool file extents, and the maximum spool file size. This is because spool files like all MPE disc files, are limited to a maximum of 32 extents, regardless of the size of each individual file extent. The default extent size is 384 sectors. Using the default, the maximum spool file size is:

$$384 \text{ sectors} * 32 \text{ extents} = 12,288 \text{ sectors}$$

This is approximately equal to 25,000 print lines.

You should increase the extent size only if your spool files are very large. File extents must be contiguous areas of disc space, and the larger they are, the more difficult they are to find. Particularly when disc space on the spooling disc is fragmented, a large spool file extent size may require using RELOAD, repacking the discs to recover usable space, or using VINIT to CONDENSE with RECOVER more often than would be necessary with a smaller extent size.

MPE LOGGING FACILITIES

MPE provides users with three separate logging facilities: system logging, memory logging, and user logging. The operation of each is unique and has no effect on the other. Each has a specific purpose, defined below.

System Logging

System logging is intended to record the use of certain system resources by accounts, groups, and users on a job/session basis. As System Supervisor, you choose to enable or disable system logging during the SYSDUMP dialogue; it is also your responsibility to determine which events will be logged.

The System Supervisor

- Memory Logging** The Memory Logging facility records errors which have occurred in memory. The System Manager determines how frequently the log file is posted with memory error data by using the utility MEMTIMER. He or she is also responsible for analyzing the log file (MEMLOG.PUB.SYS) with the MEMLOGAN utility, and flushing the log file.
- User Logging** User logging allows users and subsystems to record additions and modifications to data bases and other files used in applications programs. As Supervisor, you will determine the maximum number of logging processes and the maximum number of users per logging process.

In the following discussion, system logging is explained in detail. Your role in user logging is also discussed. However, since this topic is treated in depth elsewhere, the information presented here is selective rather than comprehensive. Additional information about user logging is presented in Section III ("OPTIONAL CAPABILITIES") of the MPE V Intrinsic Reference Manual (32033-90007) and in Section II ("COMMAND DEFINITIONS") of the MPE V Commands Reference Manual (32033-90006). Memory logging, which is the System Manager's responsibility, is not discussed in this section. For further information about memory logging, refer to the MPE V Utilities Reference Manual (32033-90008).

System Logging

System logging records the use of certain resources by accounts, groups, and users. Like the Accounting System, system logging can be used for billing purposes or simply for obtaining an overview of system usage. Unlike the Accounting System, however, system logging describes system usage by creating a running log of actual events, correlated with the job or session that caused each event. System logging is the only means to record system usage on a job/session basis.

To modify system logging, or simply to list the current logging status, respond "YES" to the SYSDUMP questions "LOGGING CHANGES?" and "LIST LOGGING STATUS?". MPE will respond by displaying a list of system logging events, their type, and their status (whether ON or OFF) as shown in the sample listing below. Following this, SYSDUMP prompts you to change two additional logging parameters: the log file's record size (in sectors), and the number of records in the log file (i.e., the maximum log file size).

The majority of logging events displayed during the SYSDUMP dialogue are optional, meaning that you can select whether they will be recorded or not. Three events, in addition to the "LOGGING ENABLED" event, are always enabled when the system is started. These three are: Type 11, I/O error, Type 46, Maintenance events, and Type 47, DCU events. (The last two, Type 46 and Type 47, are not displayed when you list the logging status during the SYSDUMP dialogue.) Therefore, only optional logging events can be disabled. Logging itself cannot be disabled, regardless whether you change the status of the first event, LOGGING ENABLED, to "OFF" or not.

```

LOGGING CHANGES? Y
LIST LOGGING STATUS? Y
TYPE          EVENT          STATUS
  1  LOGGING ENABLED      ON
  2  JOB INITIATION       ON
  3  JOB TERMINATION      ON
  4  PROCESS TERMINATION  ON
  5  FILE CLOSE           ON
  6  SYSTEM SHUTDOWN     ON
  7  POWER FAIL           ON
  8  SPOOLING             ON
  9  LINE DISCONNECTION  ON
 10  LINE CLOSE           ON
 11  I/O ERROR            ON
 12  VOLUME MOUNT        OFF
 13  VOLUME SET MOUNT    OFF
 14  TAPE LABELS         OFF
 15  CONSOLE              ON
 16  PROGRAM FILE EVENT  ON
 17  CALL PROGRESS SGNLS OFF
 18  DCE PROVIDED INFO   OFF
LOG FILE RECORD SIZE (SECTORS) = 2 (MIN=1, MAX=8)?
LOG FILE SIZE (RECORDS) = 1024 (MIN=16, MAX=32767)?

```

The events you choose to monitor are recorded on log records contained in a disc file. Each event is recorded in one logical record. As System Supervisor, you can configure the log files, create, close, and purge such files, and display the status of the log file currently being used to record system events. However, the contents of log files (the individual log records) are not displayed nor otherwise used by MPE. They are intended for system users who use the information for billing and/or security purposes. The system logging records are also used to analyze system performance. For example, the "I/O ERROR" event, which is always turned ON, helps your SE or CE determine the cause of system failures.

CREATING AND NAMING LOG FILES. When system logging is first enabled, MPE creates and opens the first log file and begins recording events as they occur. When this log file is full, or when the system is shut down and cold loaded, MPE creates and opens a new log file. This new file becomes the current log file, and the previous log file is deactivated.

Log file names always take the form "LOG *xxxx*.PUB.SYS", where *xxxx* is the log file number, ranging from 0000 to 9999. The first log file is LOG0000; when it is closed and a new log file opened, MPE increments *xxxx* by one. Each time a new log file is created, a message similar to the following displays the new log file number.

```
LOG FILE NUMBER xxxx ON
```

LOG FILE COMMANDS. Three MPE commands, :SHOWLOG, :SWITCHLOG, and :RESUMELLOG are available to you to control system logging. At any time you may issue the :SHOWLOG command to display the number of the active log file as well as the amount (percentage) of available file space already used to record logging events. For example, if the current log file is LOG9675, and it is 16 per cent full, the following response to ":SHOWLOG" would be displayed:

```
LOG FILE LOG9675 IS 16% FULL
```


The System Supervisor

The second command, `:SWITCHLOG`, will close the current log file before it is full, and create and open a new one. The third command you may use to control system logging is `:RESUMELOG`, which, as the name implies, resumes the logging process after it is suspended due to an error.

To summarize, there are three ways in which a new log file is created and the current one deactivated.

1. When the current log file is full.
2. When the system is restarted.
3. When the System Supervisor issues the `:SWITCHLOG` command.

Because new log files are opened and the current one closed with varying frequency, several log files are usually stored on the system at one time. MPE will post logging events to only the current log file. The other log files, which are no longer used by MPE, are considered permanent disc files. As such, they remain on disc until you copy them to tape and purge the old log files from the disc. You may also duplicate them on tape without purging the disc files.

LOG RECORD AND FILE SIZE. After the list of logging events and their status is displayed, SYSDUMP prompts you to choose the log file record size and the size of the log file itself with the following questions.

```
LOG FILE RECORD SIZE (SECTORS) = (MIN=1, MAX=8)?  
LOG FILE SIZE (RECORDS) = (MIN=16, MAX=32767)?
```

The first question asks you to define the number of logical records to be treated as a single physical unit. This is called the "block size", and is determined in disc sectors. The block size cannot exceed 1024 words, or 8 sectors. Because the logging system uses an internal double-buffering system, the block size will also be equivalent to the size of the log file buffer.

The second question asks you to define the size of the log file size, specified in number of blocks. Regardless of configured size, the log file is always created with 16 disc extents. One extent is allocated initially; others are allocated, one at a time, as needed. The number of sectors in each extent (except possibly the last) is determined by the following formula:

$$\text{Sectors} = [(\text{Log File Size})/16] * \text{Log Record Size}$$

FILE SECURITY. Log files are created by, and therefore belong to, the system logging process. By implication, their creator is the original System Manager, `MANAGER.SYS`. They are assigned the MPE default security provisions typically assigned files within the `PUB` group of the `SYS` account. The current log file can only be modified by users assigned Account Librarian (`AL`) capability for `SYS` account, or by `PUB` group users (`GU` capability) of the `SYS` account.

Once the log file has been closed, MPE changes all the file access restrictions on the file from "ANY" to "CR" (the file creator) only. The result is that only the System Manager controls access to current and closed log files. You, as System Supervisor, manage the logging facility by specifying the log file and record size, enabling and disabling logging, and selecting which events will be logged.

CONSOLE MESSAGES FOR LOG FILES. Log file status and error messages are reported to the system console. They conform to the format: *hh/mm/PIN/message*

Where:

hh = The hour of the day.
mm = The minute of the hour.
PIN = The process identification number.
message = The message text.

The log file status message text may consist of any of the following:

- "LOG FILE NUMBER *xxxxxxx* ON" indicates that a new log file has been created. This message always appears prior to the *WELCOME* message after a cold load. If displayed while the system is running, it indicates that the previous current log file has been closed.
- "LOG FILE NUMBER *xxxxxxx* IS 1/2 FULL" indicates that logging data fills up half of the log file's allotted file space.
- "LOG FILE NUMBER *xxxxxxx* IS 3/4 FULL" indicates that logging data fills up three-quarters of the log file's allotted file space.
- "LOG FILE NUMBER *xxxxxxx* LOGGING RESUMED" indicates that a :RESUMELOG command was successfully executed.

Log file errors are reported in one of the following messages. Refer to Table 5-3 for a summary of log file error numbers, their meaning, and whether they are recoverable or irrecoverable errors.

- "LOG FILE NUMBER *xxxxxxx* ERROR #*nn*. LOGGING STOPPED" indicates that an irrecoverable error occurred; system logging is disabled until the next system startup.
- "LOG FILE NUMBER *xxxxxxx* ERROR #*nn*. LOGGING SUSPENDED" indicates that a recoverable error occurred. A recoverable error will temporarily suspend logging until the System Supervisor issues the :RESUMELOG command, discussed above.

FILE ERROR HANDLING. Two types of errors can prevent the System Logging facility from maintaining the log file:

- Catastrophic errors, which are either physical input/output errors or unit failures. These errors are not recoverable, and will disable logging until the next cold load.
- Managerial errors during the creation and management of the log file. These are usually recoverable, and will only cause logging to be temporarily suspended until the problem is resolved and a :RESUMELOG command is issued.

When logging resumes, a special log record is created, denoting the total number of records missed, the number of job/session initiation records missed, and the number of job/session termination records missed.

For further information about system logging events, including log record format and the data each contains, refer to the MPE V Intrinsic Reference Manual (32033-90007).

Table 5-3. Log File Errors

Error No.	Error	Recoverable?
1	Input/output error in accessing the system disc.	No
2	Input/output error in accessing disc log file.	No
21	Data parity error.	No
26	Transmission error.	No
27	Input/output timeout.	No
28	Data overrun.	No
29	SIO failure.	No
30	Unit failure.	No
46	Insufficient disc space to create log file.	Yes
47	Input/output error on file label.	No
57	Virtual memory not sufficient.	No
61	Group (PUB) disc space exceeded in creating log file.	Yes
62	Account (SYS) disc space exceeded in creating log file.	Yes
63	Group disc space exceeded in allocating new extent to the log file.	Yes
64	Account disc space exceeded in allocating new extent to the log file.	Yes
100	A file of the same name as the current log file already exists in the system file directory.	Yes
102	Directory input/output error.	No
103	System directory overflow.	No
105	Illegal variable block structure.	No

User Logging

The MPE User Logging facility provides a means to record additions and modifications to data bases and subsystem files. The logging data can be recorded on disc, tape, serial disc, and cartridge tape. Logging is done programmatically by incorporating the following intrinsics into the program code: LOGSTATUS, OPENLOG, CLOSELOG, FLUSHLOG, BEGINLOG, and ENDLOG. In addition to these intrinsics (which are documented in the MPE V Intrinsics Reference Manual (32033-90007)), there are also standard MPE commands used with the logging facility. They are: :ALTLOG, :GETLOG, :LISTLOG, :RELOG, and :SHOWLOGSTATUS. These commands are documented in the MPE V Commands Reference Manual (32033-90006).

The Operator :LOG command turns on logging:

:LOG LOGID,START

To enter data into the log file, applications programmers will incorporate the intrinsics OPENLOG, WRITELOG, and CLOSELOG in their code. Like any other file used with MPE, access may be restricted to a log file by assigning a lockword to it. The data stored in the log file can then be used in combination with the a lost data set to recover lost transactions.

USER LOGGING PROCESSES. The number of user logging processes permitted on the system is principally determined by the flexibility of your logging requirements. The maximum number of user logging processes is 64. The size of the logging identifier table affects the number of logging processes per application: One user logging file per application, which allows one logging process per application, is normally sufficient.

THE NUMBER OF USERS PER LOGGING PROCESS. You will also need to enter the number of users who can access a single log file. This number cannot exceed 128 on the E/F.00.00 release of MPE V. The maximum number of users per logging process on the G.00.00 release of MPE V has been expanded to 256. Determine the maximum number of users that will need access to the log file and enter that number in response to the question "# OF USERS PER LOGGING PROCESS?".

1

2

3

4

5

THE SYSTEM MANAGER

SECTION

VI

The System Manager has the most extensive capabilities of any user on the system. By definition, System Managers have all the capabilities of the standard users, as well as more powerful capabilities which are unique to them. This section discusses the issues with which the System Manager must be concerned, and covers the associated responsibilities in detail.

CAPABILITY SETS

The HP 3000 Computer System is used by a large variety of users. They range from those who want to run simple applications programs in BASIC, to system programmers who want to actually modify MPE. To protect the operating system, users with System Manager and Account Manager capabilities can limit special system capabilities access to only those who fully understand their correct use. When a System Manager creates an account, he defines a set of capabilities for it which determine which functions users, communicating with MPE through this account, will be allowed.

When an Account Manager defines the account users, he allocates some or all of the general account capabilities to each user. Each capability set contains three types of attributes: user, file-access, and capability-class. A fourth attribute, the local attribute, may also be defined. The combination of these attributes determines the set of commands and intrinsics available to the user. This division of commands and intrinsics greatly simplifies use of the system from the standpoint of each user. It defines the extent to which the user must understand and interrelate with MPE, and permits a user to ignore aspects of MPE that do not apply, individually.

Capability sets are defined for groups by the Account Manager. Group capability sets contain only the capability-class attributes. The capability set for a group may allow that group some or all of the capability-class attributes defined for the account to which the group belongs. The group capabilities relate to the user's capabilities as noted under "Capability-Class and Program Attributes" in this section. Capability-class attributes are also associated with each program on a program file, and passed, as parameters, to the MPE Segmenter in the command that prepares the program.

User Attributes

The user attributes designate the general level at which the user interfaces with MPE. These attributes can be assigned in any combination. They define capabilities in addition to those assigned to a standard user.

SYSTEM MANAGER ATTRIBUTE (SM). This capability grants the user the capability to manage the overall system and create the accounts within it. The first user with the System Manager Attribute is designated on the system tape furnished with the HP 3000 Computer System. The System Manager, in turn, can designate other accounts having the same, or different, capabilities.

The System Manager

The System Manager's functions are as follows:

- Create new accounts.
- Modify accounts.
- Delete accounts.
- List accounts, groups, and users for record purposes.
- List file attributes.
- Obtain reports for all accounts.
- Store and restore any or all files on the system.
- Designate User Defined Commands (UDCs), for all system users.
- Specify the expected System Startup State for each possible startup (WARMSTART, COOLSTART, COLDSTART, UPDATE, RELOAD), using the System Startup State Configurator. (The System Startup State Configurator is described later in this Section.)

ACCOUNT MANAGER ATTRIBUTE (AM). This capability allows the holder to manage all users and groups within the account. The first manager for each account is designated by the System Manager when the account is created. The Account Manager can, in turn, assign this attribute to other users in the account.

Within the account, the Account Manager's functions are as follows:

- Create new groups and users.
- Modify groups and users.
- Delete groups and users.
- List groups and users for record purposes.
- Obtain reports for his/her account.
- List account files.
- Store and restore account files (some files may also require SM, OP, or PM capability).
- Designate User Defined Commands (UDCs) for all account users.

SYSTEM SUPERVISOR ATTRIBUTE (OP). This capability allows the user to have day-to-day external control of the system. It allows the user to manage scheduling subqueues, alter the system configuration, maintain the system and user logging facilities, and display various items of system information. The System Supervisor attribute can be assigned by the System Manager.

The System Supervisor's functions are as follows:

- Manage the system log file facility.
- Exercise scheduling control over processes.
- Permanently allocate/deallocate code in virtual memory.
- Obtain certain system reports and information.
- Back up the operating system.
- Modify the operating system parameters.
- Save any or all files for archival purposes on magnetic tape or serial disc.
- Manage the disc caching facility.

ACCOUNT LIBRARIAN ATTRIBUTE (AL). This gives a user special file-access modes for file maintenance within the account. For example, an Account Librarian Attribute may designate users who can purge files within the account, although not create or alter them. (File-access modes such as READ or WRITE, are discussed later in this section.) This attribute is assigned by users with the Account Manager Attribute.

GROUP LIBRARIAN ATTRIBUTE (GL). Similar to the Account Librarian Attribute, but limits a user's special file-access modes to his home group. This attribute is assigned by users with the Account Manager Attribute. It could be used, for example, to ensure that only one user has the ability to alter files within a particular group. This user could be assigned the Group Librarian Attribute, and the access modes could be made less restrictive than for other users.

DIAGNOSTICIAN ATTRIBUTE (DI). Permits the user to run certain device and CPU verification programs. Normally, the Hewlett-Packard service representative (Customer Engineer) is the only user who will need this attribute. The Diagnostician attribute is assigned by users with the Account Manager attribute.

STANDARD USER. All other users, not specifically assigned one or more of the above user attributes, fall into the class of Standard User by default.

File Access Attributes

The file access attributes determine whether the user has these capabilities:

SAVE USER FILES PERMANENTLY (SF). Only those users who have this capability can use the :BUILD, :SAVE, and :RESTORE commands and the :SAVE option of the :FILE command, described in the MPE V Commands Reference Manual (32033-90006). Users who do not have SF capability can open job/session temporary files, but such files will be deleted automatically when the job/session is terminated.

USE NONSHARABLE DEVICES (ND). This attribute is needed to use devices other than terminals and disc including spooled devices (except for the standard job/session input and list devices). If the device is not spooled, the user will have complete and absolute control of the device. Some examples are: card readers, line printers, magnetic tape units, plotters, etc. It should be noted that this attribute is not necessary for the standard job/session input and list devices.

CREATE VOLUME SETS (CV). This attribute is needed to create, alter, and delete private disc volume sets. If this capability is given, UV is automatically given.

USE PRIVATE DISC VOLUMES (UV). This attribute is needed to access files residing on private volumes.

USE USER LOGGING FACILITY (LG). This attribute permits the use of user logging commands.

USE COMMUNICATIONS SOFTWARE (CS). This attribute allows users to obtain exclusive access to a communications device such as a DSN/RJE line or a DSN/DS line. It is required for use of the DSN/RJE subsystem.

PROGRAMMATIC SESSIONS (PS). This attribute allows the user to execute the ;STARTSESS command and call the STARTSESS and ABORTSESS intrinsics. This capability can be assigned to any MPE user, but will probably be used most frequently by the System Manager (when he or she creates SYSSTART.PUB.SYS for the Startup State Configurator), or by applications programmers creating turnkey systems.

Capability-Class and Program Attributes

These attributes define the general resources available to a user for writing and running programs.

Each time someone runs a program, MPE automatically assigns to that program the user and file-access attributes of that user. But the capability-class attributes assigned to the program are designated by the user who originally prepares the program. They are passed to the MPE Segmenter as parameters of the command that prepares the program. If the preparing user does not designate capability-class attributes for his program, MPE assigns, by default, the standard capabilities possessed by that user: interactive access (IA), batch access (BA), or both. When programs prepared from passed files or job temporary files are run, they are assigned the standard capabilities (interactive and/or batch access) possessed by the user who runs them.

If the program resides on a permanent file, the program's capability-class attributes should not exceed those defined for the group to which the program file belongs. If they do, the user will be unable to run the program.

Because the capability set is associated with the entire set of code segments being run (and hence with the process running them), all procedures, subprograms, and subroutines on those code segments have the same capability. For the same reason, a user does not need the same capabilities as the program. For example, the LISTDIRS program requires a PM capability-class attribute to access MPE directory structures. Users without PM capability can run LISTDIRS. But if FCOPY is used to copy LISTDIRS to a group that does not have PM capability, the program will not run.

The six capability-class and program attributes are defined as follows:

- **EXTRA DATA SEGMENTS (DS).** This attribute allows users and programs to manage (create) extra data segments. Normally, a programmer uses these data segments for temporary storage of large amounts of data; thus, the program's global data area remains relatively small. The extra data segment is purged at the termination of the program. Extra data segments are managed through the GETDSEG, FREEDSEG, DMOVIN, DMOVOUT, and ALTDSEG intrinsics, which are discussed in the MPE V Intrinsics Reference Manual (32033-90007).
- **PRIVILEGED MODE (PM).** The Privileged Mode attribute allows a user or program to access all MPE resources, including intrinsics, privileged procedure calls, main memory, system tables, and privileged CPU instructions. A programmer with this capability can run programs in a permanently privileged mode, or a temporarily privileged mode through the GETPRIVMODE, GETUSERMODE, and SWITCHDB intrinsics. Also, the CREATE and GETPRIORITY intrinsics may be used. These intrinsics are discussed in the MPE V Intrinsics Reference Manual (32033-90007).

CAUTION

The normal checks and limitations that apply to the standard MPE users are bypassed in privileged mode. It is possible for a privileged mode program to destroy file integrity, including the MPE operating system software itself. Upon request, Hewlett-Packard will investigate and attempt to resolve problems resulting from the use of privileged mode code. This service, which is not provided under the standard Service Contract, is available on a time and materials billing basis. However, Hewlett-Packard will not support, correct, or attend to any modification of the MPE operating system software.

- **MULTIPLE RIN (MR).** This attribute allows the acquisition of more than one global Resource Identification Number (RIN) for a single process. It allows exclusive use of more than one resource number simultaneously. You should be aware, however, that resource deadlocking can occur if multiple resources are not managed correctly. This may seriously degrade system performance.
- **PROCESS HANDLING (PH).** This attribute allows the direct creation of other processes by the running user process. In addition, it allows process suspension, interprocess communication, and process deletion. The programmer can use any of the following intrinsics, which are discussed in the MPE V Intrinsics Reference Manual (32033-90007):

CREATE	ACTIVATE	SUSPEND	GETPRIORITY
TERMINATE	MAIL	GETORIGIN	FATHER
KILL	SENDMAIL	RECEIVEMAIL	GETPROCINFO
			GETPROCID

All of the above class and program capabilities are optionally assignable. For the following two capabilities, one or both must be assigned to all users:

- **INTERACTIVE ACCESS (IA).** Allows access to MPE in an interactive (session) mode.
- **BATCH ACCESS (BA).** Allows access to MPE in a batch processing (job) mode.

Most users have only interactive access and batch access (IA,BA) standard capabilities. At least one of these attributes is required in order for the user to communicate with MPE. The optional capabilities (DS, PM, MR, PH) are independent and can be assigned in any combination. Note, however, that the more powerful the optional capability, the more hazardous its misuse is to the system integrity.

The operating system makes a check for some or all of the capabilities described above, at various times during a job or session. These checks are made on several occasions, including:

- `:NEWUSER`, `:ALTUSER` time. The system checks the user capability against that of the account. The user being created or modified cannot exceed the capability of the account.
- Program preparation time. The Segmenter checks the user capability against those capabilities requested in the preparation (`:PREP`) command. The capabilities of the program being prepared cannot exceed the capability of the user who is requesting the preparation.
- Program run time. The capabilities of the program being run cannot exceed the capabilities of the group in which the program resides. In addition, certain intrinsics require extra capability. When a program is run, and calls an intrinsic requiring extra capability, a check is made against the program to ensure it has the extra capability required.

Local Attributes

Local attributes are contained in a double-word (i.e., two 16-bit computer words) bit map, used only for special applications that require further unique classification of users by other users. Each of the 32 bits represents one local attribute, so 32 local attributes are available. Local attributes are checked by the `:ALTUSER` and `:NEWUSER` commands with the account-assigned attributes. The local attributes are defined by System or Account Managers, and are used by accounts or users for any purpose desired. You may access the local attributes in your program via the `WHO` intrinsic described in the MPE V Intrinsics Reference Manual (32033-90007).

Account and user local attributes are represented by bit maps, and are compared on a bit-by-bit basis. It is necessary to assign a bit pattern of user local attributes which is a subset of the account local attributes' bit pattern. For example, suppose the System Manager assigns account local attributes with a value of 12. The bit pattern for 12 is 1100, so a user may have local attributes which are represented by 8 (bit pattern 1000) or 4 (bit pattern 0100) or 0 (bit pattern 0000) or 12 (bit pattern 1100). If an attribute bit is set for a user, and the corresponding attribute bit is not set for the account, then the user local attribute is not valid. Thus, in the example above, a user may not specify local attributes represented by 6, because the bit pattern for 6 (0110) is not a subset of 12 (1100). In this case, MPE would print an error message to the user, the result of a Logical AND of the account's local attributes, and the value specified for the user. In this example, the user would receive the local attribute of 4.

FILE SECURITY

Associated with each account, group, and individual file is a set of security provisions that specifies any restrictions on access to the files in that account or group, or to that particular file. Note that these provisions apply to disc files only. These restrictions are based on the following three factors:

- Modes of access (reading, writing, or saving, for example).

- Types of users (users with Account Librarian or Group Librarian capability, for example) for whom the access modes specified are permitted.
- Use of private volumes. This allows users to access files residing on private disc volume sets.

The security provisions for any file describe what modes of access are permitted, and to which users.

Table 6-1 lists the access modes possible, the mnemonic codes used to reference them in MPE commands relating to file security, and the complete meanings of these modes. Table 6-2 lists the types of users recognized by the MPE security system, the mnemonic codes used to reference them, and their complete definitions.

Users with System or Account Manager capability bypass the standard security mechanism. A System Manager has unlimited file access to any file in the system, but can save files only in his account. An Account Manager user has unlimited access to any file within the account. One exception is that in order to access a file with a negative file code, the Account Manager must also have the Privileged Mode (PM) capability.

The user-type categories that a user satisfies depend on the file he is trying to access. For example, a user accessing a file that is not in his home group is not considered a group librarian for this access, even if he has the Group Librarian user attribute. Notice that in order to extend a file, either W or A access to that file is required.

In addition to the restrictions above in force at the account, group, and file level, a file lockword can be specified for each file. Users then must specify the lockword as part of the file.

The security provisions for the account and group levels are managed only by users with the System Manager and the Account Manager capabilities respectively, and can be changed only by those individuals. The provisions are assigned and altered by the *fileaccess* parameter in the :NEWACCT, :ALTACCT, :NEWGROUP, and :ALTGROUP commands.

Account-Level Security

The security provisions that broadly apply to all files within an account are set by a System Manager user when creating the account. The initial provisions can be changed at any time, but only by a System Manager user. When a user tries to open a file, the account, group, and the file security is checked to see if the user is allowed to access the file. The user must be allowed to access the file at all three levels. If a security check is not passed at one of the three levels, the file is not opened. At the account level, five access modes are recognized:

- READ (R).
- LOCK (L).
- APPEND (A).
- WRITE (W).
- EXECUTE (X).

Also, at the account level, two user types are recognized:

- Any User (ANY).
- Account Member (AC).

Table 6-1. File Access Modes

ACCESS MODE	MNEMONIC CODE	MEANING
READ	R	Allows users to read files.
LOCK	L	Permits a user to prevent concurrent access to a file by himself and another user. Specifically, it permits use of the FLOCK and FUNLOCK intrinsics, and the exclusive-access option of the FOPEN intrinsic, all described in the MPE V Intrinsics Reference Manual (32033-90007).
APPEND	A	Allows users to add information and disc extents to files, but prohibits them from altering or deleting information already written. This access mode implicitly allows the LOCK (L) access mode described above.
WRITE	W	Allows users general writing access, permitting them to add, delete, or change any information on files. This includes removing entire files from the system with the :PURGE command. WRITE (W) access also implicitly allows the LOCK (L) and APPEND (A) access modes described previously.
SAVE	S	Allows users to declare files within a group as permanent, and to rename such files. This includes the ability to create new permanent files with the :BUILD command.
EXECUTE	X	Allows users to run programs stored on files, with the :RUN command, and use of the CREATE intrinsic.

If no security provisions are explicitly specified for the account, the following provisions are assigned by default:

- For the system account (named SYS), through which the System Manager user initially accesses the system, READ and EXECUTE access is permitted to all users; APPEND, WRITE, and LOCK access is limited to account members. Symbolically, these provisions are expressed as follows: (R, X:ANY;A,W,L:AC).

In this format, colons are interpreted to mean "... is permitted only to ...", or "... is limited to ...". Commas are used to separate access modes or user types from each other. Semicolons are used to separate entire access mode/user type groups from each other.

- For all other accounts, the READ, APPEND, WRITE, LOCK, and EXECUTE access are limited to account members (R, A,W,L, X:AC).

Table 6-2. User Type Definitions

USER TYPE	MNEMONIC CODE	MEANING
Any User	ANY	Any user defined in the system. This includes all categories defined below.
Account Librarian User	AL	User with Account Librarian capability, who can manage certain files within the account which may include more than one group.
Group Librarian User	GL	User with Group Librarian capability, who can manage certain files within a home group only.
Creating User	CR	The user who created this file.
Group User	GU	Any user allowed to access this group as the log on or home group, including all GL users applicable to this group.
Account Member	AC	Any user authorized access to the system under this account. This includes all AL, GU, GL, and CR users under this account.

Group-Level Security

The security provisions that apply to all files within a group are initially set by an Account Manager user when creating the group. They can be equal to, or more restrictive than, the provisions specified at the account level. (The group's security provisions also can be less restrictive than those of the account. This effectively equates the group restrictions with the account restrictions, since a user failing security checking at the account level is denied access at that point, and is not checked at the group level.) The initial group provisions can be changed at any time, but only by an Account Manager user for that group's account.

At the group level, six access modes are recognized:

- READ (R).
- LOCK (L).
- APPEND (A).
- WRITE (W).
- SAVE (S).
- EXECUTE (X).

The System Manager

Also, at the group level, five user types are recognized:

- Any User (ANY).
- Account Librarian User (AL).
- Group Librarian User (GL).
- Group User (GU).
- Account Member (AC).

If no security provisions are explicitly specified, the following provisions apply by default:

- For a public group (named PUB), whose files are normally accessible in some way to all users within the account, READ and EXECUTE access are permitted to all users; APPEND, WRITE, SAVE, and LOCK access are limited to Account Librarian users and group users (including Group Librarian users) (R,X:ANY; A,W,L,S:AL,GU).
- For all other groups in the account, READ, APPEND, WRITE, SAVE, LOCK, and EXECUTE access are limited to group users (R,A,W,L,X,S:GU).

File-Level Security

When a file is created, the security provisions that apply to it are the default provisions assigned by MPE at the file level, coupled with the provisions assigned to the account and group to which the file belongs. At any time, however, the creator of the file (and only this individual) can change the file-level security provisions, as described in the MPE V Commands Reference Manual (32033-90006).

If no security provisions are explicitly specified by the user, READ, APPEND, WRITE, LOCK and EXECUTE access are permitted to all users (R,A,W,L,X:ANY), for all files, by default.

Because the total security for a file always depends on security at all three levels, a file not explicitly protected from a certain access mode at the file level may benefit from the default protection at the group level. For example, the default provisions at the file level allow the file to be read by any user; but the default provisions at the group level allow access only to group users. Thus, the file can be read only by a group user.

In summary, the default security provisions at the account, group, and file levels combine to result in overall default security provisions as listed in Table 6-3. Stated another way, when the default security provisions are in force at all levels, the standard user without any other user attributes has:

- Unlimited access (in all modes) to all files in the logon group, and the home group.
- Reading and executing access (only) to all files in the PUB group of his account, and the PUB group of the SYS account.

Following are the important file security rules:

- Users can only create files in their own account, regardless of their capability.
- Only the creator can modify a file's security.
- If a lockword is present on a file, then it is always required in order to open the file. A program could open the file specifying the lockword, but the user will not be able to open the file unless he knows the lockword.
- Account Managers have unlimited access to the files within their account (must supply lockword).
- System Managers have unlimited access to any file, but can only save files in their account (must supply lockword).
- The :RELEASE command allows unlimited file access, and the :SECURE command resecures a file that has been released.
- The :ALTSEC command restricts access to files in a group to which access is normally not restricted.

Table 6-3. Default Security Provisions

FILE REFERENCE	FILE	ACCESS PERMITTED	SAVE ACCESS TO GROUP
<i>filename</i> .PUB. SYS	Any file in Public group of System account.	(R, X:ANY; W:AL, GU)	AL, GU
<i>filename.group-name</i> .SYS	Any file in any group in System account.	(R, W, X:GU)	GU
<i>filename</i> .PUB. <i>accountname</i>	Any file in Public group of any account.	(R, X:AC; W:AL, GU)	AL, GU
<i>filename.group-name</i> . <i>accountname</i>	Any file in any group in any account.	(R, W, X:GU)	GU

ACCOUNT/GROUP/USER ORGANIZATION

When you log onto MPE, two basic elements must be defined: an identifiable unit to which system resources (such as disc file space and central processor time) are allocated and charged, and a local set (domain) of disc files accessible by you. The basic unit to which resources are assigned is the account. This is the major "billable unit" in MPE. Associated with each account are three items: one, an unique file domain; two, a set of users who access MPE through the account; and three, a set of groups which partitions the account's accumulated resources and divides its file domain into private subdomains.

The System Manager

Each account is defined, modified, and deleted by commands issued by a user with the System Manager capability. Every account is identified by a name. Optionally, a logon password can be associated with the account to validate a user's ability to access MPE under this account. A maximum priority also is associated with the account. This designates the highest priority at which any process within this account can be scheduled. Limits are assigned for maximum disc file space, central processor time, and online connect time permitted each account. Running counts of the use of these resources are maintained for billing purposes. To maintain an account, the user acting as System Manager grants a user the Account Manager capability. This Account Manager may then assign the same capabilities, or some subset of these capabilities, to other users in his account.

The users and groups associated with each account are defined by commands issued by the Account Manager user. Each user is identified by a unique name, within this account, and by an optional password. He is assigned a maximum allowable priority for his processes, which cannot exceed the maximum account priority. Each account possesses a Public group (called PUB), to which all of its users have read and program-execution access, in addition to other groups that may be covered by various security provisions. Each group is identified by a name unique within its account, and optionally, by a password used to validate access to the group and its files at logon. As with an account, limits are assigned for the maximum disc file space, central processor time, and online connect time usable by a group. Running counts of resources used by the group are maintained. File space is always charged to the group containing the file, rather than the group to which the user who created the file was logged on.

Any MPE installation can contain several accounts. Each account can have several users and groups associated with it. Each group can possess several files which constitute a subset of the file domain. When the user logs on, he specifies the account, user and group names (and, if required, the account, user, and group passwords). Furthermore, any file in a group may also be protected by a lockword, which must be supplied at any time the user opens the file during the course of his job or session. In addition, there are standard file security mechanisms that are described later.

Each user can be associated with a home group by the Account Manager. If the user does not specify a group when he logs on, he is associated to the home group by default. If the Account Manager does not assign a user a home group, that user must always specify a group when he logs on.

Once the standard user has established communication with MPE, if the normal (default) system security provisions are in force, the user has unlimited access to all files in his logon group and home group. Furthermore, he can read and execute programs residing in files in the Public group (PUB) of his account, or in the public group of the System account (PUB.SYS). He cannot, however, access other files in the system in any way.

The normal MPE security provisions can be overridden at the account, group, or file level, (by System Manager, Account Manager, or standard users, respectively) to provide more or less restriction to users. Users with special capabilities are generally subject to fewer restrictions.

A user with MPE System Manager capability can create, modify, and delete accounts. With each account, the System Manager user also creates a user with the Account Manager capability and a public group (named PUB). The Account Manager user can then create, modify, and delete groups and users within his account. The public group (PUB) is a group whose file library is normally accessible for reading and program execution to all users within the account.

Typical Accounts

To illustrate the various ways in which accounts, groups, and users can be defined and organized at an HP 3000 Computer System site, several examples are presented. Notice that these are only examples, and are not meant to imply formal organizational rules.

A MULTI-DIVISION COMPANY. Suppose that a certain multi-division company has a corporate HP 3000 Computer System. The company has many separate operating divisions, but we will use the General Systems Division (GSD) to show the details of the accounting structure. (See Figure 6-1.)

The System Manager user assigns the name GSD to an account, and an Account Manager user name MGR. The Account Manager then logs onto the system and defines the groups for the Accounting department (ACCTG), Marketing department (MKTG), and Engineering department (ENGR). He or she also assigns users to the various groups as detailed in the figure. In this case, the structure within the account follows the functional departmental scheme.

AN IN-HOUSE SERVICE BUREAU. An in-house service bureau, providing both batch and interactive capabilities, serves different users within the same company. The manager of the Data Center, having System Manager capability, creates an account for each department (Engineering, Marketing, Accounting, and other departments) in the company. For each account, an Account Manager user assigns all programmers in his department as users, and assigns them all standard capabilities, plus the following optional capabilities: Process-Handling (PH), Data-Segment handling (DS), and Multiple RINs (MR). The Account Manager user also defines the groups for the account.

As an example of a typical account, the account for the Engineering department defines all programmers in that department as users. This account contains the following groups:

- Public Group, containing utility programs, for which all users of the account have EXECUTE and READ access only.
- Data-Collection Group, for which all users have READ, WRITE (append only), SAVE, and LOCK access.
- Common Group, used for miscellaneous department overhead. Unrestricted access; no passwords necessary.
- Project Groups (one per project). Access restricted to project members.
- Private Groups (one for each programmer), with private password.

The MPE Accounting System would be used, to some extent, for internal bookkeeping. This system monitors permanent file space and central-processor time used by job/sessions for accounts and groups, and interactive terminal connect-time used by sessions for accounts and groups.

A COMMERCIAL SERVICE BUREAU. A commercial service bureau, also providing batch and interactive capabilities, offers its services to various outside companies (customers). An account is established for each customer. Users are given standard capabilities but no optional capabilities. The group organization is similar to that for the in-house service bureau described previously. The MPE Accounting System is used more fully in the commercial service bureau, however, because with this organization, each customer can be billed separately for his/her CPU time and disc space.

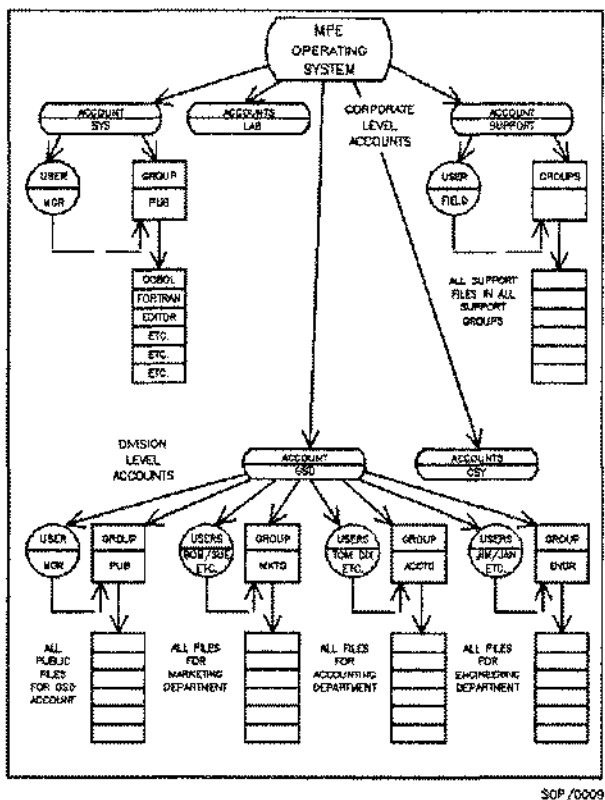


Figure 6-1. Accounting Structure in a Corporation.

A SCIENTIFIC RESEARCH CENTER. In a research center, where scientific programmers are using the system for batch and interactive applications, the following accounts are available:

- System account, used by all users.
- Data-processing account, containing groups allocated as required, used by all research users. For this account, all users have the standard capabilities and the following optional capabilities: Process-Handling, Data-Segment handling, and Multiple RINs.
- Special accounts, used by agencies such as the Personnel and Accounting Offices. Access is restricted to members of these agencies.

ACCOUNTING INFORMATION

The MPE Accounting System keeps track of various system resources used by each account and group. These resources are: total permanent file space and central processor time (accumulated by jobs and sessions), and terminal connect time (accumulated by sessions). Furthermore, limits can be set for the maximum use of these resources at the account level (by System Manager users issuing the :NEWACCT or :ALTACCT commands) and at the group level (by Account Manager users issuing the :NEWGROUP and :ALTGROUP commands).

When a job or session is in progress, MPE maintains counts of the resources used by that job or session. When the job or session is logged off, its total time-resource use counts are used to update the time resource-use counters for its logon account and group. When another job or session attempts to log on to the same account (and, perhaps, group), and the central-processor time limit or session connect-time limit has been exceeded by the previous job/session at the account (or group) level, access is refused.

When a request is made to save a file, or add an extent to an existing file, and this action would result in exceeding the permanent file space limit at either the account or group level, the request is denied. File space is always charged to the group containing the file, rather than the group where the user who created the file was logged on.

Accounts Supplied With System

When Hewlett-Packard delivers an HP 3000 Computer System, there are two accounts on the system: SYS, and SUPPORT.

The SYS account is present on the system because system files must belong to some account. Files such as PROGEN, INITIAL, SYSDUMP, the system Segmented Library (SL.PUB.SYS), DEFDATA and Hewlett-Packard-supplied subsystems such as COBOL and FORTRAN, have been assigned to the SYS account. (Subsystem programs and files are not part of the operating system, but are in the SYS account for convenience.)

The SUPPORT account is primarily used by Hewlett-Packard's Systems Engineering organization to distribute and maintain system software and all supported software utilities and verification programs. Software support is not considered a user function, so the SUPPORT account is not discussed in this manual. Your local Hewlett-Packard field representative can provide any information you may require concerning this special account.

Thus, the system's primary initial account is the SYS account. It is always initially present, and thereafter, is expected to be present at all times. It cannot be purged. The SUPPORT account can be purged.

Every account has a group to contain files, and a user to access those files. The SYS account also has an initial group, and user. The group is named PUB; the user is named MANAGER. The PUB group contains all system files, subsystem files, and Segmented Library procedures.

The System Manager user has full control over the SYS account and, in addition, has the ability to create all other accounts and managers that will be required for the installation.

SYSTEM MANAGER CAPABILITIES

The System Manager has the most extensive capabilities of any user on the system. By definition, he has all the capabilities of the standard user, as well as those that are unique to the System Manager user. There are functions unique to the System Manager capability:

The System Manager

- Creation of new accounts, and Account Managers.
- Modification of account capabilities and status.
- Deletion of entire accounts, with associated groups, users, and files.
- Listing of any, or all, files on the system.
- Obtaining account reports of system usage and resources.
- Storing/restoring any, or all, files on the system on to magnetic tape or serial disc.
- Defining altering, and deleting private disc volume sets and classes.
- Describing User-Defined Commands (UDCs) known to all system users.
- Creating the device-user association table.
- Creating an OPERATOR.SYS user.

The System Manager normally logs on in session mode with:

:HELLO MANAGER.SYS

Initially there is no password on either the account, the group, or the user. Once logged on, the user can define new accounts and Account Manager users in order to set up the various billable units. He also can alter the SYS account, PUB group, and MANAGER user. He may create a new account with any or all of the MPE attributes. If the System Manager capability (SM) is assigned to another user of a different account, then that manager user will also be a System Manager. Thus, it is possible that several different "system" accounts and several "system managers" could exist simultaneously on one system. However, it is recommended that only passwords be added or altered. This is especially true during the first few days of system use, since the SYS account is specially known by the operating system. If alterations are made to the SYS account before a working knowledge of the system is acquired, it could result in loss of system integrity.

In any case, the SYS account will always reside in the system; it cannot be purged. Normally (as when delivered by Hewlett-Packard), the SYS account is assigned the maximum attributes. The PUB group of the SYS account is assigned the maximum group capabilities when the system is delivered and should not be altered routinely. If the SYS account is altered for any reason, it must have the following attributes, as a minimum:

<i>capabilitylist</i>	It is recommended that all capabilities be assigned to the SYS account.
<i>passwords</i>	Account, group, and user <i>passwords</i> may be assigned by the System Manager, to the SYS account, as desired.
<i>filespace</i>	Must be unlimited for the SYS account. Additionally, the system is periodically changed by Hewlett-Packard. In most cases, more disc space is required in the SYS account when changes are made.

cpu Central processing time is not counted against system files, and subsystems which are run on behalf of users in other accounts. CPU process time in the SYS account is primarily used to determine the accounting of the System Manager and System Supervisor. If there are other users and groups in the SYS account, it may be useful to keep track of the CPU resource used by those users and groups, and to impose a limit. If this limit is exceeded, System Manager users will be warned when logging on. Other users will be denied access.

connect Like the *cpu* processing attribute, a connect-time limit may be useful for accounting purposes, particularly if there are other groups and users in the SYS account. If this limit is exceeded, a System Manager user will be warned when logging on. Other users will be denied access.

fileaccess It is not advisable to alter the file accessing parameters of the SYS account, and PUB group. Normally, all users in the system can read and execute any file in the PUB group of the SYS account. Since all systems programs, and all supported subsystems reside in the PUB group of the SYS account, it is reasonable to allow all users the READ and EXECUTE access. If a System Manager desires to place user programs and files in the PUB group of the SYS account, and requires limited access to those programs and files, it is better to place lockwords on those programs and files rather than to alter the access attribute.

NOTE

The system programs residing in the PUB group of the SYS account are normally executed by the operating system on behalf of users. If users should attempt to :RUN such system programs as PROGEN or PFAIL, for example, the operating system will reject the attempt.

subqueuename The default subqueue assigned to the SYS account is CS. The CS subqueue is the highest priority subqueue under which any user should access the system, and this includes System Managers. Allowing any user to execute on a higher priority will interfere with normal system processing and could cause degradation of system performance.

localattribute The default assigned to the SYS account is a double-word 0. The System Manager can assign to the SYS account any local attribute he desires.

The System Manager user has the following commands for his exclusive use:

- :ALTACCT
- :LISTACCT (For all accounts)
- :NEWACCT
- :PURGEACCT
- :REPORT (For all accounts)
- :RESETACCT

Defining Accounts

To create a new account (and an associated Account Manager user and PUB group), the System Manager logs on to the system and enters the `:NEWACCT` command, together with any optional parameters.

Suppose that Bill Williams, of the accounting department, wants an account for his personnel. He plans 25,000 sectors of disc space, so that some of his programs can create large permanent files. He will be the Account Manager, and decides on an account password: `USONLY`. He further states that he wants unlimited connect and CPU processing time, and desires to access magnetic tapes and the line printer. As the System Manager, you determine, with Bill, that his account will be named `ACCTG`, and the Account Manager name will be `BILL`. You then log onto the system as `MANAGER.SYS` (with passwords, if any) and assign the new account, as follows:

```
:NEWACCT ACCTG,BILL;FILES=25000
```

When a new account is created, the `:NEWACCT` command assigns default values to any optional parameters. Refer to `:NEWACCT` command in Section III for the assigned default values.

To ensure that the account, the PUB group, and Account Manager user are correct, you enter the following:

```
:LISTACCT ACCTG ** A listing of the account will be printed;
```

```
:LISTGROUP PUB.ACCTG** A listing of the PUB group of ACCTG will be printed; and
```

```
:LISTUSER BILL.ACCTG ** A listing of the Manager user will be printed.
```

Refer to `:LISTACCT`, `:LISTGROUP`, and `:LISTUSER` commands in Section III to translate the octal listing into its decimal representation. After decoding the account/group/user, you will have the following information:

ACCOUNT

<i>acctname</i>	ACCTG
<i>password</i>	Null (none)
<i>filespace</i>	25,000 sectors available
<i>cpu</i>	Unlimited time
<i>connect</i>	Unlimited time
<i>capabilitylist</i>	AM,AL,GL,SF,ND,IA,BA
<i>fileaccess</i>	(R,A,W,L,X:AC)
<i>subqueue name</i>	CS
<i>localattribute</i>	Null (double-word 0)

GROUP

<i>groupname</i>	PUB
<i>password</i>	Null (none)
<i>filespace</i>	25,000 sectors available
<i>cpu</i>	Unlimited time
<i>connect</i>	Unlimited time
<i>capabilitylist</i>	IA,BA
<i>fileaccess</i>	(R,X:ANY;A,W,L,S:AL,GU)

USER

<i>username</i>	BILL
<i>password</i>	Null (none)
<i>subqueuename</i>	CS
<i>localattribute</i>	Null (double-word 0)
<i>homegroup</i>	PUB
<i>capabilitylist</i>	AM,AL,GL,SF,ND,IA,BA

After all the decoding is complete, you become aware that the account password was inadvertently omitted. You correct the problem by entering:

```
:ALTACCT ACCTG;PASS=USONLY
```

All the other attributes described for the account ACCTG remain the same except that the account password is now USONLY. After establishing the account, it is a good idea to discuss the Account Manager responsibilities with Bill Williams before he, and any of his personnel, begin to use the account.

After several weeks, Bill Williams returns to you and informs you that he must have the capability to obtain extra data segments. You then log onto the system, and enter:

```
:ALTACCT ACCTG;CAP=AM,AL,GL,SF,ND,IA,BA,DS
```

You must enter the complete list of "CAP=" capabilities in order to retain the existing capabilities. All other attributes of the account remain the same. In addition, all groups and all users within the account have remained the same. That is, the PUB group and all other groups, as well as the Manager user BILL, and all other users' attributes, have not been changed to include the extra data segment (DS) capability. It is now the responsibility of the Account Manager user to alter any groups by using the (:ALTGRDUP) command, and users (including himself) by using the :ALTUSER command, to include the extra data segment (DS) capability for those who need it. If a capability is removed, all users and groups within the account will lose the capability.

Displaying Accounting Information

A System Manager can list the attributes (previously specified in the :NEWACCT or :ALTACCT commands) for one or all accounts in the system by using the :LISTACCT command. Also, by using the :LISTGROUP and :LISTUSER commands, he can list the attributes for one or all groups and users in the system.

Each listing appears as an octal dump showing one or more entries. Each entry is headed by A= (for accounts), G= (for groups), or U= (for users), followed by an appropriate name and three or four lines of octal-coded information.

There is also a supported utility program, LISTDIR2.PUB.SYS for MPE V/P, and LISTDIR5.PUB.SYS for MPE V/E, which will format all of the octal information that is printed by the commands. Privileged information within the programs is limited to System Managers and Account Managers.

In addition to the list commands, the System Manager also may use the :REPORT command to obtain account and group reports. As an example, suppose that your site is a timesharing business which bills the various customers monthly. You bill each customer by their account, and by how much of the following resources have been used:

- Permanent disc space being used.
- CPU processing time.
- Connect time in minutes since last billing cycle.

Further, suppose that today is the end of the billing period and you as System Manager must obtain a list of resources used by each account (customer). In addition, there is a delinquent account, DIAG. You intend to purge that customer from the system, in order to deny them access. Therefore, you want an individual report for that account. In order to obtain these reports of account usage, the System Manager will use the :REPORT command:

```
:REPORT DIAG
ACCOUNT      FILESPACE-SECTORS      CPU-SECONDS      CONNECT-MINUTES
  /GROUP      COUNT      LIMIT      COUNT      LIMIT      COUNT      LIMIT
DIAG          49552      50000      56729      **      65820      **
  /PUB         4354       50000       5254       **       4466       **
```

When obtaining information for a private volumes group, two :REPORT commands must be entered to get the complete accounting information. Two commands are necessary because when a group is bound to a private volume set, the accounting information for that group is kept in two places. The CPU time and connect counts and limits are kept in the system directory, while the file space counts and limits are kept in the directory, on the group's home volume set.

Therefore, to obtain the accounting information from the system directory, a command of the following form should be entered:

```
:REPORT groupset
```

This gives the CPU and connect time and limits for all groups, but only the file space counts and limits for those groups which are not bound to a private volume set. Note that the total file space count for an account obtained from this command does not include the file-space counts for private volume groups.

To obtain these counts, a command of the following form must be used:

```
:REPORT groupset;VS=volset
```

This command lists only the groups and accounts which are in the directory for the private volume set specified. The only valid information obtained in this report is the file space counts and limits.

The **:REPORT** command for the System Manager is an expanded version of the command that is available to the standard user for displaying total accounting information for a user's logon account and group; this is discussed in the MPE V Commands Reference Manual (32033-90006).

The type of output written to the list file depends on the type of file (ASCII or binary) specified or implied. If the list file is an ASCII file, a standard ASCII listing is produced; on this listing, an unlimited quantity is denoted by a double asterisk (**). If the list file is a binary file, which is typically used to help in automatic processing of the report data, a 17-word record is written for each account/group. Counts and limits are double-word integers; an unlimited quantity is denoted as %17777777777. When **:REPORT** does an FOPEN on the file, it opens it as NEW, ASCII, Variable, Carriage-Control, Write-only Access, and Exclusive. Since CCTL and BINARY will not work together, the user must specify NOCCTL to override with binary files.

On the list files for both ASCII and binary, the entry for each account is followed immediately by the entries for all of its groups. The record report format is decoded as shown in Table 6-4.

Table 6-4. Report Record Format

WORD	CONTENTS
0	Type of entry, where: 1 = A group entry. 2 = An account entry.
1-4	Account or group name, left justified and padded with blanks.
5-6	Permanent file space count (in sectors).
7-8	Permanent file space limit (in sectors).
9-10	Central processor time count (in seconds).
11-12	Central processor time limit (in seconds).
13-14	Connect time count (in minutes).
15-16	Connect time limit (in minutes).

The System Manager

As an example, the System Manager logs onto the system in the usual way, entering passwords as appropriate. Since this is to be a very long printed report, the manager first enters a file command to direct output to the high-speed line printer. Assuming that logical device 6 is the line printer, the command is:

```
:FILE LINEPR;DEV=6
```

The System Manager then enters the command to obtain the accounting report as follows:

```
:REPORT @.@,*LINEPR
```

The report for the entire accounting system is then printed on the high speed line printer. After the report is done, the System Manager then desires to have a report on all groups of the delinquent account DIAG printed on his terminal. He enters:

```
:REPORT @.DIAG
```

Resetting Accounts

After the foregoing reports are obtained and the printed accounting report is delivered to the billing department, the System Manager desires to reset the CPU time and connect time counts for the new billing period. He enters the following command:

```
:RESETACCT @
```

This command, without any optional parameters, will reset the CPU processing time and the connect time for all accounts and groups on the system. The end result is that all CPU and connect counts will be set to zero. Users on the system will now begin accumulating CPU and connect time for the new billing period. Note that this command does not change the allowable limits for each account and group, only the counters for actual use.

Storing Files Offline

Continuing with the preceding example, suppose that the System Manager now desires to purge the DIAG account. Before he does this, he must ensure that any users, groups, and files are saved on tape. He does this in anticipation of the customer paying his delinquent account, which would require reinstatement of the account. The System Manager saves the account files via the :STORE command.

The System Manager user, like the System Supervisor user, has the ability to dump and retrieve any or all files in the system by using the :STORE and :RESTORE commands. These commands are defined in Section III. In this example, the System Manager first enters the :FILE command to direct the output to magnetic tape unit as (associated with the class TAPE) as follows:

```
:FILE SAVDIAG;DEV=TAPE
```

The System Manager then mounts a magnetic tape on the magnetic tape device and enters the following command.

```
:STORE @.@.DIAG;*SAVDIAG;SHOW
```

After the System Operator intervenes to assign the proper magnetic tape device, all files in all groups of the DIAG account will be stored on the magnetic tape. In addition, the optional parameter SHOW was included by the System Manager, so that a record of all files for the account can be kept. Once the entire file structure has been saved, the System Manager is now ready to delete the account.

Purging Accounts

Now the System Manager can delete the DIAG account and still be able to restore it if the customer is reinstated. He enters the command as follows:

```
:PURGEACCT DIAG
```

The system will then request verification from the user:

```
ACCOUNT DIAG TO BE PURGED? (YES/NO)
```

The System Manager responds "YES". At this time, files, users, and groups are purged, along with user-level and account-level UDCs within the DIAG account, and the DIAG account itself.

Job/Session Priority Request

A special capability granted to System Managers and System Supervisors is the use of the optional HIPRI parameter in the :HELLO and :JOB commands. (Refer to the MPE V Commands Reference Manual (32033-90006).) This is a request for maximum job-selection priority, and will cause the job or session to be initiated regardless of current job fences set by the operator.

Listing Files

The System Manager, as well as any system user, has the ability to list files. The System Manager can list any or all files on the system using the :LISTF command with a -1 optional parameter. A :LISTF, -1 displays the octal listing of the file, which includes the directory entry and the file label. Refer to the MPE V Commands Reference Manual (32033-90006) for a discussion of this command.

User Defined Command (UDC) Files

A User Defined Command, or UDC, is a command defined by one or more standard MPE commands. Entering the UDC name causes MPE to execute the command or commands previously defined. UDC's, defined by the System Manager, can be made known and available to all system users.

The UDC definitions are stored in one or more files. These files can exist at one of three levels: user, account or system. UDCs may be created by any user for personal use, by the Account Manager for anyone in the account, and by the System Manager for use by any user on the system. System-wide UDCs must be defined in a file that is released to all users. who have READ and LOCK access to the file.

When identically named UDCs occur at different levels, the user UDC takes precedence over the account-level UDC, which in turn, takes precedence over the system-level UDC. For this reason, it is a good practice to give your UDCs distinct names. Exceptions to this rule are Nested and Logon UDCs.

ESTABLISHING A UDC CATALOG. The `:SETCATALOG` command is used to inform MPE that a specified file name contains user-defined commands. A user must have `LOCK` access specified for the group in which the file is located to use the `:SETCATALOG` command; a user must also have `READ` access to the file. Note that the default file access for the `PUB` group gives `LOCK` access only to those users with `AL`, `GL` or home group (`GU`) capability.

You may want to restrict general-user access to `COMMAND.PUB.SYS`, since this file contains information which you may consider sensitive: the names of all UDC files on the system and the lockwords for those files. To use UDCs, users need only have `EXECUTE` and `LOCK` access to `COMMAND.PUB.SYS`. If, on your system, the default access rights to `COMMAND.PUB.SYS` include `READ` access, you can use the `:ALTSEC` command to restrict the access rights to this file. For example:

```
:ALTSEC COMMAND;(X,L:ANY;R,W,A:CR)
```

Refer to Section II of the MPE V Commands Reference Manual (32033-90006) for more information on this command.

`COMMAND.PUB.SYS` must exist for the `:SETCATALOG` command to execute properly. If this file does not exist on your system, log on as `MANAGER.PUB.SYS`, and build it as follows:

```
:BUILD COMMAND.PUB.SYS;REC=20,6,F,BINARY
```

If you want to have the UDC file named `SMUDC1` established for all users in the system, enter:

```
:SETCATALOG SMUDC1;SYSTEM
```

If the file has a lockword, you must include it with the file name. Note: once a UDC file is entered into a catalog with the `:SETCATALOG` command, that file cannot be purged with the `:PURGE` command, or modified and kept under the same name with the Editor, while the file is being accessed by any user. Any attempt to do either of these two operations will result in an error message (Exclusive Violation).

To purge or modify such a file, it must be removed from the catalog by issuing the `:SETCATALOG` command without a file name, as follows:

```
:SETCATALOG;SYSTEM
```

The effect is that all UDC files are removed from the catalog after all users, except you, who were accessing the file have logged off, or issued a `:SETCATALOG` command themselves. Incidentally, the files are not purged; they are merely deleted from the catalog. To re-enter them into the catalog, issue the `:SETCATALOG` command, followed by the file names and associated lockwords, if any. `LOGON` UDCs do not allow the user to respond to an MPE prompt with a new `:SETCATALOG` command.

`:SETCATALOG` has been enhanced to allow users with `AM` capability to assign a set of user-level UDC catalogs to any user in their account. Users with `SM` capability can assign a set of user-level UDC catalogs to any user in the system.

The syntax is:

```
:SETCATALOG ... [;USER=username [acctname]]
```

For more information on the `:SETCATALOG` command refer to the MPE V Commands Reference Manual (32033-90006).

LISTING UDCs. To list the contents of the UDC file catalog, enter:

```
:SHOWCATALDG
```

MPE responds by providing a list of UDCs by assigned name and level (USER, ACCOUNT, or SYSTEM). For more information on UDCs refer to Section III of the MPE V Commands Reference Manual (32033-90006).

SYSTEM STARTUP STATE CONFIGURATOR

Each time that the system is started, various system parameters (e.g., JOBFENCE, Job LIMIT, OUTFENCE, etc.) are automatically assigned default values. The System Manager can use the System Startup State Configurator facility to automatically reset any of the system defined defaults, stream special jobs, open DS lines, or perform any task appropriate to system initialization. In conjunction with the Programmatic Creation of Sessions capability the System Manager can automatically create user sessions on selected terminals when the system comes up. Using the full functionality of the System Startup State Configurator it is possible for the System Manager to describe beforehand exactly what the desired System Startup State should be.

The System Startup State Configurator facility is maintained by the System Manager in a file named SYSSTART.PUB.SYS. The MANAGER.SYS is the only user with sufficient privilege to create this file. SYSSTART.PUB.SYS defines selected System Startup State Commands. The only System Startup State Commands supported are STARTUP, WARMSTART, COOLSTART, UPDATE, RELOAD, and COLDSTART. Each of these commands, except for STARTUP, corresponds to one of the different system starts. A sample SYSSTART.PUB.SYS is shown below:

```
STARTUP
STREAMS 10
ALLOW @. @;COMMANDS=REPLY
ALLOCATE COBOLII.PUB.SYS
LIMIT 4, 16
JOBFENCE 4
OUTFENCE 5
OUTFENCE 12;LDEV=14
COMMENT A continuation record follows:
DSCONTROL 90;OPEN;RETRY=10;&
TRACE, DNALL, ,60,WRAP
***
WARMSTART
STARTSESS 20;MGR.ACCT;HIPRI;NOWAIT
STARTSESS 21;USER.ACCT
STARTSESS 22;USER.ACCT
STARTSESS 23;USER.ACCT
***
COOLSTART
STARTSESS 20;MGR.ACCT;HIPRI;NOWAIT
STARTSESS 21;USER.ACCT
STARTSESS 22;USER.ACCT
STARTSESS 23;USER.ACCT
***
```

In the example above the STARTUP command defines actions that the system will perform regardless of the type of system startup used by the operator. WARMSTART and COOLSTART, as defined

The System Manager

above, will cause sessions to be created for MGR.ACCT on logical device 20 (the Console) and for USER.ACCT on the other selected terminals. Note that UPDATE, RELOAD, and COLDLOAD were not defined; if the system comes up in any of these starts, only those commands listed under the STARTUP block will be executed. There is no requirement that any or all of the possible System Startup State Commands be present in SYSSTART.PUB.SYS.

The MPE commands available for execution in SYSSTART.PUB.SYS are:

ACCEPT	DOWNLOAD	LIMIT	STOPSPool
ALTLOG	DSCONTROL	LMOUNT	STREAM
ALLOCATE	FOREIGN	LOG	STREAMS
ALLOW	GIVE	MPLINE	SUSPENDSPool
CACHECONTROL	HEADOFF	MRJECNTROL	TAKE
COMMENT	HEADON	OUTFENCE	TELL
CONSOLE	IMFCONTROL	REFUSE	TELOP
DEALLOCATE	JOBFENCE	STARTCACHE	TUNE
DISALLOW	JOBSECURITY	STARTSESS	UP
DISCRPS	JOBPRI	STARTSPool	VMOUNT
DOWN	LDISMOUNT	STOPCACHE	

These MPE commands were chosen on the basis of being programmatically executable and requiring no user interaction. No other commands, UDCs, or other System Startup State Commands are allowed in the body of a System Startup State Command.

The following restrictions apply to the System Startup State Configurator:

- No options are available with the six System Startup State Commands. They will be echoed to the Console (with passwords stripped), BREAK will be disabled.
- A "valid" SYSSTART.PUB.SYS is a regular EDITOR ASCII file which has one of the six System Startup State Commands as its first record. Blocks are terminated by a "*" in the first byte of a record or by the end-of-file. Records are continued onto another line by adding a "&" as the last non-blank character in the record. The maximum continued record length is 239 bytes.
- The commands in the STARTUP block (if it exists) will be executed first, no matter what kind of startup is specified; the commands in the appropriate block are executed next (if a block corresponding to the specified type of startup exists). These executions occur immediately before OPERATOR.SYS is logged onto the Console.
- If no SYSSTART.PUB.SYS can be found, system startup works as it has in the past, and OPERATOR.SYS is allowed to log on. If any of the MPE commands in the System Startup State block results in an error, an error message will be generated and execution will continue at the next MPE command in the block.
- If one of the System Startup State Commands (SSSC) creates a session on the Console, the automatic logon of OPERATOR.SYS will fail.
- Once the system is up, the System Startup State Commands will not be recognized.
- The System Startup State Configurator facility can be disabled simply by renaming SYSSTART.PUB.SYS
- Lockwords are not permitted on SYSSTART.PUB.SYS

Managing Expanded Console Capabilities

System Operator functions are sometimes associated with one specific user: the System Operator. The use of expanded Console capabilities increases System Console accessibility and enables the System Operator to disperse Console functions to other users who may require them. The fact that Console commands are processed by the MPE Command Interpreter enables the System Operator to assign to individual users the ability to execute certain Console commands. The System Console, itself, can be moved to any terminal on the system with the `:CONSOLE` command. Users with System Manager (SM) capability may use the `:CONSOLE` command even if they have not been allowed the command. This enables them to retrieve the Console at any time. Users can be associated with specific devices, thereby enabling them to use the commands that control each device. Users can also be granted the ability to use job control commands on their own jobs.

Although not directly responsible for assigning these capabilities to users, the System Manager plays an important role in managing expanded Console capabilities. Specifically, the System Manager must:

- Create a device-user association table for use with the `:ASSOCIATE` command.
- Create a special user called `OPERATOR.SYS`.

CREATING A DEVICE-USER ASSOCIATION TABLE. The device-user association table identifies the devices which may be assigned by the System Manager with `SAVE` and `WRITE` access to `PUB.SYS`, to other system users. The table is generated by running the utility `ASOCTABL.PUB.SYS` for MPE V/P or `ASOCTBL5.PUB.SYS` for MPE V/E. Each utility creates a file called `ASSOCIATE.PUB.SYS`, the device-user association table. These utilities are described in the MPE V System Utilities Reference Manual (32033-90008).

In response to the `">"` prompts issued by the utility, the System Manager enters association statements in the form:

```
>deviceclassname = username.accountname [,username.accountname,...]
```

The parameter *deviceclassname* is the appropriate device identifier (class name) assigned to the device to be associated. The *username* parameter is the name of the user to be allowed to associate with the device. The *accountname* parameter specifies the name of the user's account. More than one user may be allowed to associate with a device in the table. The specification `@.acct` may be used to indicate all users within an account; `@.@` may be used to indicate all users on the system.

For example, to allow device class `LPX` to be associated by a user named `ALDEN` in account `SALES`, enter:

```
>LPX=ALDEN.SALES
```

Once the table is created, any of the users listed can associate with the special device class by using the `:ASSOCIATE` command. Although more than one user may have permission to associate with a device class in the table, a user can actually associate to a device class only if none of the devices in that class are associated to anyone else. Refer to the MPE V Command Reference Manual (32033-90006) for additional information.

CREATING OPERATOR.SYS. The creation of the user `OPERATOR.SYS` should be done at the time the system is first brought up. You need only create this user once, as `OPERATOR.SYS` remains on the system for use thereafter.

The System Manager

The first step in creating OPERATOR.SYS is to determine the home group and system capabilities that will be needed by the user. The home group used can be PUB or another group, even one created particularly for OPERATOR.SYS. The capabilities you decide to assign should take into account the kinds of activities that the user of OPERATOR.SYS will need to perform. It is recommended that the following capabilities be assigned as a minimum: OP to allow ;HIPRI logons, and IA. This will allow the user to log on and run programs. Additional capabilities that will usually be required are: UV for handling private volumes, SF for storing files, ND for using tapes, and BA for batch jobs. Additional capabilities can be assigned if they are needed. Care should be taken, however, not to jeopardize the integrity of the system.

To create OPERATOR.SYS, log on with:

```
:HELLO MANAGER.SYS
```

Then enter the following information, substituting the home group and capabilities you've selected for assignment. For example:

```
:NEWUSER OPERATOR.SYS;HOME=PUB;CAP=OP,IA,UV,BA,SF,ND
```

ACCOUNT MANAGER CAPABILITIES

When an account is created by a System Manager, it always has an account name, a public group (PUB), and an Account Manager with the AM capability attribute. This attribute allows this user certain expanded capabilities over other users within the account. The Account Manager has less capability than the System Manager, but does have final control over the overall use of the account. The Account Manager is automatically assigned a home group of PUB.

Suppose that a System Manager has created an account for Tom Smith, having used the command

```
:NEWACCT SMITH,TOM;CAP=AM,AL,GL,CV,SF,ND,UV,IA,BA;LOCATTR=%177
```

The account structure would be as follows:

ACCOUNT

<i>acctname</i>	SMITH
<i>password</i>	Null (none)
<i>filespace</i>	Unlimited
<i>cpu</i>	Unlimited time
<i>connect</i>	Unlimited time
<i>capabilitylist</i>	AM,AL,GL,CV,SF,ND,UV,IA,BA
<i>fileaccess</i>	(R,A,W,L,X:AC)
<i>subqueue name</i>	CS
<i>localattribute</i>	%177

GROUP

<i>groupname</i>	PUB
<i>password</i>	Null (none)
<i>filespace</i>	Same as account files
<i>cpu</i>	Same as account time
<i>connect</i>	Same as account time
<i>capabilitylist</i>	UV, IA, EA (Default)
<i>fileaccess</i>	(R, X: ANY; A, W, L, S: AL, GU) (Default)

USER

<i>username</i>	TOM
<i>password</i>	Null (none)
<i>subqueue name</i>	Same as account
<i>localattribute</i>	Same as account
<i>homegroup</i>	PUB
<i>capabilitylist</i>	Same as account

It is important for an Account Manager (like TOM in the present example) to remember that any changes required to the account must be made by the System Manager. The Account Manager, however, can perform the following functions within his own account:

- Create new groups and users.
- Modify the attributes of groups and users.
- Delete entire groups, users, and files within the group.
- Obtain reports on resources used within the account.
- List any or all groups, users, and files within the account.
- Store and restore files within the account (some files may also require SM, OP or PM capability).
- Define, alter, and delete private disc volume sets and classes for groups within the account. (Must have CV capability.)
- Define User-Defined Commands (UDCs) which are known to all users in the account.

The System Manager

After the SMITH account has been created, the Account Manager can log onto the system with:

:HELLO TOM.SMITH

There is no password on this account; the System Manager did not assign one. The Account Manager can define new groups and users in order to divide the account logically. The only limitation to the number of groups and users that can be defined is the physical size of the System Directory. The System Directory resides on the system disc. Its size, in sectors, is determined when the system is configured for a given installation by the System Supervisor. The directory contains the structures for all accounts, groups, users, and files. Therefore, it is possible to have insufficient disc space allocated for the directory if a great many accounts, groups, users, and files will be required. The Account Manager's responsibility in this case is to discuss his account structure with the System Manager and System Supervisor prior to implementation. This will preclude any possibility of exceeding the directory space limitations.

The Account Manager has the following commands available for his use:

:ALTGROUP
:ALTUSER
:ALTVSET (Must have CV capability)
:LISTACCT (For his account only)
:LISTGROUP
:LISTUSER
:NEWGROUP
:NEWUSER
:NEWVSET (Must have CV capability)
:PURGEGRDUP
:PURGEUSER
:PURGEVSET (Must have CV capability)
:REPORT (For his account only)
:SETCATALOG
:SHOWCATALOG

Defining Groups

To create a new group the Account Manager logs onto the system and enters the `:NEWGROUP` command and any optional parameters.

Suppose that Account Manager Tom Smith has three programmers working for him. Jim Johnson is developing a parts inventory system. Mary Mason is developing a parts processing system. Bob Blake is developing an order processing system, and is responsible for maintaining and executing the current employee salary data base. Each programmer desires an individual group in order to save his developmental programs and files. Tom Smith consults his programmers and the System Manager. He proposes that four groups will be created, with three users. He charts the structure and the various non-default attributes as follows:

GROUPS	
<i>groupname</i>	JOHNSON
<i>filespace</i>	10000 sectors
<i>groupname</i>	MASON
<i>filespace</i>	10000 sectors
<i>groupname</i>	BLAKE
<i>filespace</i>	10000 sectors
<i>groupname</i>	PAYROLL
<i>filespace</i>	Unlimited
<i>password</i>	MANYBUKS
<i>capabilitylist</i>	BA

USERS	
<i>username</i>	JIM
<i>password</i>	J2DEV
<i>homegroup</i>	JOHNSON
<i>username</i>	MARY
<i>password</i>	AQUARIUS
<i>homegroup</i>	MASON
<i>username</i>	BOB
<i>password</i>	ME98
<i>homegroup</i>	BLAKE
<i>localattribute</i>	%41

Tom then logs onto the system and carries out the group creations. He enters:

```
:NEWGROUP PAYROLL;PASS=MANYBUKS;CAP=BA
```

In a similar manner, Tom defines groups BLAKE, MASON, and JOHNSON.

Defining Users

Following the previous example, the Account Manager Tom Smith assigns new users to the previously created group structures. He enters:

```
:NEWUSER BOB;PASS=ME98;HOME=BLAKE;LOCATTR=%41
```

Tom defines the other users, JIM and MARY, in the same way.

Altering Account Attributes

The Account Manager can change one or more attributes of users or groups within his own account. The Account Manager Tom Smith desires to have a password (T1X2Z) on his own user name. Tom needs to prevent unauthorized entry to the Account Manager user's structure. He enters:

```
:ALTUSER TOM;PASS=T1X2Z
```

It should be noted here that the password is not in effect for Tom until he terminates the current session. The next logon to the system, however, will require the password.

Account Discussion

The account SMITH as defined by the Account Manager Tom Smith is now fully created. Figure 6-2 shows the basic structure within this account.

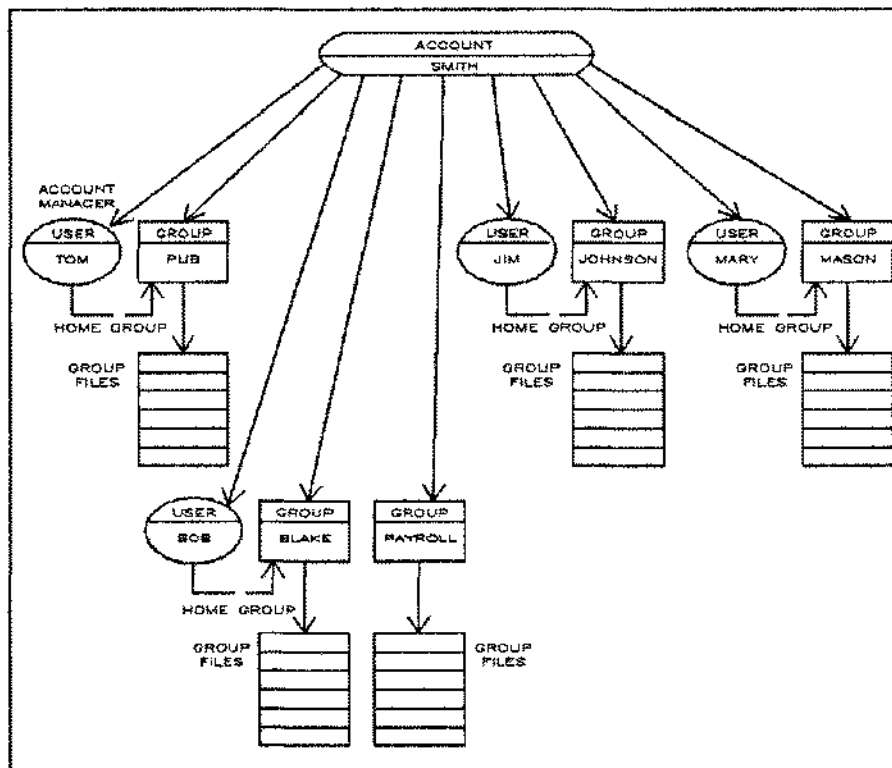


Figure 6-2. Sample Account Structure

Notice that each group is empty of files. Since neither Tom nor any other user has had the opportunity to create files, there is really no file space for those files as yet. Note also that the PAYROLL group has no user assigned. As stated previously, Bob Blake is responsible for maintaining and executing the payroll system. He also is responsible for development of an order processing system. For his development work, he has been assigned a home group of ELAKE. This does not prevent him from using the group PAYROLL as a logon group. A home group assignment is primarily for the convenience of the user, so that he will not be required to enter the name of the group desired each time he logs onto the system. Also, a user is not required to enter the password for his home group when logging on.

If Mary Mason desired to log on the system and access the files belonging to the group JOHNSON, she would log on as follows:

```
:HELLO MARY.SMITH,JOHNSON
```

When the group JOHNSON is specified in the logon, it overrides the default home group assignment made by the Account Manager. Provided that Jim Johnson has not placed a lockword on the file that Mary Mason desires to read, she will be allowed access to that file.

In looking back at the account structure, you will notice that there is a password, MANYBUKS, assigned to the group PAYROLL. The reason for the password is to deny access to the PAYROLL group for other users within the account. In addition, since it is Bob Blake's responsibility to ensure the security of the payroll group and files, Bob has altered the payroll program by inserting a call to the WHO intrinsic. (This intrinsic is discussed in the MPE V Intrinsic Reference Manual (32033-90007).) This alteration to the program has the purpose of checking the local attribute of the user running the program. Within the program, it specifically checks to see that the calling user has a local attribute of 184. In this way, a further check on the proper user is made prior to actual execution of the program. Looking back at the examples where the SMITH account was created and given a local attribute of %177 (001 111 111), and the user BOB given a local attribute of %41 (100 001), the SMITH account is restricted to 7 of the 10 system-wide payroll programs, and the user, BOB, is restricted to 2 of the 7 applications that are available to the account. Each of the 10 restricted applications will call the WHO intrinsic to return the local attribute of the user running it; it then checks its assigned bit and if this bit is not on, the program will terminate.

Bob now moves the programs and data files into the PAYROLL group. Then he assigns a lockword on the program file PAYPROG, using the :RENAME command as follows:

```
:RENAME PAYPROG,PAYPROG/NOWORDIT
```

This will provide further security for execution of the payroll program. In addition, he places a lockword on the data file, and alters his program to be able to open the data file, by placing the lockword in the *formaldesignator* in the FOPEN intrinsic.

Suppose, now, that Bob Blake must run the new payroll for the current pay period. Bob gathers the new data on cards, places his special logon and logoff cards in the deck, and places the whole deck in the card reader. He also will make arrangements for the blank checks to be placed in the high speed line printer at the appropriate time. He commences the job as follows:

The System Manager

```
!JOB PAYROLL,BOB/ME98,SMITH,PAYROLL/MANYBUKS
!RUN PAYPROG/NOWDOIT
.
.
.
data cards
.
.
.
!EOJ
```

Now consider the various security checks that are required in order to execute the payroll program. The system first checks Bob's user password (ME98) against the password that is being input. Then the system checks for a proper account name, SMITH. Then it checks the group password (MANYBUKS) against the password which is being input. After being passed on all these checks, the user BOB is finally able to achieve logon. The next command calls for execution of the PAYPROG program. The system now checks for the existence of the program and then validates the lockword that is being input. At this time, the program is brought into execution, having passed every system security check placed by the Account Manager and by the user BOB. Now the program itself issues a call to the WHO intrinsic and checks the local attribute to ensure that the proper user is executing the program. The program then opens the data file and commences to issue new pay checks for the period defined.

The above example shows how some of the various attributes assigned by the Account Manager and the user can be used to ensure a high level of privacy within an account. Note that the Account Manager Tom Smith has knowledge of the user's password, the group's password, and the user's local attributes. The Account Manager could also obtain information on the lockwords through use of the :LISTF command, with certain optional parameters allowed for Account Managers. It is then apparent that the Account Manager who has the local attribute of %177, as well as the user BOB, could access the PAYROLL group and execute the payroll program. Remember that the Account Manager can gain access to any file within the account, with one exception: an Account Manager cannot gain access to files with negative file codes unless he also has the Privileged Mode (PM) capability.

Purging Groups and Users

The Account Manager user has the responsibility for removing users and groups which are no longer required in the account. He does this with the :PURGEGRUOP and :PURGEUSER commands. If, for instance, a :PURGEGRUOP command is entered, it will remove every file within the group and then remove the group from the account structure. If a file was somehow left in a state such that the operating system verified it to be in an OPEN (busy) mode, then that file and the group itself would not be purged but all other files in the group would be. Under those conditions, it is conceivable that the system would have to be restarted in order to clear the file, so that it and the group could be removed with another :PURGEGRUOP command. Additionally, if no files are in use, but a user is logged onto the system with the group used as a logon group, then all files will be removed, but not the group.

If a group is to be deleted from a private volume set, the *volset* parameter must be specified in the :PURGEGRUOP command, and a :MOUNT command must be entered for that volume set before the :PURGEGRUOP command is entered. If the volume is already mounted due to an explicit or implicit request by a user, then all files not in use for the group will be purged, but the group itself will not be purged.

The :PURGEGRUOP command is useful for removing all files within a group, especially if there are many files to be removed. For example, suppose Bob Blake has used all of his disc space within his

group BLAKE. In order to continue his development schedule without requesting more disc space, he saves all of the present files on magnetic tape or serial disc using the :STORE command (defined in Section III). Then he requests the Account Manager to purge the BLAKE group. The Account Manager logs onto the system in Blake's home group and enters:

```
:PURGEGROUP BLAKE
GROUP BLAKE TO BE PURGED? (YES/NO) YES
IN USE: CAN'T BE PURGED (CIERR 724)
```

What has occurred is the removal of all of Bob Blake's files from within his group. However, his group structure still exists, because the Account Manager was logged onto the system in the home group BLAKE, at the time the command was entered. This is the desired effect, and the error indication can be ignored.

Suppose, now, that Jim Johnson receives a promotion and leaves Tom Smith's organization. The Account Manager Tom Smith hires Fred Free to replace Jim Johnson. Fred desires to have his own group and user name, rather than using Jim Johnson's identification. Tom creates a new group, FREE, and a user, FRED, with the same attributes as previously granted to Jim Johnson. Fred then uses the FCOPY utility (described in the FCOPY/3000 Reference Manual (03000-90064)) to copy the pertinent programs and files into his group, from the JOHNSON group. On completion of the transfers, Fred notifies Tom Smith that the group and username identified with Jim Johnson are no longer required. Tom logs onto the system as TOM.SMITH and enters:

```
:PURGEGROUP JOHNSON
GROUP JOHNSON TO BE PURGED? (YES/NO) YES
:
```

At this point, all files within the JOHNSON group have been removed, and the group structure structure itself has also been removed. However, the username JIM and its attributes still exist within the account. Tom must issue a specific command to remove the user JIM from the account structure. He enters:

```
:PURGEUSER JIM
USER JIM TO BE PURGED? (YES/NO) YES
:
```

At this time, the username JIM and all its attributes, and any associated UDCs, will be removed from the account structure. Note that, unlike the :PURGEGROUP command, if someone had been logged onto the system with the username JIM under the account SMITH, that user would have prevented the *username* JIM from being removed. The Account Manager would have to wait until the person using that user name logs off.

Account Librarian/Group Librarian

The Account Librarian (AL) and Group Librarian (GL) attributes are assigned to the Account Manager of a newly created account. The Account Manager can, in turn, pass on the AL and GL capabilities to other users as needed.

The Account Librarian (AL) attribute is normally assigned to a user in order to grant that user special file access for maintenance of certain files within the account. It is assigned to a user so that he may create and purge programs and account SL segments with the PUB group (or any group) of the account. Those files are usually accessible by any user of the account, but can only be modified or deleted by the user with the Account Librarian (AL) attribute.

The Group Librarian (GL) attribute is assigned to a user for the same reason as an Account Librarian, except that the Group Librarian attribute is restricted to the user's home group.

Basically, both attributes are meant to be used to control the degree of file access that standard users may attain. AL and GL do not give a user special command capability as do OP, AM, or SM.

Displaying Accounting Information

MPE gives you the ability to list account attributes, and to obtain other information about the various groups within a specified account.

ACCOUNT/GROUP/USER ATTRIBUTES. An Account Manager can list the attributes for his own account by using the `:LISTUSER` command. He can list the attributes for one, or all, groups in his account, or for one, or all, users in his account.

Each listing appears as an octal dump showing one or more entries. Each entry is head by A= (for accounts), G= (for groups), or U= (for users), followed by the appropriate name, and three or four lines of octal-coded information. Refer to the specific commands, `:LISTACCT`, `:LISTGROUP`, and `LISTUSER`, for decoding information.

There are also supported utility programs, `LISTDIR2.PUB.SYS` and `LISTDIR5.PUB.SYS` which will format all of the octal information that is printed by the commands. Privileged information within `LISTDIR5` is limited to System Managers and Account Managers.

ACCOUNT/GROUP REPORTS. The accounting information for the logon account, or for any groups in that account, can be extracted and displayed, showing counts and limits for permanent file space (in disc sectors), central processor time (in seconds), and session connect-time (in minutes).

The accounting information, requested with the `:REPORT` command, can be used for billing or for simply obtaining an overview of system usage on an account/group basis.

The `:REPORT` command is an expanded version of the command that is available to the standard user for displaying the total accounting information for his logon account and group; this is discussed earlier in this Section, and in the MPE V Commands Reference Manual (32033-90006). For any particular resource, the sum of all group counts within any account always equal the total count accumulated by the account.

Backing Up Disc Files on Tape or Serial Disc

Account Manager Users have the ability to dump and retrieve any files in their account by using the `:STORE` and `:RESTORE` commands. SM, OP, or PM capability may also be required to store or restore some files. These commands are defined in Section III.

Defining UDC Commands

A User Defined Command (UDC) is a procedure built from one or more standard MPE commands. When you combine several MPE commands into a single procedure and assign a name to that procedure, you create a UDC. In this way it is possible to enter the UDC name and cause several MPE commands to be executed. UDCs defined by the Account Manager may be known to and available to all users in the account.

The System Manager

User Defined Commands may also be defined by the System Manager for use by all system users, and by individual users for private use. When identically named UDCs occur at different levels, the user level UDC takes precedence over the account level UDC which, in turn, takes precedence over system level UDCs. The format of a User-Defined Command is fully described in Section III of the MPE V Commands Reference Manual (32033-90006).

ESTABLISHING A UDC CATALOG. The `:SETCATALOG` command is used to inform MPE that a specified file name contains user defined commands. The Command Interpreter then searches the file and establishes a directory for each command contained in the file. The file name is stored in a directory (`COMMAND.PUB.SYS`) of all UDC users. A user must have lock access specified for the group in which the file is located to use the `:SETCATALOG` command. Note that the default file access for the `PUB` group gives lock access only to users with `AL`, `GL`, or home group (`GU`) capability.

The `EDIT/3000` subsystem, or an equivalent editor, can be used to modify commands stored in a file, if that file is not being accessed. Note, however, that a UDC file, once entered into a catalog with the `:SETCATALOG` command, cannot be modified and kept under the same name with the editor. You must first release the file from the UDC catalog by issuing the `:SETCATALOG` command without parameters. This releases all the files in the UDC catalog.

The UDC directory, `COMMAND.PUB.SYS`, must exist for the `:SETCATALOG` command to properly execute. If this file does not exist on your system, you must build it with a record size of 20.

If you want to have the file named `AMUDC1` searched by the Command Interpreter, and have the User Defined Commands contained therein entered into a catalog, enter:

```
:SETCATALOG AMUDC1;ACCOUNT
```

Note that once a UDC file is entered into a catalog, using the `:SETCATALOG` command, that file cannot be purged with the `:PURGE` command or modified and kept under the same name with the Editor. Any attempt to do either of these two operations will result in an error message (Exclusive Violation).

In order to purge or modify such a file it must be removed from the catalog by issuing the `:SETCATALOG` command with no file names, as in:

```
:SETCATALOG;ACCOUNT
```

The effect is that all UDC files are removed from the catalog. They are not purged, merely deleted from the catalog. This will take effect only after all users, except you, who have been accessing the file, have logged off or issued a `:SETCATALOG` themselves. To enter UDC files into the catalog, enter the `:SETCATALOG` command for these files.

LISTING UDCS. To list the contents of a UDC file catalog, enter:

```
:SHOWCATALOG
```

MPE responds by providing a list of UDCs by assigned name and level (`USER`, `ACCOUNT`, or `SYSTEM`).

CONFIGURING YOUR SYSTEM

SECTION

VII

This section explains the process of configuring your system using the :SYSDUMP command and the Initiator/User (INITIAL) dialogue. It also provides information for general peripheral configuration. For information on configuring data communication devices, refer to the Data Communications Handbook (5957-4634). Suggested parameter settings for various system tables and the maximum and minimum number of obtainable entries, are also discussed. The last topic in this section, Options for Modifying the System, in table format, classifies when the System Supervisor can alter I/O configuration and critical parameters.

Documentation of SYSDUMP and INITIAL applies to all current releases of software unless noted:

- E/F.00.00 refers to the first software release of MPEV with disc caching. This release specifically supports the HP 3000 High Performance Series 39, 42, 48 and 68.

E/F.01.00 supports the Series 38/40/42/44/48, and 64/68. Both E.F.00.00 and E/F.01.00 will be designated as "E/F.00.00" in this manual since the functions described for each release are the same.

- G.00.00 is MPEV with tables expansion. This release supports the HP 3000 Series 39/40/42/48 and 64/68 computer systems.
- G.01.00 designates the software release supporting all HP 3000 computer systems, including the first-time release of the Series 37.

DEVICE DEFAULTS

DEFDATA.PUB.SYS is a table introduced in the G.01.00 software release that contains the device configurator defaults for SYSDUMP and INITIAL. This table eliminates the need to look up configurator information every time a device is added to the system. DEFDATA is loaded on the system during a cold load (UPDATE, COLDSTART, or RELOAD). The device defaults from DEFDATA that a user of SYSDUMP or INITIAL will see are listed in Table 7-0.

SYSDUMP/CONFIGURATOR DIALOGUE

One of two ways in which you may modify system parameters and tune the performance of the system is the SYSDUMP/Configurator dialogue, also called the Configurator. To start the dialogue, enter the :SYSDUMP command. MPE will respond by displaying a series of questions and statements, which you will use to modify as many, or as few, system parameters as you wish.

The content of the question indicates the type of answer required. To those questions requiring a simple affirmative or negative response, answer YES (or Y) or RETURN or NO (or N). Other questions which contain values followed by a question mark normally specify an existing parameter value, or the number of entries in use minimum (min) followed by the existing maximum (max). To keep the existing value, enter a RETURN. To change it, enter the new value. Always conclude your answer with a RETURN to transmit the information to MPE.

Configuring Your System

Refer to the discussion on the `:SYSDUMP` command in Section III before entering the following dialogue.

Begin the SYSDUMP dialogue by responding to the questions. The dialogue steps are numbered for convenience only — step numbers are not displayed on the screen. A YES response may also be entered as Y, y or yes. NO may also be entered as N, n or no. If you make a typing error, press the **(BREAK)** key, then enter `:ABORT`. This allows you to reenter `:SYSDUMP` and begin again.

Step No. Dialogue

1 ANY CHANGES?

To prepare for changes, enter YES. To omit changes and skip to Step 153, enter NO or **(RETURN)**.

2 SYSTEM ID = HP32033 G.01.00?

v is the current MPE version, *uu* is the present update-level number, and *ff* is the fix-level number. In the example dialogue, *v*=G, *uu*=01, and *ff*=00.

G.00.00 reports both the user-defined *v.uu.ff*, and the official base *v.uu.ff*, of the Hewlett-Packard version of the operating system software. The official base *v.uu.ff* is not modifiable by `:SYSDUMP`.

An example of the *v.uu.ff* for G.00.00 displayed by the `:SHOWME` command is:

```
:SHOWME
```

```
USER: #S1033,MGR.50PRM,SECT3      (NOT IN BREAK)
MPE VERSION: HP32033G.00.00.      (BASE G.00.00).
CURRENT: SAT, JUL 14, 1984, 2:52 PM
LOGON: SAT, JUL 14, 1984, 9:39 AM
CPU SECONDS: 968                  CONNECT MINUTES: 314
$STDIN LDEV: 50                  $STDLIST LDEV: 50
```

When making system software changes, or user-defined changes, a change to the *v.uu.ff* is recommended, and should be recorded in the system logbook. Your SE will provide instructions if it is necessary to change the *v.uu.ff*.

Otherwise, enter a **(RETURN)**.

3 MEMORY SIZE = XXXX?

G.01.00 MEMORY SIZE=<XXXX> (MIN=256, MAX=4096)?

XXXX denotes the present size of main memory. To indicate the size of main memory for the system for which MPE is being configured, enter one of the following values: 128, 160, 192, 224, 256, 384, 512, 768, 1024, 1280, 1536, 1792, 2048, or 4096. This indicates the memory size.

Series 64/68 will support 2 to 8 Mb. Series 44/48 will support 1 to 4 Mb. Series 39/40/42 will support 512 Kb to 3 Mb. Series 37 will support from 1/2 Mb to 2 Mb. Values allowed are 256, 512, and 1024 only.

NOTE

The series type (37/39/40/42/44/48/64/68) determines which of these memory sizes are available.

To retain the present memory size, enter a RETURN.

4 I/O CONFIGURATION CHANGES?

To prepare for addition or deletion or change of input/output devices, enter YES.

To maintain the same input/output device configuration and skip to Step 77, enter NO or RETURN.

5 LIST I/O DEVICES?

Enter YES for a list of I/O devices. A sample format is:

LOG DEV #	DRT #	U N	C H	T Y	SUB TYPE	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASSES
					TERMINAL TYPE SPEED					
					I A P					
					T N E					
1	25	0	0	0	9	128	0		HIOMDSC1	SYSDISC
2	26	0	0	3	8	128	0		HIOMDSC2	SPOOL

Enter NO to suppress this listing.

1

2

3

4

The headings denote the following:

LOG DEV #	Logical device number
DRT#	Hardware device address (Device Reference Table number)
UNIT	Hardware unit number of device on its controller
CHAN	Software channel number of device on its controller
TYPE	Device type
SUB TYPE	Device subtype
TERMINAL	Subtype
TYPE	Terminal type
SPEED	Terminal speed
REC WIDTH	Record width in decimal words
OUTPUT DEV	Device class name or logical device number of associated output devices
MODE	J = Accept jobs A = Accept data I = Interactive device D = Duplicative device S = Spooled device R = Auto reply (G.01.00)
DRIVER NAME	Driver name (Refer to Tables 7-1/7-16)
DEVICE CLASSES	General class(es) to which device belongs.

NOTE

The following prompt (Step 6) appears only if a communications interface (INP), is currently configured into the system.

6 LIST CS DEVICES?

To list the characteristics of all Communications Systems devices currently assigned to the system, enter YES. The format of the output is:

```
LDN PM PRT LCL TC RCV LCL CON MODE TRANSMIT TM BUFFER D DRIVER
      MOD  TMOUT TMOUT TMOUT      SPEED      SIZE C OPTIONS
```

If you have a switched device, such as those that are connected through a dial-up telephone line, you will receive the following additional output:

```
LDN CTRL PHONE NUMBER LIST LOCAL ID SEQUENCE
      LEN                      REMOTE ID SEQUENCE
```

To suppress this listing, enter NO.

The headings denote the following:

LDN	Logical device number
PM	Port Mask
PRT	Protocol
LCL MOD	Local mode
TC	Transmission code
RCV TMOUT	Receive timeout
LCL TMOUT	Local timeout
CON TMOUT	Connect timeout
MODE	0 = Dial out I = Manual answer A = Automatic answer D = Dual speed H = Half speed C = Speed changeable
TRANSMIT SPEED	Transmission speed (characters per second)
TM	Transmission mode
BUFFER SIZE	Default buffer capacity, in words
DC	Driver changeable or not changeable
DRIVER OPTION	Driver options
DEVICE CLASSES	Class name assigned to device
LDN	Logical device number
PHONE NUMBER LIST	A single telephone number - the default for the communications line
LOCAL ID SEQUENCE	The default identification of the local computer
REMOTE ID SEQUENCE	The default identification of the remote computer

6.1 LIST DEVICE DEFAULTS? Y or N?

G.01.00 The device defaults for SYSDUMP and INITIAL are contained in DEFDATA.PUB.SYS. Entering Y will print a list of the device defaults to the screen. Table 7-0, Device Defaults, contains a complete listing.

7 HIGHEST DRT=XX?

G.01.00 HIGHEST DRT=<XXX> (MIN=X, MAX=XXX)?

XX is a value denoting the present highest Device Reference Table (DRT) entry number that can be assigned to a device.

The highest DRT entry number that can be assigned to a device is 511. To change XX, enter the new value desired. The maximum DRT value offered is CPU-dependent.
CPU-dependent.

In the Series II/II, if the highest-numbered device in the configuration is a device that uses more than one DRT entry (such as a terminal controller with one or two data set controllers) be sure to enter the highest of the DRT numbers.

To maintain the current *XX*, enter a **RETURN**.

8

LOGICAL DEVICE #?

To specify a device to be added, changed or removed, enter the logical device number of that device.



For E/F.00.00, the maximum number of logical devices is 255.

For G.00.00 the maximum number of logical devices is 1024. However, a number in the range 1-999 must be entered. Remaining logical devices are used for spoolfiles if necessary.

If a zero (0) or a **RETURN** is entered, skip to Step 40..

8.1 DEVICE NAME?

G.01.00 Enter a device name (beginning with "HP" plus a product number) from the DEFDATA file to take advantage of default information. Enter **RETURN** to configure devices not included in DEFDATA or to delete a device.

9 DRT #?

G.01.00 DRT # = X?

INITIAL will supply this default only if the device is physically connected, turned on, and not already configured. If more than one device is available, INITIAL will offer the lowest DRT# available. IOMAP is used to find the default by polling the physically connected devices. The default DRT number will be displayed only for devices not already in the configuration. To delete a device and remove it from the configuration, enter 0 as the DRT entry number. The dialogue will skip back to Step 8.

To add a device, enter its Device Reference Table (DRT) entry number. In the case of all data communications devices, the DRT number you assign must be the logical device number of the associated INP, preceded by a pound sign (#). For example: #40.

NOTE

Each ADCC-connected terminal has its own DRT, and handles up to 8 terminals. If port 0 starts at DRT 8 (%10) then port 2 on that same ADCC would be DRT 10 (%12¹⁰) and port 7 would be DRT 15 (%17). The System Console¹⁰ must be configured as DRT 8, the lowest configurable DRT.

10 UNIT #?

G.01.00 UNIT = X?

This default value will be offered only if the DRT default value was supplied (G.01.00). Enter the physical hardware unit number of the device, if the device shares its controller with other devices. If the device does not share its controller with other devices, enter 0 to continue.

NOTE

All ADCC-connected terminals must be configured as UNIT 0.

If you are configuring a data communications subsystem, refer to the Data Communications Handbook (5957-4634) for unit numbers. Note that for MTS multipoint terminals, unit numbers identify the terminal by group ID and device ID. The numbering scheme is explained in the MTS Reference Manual (32193-90002). For MRJE, you must specify unit numbers for pseudo devices.

11 SOFTWARE CHANNEL #?

■ G.01.00 SOFTWARE CHANNEL# = X?

If the device is to be on a multicontroller channel, enter channel number; if not, enter 0.

Enter 0 for all data communications devices and pseudo devices.

12 TYPE?

■ G.01.00 TYPE = X?

Enter the device type. Use one of the decimal numbers listed below:

- 0 = Moving-Head Disc (7906, 7920, 7925)
- 2 = Flexible Disc (7902, 9896)
- 3 = 7911; 7912; 7914; 7933; 7935; 7945; 9140; 9144
- 7 = Foreign Disc
- 8 = Card Reader
- 16 = Terminals, DS pseudo terminals, multipoint terminals, multipoint supervisor, asynchronous terminal controller (Series II/III only).
- 17 = Intelligent Network Processor (INP)
- 22 = MRJE, Pseudo Device
- 24 = Magnetic Tape
- 31 = Serial Disc
- 32 = Line Printer
- 41 = DS Communications Driver

13 SUB TYPE?

■ G.01.00 SUB TYPE = X?

Enter the device subtype in the range 0 to 15.

■ Refer to Tables 7-1/7-16 at the end of this section for the subtype information.

NOTE

If you are configuring a terminal or printer (type 16 or 32), the dialogue continues to Step 14. If you are configuring an INP (type 17), the dialogue skips to Step 19. For all other device types, the dialogue skips to Step 30.

14 TERM TYPE?

(E/F.00.00) ENTER [TERM TYPE#], [DESCRIPTOR FILENAME]?

(G.00.00) To specify a default terminal type to be used at log on, enter one of the terminal type number in Table 7-3.

For DS pseudo terminals, refer to the Data Communications Handbook (5957-4634) for terminal types.

ENTER [TERM TYPE#], [DESCRIPTOR FILENAME] =
(CXX, TTPCL_{nn}.PUB.SYS)?

This question is asked only if device type is 16 or 32 (subtypes 14 and 15).



The possible responses are:

- A **RETURN** to specify no terminal type number.
- Enter a terminal type number from Table 7-3.
- Enter a descriptor file name and no terminal type number.
- Enter a terminal type number and descriptor file name. In this case, the terminal type number is used only in the event that the descriptor file cannot be found. For additional information on descriptor file names and creating a user-defined file, refer to the Workstation Configurator Reference Manual (30239-90001).

NOTE

For DS pseudo terminals, or if the terminal type is not known, enter a **RETURN**. Terminal types 19 through 22 are intended for use only with devices configured as Device Type 32.

15 SPEED IN CHARACTERS PER SECOND?

G.01.00 SPEED IN CHARACTERS PER SECOND =XXX?

This question is asked only if device type is 16 or 32. Specify zero or a **RETURN** for all DS pseudo terminals, the multipoint supervisor, and MTS multipoint terminals. For other terminals, to specify the terminal speed in characters per second, enter 10, 14, 15, 30, 60, 120, 240, 480, or 960. For ATP, you can also enter 1920. (A numeric response is required for subtypes 4-5).

Otherwise, enter 0 or a **RETURN** to cause speed sensing at log on.

The dialogue skips to Step 30 if you are not configuring a communication device.

16 RECEIVE TIMEOUT?

A value from 0 to 32,767. Default is 20 seconds. Entering 0 disables the timeout feature. Enter the positive number of seconds the communications software will wait to receive text before terminating the read mode.

A batch job terminates if a timeout occurs. In a session, Receive Timeout is disabled.

NOTE

For all timeout responses (Steps 19, 20 and 21), the subsystem displays an error when the communications software (CS) disconnects because of a timeout.

17 LOCAL TIMEOUT?

A value from 0 to 32,767. Default is 60 seconds. Entering 0 disables the timeout feature. Enter the positive number of seconds a connected local station will wait to transmit or receive before disconnecting.

The local timeout feature notes the time between requests to the communications interface.

The local timeout feature is disabled in a session.

18 CONNECT TIMEOUT?

A value from 0 to 32,767. Default is 900 seconds. Entering 0 disables the timeout feature. Enter the positive number of seconds the local station will wait after one attempt to make a connection to a remote station.

A connect timeout occurs if the "data terminal ready" signal fails to indicate line connection within the specified time.

NOTE

Steps 19 through 21 apply only to CS devices with switched lines connected through a modem (dial telephones, subtype 0). For CS devices with nonswitched lines connected through a modem (private lines, subtype 1), the dialogue skips to Step 22. If the CS device is hardwired (subtype 0), the dialogue skips to Step 27.

19 DIAL FACILITY?

Enter YES calls can be dialed from the local station. Enter NO when they cannot.

20 ANSWER FACILITY?

Enter YES if the modem can answer calls, either manually or automatically. Enter NO if it cannot. A NO response causes the next step to be skipped.

21 AUTOMATIC ANSWER?

Enter YES if the local modem can automatically answer calls. Enter NO if manual answering is required.

22 DUAL SPEED?

Enter YES if the local modem is dual speed (European modem). Enter NO if it is single speed. A NO response causes the next step to be skipped.

23 HALF SPEED?

Enter YES if the local modem is to operate at half speed. Enter NO if it is to operate at full speed.

The dialogue skips to Step 25.

24 SPEED CHANGEABLE?

Enter YES if the speed of the line is changeable. Enter NO if the line speed is fixed. You must respond YES if the line is hardwired and users will specify the transmission speed (that is, override the configured transmission speed).

25 TRANSMISSION SPEED?

For the Intelligent Network Processor, enter the speed in characters per second (150, 300, 600, 1200, 2400, 3600, 4800, or 7000).

The transmission speed you specify is ignored for modems that provide internal clocking signals. This allows modems of different speeds to be used without reconfiguring the operating system.

The speed you specify becomes the system default. For DS and MTS, the System Operator can override the default by including the speed parameter in the :DSCONTROL console command.

26 TRANSMISSION MODE?

Enter the appropriate number for the transmission mode in use.

0 = Full duplex (i.e. constant carrier)
1 = Half duplex (i.e. switched carrier)

Configure an INP for Full Duplex (0) if your facility uses one of the following:

- A leased line with four wire point-to-point installation.
- A dial network with two lines (four wire equivalent).
- A dial network with Wide Band Service.

Configure an INP for Half Duplex (1) if your facility uses one of the following:

- A leased line four wire multidrop installation.
- A dial network with a single-line (two wire) installation.
- An HP Data Link.
- A hardwired INP to INP.

Your response must agree with the remote system's configuration and with the characteristics of the communication line.

Configuring Your System

27 PREFERRED BUFFER SIZE?

Enter the desired buffer size in words, up to a maximum of 1024 for an INP. Large buffer sizes can increase transmission efficiency depending on the error rate of the line, but use up memory space. Match buffer sizes whenever possible, because the effective buffer size that can be used is the smaller of the two buffer sizes between sender and receiver.

For MTS subsystems, your response must correspond to the strapped buffer size on the Multipoint Communications Printed Circuit Assemblies in the multipoint terminals.

28 DRIVER CHANGEABLE?

Enter NO.

29 DRIVER OPTIONS?

Enter 0.

30 RECORD WIDTH?

■ G.01.00 RECORD WIDTH = XX?

Enter the record width (in decimal words) for the device. Default widths are referenced in Tables 7-1/7-16. Disc device defaults should be used. However, for other devices, any record width up to the maximum may be specified for your configuration.

31 OUTPUT DEVICE?

■ G.01.00 OUTPUT DEVICE = 0?

If the device is ever used as a job or session input device, enter the class name or logical device number to be used for the corresponding default job/session listing device. There are advantages in using class names under certain circumstances. Suppose there are two line printers and two card readers in the system. Both line printers are in class LP. You may configure the output device for both card readers as LP. In this way, either card reader can acquire either one of the line printers dynamically (provided at least one line printer is unallocated or spooled) at run time.

If this device is not a job/session input device, enter 0.

32 ACCEPT JOBS/SESSIONS?

■ G.01.00 ACCEPT JOBS/SESSIONS=Y or N?

To specify that this device can accept a job or session input stream (J in I/O list), enter YES. Otherwise, enter NO. Note that disc devices should not be job accepting.

33 ACCEPT DATA?

G.01.00 ACCEPT DATA = Y or N?

To specify that this device can accept data external to a job or session input stream (A in I/O list), enter YES. Otherwise, enter NO or RETURN. Note that disc devices should not be data accepting.

34 INTERACTIVE?

G.01.00 INTERACTIVE=Y or N?

To specify that this is an interactive device (I), enter YES. Otherwise, enter NO. Note that disc devices should not be interactive.

35 DUPLICATIVE?

G.01.00 DUPLICATIVE=Y or N?

To specify that this is a duplicative device (D in I/O list), enter YES. Otherwise, enter NO. Note that disc devices should not be duplicative.

36 INITIALLY SPOOLED?

G.01.00 INITIALLY SPOOLED = Y or N?

To designate this device as being spooled at cold load (S in I/O list), enter YES. Otherwise, enter NO or RETURN; the dialogue will proceed to Step 38.

37 INPUT OR OUTPUT?

This question is asked only if the device is initially spooled and the device is an input/output device, such as a card reader/punch. Enter IN or OUT. If using device defaults, this question is only asked if the device was not initially spooled, but the default was overridden with a "Y" response.

37.1 AUTO REPLY=Y or N?

G.01.00 To designate this device as automatically allocatable (R in I/O list) enter YES. Otherwise, enter NO. Note that a YES reply will be ignored for a device other than a tape drive or serial disc.

Configuring Your System

38 DRIVER NAME?

G.01.00 DRIVER NAME=*name*?

Enter the name of the program file containing the driver for this device (Tables 7-1/7-16). For drivers written and supplied by the user, this name must contain from one to eight alphanumeric characters, beginning with an alphabetic character. If the driver name is preceded by an asterisk (*), the driver will reside permanently in main memory (which is not necessary for normal MPE operation).

NOTE

Steps 39 through 42 apply to CS devices with switched lines (device type 17, subtype 0). The dialogue for all other devices skips to Step 43.

39 PHONE LIST?

You can supply one number (usually a frequently dialed number) which will be the system default. Note that MRJE does not use this number. Instead, it uses the number configured in the MRJE configuration file.

Enter YES to provide a default phone number. Enter NO if none is to be provided. A NO response causes the next step to be skipped.

40 PHONE NUMBER?

Enter a string of no more than 30 characters, (which can include hyphens and blanks) to cause delays for dial tones.

41 LOCAL ID SEQUENCE?

Only DS recognizes local ID sequences.

The default local ID sequence can be specified in terms of a code or a number system. Enter a RETURN for a null local ID sequence. Enter the letter A, followed by the ID sequence in quotes.

Do not enter more than 16 characters for the local or remote ID sequence.

42 REMOTE ID SEQUENCE?

Only DS recognizes remote ID sequences.

Enter the default remote ID sequence in the same format as the local ID sequence (above). This can be repeated until a RETURN is entered.

43 DEVICE CLASSES?

G.01.00 DEVICE CLASSES = *class*?

Enter a list containing a device class name (*devclass*) (up to eight alphanumeric characters, beginning with an alphabetic character). Device class names are separated from each other by commas. These names are left to the discretion of the System Supervisor. They will be used in certain file commands or intrinsics when any member of a group of devices, rather than a specific device, can be referenced. No name need be entered.

A device can belong to more than one class, such as DISC and FHDISC. Only the classes DISC and SPOOL (if spooling is desired) are specifically required by MPE. DISC is the default device class for building files. SPOOL is the device class for designating "spooling discs." Spool files will only be allocated on discs which are included in the special device class SPOOL. User files also may reside on spooling discs.

JOBTAPE is usually included as a device class if the streaming facility is used.

The class DDUMP must be specified on the serial device to be used for doing memory dumps.

LP is assigned to the system line printer.

PP is one of several classes commonly associated with the HP2680 Laser Printer.

The following classes must also be included if the User Logging Facility will be used with devices in a class other than DISC:

TAPE must refer to devices in a magnetic tape class.

SDISC or CTAPE must refer to devices in a serial disc class.

1

2

3

4

If Step 44 is not necessary, control returns to Step 8.

44 IS *devclass* A SERIAL DISC CLASS?

This question is asked for each class being implicitly created by this logical device change, if the device being configured is a supported serial disc device, and *devclass* is not the name of an existing device class.

Enter YES or NO or RETURN.

Note that the response to this question must be NO for all classes of system and private volume discs.

If the answer is YES, control returns to Step 8.

G.01.00 IS CTAPE A SERIAL DISC CLASS? YES

IS SDISC A SERIAL DISC? YES

IS DDUMP A SERIAL DISC CLASS? YES

NOTE

These questions only occur if the serial disc class has not been previously configured.

45 IS *devclass* A FOREIGN DISC CLASS?

This question is asked for each class being implicitly created by this logical device change, if the device being configured is a supported serial disc device, and *devclass* is not the name of an existing device class.

Answer YES or NO

Note that a YES response is appropriate only if the class is NOT a serial disc class.

This question will be asked only if Question 44 was answered NO. Control returns to Step 8.

46 MAX # OF OPENED SPOOLFILES = XXX?

G.01.00 MAX # OF OPENED SPOOLFILES = XXX? (MIN = 0, MAX = XXX)?

To change the maximum number of input and output spool files which can be opened at one time, enter the new limit. To retain the current value, enter a RETURN. This can be used to control the generation of output spool files.

Configuring Your System

The highest number you can specify as a maximum is dependent upon the number of logical devices on your system. The formula for determining this maximum number of spool files is:

$$\frac{16244 - (\text{number of logical devices} \times 4)}{30}$$

NOTE

Each concurrent batch job to be executed requires at least two spool files - one for standard input and one for standard output. Thus, if you specify a maximum of 20 spool files in response to the above prompt, the system is restricted to running ten concurrent jobs, assuming no sessions have opened spool files..

1

2

3

4

Configuring Your System

47 LIST I/O DEVICES?

To print a listing of the new input/output device configuration, enter YES. This list appears in the format described in Step 5.

To suppress the list, enter NO.

NOTE

The prompt in Step 48 below, appears only if you have configured a CS device into the system.

48 LIST CS DEVICES?

Enter YES to list the characteristics of the new CS device configuration. Enter NO to suppress the listing. On MPE V/P systems, the dialogue will now skip to Step 57.

49 TERMINAL TYPE CHANGES?

G.00.00 Enter YES to make changes to terminal type files. Otherwise, enter a RETURN to skip to Step 57.

50 LIST TERMINAL TYPE FILES?

G.00.00 Enter YES to list terminal type files. Otherwise enter a RETURN or NO to continue.

51 DELETE TERMINAL TYPE FILES?

G.00.00 Enter YES to delete terminal type files. Otherwise enter a RETURN to skip to Step 53.

52 FILES?

G.00.00 Enter file name to be deleted. This prompt repeats until a RETURN is entered.

53 ADD TERMINAL TYPE FILES?

G.00.00 Enter YES to add terminal type files. Otherwise, enter a RETURN to skip to Step 56.

54 FILE NAME?

G.00.00 Enter terminal type file name to be added.

55 LOGICAL DEVICE #'S?

G.00.00 Enter logical device number of terminal. Steps 54 and 55 repeat until just a RETURN is entered.

56 LIST TERMINAL TYPE FILES?

G.00.00 Enter YES to list terminal type files. Otherwise enter a RETURN to continue.

57 CLASS CHANGES?

If you plan to add, delete, or change device class specifications, enter YES and continue at Step 58. Otherwise, enter NO.

All device classes are checked for validity. If there are no errors, the dialogue skips to Step 69. Otherwise, it returns to Step 4.

58 LIST CLASSES?

To list the device classes and the logical devices contained in them, enter YES. Enter NO to suppress the listing.

The format of the listing is:

CLASS NAME	ACCESS TYPE	LOGICAL DEVICES
---------------	----------------	--------------------

Where:

CLASS NAME shows the classes specified in the I/O configuration.

ACCESS TYPE is in the form:

IN - serial input (device types 8-15)
 OUT - serial output (device types 32-39)
 DA - direct access (device types 0-7)
 FD - foreign disc (device types 0, 2, 3)
 SD - serial disc (device types 0, 2, 3)
 I/O,C - input/output, concurrent devices (device types 16-23)
 I/O,NC - input/output, nonconcurrent devices (device types 24-31)

LOGICAL DEVICES are the logical device numbers of all devices specified for this class in the I/O configuration.

59 DELETE CLASSES?

To delete previously defined classes, enter YES. Otherwise, enter NO to skip to Step 61.

60 CLASSES?

Enter names, separated by commas, of classes to be deleted.

61 ADD CLASSES?

To define new classes or to add devices to previously defined classes, enter YES. To skip to Step 68, enter NO.

Configuring Your System

62 CLASS NAME?

To define a new class or to add devices to a previously defined class, enter class name.

To skip to Step 68, enter a RETURN.

63 LOGICAL DEVICE #'S?

Enter logical device numbers, separated by commas, in the preferred order of allocation.

If it is not necessary to ask Question 64 or 66 the dialogue returns to Step 62.

64 IN, OUT, OR IN/OUT?

Depending upon the types of the devices within the class, this question is asked to determine the desired device class access type. Enter one of the following:

IN (Used primarily for card readers and some MRJE devices)
OUT (Generally used for printers)
IN/OUT (Only used for Series II/III card reader punches)

If your response to this question was IN/OUT, then you are asked an additional question:

65 CONCURRENT OR NON-CONCURRENT?

Are all the devices in the class capable of concurrent IN/OUT? If so, enter C. Otherwise, enter NC.

If it is not necessary to ask Question 66, the dialogue returns to Step 63.

66 SERIAL DISC CLASS?

This question is asked if all devices in the class are supported serial disc devices.

Enter YES if the class name is to be used exclusively for access of serial disc devices.

Enter NO for all other device classes.

NOTE

It is possible to configure a disc drive into two classes, one of which is a serial disc class and the other which is not, thus giving the drive the potential for use in either class.

The dialogue returns to Step 63 if the answer is YES.

67 FOREIGN DISC CLASS?

This question is asked if the class is a serial disc class.

Enter YES if the *devclass* is to be used exclusively for access of foreign discs.

Enter NO if the *devclass* is not foreign disc.

68 LIST CLASSES?

To list the device classes and logical devices contained therein, enter YES.

To suppress the listing, enter NO.

If there are any errors in classes the dialogue returns to Step 4.

69 LIST I/O DEVICES?

To print a listing of the new I/O configuration, enter YES.

To suppress the listing, enter NO.

NOTE

The prompts in Steps 70 through 76, appear only if a CS device is configured or if additional drivers exist (for the CS driver changeable option). If neither case exists, the dialogue returns to Step 4.

70 ADDITIONAL DRIVER CHANGES?

To prepare for additional driver changes, enter YES.

If no additional driver changes are required, enter NO. If NO is entered, dialogue returns to Step 4.

NOTE

The prompts in Steps 72 through 74, below, appear only if additional drivers are already configured; otherwise, the dialogue skips to Step 73.

71 LIST ADDITIONAL DRIVERS?

To print a listing showing the presently configured additional drivers, enter YES.

To suppress this listing, enter NO.

Configuring Your System

72 DELETE DRIVERS?

To delete an existing additional driver, enter YES.

To skip to Step 75, enter NO.

73 DRIVER NAME?

Enter the name of the driver to be deleted. This prompt is repeated until you enter a RETURN, or until all drivers are deleted.

74 ADD DRIVERS?

To prepare for adding drivers, enter YES.

To skip to Step 77, enter NO.

75 DRIVER NAME?

Enter the name of the driver to be added. This prompt is repeated until you enter a RETURN, or until the maximum of 32 drivers have been added.

76 LIST ADDITIONAL DRIVERS

To print a listing showing the presently configured additional drivers, enter YES.

To suppress this listing, enter NO.

Dialogue returns to Step 4.

77 SYSTEM TABLE CHANGES?

To prepare for changing the CST, DST, PCB, IOQ, or MTAB, or other parameters relating to memory usage, enter YES. To bypass these changes, and proceed to Step 97, enter NO.

78 CST = XXX?

G.01.00 CST=<XXX> (MIN=80, MAX=2048)?

To change the size of the sharable portion of the Code Segment Table from XXX entries to another value, enter the new value.

To retain the current value, enter a RETURN.

79 EXTENDED CST = XXXX?

G.01.00 EXTENDED CST = <XXXX> (MIN=16, MAX=8191)?

To change the size of the program portion of the CST from XXXX entries to another value, enter the new value.

To retain the current value, enter a RETURN.

80 DST = XXXX?

G.01.00 DST = <XXXX> (MIN=70, MAX=4096)?

To change the size of the DST from XXXX entries to another value, enter the new value.

To retain the current value, enter a RETURN.

81 PCB = XXX?

G.01.00 PCB = <XXX> (MIN=12, MAX=1024)?

To change the size of the PCB table from XXX entries to another value, enter the new value.

To retain the current value, enter a RETURN.

82 I/O QUEUE = XXX?

G.01.00 I/O QUEUE = <XXX> (MIN=20, MAX=1300)?

To change the number of the input/output queue entries permitted from XXX entries to another value, enter the new value.

To retain the current value, enter a RETURN.

83 DISC REQUEST TABLE = XXX?

G.01.00 DISC REQUEST QUEUE = <XXX> (MIN=20, MAX=900)?

To change the size of the disc request table from XXX to another value, enter the new value.

To retain the current value, enter a RETURN.

84 TERMINAL BUFFERS PER PORT = XXX?

G.01.00 TERMINAL BUFFERS PER PORT = <XX> (MIN=1, MAX=99)?

To change the number of terminal buffers per port in the system from XXX, enter the new value.

To retain the current value, enter a **RETURN**.

NOTE

Terminal buffers are shared among all terminals. Entering a number for terminal buffers "per port" will not necessarily limit a given terminal to that number of buffers.

85 SYSTEM BUFFERS = XXX?

■ G.01.00 SYSTEM BUFFERS = <XXX> (MIN=8, MAX=253)?

To change the number of system buffers in the system, from *XXX* to another value, enter the new value. To retain the current value, enter a **RETURN**.

86 SWAP TABLE = XXX?

■ G.01.00 SWAP TABLE = <XXX> (MIN=128, MAX=5400)?

To change the size of the swap table from *XXX* to another value, enter the new value. To retain the current value, enter a **RETURN**.

87 PRIMARY MESSAGE TABLE = XXX?

■ G.01.00 PRIMARY MESSAGE TABLE = <XXX> (MIN=10, MAX=1023)?

To change the size of the primary message table from *XXX* to another value, enter the new value. To retain the current value, enter a **RETURN**. You should have at least as many primary message table entries as system buffers.

88 SECONDARY MESSAGE TABLE = XXX?

■ G.01.00 SECONDARY MESSAGE TABLE = <XXX> (MIN=10, MAX=1023)?

To change the size of the secondary message table from *XXX* to another value, enter the new value. To retain the current value, enter a **RETURN**.

89 SPECIAL REQUEST TABLE = XXX?

■ G.01.00 SPECIAL REQUEST TABLE = <XXX> (MIN=10, MAX=2048)?

To change the size of the special request table from *XXX* to another value, enter the new value. To retain the current value, enter a **RETURN**.

90 ICS = XXXX?

G.01.00 ICS = <XXXX> (MIN=256, MAX=4096)?

To change the number of words in the interrupt control stack (ICS), enter the new value. To retain the current value, enter a RETURN.

91 LOADER SEGMENT TABLE = XXXXX?

G.01.00 LOADER SEGMENT TABLE = <XXXXX> (MIN=2048, MAX=32760)?

To change the number of words in the Loader Segment Table, enter the new value. To retain the current value, enter a RETURN.

92 UCOP REQUEST QUEUE = XXX?

G.01.00 UCOP REQUEST TABLE = <XXX> (MIN=1, MAX=1024)?

To change the number of entries allowed in the user controller process request queue to another value, enter the new value. To retain the current value, enter a RETURN.

93 TIMER REQUEST LIST = XXX?

G.01.00 TIMER REQUEST LIST = <XXX> (MIN=6, MAX=1023)?

To change the maximum number of concurrent time-out requests for the system clock allowed, enter the new value. To retain the current value, enter a RETURN.

94 BREAKPOINT TABLE = XXX?

G.01.00 BREAKPOINT TABLE = <XXX> (MIN=1, MAX=1024)?

To change the size of the breakpoint table from XXX entries, enter the new value. To retain the current value, enter a RETURN.

95 MAX NUMBER OF USER LOGGING PROCESSES = XXX?

G.01.00 MAX NUMBER OF USER LOGGING PROCESSES = <XX> (MIN=1, MAX=64)?

To change the maximum number of processes allowed on the system, enter the new value. To retain the current value, enter a RETURN.

Configuring Your System

96 MAX NUMBER OF USERS PER LOGGING PROCESS = XXX?

G.01.00 MAX NUMBER OF USERS PER LOGGING PROCESS = <XXX> (MIN=1, MAX=256)?

To change the maximum number of users per process, enter the new value. To retain the current value, enter a RETURN.

97 MISC CONFIGURATION CHANGES?

To prepare for the following miscellaneous configuration changes, enter YES.

- Listing and (optionally) deleting global resource identification numbers (RINs) assigned to users.
- Number of RINs available in the RIN pool.
- Maximum number of global RINs available.
- Number of seconds allowed for logging on.
- Maximum number of jobs allowed on the system.
- Maximum number of concurrent sessions allowed in execution.
- Default central processor time limit for jobs.
- Message catalog changes.

To bypass these changes and proceed to Step 112, enter RETURN.

98 LIST GLOBAL RIN?

To list the currently assigned global resource identification numbers (RINs), enter YES. To suppress this listing, enter NO.

The listing consists of the RIN number and the name of the user and account to which it is assigned (for each RIN).

99 DELETE GLOBAL RIN? (RELOAD option only.)

To prepare for deleting any of the currently assigned global RINs, enter YES. To bypass deletion and skip to Step 102, enter NO.

100 ENTER RIN NUMBER?

To delete a currently assigned global RIN, enter the RIN number.

This step is repeated until a RETURN is entered.

NOTE

Since global RINs are permanently assigned to users and the RIN numbers will be hard-coded into their programs, RINs should be deleted with caution.

For this same reason, the most up-to-date RIN table (which resides on disc) is used when the system is cold-loaded, except in the case of a RELOAD. This implies that any changes to the RIN table occurring during a :SYSDUMP operation, including changes to the size of the table, only take effect when the tape produced by the :SYSDUMP is cold loaded using the RELOAD option.

101 LIST GLOBAL RINS?

To list the updated global RINs (as in Step 98), enter YES.

To suppress the listing, enter NO.

102 # OF RINS MIN = YYY, MAX = XXXX?

G.01.00 # OF RINS = <YY> (MIN=XX, MAX=1024, USED=XX)?

To change the number of RINs available in the RIN pool, enter a new value for XXXX. This value must be at least as great as YYY. (YYY is the maximum of 5 and the highest currently assigned global RIN number).

To maintain the current maximum, enter a RETURN.

103 # OF GLOBAL RINS USED = YYY, MAX = XXXX ?

G.01.00 # OF GLOBAL RINS = <YYY> (MIN=XX, MAX=1024, USED=XX)?

To change the maximum number of global RINs available, enter a new value for XXX. Because of the current assignment of global RIN numbers, this must be at least as great as YYY.

To maintain the current value, enter a RETURN.

104 # OF SECONDS TO LOG ON = XXX?

G.01.00 # OF SECONDS TO LOG ON = <XXX> (MIN=10, MAX=600)?

To change the number of seconds allowed for logging on, enter the new value.

To retain the current value, enter a RETURN.

Configuring Your System

105 MAX # OF CONCURRENT RUNNING SESSIONS = XXXX?

■ G.01.00 MAX # OF CONCURRENT RUNNING SESSIONS = <XXX> (MIN=1, MAX=500)?

To change the maximum number of sessions allowed in execution at one time, enter the new value.

To retain the current value, enter a RETURN.

106 MAXIMUM # OF CONCURRENT RUNNING JOBS = XXX?

■ G.01.00 MAX # OF CONCURRENT RUNNING JOBS = <XXX> (MIN=1, MAX=500)?

To change the maximum number of jobs allowed in execution at one time, enter the new value.

To retain the current value, enter a RETURN.

107 DEFAULT JOB CPU TIME LIMIT =XXXXX?

■ G.01.00 DEFAULT JOB CPU TIME LIMIT = <XXXXX> (MIN=0, MAX=32767)?

To change the value, enter the new value in seconds. A zero implies that jobs are limited; sessions are limited only if the user supplies a limit on the :HELLO command.

To retain the current value, enter a RETURN.

108 MESSAGE CATALOG CHANGES?

To create a new message catalog from a user-supplied file, enter YES.

To skip to Step 110, enter NO or a RETURN.

109 CATALOG INPUT FILE NAME?

Name of disc file or formal designator to define the input file from which new catalog is to be built.

110 SOFTDUMP COMMAND CHANGES?

To make changes, enter YES. For no changes, enter NO dialogue. Skips to Step 112.

111 SOFTDUMP COMMAND FILE NAME?

Enter file name.

Dialogue will respond with: NEW COMMAND FILE CREATED



112 LOGGING CHANGES?

To prepare for changes to the logging characteristics of the system, enter YES.

To bypass such changes and proceed to Step 119, enter NO.

113 LIST LOGGING STATUS?

To print a list of the events that can be logged and whether or not they are currently being logged, enter YES.

To suppress the listing, enter NO.

114 STATUS CHANGES?

To prepare for changes to the logging status, enter YES. If no changes are desired, enter NO to skip to Step 117.

115 ENTER TYPE, ON/OFF?

You should enter the type number of the event (defined below), a comma (,), and either ON to signify that it is to be logged, or OFF to state that it is not.

The following events may be logged:

Type No.	Event
1	Logging enabled
2	Job initiation
3	Job termination
4	Process termination
5	File close
6	System shutdown
7	Power failure
8	Spooling log record
9	Line disconnection
10	Line close
11	I/O error
12	Physical mount/dismount log record
13	Logical mount/dismount log record
14	Tape labels log record
15	Console log record
16	Program file event
17	Call process signals
18	DCE provided information

NOTE

For software release G.00.00, event 1 must be ON for any logging to take place. Turning event 1 OFF will disable all types except 11. If event 2 is on and logging is enabled, the default input priority for jobs and sessions is 8; if event 8 is on and logging is enabled, the default output priority is 8. The normal default is 8 for both input and output priorities. Event 11 will always be enabled. Requests to disable this type will be ignored.

Step 115 is repeated until a RETURN is entered.

116 LIST LOGGING STATUS?

To list the updated logging status, respond with YES. To suppress the listing, enter NO.

117 LOG FILE RECORD SIZE (SECTORS) = XX?

G.01.00 LOG FILE RECORD SIZE(SECTORS) = <X> (MIN=1, MAX=8)?

To change the value of the log file physical record size, enter the number of sectors desired. This number determines the size of the buffer for entries in the log file. (A sector is equal to 128 words.)

To retain the current value, respond with a RETURN.

118 LOG FILE SIZE (RECORDS) = XXXX?

G.01.00 LOG FILE SIZE(RECORDS) = <XXXX> (MIN=16, MAX=32767)?

To change the maximum number of physical records permitted in the log file, enter a new value. The log file has 16 extents, so each extent will contain:

$[(\text{log file size}/16) * (\text{log file record size})] - \text{sectors of disc space.}$

To retain the present value, enter a RETURN.

119 DISC ALLOCATION CHANGES?

To prepare for disc allocation changes, enter YES.

To bypass such changes and proceed to Step 128, enter NO.

120 DIRECTORY USED = YYYY, MIN = ZZZZ, MAX = XXXX?

G.01.00 MAX DIRECTORY SIZE (SECTORS) = XXXX (MIN=5700, MAX=65000, USED=XXXX)?

Configuring Your System

To change the maximum size of the directory from *XXXX* sectors, enter the new value; *YYYY* specifies the amount of directory currently used; *ZZZZ* specifies the minimum value to which *XXXX* can be set. (*ZZZZ* will often be greater than *YYYY* due to unused areas that are not at the end of the space allotted to the directory.) Maximum size cannot exceed 65,000 sectors.

To retain the present maximum size, enter a RETURN.

121

LIST VOLUME TABLE?

To list the disc volumes and their currently-assigned logical device numbers, enter YES.

The listing is printed in the following format:

VOLUME#	NAME	LOG DEV#
<i>volnumber</i>	<i>volname</i>	<i>ldev</i>
.	.	.
.	.	.
.	.	.

In this listing, *volname* is a name of up to eight alphanumeric characters, beginning with an alphabet, identifying the volume; *ldev* is the logical device number assigned to that volume.

To suppress this listing, enter NO.

NOTE

Volume table changes take effect during RELOAD only.

122 DELETE VOLUME?

To prepare to delete a volume, enter YES. To bypass deletion and skip to Step 124, enter NO.

123 ENTER VOLUME NAME?

To delete a volume, enter the volume name. (When the name is entered, the question is repeated.) Otherwise, enter RETURN.

124 ADD VOLUME?

To prepare to add a volume, enter YES. To bypass addition and skip to Step 126, enter NO.

125 ENTER VOLUME NAME

To add a volume, enter the volume name. (When the name is entered, the question is repeated.) Otherwise, enter RETURN.

126 LIST VOLUME TABLE?

To list the disc volumes and their currently assigned logical device numbers (as in Step 121), enter YES. In this listing, volumes just added (Step 124) will have logical device numbers of zero. To suppress this listing, enter NO.

127 VIRTUAL MEMORY CHANGES?

To change the allocation of disc space used for virtual memory, enter YES. To retain the current allocation, enter RETURN. Dialogue skips to Step 131.

Virtual memory allocation for LDEV 1 (the system disc) can be changed only during RELOAD or a SYSDUMP. Allocation for other discs can also be changed during COOLSTART, COLDSTART or UPDATE.

128 LIST VIRTUAL MEMORY ALLOCATION?

G.01.00 LIST VIRTUAL MEMORY DEVICE ALLOCATION?

To list the disc volume, logical device number, and virtual memory allocation, enter YES. To suppress listing, enter a RETURN. The listing is printed in the following format:

VOLUME NAME	LDEV#	VM ALLOCATION
MH7920U0	1	10

129 ENTER VOLUME, SIZE IN KILOSECTORS?

Enter volume name or logical device number, a comma (,), and the size (in kilosectors).

CAUTION

You must configure at least 1 kilosector of virtual memory on logical device 1.

130 VIRTUAL MEMORY CHANGES?

Enter a YES to loop back to Step 128. Enter a RETURN to continue dialogue.

131 MAX# OF SPOOLFILES KILOSECTORS=XXXXX?

G.01.00 MAX # OF SPOOLFILE KILOSECTORS = <XXX> (MIN=0, MAX=77777)?

To change to maximum number of sectors (expressed in thousands of sectors) which can be allocated to spool files, enter new value.

To retain the current limit, enter a RETURN.

132 # OF SECTORS PER SPOOLFILE EXTENT = XXXXX?

G.01.00 # OF SECTORS PER SPOOLFILE EXTENT = <XXXXX> (MIN=128, MAX=32764)?

Enter the size, in sectors, for each spool file extent. This must be a value between 128 and 32,767.

133 SCHEDULING CHANGES?

This heading preserved to eliminate the need to alter batch job headings.

Subheading reserved for future use.

NOTE

Scheduling changes are accomplished only by use of the :TUNE command.

134 SEGMENT LIMIT CHANGES?

To prepare for changing the limits on code and data segments, enter YES.

To retain the current limits and skip to Step 142, enter NO.

135 MAX # OF CONCURRENT RUNNING PROGRAMS=XXX?

■ G.01.00 MAX # OF CONCURRENT RUNNING PROGRAMS = <XXX> (MIN=1, MAX=511)?

This parameter is often referred to as "CST Block Table." To change the maximum number of concurrently running programs from *XXX*, enter the new value.

To retain the current value, enter a RETURN.

136 MAX CODE SEGMENT SIZE=XXXXX?

■ G.01.00 MAX CODE SEGMENT SIZE = <XXXXX> (MIN=1024, MAX=16384)?

To change the maximum number of words allowed in any code segment from *XXXXX*, enter the new value.

To retain the current value, enter a RETURN.

137 MAX # OF SEGMENTS/PROCESS = XX?

G.01.00 MAX # OF SEGMENTS/PROCESS = <XX> (MIN=1, MAX=255)?

To change the maximum number of code segments allowed any user process, enter the new value.

To retain the current value, enter NO.

138 MAX STACK SIZE = XXXXX?

G.01.00 MAX STACK SIZE = <XXXXX> (MIN=256, MAX=31232)?

To change the maximum number of words allowed in any user stack from XXXXX, enter the new value. (A maximum value of 31,232 is permitted.)

To retain the current value, enter a RETURN.

139 MAX EXTRA DATA SEGMENT SIZE = XXXXX?

G.01.00 MAX EXTRA DATA SEGMENT SIZE=<XXXXX>(MIN=0, MAX=32764)?

To change the maximum number of words allowed in any extra data segment from XXXXX, enter the new value. New value must be divisible by 4 without a remainder.

To retain the current value, enter a RETURN.

140 MAX # OF EXTRA DATA SEGMENTS/PROCESS = XXX?

G.01.00 MAX # OF EXTRA DATA SEGMENTS/PROCESS= <XXX> (MIN=0, MAX=255)?

To change the maximum number of extra data segments that a process can have, enter the new value.

To retain the current value, enter a RETURN.

141 STD STACK SIZE = XXXX?

G.01.00 STD STACK SIZE= <XXXX> (MIN=256, MAX=4096)?

To change the number of words initially assigned for a user stack (Z-Q area) by default (when the user specifies no value) at preparation time from XXXX, enter the new value.

To retain the current value, enter a RETURN.

Configuring Your System

142 SYSTEM PROGRAM CHANGES?

To prepare to replace a program belonging to the system, enter YES.

To proceed directly to Step 144, enter NO.

143 ENTER PROGRAM NAME, REPLACEMENT FILE NAME?

To replace a program belonging to the system, enter the name of the program, a delimiting comma, and the name of the program file which is to replace the program. The replacement program need not be in the public group of the system account, PUB.SYS. However, a fully qualified program file name will be required if the program file is not in the logon account/group structure.

The question is repeated until a RETURN is entered.

144 SYSTEM SL CHANGES?

To prepare for changes to the system Segmented Library (SL.PUB.SYS) enter YES. Otherwise, enter NO to skip to Step 153.

145 LIST LIBRARY?

To list the names of the code segments in the system Segmented Library and their entry points and external procedures, enter YES.

To suppress this listing, enter NO.

146 DELETE SEGMENT?

To prepare for deleting a code segment from the system Segmented Library (SL.PUB.SYS), enter YES.

To proceed directly to Step 148, enter NO.



147 ENTER SEGMENT NAME?

To delete a code segment from the system Segmented Library, enter the name of that segment. (When the segment name is entered, the question is repeated.)

Otherwise, enter a **RETURN**.

148 REPLACE SEGMENT?

To prepare for replacing a code segment in the system Segmented Library, enter YES.

To proceed directly to Step 150, enter NO.

149 ENTER SEGMENT NAME, USLFILE NAME [,S/C/P]?

To replace a code segment in the System Segmented Library, enter the name of the segment; a delimiting comma, and the name of the USL file where the replacement segment can be found. Also, optionally, enter a delimiting comma followed by one of these indicators:

None Segment is placed in the library as a user segment, but is not permanently allocated.

P To declare the segment to be a permanently allocated user segment. (This option requests the same function as the :ALLOCATE command, defined in Section III.)

S To declare the segment to be a permanently allocated system intrinsic segment (in virtual memory).

C To declare the segment to be a Core Resident system intrinsic segment.

The question is repeated until a **RETURN** is entered.

To proceed without replacing a code segment, enter a **RETURN**.

NOTE

If you incorrectly enter a USL file name, an error message results and the Configurator proceeds back to Step 146. The segment which was to have been replaced has, in fact, been deleted. You may proceed to Step 150 and attempt to add the USL file.

150 ADD SEGMENT?

To prepare for adding a code segment to the system Segmented Library, enter YES.

Otherwise, enter NO to skip to Step 152.

151

ENTER SEGMENT NAME, USLFILE NAME [,S/C/P]? , patchsize words

To add a code segment to the system Segmented Library, enter the name of the segment; a delimiting comma, the name of the USL file where the segment can be found. Also, optionally, enter a delimiting comma followed by one of these indicators:

None Segment is placed in the library as a user segment, but is not permanently allocated.

P To declare the segment to be a permanently allocated user segment, in virtual memory. This option requests the same function as the :ALLOCATE command, defined in Section III.

S To declare the segment to be a permanently allocated system intrinsic segment, in virtual memory.

C To declare the segment to be a Core Resident system intrinsic segment.

The question is repeated until a **RETURN** is entered.

Otherwise, enter a **RETURN**.

NOTE

If you enter a USL file name which is in error (any error), an error message results and the Configurator proceeds back to Step 141.

152

LIST LIBRARY?

To list the updated system Segmented Library, enter YES.

NOTE

The list is extremely long.

To suppress this listing, enter NO.

153

ENTER DUMP DATE?

To copy only the modified operating system to a serial medium, enter a **RETURN**. The dialogue skips to Step 156.

To copy the MPE system, the current accounting structure, and all files to serial media enter 0. This medium can then be used to RELOAD the system (System Operator function). The tape can also be used with the :RESTORE command (described in Section III to retrieve a file).

Configuring Your System

To copy the MPE system, the current account structure, and any files that were changed on or after a particular date, enter that date in the format *mm/dd/yy*. (In this format, *mm*, *dd*, and *yy* are one or two decimal digits representing the month, day, and year, respectively.) This medium can be used in conjunction with other media to RELOAD the system, or to retrieve one or more files by using the :RESTORE command.



NOTE

Because files in use with write, append, update, or read/write access will not be copied, system backup should be performed only when no users are logged onto the system.

154 ENTER DUMP FILE SUBSET(S)?

At this point, you can instruct the Configurator to dump only certain files by entering file subsets. These subsets are entered in the fileset as discussed under the STORE command fileset parameter in Section III. In addition, you can use any of the options under the :STORE command (SHOW, FILES, DATE, and ONERROR.) The *storefile* parameter is not allowed in the :SYSDUMP command.

For a complete :SYSDUMP, enter a carriage return or @.@.@. This is the case where the Configurator copies the system, the account, group, user, and file structure as well as all files on the system. This type of :SYSDUMP is done periodically to ensure integrity of the system and all files. This operation should be done at a convenient time, when there are no other users on the system. If there are other users on the system and they are accessing some files, those files being accessed will not be copied to the storage medium. This defeats the purpose of a full system and file backup. Because you are saving files along with the system, the Configurator proceeds to Step 155.

Filesets may be continued on a new line by entering an ampersand (&) as the last non-blank character of the present line; continue filesets on the next line. Be sure to enter the ampersand before you get to column 73. A *fileset* may not be divided between two lines. The total number of lines that may be entered is determined by the amount of available stack space remaining. If the total space is exceeded :SYSDUMP will terminate with the message UNABLE TO OBTAIN STACK SPACE.

NOTE

SUBSET can be any *fileset* and/or option in the :STORE command format.

155 LIST FILES DUMPED?

To obtain a list showing the name of each file copied, enter YES. To suppress this list, enter NO. The optional *listfile* parameter to the :SYSDUMP command is useful to direct the list to a high speed printing device when it is known that a great many files exist in the system. A list showing the number (count) of files copied, the number of files not copied, the names of the files not copied, and the reasons why they were not copied is always provided. The formats for these listings are:

```
FILES STORED =
  FILE .GROUP .ACCOUNT LDN ADDRESS VOLUME
```

```
FILES NOT STORED =
  FILE .GROUP .ACCOUNT FILESET REASON
```

- 156 The System Operator is now requested to assign the serial storage device on which you have arranged for a scratch tape, serial disc, or cartridge tape to be mounted. After operator assignment, the system is copied to the appropriate serial medium. It then can be loaded and initialized as directed under the heading System Startup and Modification. A tape request will appear at the Console, unless auto reply is enabled and a tape is already online (G.01.00).

NOTE

If flexible discs are to be used, you must be certain that an adequate number of preserialized flexible discs are available.

- 157 Check the list of files not dumped for user files you want to save. Frequently the files LOADLIST, MEMLOG, SL, and LOGXXX are open when :SYSDUMP is running, so their names often appear on the list of files not dumped. By a special process, :SYSDUMP records the system file, SL, on the serial medium, so it is saved. The other three files mentioned above are recreated from scratch by the Initiator each time the system is started.

If any file belonging to the system is not copied, the message:

```
***WARNING*** FOLLOWING SYSTEM FILES NOT DUMPED
```

is issued and the file name and the reason it was not copied is listed. If the file was to replace a system program, the program name follows in parentheses.

If a response other than a RETURN was entered in answer to the ENTER DUMP DATE? question in Step 153, the list and count of files will be provided as described in Step 155.

To denote termination of the Configurator Dialogue, the following message is printed:

```
END OF SUBSYSTEM
```

Example of System Only Backup

The Configurator User dialogue proceeds with output from the Configurator (:SYSDUMP) and input from the System Supervisor user. In the following example, only the system will be saved on a serial storage device. Before entering the dialogue, the user logon to the system, and enters a file reference to a serial storage device. A typical example is:

```
:FILE SYSCOPY; DEV=TAPE  
:SYSDUMP #SYSCOPY
```

Assume that device class TAPE is a magnetic tape. The Configurator dialogue with the user is:

```
1 ANY CHANGES? NO
```

Reply NO (or RETURN) to omit changing the system and to skip to Step 153.

153 ENTER DUMP DATE?

Enter RETURN. This requests a copy of the operating system only.

The System Operator is now requested to assign the serial storage device on which you have arranged for a serial storage medium to be mounted. After operator assignment, the system (only) is copied to the appropriate medium. In this regard, note that the account, group, and user structure is not copied to the device. However, the system programs in PUB.SYS are copied. This tape is not usable for a reload, it is only good for coldstart and update.

NOTE

If flexible discs are to be used, you must be certain that an adequate number of preserialized flexible discs are available.

To denote termination of the Configurator program, the following message is printed:

END OF SUBSYSTEM

Examples of a Full System Backup

The Configurator/user dialogue proceeds with the Configurator (:SYSDUMP) output and user input desired. In the first example below, the system and all files will be saved. In the second example, the system and a portion of the files will be saved. Prior to entering the dialogue, the user logs onto the system and inputs a file reference to a serial storage device.

A typical example is:

```
:FILE SAVALL; DEV=TAPE  
:FILE LISTIT; DEV=LP  
:SYSDUMP *SAVALL,*LISTIT
```

Assume that device class TAPE and LP are a magnetic tape and a high speed printer respectively.

In this example to save the system and all files, the dialogue is as follows:

1 ANY CHANGES? NO

Enter NO (or RETURN) to omit modification to the system and to skip to Step 153.

153 ENTER DUMP DATE?

Enter 0.

154

ENTER DUMP FILE SUBSETS?

At this point, you can instruct the Configurator to dump only certain files by entering file subsets.

For example, the user can pass any of the :STORE command options to SYSDUMP. The FILES=#option, for example, can be used to raise the number of files that can be stored. To use any of the :STORE options, add them to the response to ENTER DUMPFIL FILE SUBSETS:

@.@.@;FILES=20000

Another option that can be changed is ONERROR#. The default for SYSDUMP is ONERROR=REDD. To change the default, enter:

@.@.@;ONERROR=QUIT.

Two other :STORE options, Indirect Files and Fileset Exclusion are available in SYSDUMP.

NOTE

To run SYSDUMP in a job stream using indirect files, insert a blank in column one to avoid getting an end-of-file on \$STDIN.

These subsets are entered in the fileset form as discussed under the :STORE command *fileset* parameter in Section III.

NOTE

SYSDUMP has a limit of 240 characters in which to specify dump file subsets. Use indirect files for a fileset which requires more than a 240-character description.

For a complete :SYSDUMP, enter a carriage return or @.@.@. This is the case where the Configurator copies the system, the account, group, user, and file structure as well as all files on the system. You may dump a maximum of 16,000 files unless changed with the FILES=option. This type of :SYSDUMP is done periodically to ensure integrity of the system and all files. This operation should be done at a convenient time, when there are no other users on the system. If there are other users on the system and they are accessing some files, those files being accessed will not be copied to the storage medium. This defeats the purpose of a full system and file backup. For this example, since no files are being saved, proceed to Step 156.

155

LIST FILES DUMPED?

To obtain a listing showing the name of each file copied, enter YES. To suppress the list, enter NO. (A list showing the number (count) of files copied, the number of files not copied, the names of the files not copied, and the reasons why they were not copied is always provided.)

156

The Operator is now requested to assign the store device on which the :SYSDUMP will be placed. To denote termination of the Configurator program, the following message is displayed:

END OF SUBSYSTEM

In the next example, the Configurator is used to copy the system, all accounting structures, and some files. This particular use of the Configurator needs further explanation before proceeding with the example.

When the system is operational, any file which is modified in some way will have a modification date placed in the file label at the time of modification (during the file close process). Possibilities are: writing to an existing file, creating a (new) permanent file, and using the :RENAME command. The process of reading a file or purging a file does not constitute a modification.

Backing up the complete system, all accounting structures, and all files every day is time-consuming. A practical alternative to a daily full backup is a weekly backup of everything, supplemented by a daily backup of files modified since the last full backup.

In the next example, assume that on Friday, September 30, 1983, you did a full system backup. On Monday, October 3, the users on the system created many new files. When there are no other users on the system, you, as the System Supervisor, log onto the system and enter a file reference to a store medium, a magnetic tape for example:

```
:FILE SAVESOME;DEV=TAPE  
:FILE LISTSOME;DEV=LP  
:SYSDUMP *SAVESOME,*LISTSOME
```


Configuring Your System

The dialogue is as follows:

Step No. Dialogue

1 ANY CHANGES? NO

Enter NO (or RETURN) to omit modifications to the system and to skip to Step 154.

ENTER DUMP DATE? 9/30/83

Enter the date on which the full system and file backup was made. The Configurator program (:SYSDUMP) will save the system and all accounting structures. It will then compare each and every file label modification date to the one which was entered in Step 154. Only those files whose modification date is the same or later than the date which you have input will be considered for saving. In this way, it can be seen that if the system had to be completely reloaded for any reason, it could be accomplished in two steps assuming a full backup plus one partial.

First, you RELOAD the most recent tape (or serial disc), SAVESOME. When asked if there are more files, you mount the full system backup tape (or serial disc). This assures that the most recent versions of files are restored since RELOAD acts like RESTORE with the KEEP option.

154 ENTER DUMP FILE SUBSETS?

At this point, you can instruct the Configurator to dump only certain files by entering file subsets. These subsets are entered in the fileset form as discussed under the :STORE command fileset parameter in Section III.

To save all files modified since 9/30/83, enter a RETURN or @.@.@.

155 LIST FILES DUMPED?

To obtain a listing of all the files which have been dumped, enter YES. To suppress the listing, enter NO. A list showing the number (count) of files copied, the number of files not copied, the names of the files not copied, and the reasons why they were not copied is always provided.

To denote termination of the Configurator program, the following message is displayed:

END OF SUBSYSTEM

Keeping the Accounting Structure Offline

NOTE

Label this tape as a partial backup showing both current date and date of last full backup.

In the previous discussion of the Configurator dialogue, under Step 154, it was stated that your account, group, user, and file structure information is kept on the serial storage medium (except the option to save only the operating system). Experience has shown that it is a good idea to keep all of the created structures on some offline medium such as a magnetic tape or serial disc file or a job card deck. This requires extra effort on the part of the System Supervisor in order to keep the offline media current.

SYSTEM STARTUP AND MODIFICATION

Any person with access to the System Console can turn the system power on and off, start up MPE, alter the current input/output device configuration, and shut down the system. This person need not have System Manager or System Supervisor capability. In fact, because he does not need to logon to the system, he need not even have standard user capability. Refer to the Section IV power on/off procedures for full details.

Startup of MPE, recovery of spool files or the reconfiguration of the input/output devices and the system, and handling of disc errors are done through a program called the Initiator (or INITIAL). The Initiator is a standalone program that creates an operational MPE using files and table information available to it from tape, or, in certain cases, from disc. The Initiator program is brought into memory for execution via a the Initial Program Loader (IPL).

The startup operation loads a subset of the Initiator program into memory from disc or serial storage devices. The switches used to start the Initiator program vary with the Series 37/39/40/42, 44/48, and 64/68. Refer to Section IV for a description of the system startup procedure for your system.

NOTE

Once the INITIAL program is started, an interactive dialogue will be displayed on the Console. If the Console is NOT a Hewlett-Packard terminal, it is necessary to press **RETURN** to begin the dialogue.

There are five types of startups: WARMSTART, COOLSTART, UPDATE, COLDSTART, and RELOAD. (Refer to Tables 4-2 and 4-3.) A subset of the Initiator is loaded into memory from the system disc during a WARMSTART or a COOLSTART. A subset is loaded from a backup serial storage medium during an UPDATE, a COLDSTART, or a RELOAD. The individual cold load options are described in the following paragraphs.

1. WARMSTART loads the system from the system disc. This is the procedure used if incompletely processed spooled jobs and spooled files must be recovered or user logging was in operation. On any other option, any spooled files found in the system are deleted.

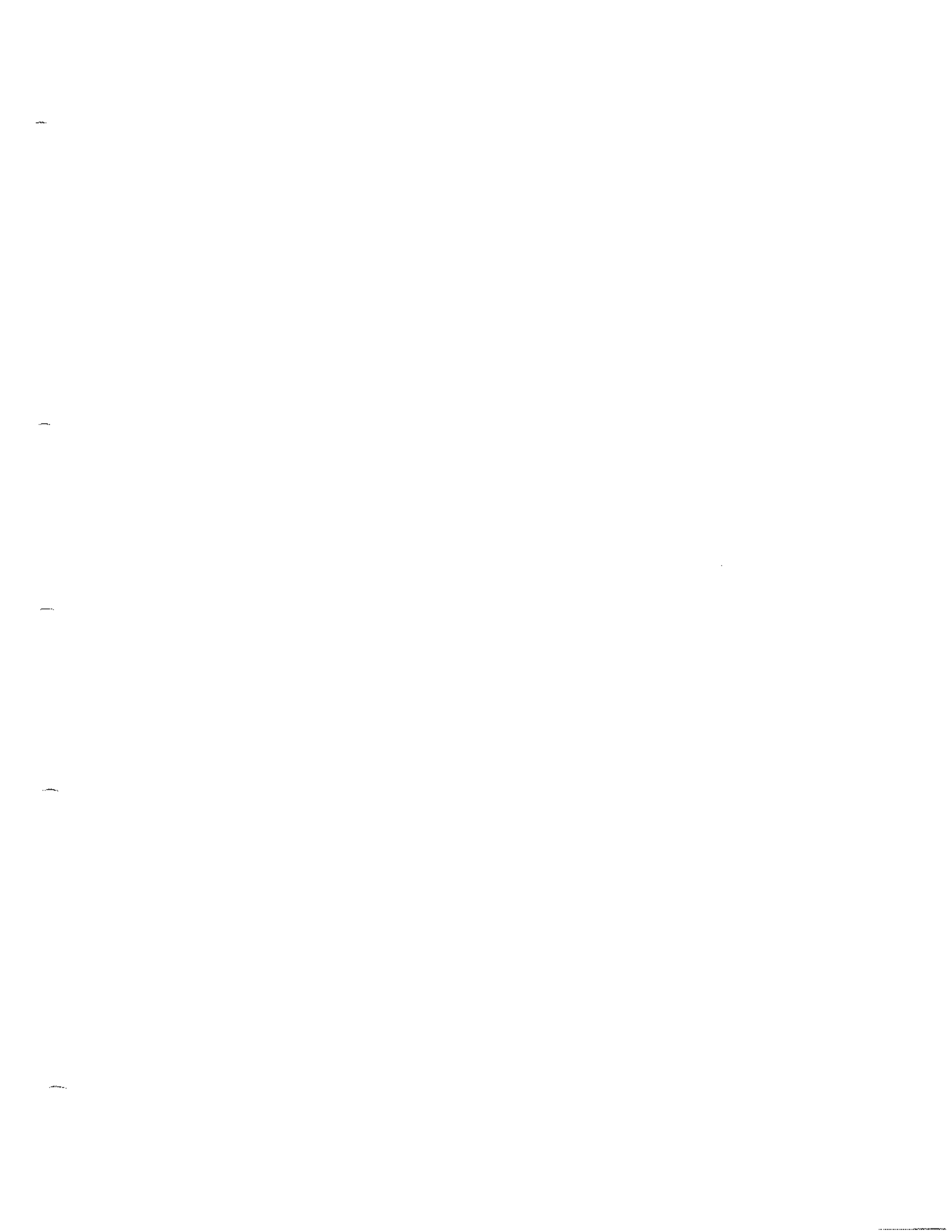
If a COOLSTART, COLDSTART, UPDATE or RELOAD does not complete for any reason, the next load may not be a WARMSTART. A violation of this results in an error message and halt.

NOTE

The Initiator program should never be halted. If error recovery is not possible, the Initiator program should be allowed to complete, i.e., run until the request for DATE? appears. (A halt may require a RELOAD.)

Configuring Your System

2. COOLSTART loads the system from the system disc. This is the standard operating procedure when a system is routinely shut down at night and brought up the next day. All permanent user files (including programs such as FORTRAN/3000, COBOL/3000, SPL/3000 and EDIT/3000 that run as MPE subsystems) are saved; but the operational environment present prior to the last shutdown is not retained. Thus, all jobs and sessions in progress at the previous shutdown are lost.
3. UPDATE cold loads the system from magnetic tape or from serial disc. The system files come from the serial medium while the I/O device configuration, directory, accounting information and global RINs come from the system disc (user's files remain undisturbed). This is the standard



operating procedure when starting the system with an updated MPE tape from Hewlett-Packard or an MPE tape prepared for a different HP 3000 Computer System, and should be used **ONLY** in those situations. If an **UPDATE** does not complete, it must be followed by a **COLDSTART**, **UPDATE**, or **RELOAD**. Any violation of this procedure results in an error message and a halt.

4. **COLDSTART** cold loads the system from magnetic tape or serial disc. The system files and I/O configuration come from the load medium, while the user files, directory, accounting information, assigned resource identification numbers (global RINs) are retained current on the system disc. This allows modification of the system configuration while retaining user information. **COLDSTART** is commonly used to allow an installation to keep several cold load tapes or discs, each with a different configuration. If a **COLDSTART** does not complete for any reason, it must be followed by a **COLDSTART**, **UPDATE**, or **RELOAD**. Any violation of this causes an error message and a halt.
5. **RELOAD** cold loads the entire system, including all user and system files and I/O configuration information, from the backup medium. This option assumes that there is no valid information on the system disc. If any user files are dumped on the backup medium, the directory, accounting information, assigned global RINs and user files may be restored to the disc from the backup copy. If the accounting structure was not dumped, a directory is created with the **SYS** account, **PUB** group, and **MANAGER** user. **RELOAD** is normally the method used to install the first MPE system supplied by Hewlett Packard. It is also used when restoring the system (from a tape or serial disc generated by the user through a **:SYSDUMP** command) following a disc crash. If a **RELOAD** does not complete for any reason, the next cold load must be a **RELOAD**. Files belonging to the nonsystem domain (private volumes) are not restored during a **RELOAD**.

When reloading from multiple volumes of tapes or serial discs that were created by the **:SYSDUMP** command, the first volume of the latest backup copy should be used for cold loading because it contains the most up-to-date directory and accounting information. If not all of the files on the system are contained in this volume, additional volume will be requested.

All load options except **WARMSTART** allow you to alter the current I/O device configuration. This is done through an interactive dialogue between the System Supervisor and the Initiator.

When the system is started with **RELOAD**, the initialization of blank system disc packs, the writing of labels for them, and the renaming of volumes, is accomplished by the Initiator. The formatting of blank disc packs is done by a diagnostic program (**SLEUTHSM**) which is part of the Diagnostic Utility System (**DUS**), rather than by the Initiator.

INITIATOR/USER DIALOGUE

The two methods of system startup which load the system from the system disc, **WARMSTART** and **COOLSTART**, are initiated in the Series 37 with Automatic Warmstart, if enabled, or via a command in Control B Mode, the **CMP START** command (Series 39/40/42/44/48), or the **DCU START** command (Series 64/68). (Refer to Section IV for the specifics on how to start your system.) After the **START** command is entered, followed by a **(RETURN)**, the system begins the dialogue shown below in Step 0.

The Initiator dialogue is similar to that for **:SYSDUMP**, described previously, and is only explained in detail where the two operations differ.

Step No. Dialogue
 0 WHICH OPTION <WARMSTART/COOLSTART>?

Enter the desired option.

Only the first 3 characters of the option are required, for example WAR or COO. If WARMSTART is selected, the system will recover certain input and all output spool files, spooled jobs that have not yet been started, and partially complete jobs remaining in the system from before the system was halted. The spool files recovered are available for further processing. Spooled jobs (i.e., those with spooled job input files) which were executing at the time of interruption will be recovered in the waiting state, if RESTART was specified in the :JOB command.

All waiting spooled jobs are also recovered. Some spoolfiles may be damaged if a crash occurred. MPE will defer all recovered jobs and output spool files by establishing job and output fences of 14. (A job or output spool file whose priority is at or below the appropriate fence is said to be deferred.)

If the System Operator specifies the WARMSTART load option, spool file recovery is initiated. All output spool files are placed in the READY state, even if they were OPENED or ACTIVE when the interruption occurred. The output fence is set to 14, thereby deferring all output spool files.

READY input spool files and spooled WAITING jobs are also recovered. In order to recover certain EXECUTING jobs, you may specify the ;RESTART parameter in the :JOB command. A job input spool file for a nonrestartable job which was executing when the interruption occurred will not be recovered; nor will any :DATA spool files opened by such a job be recovered. All other input spool files opened at the time of interruption will be placed in the READY state, completely recovered. Input spool files which were being created (i.e., were ACTIVE) when the interruption occurred can not be recovered and are automatically deleted during a WARMSTART. The job fence is set to 14, thereby deferring all jobs not specified as HIPRI.

These actions are summarized below.

Input Spool Files:

Interrupted State	WARMSTART Action
ACTIVE	Deleted
READY	READY (no change)
OPENED, not ;RESTART	Deleted
OPENED, ;RESTART	READY (complete)

Output Spool Files:

Interrupted State	WARMSTART Action
OPENED	READY (incomplete)
READY	READY (no change)
ACTIVE (single, or last copy)	READY (remaining extents)
ACTIVE (<i>m</i> out of <i>n</i> fully copied)	READY (make <i>n-m</i> full copies)

Note, however, that recovered HIPRI jobs will start immediately; and that HIPRI jobs/sessions can be submitted and processed.

Configuring Your System

When the WARMSTART option is selected, the configuration changes portion of the initiator dialogue is skipped (i.e., Steps 1 through 72 and Steps 75 through 124).

If COOLSTART is selected, skip to Step 1.

If WARMSTART is selected, skip to Step 3.1.

The three methods of system startup (COLDSTART, RELOAD, UPDATE) which load the system from a serial medium (magnetic tape, cartridge tape, or serial disc) are initiated with the Control B Mode LOAD command (Series 37), the CMP LOAD command (Series 39/40/42/44/48), or the DCU LOAD command (Series 64/68). (Refer to Section IV for the specifics on how to start your system.) After the LOAD command is entered, followed by a **RETURN**, the system begins the Initiator dialogue shown in Step 0.1.

0.1 WHICH OPTION <COLDSTART/RELOAD/UPDATE>?

Enter the option desired. Note that only the first three characters of the option are required to be input; for example COL, REL, or UPD may be entered for COLDSTART, RELOAD, or UPDATE, respectively. All existing spool files will be deleted. If RELOAD is chosen and user files exist on the input medium, the Initiator proceeds to Step 0.2. If no user files are present, the dialogue skips to Step 0.3.

NOTE

Files belonging to nonsystem domain (private) volume sets are not restored during RELOAD.

If COLDSTART is selected, the dialogue skips to Step 1. If UPDATE is selected, the following question is asked:

SYSTEM DISC DRT = *nn*

The default *nn* is, 33 for Series 37; 89 for Series 39/40/42/44/48; and 25 for Series 64/68.

If the system disc DRT number is not the same as indicated here, enter the correct DRT number.

If the DRT number is correct, enter **RETURN**.

The Initiator checks the system volume table to ensure that the system disc is mounted on *ldev* 1. If the system disc is not mounted on *ldev* 1 and the system disc is a serial disc, the Initiator prompts with the questions:

```
**WARNING** SYSTEM DISC AND COLD LOAD DEVICE ARE ON SAME DRT SYSTEM
DISC MUST BE ONLY UNIT ZERO ON THIS DRT MAKE DISC UNIT # CHANGE NOW
READY?
NEW SERIAL DISC UNIT#?
```

Before you respond to the prompts:

- Set the *ldev n* to the correct unit number, according to the I/O configuration.
- Set the unit number of *ldev 1* to "0".
- Reply YES to the READY prompt, and reply with the new unit number of *ldev n*.

0.2 WHICH OPTION <SPREAD/COMPACT/RESTORE/ACCOUNTS/NULL>?

Enter the desired RELOAD option, as described below. Entering RETURN is the same as SPREAD. The dialogue skips to Step 1.

These options select the algorithm used to determine on which disc a file is placed during RELOAD, and whether the account, group, user structure is to be placed into the appropriate directory area, as follows:

SPREAD MPE attempts to put the files back on a disc in the same device class where they were originally created. If this fails, an attempt is made to replace the files on a disc of the same type and subtype on which they were previously located (e.g., a cartridge disc). If this fails, an attempt is made to put them on a disc of the same type (e.g., a moving head disc). If this fails, an attempt is made to put the file on any disc, in device class DISC. If this fails, a message is printed and the file is not reloaded. In each of these attempts, the files are spread among similar discs, if possible. For example, if when the system was dumped there was one cartridge disc which was full, and when it is reloaded there are now two cartridge discs, each will contain one half of the files. The advantages to SPREAD are that disc seeking is reduced since files are spread out; and fragmentation is reduced because the disc is repacked. The disadvantage is that if the discs are nearly full it may not be possible to get all files that were previously on the discs back. This situation will be encountered very rarely, and when it is, one of the other options may be used.

COMPACT MPE attempts to place the files back on the same volume from which they came. If this fails, the SPREAD option is used. The major advantage of COMPACT is that if there are no new deleted tracks and the same discs are used, reloading of the system is guaranteed, no matter how full the discs are. In addition, each disc is compacted within the area between deleted tracks (if there are *n* deleted tracks, there will be at most *(n+1)* fragments). The disadvantage is that the loading of the discs may be unequal.

RESTORE MPE attempts to place the files back on the same volume at the same locations from which they came. If this fails, MPE attempts to place the files anywhere on the volumes from which they came. If this fails, the SPREAD option is used. The advantages to RESTORE are that it offers the same guarantee made in COMPACT for reloading the system, and that the same files that were previously using alternate tracks are still using them. The disadvantage is that no compacting of the discs is done so that the same fragmentation still exists.

ACCOUNTS This option loads the system, creates a directory from the input medium, and loads the system files which reside in the PUB group of the SYS account. No user files are loaded onto the system.

The directory which is created will consist of all accounts, groups, and user structures which were current at the time the tape or serial disc was written by the :SYSDUMP configurator program.

This option is useful because files saved on the input medium by the :SYSDUMP program are compatible with files stored using the STORE command. In this way you would, for example:

1. Create a new directory structure if the previous directory was destroyed.
2. Conserve vital disc space by selectively loading files into certain accounts with the :RESTORE command after the system is operational.

NULL MPE creates a null directory (as described in Step 0.3) and no user files are copied to the disc.

NOTE

Hewlett-Packard recommends using the ACCOUNTS option to reload the accounting structure, and completing the RELOAD operation. When the system is up and operational, use the :RESTORE command to restore user files into the accounts.

0.3 NO USER FILES ON TAPE - DO YOU WANT TO RELOAD?

This implies that when the system storage medium was created, no user files were dumped. To proceed with reloading the system, creating a null directory with only the SYS account, PUB group, and MANAGER user, enter YES. To return to Step 0.1 enter NO.

1 ANY CHANGES?

To change the current configuration, enter YES and proceed to Step 2. Otherwise enter NO and skip to Step 3.1.

NOTE

Any changes you make to the configuration at this step will not be backed up. At your earliest opportunity use :SYSDUMP to obtain a backup for your changes.

2 LOAD MAP?

To request a map on the Console showing the correspondences between MPE segments, programs, and code segment table (CST) entries, enter YES.

NOTE

When a particular running system halts for any reason, it is mandatory to have a LOAD MAP for analysis, provided a system memory dump is taken for the analysis.

To suppress this map, enter NO.

3 MEMORY SIZE = XXX?

G.01.00 The value *XXX* is the current size of main memory for the system (in multiples of 1024 words). To change this value, enter one of the following values (specifying memory size in multiples of 1024 words): 512, 768, 1024, 1280, 1536, 1792, and 2048. Series 37 will support 1/2 to 2 Mb. Series 64/68 will support 2 to 8 Mb. Series 44/48 will support 1 to 4 Mb. Series 39/40/42 will support 512 Kb to 3 Mb. Values allowed are 256, 512, and 1024 only.

3.1 At this time, the Initiator confirms that the configured memory size can be supported on the available physical memory. If the configured memory size exceeds the physical memory size, the following message will be output:

```
CONFIGURED MEMORY SIZE EXCEEDS PHYSICAL MEMORY AVAILABLE
PHYSICAL MEMORY AVAILABLE IS memsize
MEMORY SIZE = memsize
```

If this is a WARMSTART, or if this is a COOLSTART, COLDSTART, UPDATE, or RELOAD without changes, skip to Step 72. Otherwise, proceed to Step 4.

4 I/O CONFIGURATION CHANGES?

To prepare for addition or deletion of input/output devices, enter YES.

To maintain the same input/output device configuration, and proceed to Step 71 enter NO.

4.1 I/O MAP?

G.01.00 To print a listing of input/output devices physically connected to the system, enter YES. To suppress this listing, enter NO. The listing is displayed in tabular form.

70 ADDITIONAL DRIVER CHANGES?

To prepare for additional driver changes, enter YES.

If no additional driver changes are required, enter NO. If NO is entered, dialogue returns to Step 4. Step 4 repeats until a NO response is entered.



To print a listing showing the presently configured additional drivers, enter YES .

To suppress this listing, enter NO .

71

At this time, one or more of the following messages may be output, reflecting errors in the input/output device configuration. If any of these messages appear, the Initiator returns to Step 4, unless otherwise noted.

DEVICE OF DIFFERENT TYPE RANGES IN CLASS *devclass*

Device types (defined in the SYSDUMP dialogue, Step 4) are divided into ranges from different kinds of devices:

Type Range	Class
0- 6	Direct access
7	Foreign disc
8-15	Serial input
16-23	Concurrent input/output
24-30	Nonconcurrent input/output
31	Serial disc
32-39	Serial output

Within a device class, all defined devices must have types which are compatible; the above message indicates a violation of this rule. See the discussion of device classes (DCATs) in Section V.

USER SPECIFIED MAX DRT IS *DRT*
 FOLLOWING DRTs MUST BE CHANGED
 LDEV *ldev* DRT *DRT*

At least one device has been defined with a DRT number higher than the specified maximum. Return to Step 4.

USER SPECIFIED MAX DRT IS
 HIGHEST DRT SUPPORTED BY THIS CPU IS *DRT*

The user-specified maximum DRT cannot be supported on this CPU. Return to Step 4.

USER SPECIFIED MAX DRT IS *DRT*
 HIGHEST DRT SUPPORTED BY THIS CPU IS *DRT*
 FOLLOWING DRTs MUST BE CHANGED
 LDEV *ldev* DRT *DRT*

At least one device has been defined with a DRT number which:

- a) is higher than the specified maximum and/or
- b) cannot be supported on this CPU.

Possibly the user-specified maximum DRT cannot be supported on this CPU. Return to Step 4. LOGICAL DEVICE *ldev* DOES NOT EXIST

A device (*ldev*) specified as an output device is not defined in the configuration.

LDEV *ldev* AND LDEV *ldev* ON SAME DRT AND UNIT

More than one logical device has been defined with the same DRT and unit.

NO DEVICE IN CLASS DISC

There must always be at least one device defined in the device class DISC .

NO OUTPUT DEVICE FOR LOGICAL DEVICE *ldev*

Logical device *ldev*, which has been defined as a device which accepts jobs or sessions, does not have a corresponding job/session list device or device class assigned.

OUTPUT CLASS FOR DEVICE *ldev* NO LONGER EXISTS

The device class specified as the output (listing device) class for device *ldev* is not defined in the configuration.

72

At this time, the Initiator tests to make sure that DRTs have been handled correctly. If any messages appear, the dialogue returns to Step 4.

If no messages appear, the dialogue proceeds as follows.

If this is a RELOAD, UPDATE, or COLDLOAD with changes, continue to Step 76.

73

At this time, the Initiator checks to ensure that all volumes defined in the previous startup are mounted. If all volumes were not found, the message FOLLOWING VOLUMES NOT FOUND is output, followed by a list of volumes that were defined but not mounted. The Initiator then proceeds to Step 74.

NOTE

One of the following messages may be printed, indicating that a disc device is not in the ready state:

```
LDEV # ldev NOT READY
DISC IN DRT DRT # UNIT 0 NOT READY
```

You should make the appropriate device ready. It is imperative that you do not halt the system at this point, (or during any other portion of the Initiator/User Dialogue), since the Initiator may be in the process of updating the volume labels. If the computer is halted, the message FOLLOWING VOLUMES NOT FOUND may be printed during the next cold load, necessitating a RELOAD operation.

If all volumes were found and you had responded YES to the ANY CHANGES? question in Step 1, the dialogue skips to Step 76.

If all volumes were found and you responded NO to the ANY CHANGES? question in Step 1, the dialogue skips to Step 87.

If this is a WARMSTART, control skips to Step 125.

74

LIST VOLUME TABLE?

To list the disc volumes and their currently assigned logical device numbers, enter YES. The listing is printed in the following format:

VOLUME#	NAME	LOG DEV#
<i>volnumber</i>	<i>volname</i>	<i>ldev</i>
.	.	.
.	.	.
.	.	.

In this listing, *volname* is a name of up to eight alphanumeric characters, beginning with a letter, identifying the volume; *ldev* is the logical device number assigned to that volume. If *ldev* is 0, this indicates that the volume is not mounted.

NOTE

In order to perform a listing of defective tracks (Step 83) for any disc, the logical device is required. Listing the volume table will give you the logical devices.

To suppress this listing, enter NO.

75 MOUNT CORRECT VOLUMES OR RELOAD

Following this message, the system halts. The System Operator should either find the volumes defined on the previous cold load (listed in Step 73), mount them, and cold load the system again, or cold load using the RELOAD option and redefine the disc volume configuration (as discussed below).

76 DISC VOLUME CHANGES?

To prepare for changes to the disc volume configuration or to delete tracks, enter YES. Otherwise, enter NO or a RETURN. Control skips to Step 92.

77 LIST VOLUME TABLE?

To list the disc volume table (as in Step 74), enter YES. Otherwise, enter NO.

78 DELETE VOLUME?

To prepare to delete a volume, enter YES.

To bypass deletion and skip to Step 80, enter NO or a RETURN.

79 ENTER VOLUME NAME?

To delete a volume, enter the volume name. (When the name is entered, the question is repeated.)

Otherwise, enter a RETURN.

80 ADD VOLUME?

To prepare to add a volume, enter YES.

To bypass addition and skip to Step 82, enter NO or a RETURN.

81 ENTER VOLUME NAME

To add a volume, enter the volume name. When the name is entered, the question is repeated.

Otherwise, enter a RETURN.

82 LIST VOLUME TABLE?

To list the disc volumes and their currently assigned logical device numbers (as in Step 75), enter YES.

To suppress this listing, enter NO.

83 LIST DEFECTIVE TRACKS TABLE?

For 7911, 7912, 7913, 7914, 7933, or 7935 discs,

LIST DEFECTIVE TRACK/SECTOR INFORMATION?

To prepare for listing the defective tracks table or defective track/sector information which resides on any one of the disc volumes, enter YES. To bypass the listing and skip to Step 87, enter NO.

84 LOGICAL DEVICE# ?

To list the defective tracks table or defective track/sector information for a particular disc, enter the disc's logical device number. (After this listing, the question is repeated.) Otherwise, enter a RETURN.

If the disc is a type 0 disc, the following information is printed:

- Logical size of the device (in cylinders).
- Number of alternate tracks available.

For each entry in the defective tracks table, the following information is printed:

- Cylinder and head number of defective track.
- Absolute sector number of the first sector of the track (in octal).
- Absolute sector number of the last sector of the track (in octal).
- Track - may be one of the following:
 - (1) SUSPECT - An error has been encountered on this track.
 - (2) SUSPECT ALT - An error has been encountered on the track to which this track was reassigned.

- (3) UNREADABLE ALT - This track was reassigned to another track but the disc driver was unable to read the alternate track assignment.
 - (4) DELETED - The track is no longer available for use by the system.
 - (5) REASSIGNED - The track has been reassigned to another track.
- The cylinder and head number of the alternate track (if the track status is (2) or (5)).

If the disc is a type 1 fixed head disc, the following information is provided in the listing for each track in the table:

- Track number of the defective track.
- Absolute sector number of the first sector of the track (in octal).
- Absolute sector number of the last sector of the track (in octal).
- Track status - may be (1) or (4) as described above.

For type 3 discs, the following information is printed:

- Number of spare operations.
- Number of spare tracks used.
- Number of spare tracks available.

This is followed by a list of the logically spared tracks on the disc. This includes the logical cylinder and head of the track, and the beginning and ending sector addresses. All tracks will appear as REASSIGNED. There are no deleted tracks on a type 3 disc.

NOTE

The number of spared tracks listed will not necessarily correspond to the number of spare tracks used. This is because a logical track can be spared more than once, and thereby use up more than one spare track.

85

DELETE TRACK?

To prepare for deleting tracks, enter YES. Otherwise, enter NO to skip to Step 90.

NOTE

If you answer YES and then attempt to delete a track on a type 3 disc, the Initiator will reject the attempt and issue an error message.

86

ENTER LDEV, CYLINDER AND HEAD?

NOTE

Listing the defective tracks table of (Step 83) will provide the input for this dialogue.

To delete a track on a moving head disc, enter these three parameters separated by commas: the logical device number of the disc, the cylinder number, and the head number corresponding to the track to be deleted.

To delete a track on a fixed head disc, enter the logical device number and track number, separated by a comma.

If this is a system disc, see the discussion of disc error recovery for more information.

Otherwise, enter a RETURN to proceed to Step 88.

If input was entered to delete a track, one of the following messages may result:

ALTERNATE TRACK - CANNOT DELETE

The track is being used as alternate track and cannot be deleted.

IN DIRECTORY - CANNOT DELETE

The track is in the area used by the directory and cannot be deleted since this is not a RELOAD function.

IN DISC FREE SPACE MAP - CANNOT DELETE

The track is in the disc free space map and cannot be deleted, since this is not a RELOAD.

IN A SYSTEM DISC RESIDENT TABLE - CANNOT DELETE

The track is in an area used by a system disc resident table and cannot be deleted, since this is not a RELOAD.

IN RESERVED AREA - CANNOT DELETE

The track is in the area reserved for the disc label or bootstrap program, and cannot be deleted.

IN SYSTEM AREA - CANNOT DELETE

The track is in the area reserved for the Initiator program and its associated tables, and therefore cannot be deleted since this is a COOLSTART.

INVALID CYLINDER NUMBER

The cylinder number is not in the correct range for this moving-head disc.

INVALID HEAD NUMBER

The head number is not in the correct range for this moving-head disc.

INVALID TRACK NUMBER

The track number is not in the correct range for this fixed-head disc.

NOT A DISC

The device is not a disc. Wrong *ldev#* specified.

UNINITIALIZED DISC

A volume label has not yet been written on the disc.

****WARNING****IN VIRTUAL MEMORY DELETE?

The track is in the area reserved for the virtual memory. To delete the track (which will cause the virtual memory to be moved), respond with YES; otherwise respond with NO.

Regardless of whether one of these messages printed, control returns to the beginning of this Step.

87

At this point, the Initiator ensures that each disc defined in the configuration has a valid label, that the volume name are defined in the volume table, that all volumes defined in the volume name is defined in the volume table, and that all volumes defined in the volume table are mounted; the Initiator also lists any suspect tracks, suspect alternate tracks, and unreadable alternate tracks and requests the operator to take action on them. As a result of this verification, one or more of the following messages may appear. (All messages require a response. If no messages appear, the Initiator proceeds directly to Step 88.)

NOTE

Messages that prompt the user to "DELETE," "REASSIGN," or "RECOVER" tracks will not appear for type 3 discs.

(a) INVALID LABEL FOR DEVICE *ldev*
ENTER VOLUME NAME?

This indicates that *ldev* does not contain a valid MPE volume label. You must enter a volume name. If the name entered corresponds to that of a volume in the volume table, the logical device number *ldev* is set for that volume. Otherwise, a new entry is made in the volume table. The disc label is then updated. If device *ldev* is a type 0 disc, this is followed by the message:

LOGICAL PACK SIZE (CYLINDERS) = SIZE?

The System Operator should specify the number of cylinders to be used on this disc; the remainder will be available for alternate track assignments. To retain the default specified by maximum logical size enter a RETURN. Otherwise, enter a value between minimum logical size and maximum logical size as defined by the table below:

Type	Subtype	Minimum Logical Size	Maximum Logical Size	Maximum Physical Size
0	4*	300	400	411
0	5*	300	400	411
0	6*	300	400	411
0	7*	90	120	135
0	8	611	815	823
0	9	611	815	823
0	10	300	400	411
0	11	300	400	411
0	12	300	400	411

*These subtypes are not supported on HP-IB systems.

(b) DEVICE *ldev* VOLUME *VOLNAME* NOT DEFINED IN TABLE
ADD TO SYSTEM VOLUME SET?

If you enter YES the following message is displayed:

ENTER VOLUME NAME?

This means that the volume identified by *volname*, with the logical device number *ldev*, does not appear in the volume table. To add this volume, identified by this *volname* and *ldev*, enter a RETURN.

To add this volume under a different volume name, enter the new name. The new name will be entered in the volume table and the volume will be relabeled with that name.

Configuring Your System

- (c) VOLUME NAME *volname* ON DEVICE *ldev* ALREADY IN USE
ENTER VOLUME NAME?

This means that two volumes have the same name. To change the name of the volume on device *ldev*, enter the new name. If the name corresponds to that of a volume in the volume table, the logical device number *ldev* is set on that volume. Otherwise, a new entry is made in the volume table. The disc label is then updated.

- (d) ALL VOLUMES MUST BE MOUNTED
LIST VOLUME TABLE?

This message occurs when an entry appears in the volume table, but no corresponding volume is mounted on a disc defined in the configuration. To list the volume table (as in Step 74), response with YES. Otherwise, respond with NO. In either case, control returns to Step 5.

- (e) [SUSPECT]
[SUSPECT ALT] TRK LDEV# *ldev* CYL= *CYL* HEAD= *HEAD*
[UNREADABLE ALT]

This message, applying to a type 0 disc, indicates that an entry in the defective tracks table requires action.

The following information applies to message (e) above. A suspect track is the one on which an error has been detected while the system was running. A suspect alternate track is one that has been previously reassigned and an error has been detected on the alternate track. An unreadable alternate track is one that has been reassigned but the disc driver was unable to read the address of the reassigned track while attempting a transfer. *ldev* gives the logical device number of the disc where the error occurred; *TRACK* gives the track in error for fixed head discs; *CYL* and *HEAD* give the cylinder and head number of the bad track. Immediately following message (e) one of the messages (g) through (q) may appear; they require one of the following replies, or YES or NO as indicated:

- (1) DELETE - To remove the track from the space available for use by the system.
- (2) REASSIGN - To reassign the space on the bad tracks to one of the available alternate tracks.
- (3) RECOVER - To remove the entry from the defective tracks table, ignoring the error.
- (4) (RETURN) - To ignore the error. The message will be repeated the next time the system is restarted.

- (g) DELETE OR REASSIGN?

The track was flagged as defective previously. Only responses DELETE or REASSIGN are valid.

- (h) ****WARNING**** IN ALTERNATE AREA
DELETE?

The track was flagged as defective previously. It is located in the area reserved for alternate tracks. The only valid response is YES, since tracks in the alternate area cannot be reassigned (reassigned tracks cannot be "chained").

- (i) ****WARNING** IN ALTERNATE AREA**
DELETE OR RECOVER?

A suspect track is located in the area reserved for alternate track assignment. Valid responses are DELETE, RECOVER or a RETURN to ignore the error.

- (j) **FLAGGED TRACK IN RESERVED AREA - MUST REINITIALIZE PACK**

A track flagged as defective is located in the reserved area of the disc. The system halts at this time. You must either mount a new pack previously formatted or rerun the diagnostic on the present pack to reformat it. Following this, you should restart using the RELOAD option. See Section X for formatting procedures.

- (k) ****WARNING** IN RESERVED AREA**
RECOVER?

A suspect track is located in the reserved area of the disc. Respond with YES to remove the entry from the defective tracks table, or NO to leave it in the defective tracks table.

NOTE

RECOVER assumes that the error never occurred. This could be dangerous to system integrity.

- (l) ****WARNING** IN SYSTEM AREA**
RECOVER?

A suspect track is located in the area used for the Initiator program and its associated tables. Respond with YES to remove the entry, or NO to leave it in the defective tracks table.

- (m) ****WARNING** IN DIRECTORY**
RECOVER?

A suspect track is located in the area used by the system for the file directory. Respond with YES to remove the entry, or NO to leave it in the defective tracks table.

- (n) ****WARNING** IN DISC FREE SPACE MAP**
REASSIGN OR RECOVER?

A suspect track is located in the disc free space map. Enter REASSIGN or RECOVER, or a RETURN to ignore the error.

(o) ****WARNING**** IN A SYSTEM DISC RESIDENT TABLE
RECOVER?

A suspect track is located in a table that is resident on the system disc. Respond with YES to remove the entry, or NO leave it in the defective tracks table.

(p) ****WARNING**** IN VIRTUAL MEMORY
DELETE, REASSIGN OR RECOVER?
DELETE OR RECOVER?

A suspect track is located in the area used for the virtual memory. If this load is not a RELOAD, the second form of the question will be used and responses DELETE or RECOVER are valid. If it is RELOAD using the RESTORE option, the first form of the question will be used. Responses are DELETE, REASSIGN or RECOVER.

(q) DELETE OR RECOVER?

The suspect track is located in no special area of a moving-head disc. All responses DELETE, RECOVER, or a (RETURN) to ignore the problem, are valid.

(r) DELETE, REASSIGN OR RECOVER?

The suspect track is located in no special area of a moving-head disc. All responses are valid, including a (RETURN) to ignore the problem.

NON-SYSTEM VOLUME ON DEVICE#
ADD TO SYSTEM VOLUME SET?

Answer YES if the disc volume is to be added to the system domain or NO if it is to be added to the private volumes (nonsystem) domain.

88 If any changes have been made in the defective tracks table in Step 88, the following question will be printed:

LIST DEFECTIVE TRACKS TABLE?

or, for 7911, 7912, 7913, 7914, 7933, or 7935 discs.

LIST DEFECTIVE TRACK/SECTOR INFORMATION?

To prepare for listing the defective tracks table or defective track/sector information of any disc, respond with YES. Otherwise, respond with NO or a (RETURN) to go back to Step 84.

89 LOGICAL DEVICE# ?

Enter the logical device number of the disc for which the defective tracks table listing is desired (as in Step 85). This question is repeated until a (RETURN) is entered signifying that no further listings are desired.

- 90 If any changes have been made to the volume table in Step 87, the following question is printed.

LIST VOLUME TABLE?

Respond with YES to obtain a listing of the volume table (as described in Step 75); otherwise, enter NO or a (RETURN) to bypass the listing.

- 91 VIRTUAL MEMORY CHANGES?

To change the allocation on disc used for virtual memory, enter YES.

Logical device 1 memory allocation may be changed during RELOAD only; virtual memory allocation on other discs may also be changed during COOLSTART, COLDSTART or UPDATE.

To retain the current allocation, enter a (RETURN). Dialogue skips to Step 95.

- 92 LIST VIRTUAL MEMORY DEVICE ALLOCATION?

To list the disc volume, logical device number, and virtual memory allocation, enter YES. The listing is in the format:

VOLUME NAME	LDEV#	VM ALLOCATION
MH 7920UD	1	10

To suppress listing, enter a (RETURN).

- 93 ENTER VOLUME, SIZE IN KILOSECTORS?

Enter the volume name or logical device number, followed by the size, in kilosectors, separated by a comma.

Logical device 1 can be changed during RELOAD only. You must configure at least 1 kilosector of virtual memory space on logical device 1.

- 94 VIRTUAL MEMORY CHANGES?

Enter a YES, to loop back to Step 92.

Enter a (RETURN) to continue dialogue.

- 95 If this system has been configured with the MPE Logging Facility enabled, the following question is printed:

DISABLE LOGGING

To turn off all nonmandatory logging until the next cold load, enter YES. Otherwise, respond with NO.

NOTE

Steps 96-113 are identical to Steps 77-94 of the SYSDUMP Configurator Dialogue.

114 MAX # OF SPOOLFILES KILOSECTORS=XXXXXX ?

G.01.00 MAX # OF SPOOLFILES KILOSECTORS= <XXX> (MIN=0, MAX=77777)?

115 # OF SECTORS PER SPOOLFILE EXTENT?

Enter the size in sectors, for each spool file extent. This must be a value between 128 and 32,767.

G.01.00 # OF SECTORS PER SPOOLFILE EXTENT=<XXXXX>(MIN=128, MAX=32764)?

116 If this is not a RELOAD and no tracks have been deleted, the following question is printed:

RECOVER LOST DISC SPACE?

To recover any disc space that may have been lost because of system failures when temporary files were open, answer YES. Otherwise, enter NO.

NOTE

For systems with large numbers of files, this may take between 5 and 10 minutes for every 1000 files.

- 117 If this load is not a RELOAD and the size of the directory on disc differs from the configured size, the following message will be printed:

****WARNING** DIRECTORY SIZE ONLY CHANGED ON RELOAD**

- 118 If this load is not a RELOAD and any tracks were deleted or reassigned, the following list may be printed:

FOLLOWING FILES PURGED - DISC ERROR

filename.groupname.accountname

These files reside wholly or partially on tracks that were deleted or reassigned and were therefore purged from the directory. The space used by the files (except for the area on the defective track) was returned to the disc free-space list.

- 119 If any files lost data (but not in the file label) because of tracks or sectors which were spared (reassigned), the following list appears. Otherwise, control skips to Step 122.

FOLLOWING FILES LOST DATA DURING SPARING

The list contains file names and the addresses at which they lost data.

- 120 PURGE ALL FILES WHICH LOST DATA?

To purge all files listed in Step 119 which lost data during sparing, answer YES. This is the recommended response, since the listed files are damaged and probably cannot be relied upon or accessed easily. All of the files are purged and control proceeds to Step 122. If a file must be preserved, answer NO and control proceeds to Step 121.

- 121 SAVE FILE *filename.groupname.accountname*?

This prompt appears for each of the files listed in Step 119. To save the file, answer YES. To purge the file, answer NO.

- 122 If this is a RELOAD where user files are to be loaded onto the system, then continue. For all other types of start-up (including RELOAD where no user files are on the medium, or the ACCOUNTS option of RELOAD is specified) control proceeds to Step 123.

The user files read from the backup media and written to disc can cause one of the following messages to be printed:

(a) MOUNT REEL# *REELNUM*

The next reel of the set, *REELNUM*, should be mounted and placed on line.

(b) TAPE NOT A MEMBER OF THIS SET

The tape mounted in response to message (a) was not a member of the tape set.

(c) WRONG REEL

Reel *REELNUM*, specified in message (a), was not mounted. Another reel out of the normal sequence of reels was mounted erroneously.

(d) NOT A RELOAD TAPE OR IMPROPER TAPE FORMAT

The tape mounted in response to message (a) is not a tape generated by :SYSDUMP or :STORE.

(e) XXX FILES NOT FOUND - ANOTHER TAPE SET AVAILABLE ?

Not all of the files in the directory when the system was dumped have been found on the tape. If another set of tapes is available, respond with YES, mount the first reel of the set, and place it on line. Otherwise, respond with NO. Note that when the logging facility is enabled, the most recent in-use log file is not dumped to magnetic tape, because it is busy. However, the directory entry for the file is dumped to the tape. On RELOAD, the above message may appear even if the entire user file set is loaded onto the system. The directory entry for the log file plus the actual absence of the file on tape will provoke this message. Of course, there may be one or more other files which are missing from the tape. If you answer NO, it is advisable to list the files not found when the question is asked in the Dialogue below.

(f) WRONG TAPE SET - MUST HAVE EARLIER DATE

The tape mounted in response to message (e) has a date later than the previous tape set processed. The operator should find the first reel of the correct set, mount it, and place it on line.

(g) NOT ALL FILES FOUND - LIST?

To list files not found on the RELOAD tape, enter YES. To suppress the listing, enter NO or a RETURN.

NOTE

Listing a large number of "files not found" on the System Console device can be very time consuming.

- (h) FOLLOWING FILES PURGED BECAUSE OF
INSUFFICIENT DISC SPACE (1)
TAPE PARITY ERROR (2)
LIST?

To list files which were found on reload tape but for which disc space was unavailable, enter YES. To suppress the listing, enter NO or a RETURN. See note in Step (g) above. The message, NAME.IS.UNKNOWN, received during the listing of files, means the parity error occurred while reading the file label.

- (i) DISC SPACE ERROR

The Initiator erred while attempting to return allocated disc space after detection of a parity error on tape. This halts the configuration. Dialogue changes to Initiator/User for recovery from parity errors during RELOAD of user files.

- (j) **WARNING** DOUBLE EOF MARK
CONTINUE FROM NEXT REEL?

Two consecutive EOF marks were read. Either the tape is of the wrong format or a parity error was detected during reading of the tape trailer label. It should be possible to determine if the tape is located at the trailer label by the position of the tape reel. If this is the case enter YES, otherwise, enter NO. The Initiator cannot recover from improper tape format. A parity error in the trailer label will cause the first file of the next tape to be skipped, (probably a continuation of the last file of the previous tape) and continue RELOAD with the next file.

- (k) IRRECOVERABLE PARITY ERRORS

The Initiator encountered parity errors in both the header and trailer levels of the tape and was not able to continue with the RELOAD operation. The Initiator aborts as a result.

123 One of the following messages may be printed due to disc errors.

- (a) **WARNING** OLD WELCOME MESSAGE ON DEFECTIVE TRACKS

If doing a WARMSTART, COOLSTART, or UPDATE, an attempt is made to recover the welcome message; but if it or the Descriptor Track Table is located on defective tracks, the welcome message is set to null. The System Operator should enter a new welcome message after the load is complete.

- (b) CANNOT RECOVER DISC SPACE OF SPOOLFILE #XXXX

A disc error occurred during the attempt to recover lost disc space of the input/output spool file (WARMSTART only).

Configuring Your System

124 BANK 0 DEPENDENT MEMORY USED XXXXX

Amount of bank 0 memory used (up to 64K) during MPE system initialization.

125 DATE (M/D/Y)?

G.01.00 TUES, JAN 22, 1985, 9:00 AM? (Y or N)

Enter a **RETURN** or the current date in the following format:

mm/dd/yy

where

mm = one or two digits representing the month.

dd = one or two digits representing the day of the month.

yy = the last two digits of the year.

126 TIME (H:M)?

Enter the current time of day (24-hour clock) in the following format:

hh:mm

NOTE

When prompted for DATE (M/D/Y)?, if **RETURN** is entered instead of an actual date, the system will assume the default date/time of WED 1, 1972, 12:00 AM. This default is intended for factory use only. Always be sure to enter the correct date and time upon system startup to assure proper operation of functions related to the system clock (e.g. :SYSDUMP).

hh = one or two digits indicating the hour (on a 24-hour basis).

mm = one or two digits indicating the minute.

The Series 37 SPU supports a Time of Century (TOC) clock. Refer to Section 4 for a description.

127 MPE prints the date and time and the message ? (Y/N)

If the date and time were entered in steps 125 and 126, MPE echoes them for verification. If you respond with NO (or N), the Initiator returns to Step 125.

If the date and time are correct, enter YES or a RETURN to continue.

Startup State processing is done after the date and time prompts before a session is signed onto the Console. Refer to Section 6 for a discussion of Startup State Configurator.

The Initiator program now terminates, transferring control to MPE. When the system prints *WELCOME*, it is ready for use.

LOAD MAP

A typical map requested in Step 2 of the Initiator/User Dialogue appears as shown below. This map shows the correspondence between MPE code segments to code segment table (CST) entries. First, the CST number (in octal) is shown. Next, the System Segmented Library (SL) segment name is presented. SL segment names are followed by a parenthesized value, program file names are not. The number in parenthesis indicates the logical segment number of the segment within the system library, identified as SL.PUB.SYS.

01 ININ	31 ALLOCATE (27)
02 FILESYS1 (0)	32 ALLOCUTIL (30)
03 FILESYS4 (1)	33 HARDRES (31)
04 FILESYS5 (2)	34 ABORTDUMP (32)
05 FILESYS6 (3)	35 MESSAGE (33)
06 FILESYS6A (4)	36 PROCSEG (34)
07 FILESYS7 (5)	37 NRID (35)
10 CIALTORG (6)	40 PCREATE (36)
11 CCOMSYS (7)	41 MORGUE (37)
12 CIERR (10)	42 BIPC (40)
13 CIFILEB (11)	43 IPC (41)
14 CIFILEM (12)	44 CHECKER (42)
15 CIINIT (13)	45 UTILITY1 (43)
16 CILISTF (14)	46 UTILITY2 (44)
17 CIMISC (15)	47 LOADER1 (45)
20 CIORGMAN (16)	50 RINS (46)
21 CIPREPRUN (17)	51 JOBTABLE (47)
22 CISUBS (20)	52 DEBUG (50)
23 CISYSMGR (21)	53 NURSERY (51)
24 CIUSERUTIL (22)	54 SPOOLING (54)
25 CXSTOREST (23)	55 SPOOLCOMS1 (55)
26 RESTORE (24)	56 SPOOLCOMS2 (56)
27 STORE (25)	57 PVCOMSEG (57)
30 DIRC (26)	60 PVSYS (60)

PERIPHERAL CONFIGURATION INFORMATION

The System Operator will have to supply the information requested in the Configurator/User dialogue when configuring peripherals. This information is applicable to Steps 12-43 of the Configurator/User dialogue, and is supplied in the tables provided in this section.

A new portion has been added to Step 14 for MPE V/E for device types 16 and 32 (subtypes 14 and 15). This portion, " DESCRIPTOR FILENAME", allows the System Operator to include a user-defined terminal type which has been created using the Workstation Configurator. For additional information on this utility and user-defined terminal types, refer to the Workstation Configurator Reference Manual (30239-90001).

When configuring any data communication device or subsystem, refer to the Data Communications Handbook (5957-4634).

The following is a summary of the Tables which contains device type, subtype, terminal type, line and terminal speed, record width, and driver name.

TABLE NO.	TITLE
7-0	Device Defaults (DEFDATA.PUB.SYS), G.01.00
7-0A	Configuration Worksheet, Series 37
7-1	Asynchronous Data Communication Controller (ADCC) for Terminals
7-2	Advanced Terminal Processor (ATP) for Terminals
7-2A	Advanced Terminal Processor (ATP) for Terminals G.01.00 or Modems
7-3	Terminal Types Supported by MPE V/P and V/E
7-4	Terminal Subtypes for Device Type 16
7-5	Terminal Line Speeds for the ATP and ADCC
7-6	Printer Port Speeds for the ATP and ADCC
7-7	Serial Application Printer
7-7A	HP2687 Printer
7-8	Serial Spooled Printers
7-8A	HP2932A, HP2933A, HP2934A or HP2686 Printer
7-8B	HP2601 or HP2602 Printer
7-9	Line Printer
7-10	HP2608S, 2563A Line Printers
7-11	HP2680A, 2688 Laser Printing Systems
7-12	Card Reader
7-13	Nine-Channel Magnetic Tape Unit
7-14	Integrated Cartridge Tape Unit
7-14A	HP9144A Tape Unit
7-15	HP9895 Flexible Disc
7-16	Disc
7-16A	HP7945A Disc Drives (For Systems With Two Disc Drives)
7-16B	HP7945A Disc Drive (For Systems With One Disc Drive)
7-16C	Ending the Sysdump Dialogue

Configuring Your System

DEFDATA.PUB.SYS is a table that contains the device defaults for SYSDUMP and INITIAL. This table eliminates the need to look up default information every time a device is added to the system. DEFDATA is loaded on the system during a cold load (UPDATE, COLDSTART, RELOAD). The device defaults from DEFDATA that a user of SYSDUMP or INITIAL will see are listed below.

Table 7-0. Device Defaults (DEFDATA.PUB.SYS), G.01.00

DEVICE NAME	ID CODE	C H A N	T Y P E	SUB TYPE	REC WIDTH	OUTPUT DEV	MODE	DRIVER NAME	DEVICE CLASS	
				TERMINAL TYPE						
				SPEED						
HP2563A	!2101	0	32	9	66	0	S	HIOCIPR0	LP	
HP2565	!2101	0	32	9	66	0	S	HIOCIPR0	LP	
HP2566	!2101	0	32	9	66	0	S	HIOCIPR0	LP	
HP2608A	!2001	0	32	4	66	0	S	HIDLPR0	LP	
HP2608S	!2101	0	32	9	66	0	S	HIOCIPR0	LP	
HP2613	!200A	0	32	2	66	0	S	HIDLPR2	LP	
HP2617	!200A	0	32	2	66	0	S	HIDLPR2	LP	
HP2619	!200A	0	32	2	66	0	S	HIDLPR2	LP	
HP2680A	!2004	0	32	8	66	0	S	HIOPPR0	LP	
HP2688A	!2004	0	32	8	66	0	S	HIOPPR0	LP	
HP2893A	!0101	0	8	0	40	0		HIOCRDR0	CARDRDR	
HP7902	!0081	0	2	0	128	0		HIOFLOP0	FLOP	
HP7906BP	!FF02	0	0	12	128	0		HIO M D S C 1	DISC	
HP7906FP	!FF02	0	0	11	128	0		HIO M D S C 1	DISC	
HP7906RP	!FF02	0	0	10	128	0		HIO M D S C 1	DISC	
HP7911	!0204	0	3	1	128	0		HIO M D S C 2	DISC	
HP7912	!0208	0	3	2	128	0		HIO M D S C 2	DISC	
HP7914	!020A	0	3	4	128	0		HIO M D S C 2	DISC	
HP7920	!FF03	0	0	8	128	0		HIO M D S C 1	DISC	
HP7925	!FF04	0	0	9	128	0		HIO M D S C 1	DISC	
HP7933	!0212	0	3	8	128	0		HIO M D S C 2	DISC	
HP7935	!0212	0	3	8	128	0		HIO M D S C 2	DISC	
HP7945	!0220	0	3	5	128	0		HIO M D S C 2	DISC	
HP7970E	!0183	0	24	0	128	0		HIO TA P E 0	TA	
HP7974	!0174	0	24	3	128	0		HIO TA P E 2	TA	
HP7976A	!0176	0	24	1	128	0		HIO TA P E 1	TA	
HP7978	!0178	0	24	2	128	0		HIO TA P E 2	TA	
HP9140	!0240	0	3	0	128	0		HIO C T A P 0	SDISC	
HP9144	!0260	0	3	3	128	0		HIO C T A P 1	SDISC	
HP9895	!0081	0	2	0	128	0		HIOFLOP0	FLOP	
HPLPADCC	!0010	0	32	14	19	240	66	0	S HIOASLP2	LP
HPLPATP	!000F	0	32	14	19	240	66	0	S HIOASLP0	LP
HPPCLADCC	!0010	0	32	14	??*	960	66	0	S HIOASLP2	LP
HPPCLATP	!000F	0	32	14	??*	960	66	0	S HIOASLP0	LP
HPTERMADCC	!0010	0	16	0	10	960	40	& JAID	HIO TERM 2	TERM
HPTERMATP	!000F	0	16	0	10	960	40	& JAID	HIO TERM 1	TERM

*The DRT# and UNIT# for devices are unique to particular systems, so they will not be supplied with these device defaults. The default DRT# and UNIT# for devices on a given system will be found by polling the physically connected devices during INITIAL, using the IOMAP procedure.

Table 7-0A. Configuration Worksheet, Series 37

Port/Unit #	Product #	Description	LDEV #	DRT #
Standard ATP37				
0		Console	20	8
1			21	8
2			22	8
3			23	8
4			24	8
5			25	8
7			27	8
Add-on ATP37				
0			30	24
1			31	24
2			32	24
3			33	24
4			34	24
5			35	24
7			37	24

Table 7-1. Asynchronous Data Communication Controller (ADCC) for Terminals

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>16</u>
13	SUB TYPE?	Refer to Table 7-4.
14 E/F.00.00	TERM TYPE?	Refer to Table 7-3.
14 G.00.00	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME]?	Refer to Table 7-3 for terminal types, and to the Workstation Configurator Reference Manual (30239-90001) for information on creating a user-defined terminal type.
15	SPEED IN CHARACTERS PER SECOND?	Refer to Table 7-5.
30	RECORD WIDTH?	<u>40</u>
31	OUTPUT DEVICE?	<u>ldev#</u>
32	ACCEPT JOB/SESSIONS?	<u>YES</u>
33	ACCEPT DATA?	<u>YES</u>
34	INTERACTIVE?	<u>YES</u>
35	DUPLICATIVE	<u>YES</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIDTERM0 (MPE V/P)</u> <u>HIDTERM2 (MPE V/E)</u>
43	DEVICE CLASSES?	<u>devclass1,devclass...</u>

Table 7-2. Advanced Terminal Processor (ATP) for Terminals

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>16</u>
13	SUB TYPE?	Refer to Table 7-4. For MPE V/E, any invalid subtypes entered, defaults to subtype 0.
14 E/F.00.00	TERM TYPE?	Refer to Table 7-3.
14 G.00.00	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME]?	Refer to Table 7-3 for terminal types, and to the Workstation Configurator Reference Manual (30239-90001) for information on creating a user-defined terminal type.
15	SPEED IN CHARACTERS PER SECOND?	Refer to Table 7-5.
30	RECORD WIDTH?	<u>40</u>
31	OUTPUT DEVICE?	<u>ldev#</u>
32	ACCEPT JOB/SESSION?	<u>YES</u>
33	ACCEPT DATA?	<u>YES</u>
34	INTERACTIVE?	<u>YES</u>
35	DUPLICATIVE?	<u>YES</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIOTERM1</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Configuring Your System

Enter responses as underlined (e.g. 8). If you make an error in a response, continue responding to the rest of the questions in the table until Step No. 8 is displayed again, then repeat the table giving the correct responses.

Table 7-2A. Advanced Terminal Processor (ATP) for Terminals G.01.00 or Modems

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	LDEV#
8.1	DEVICE NAME?	<u>HPTERMATP</u>
9	DRT #?	STANDARD ATP37: <u>8</u> ADD-ON ATP37: <u>24</u>
10	UNIT #?	PORT UNIT#
11	SOFTWARE CHANNEL = 0?	<u>RETURN</u>
12	TYPE = 16?	<u>RETURN</u>
13	SUB TYPE = 0?	TERMINAL: <u>RETURN</u> ; MODEM: <u>1</u>
14	ENTER [TERM TYPE#] [DESCRIPTOR FILENAME] = (10) ?	<u>RETURN</u>
15	SPEED IN CHARACTERS PER SECOND = 960?	TERMINAL: <u>RETURN</u> ; MODEM: <u>120</u>
30	RECORD WIDTH = 40?	<u>RETURN</u>
31	OUTPUT DEVICE = <i>ldev</i>	<u>RETURN</u>
32	ACCEPT JOBS/SESSIONS = Y?	<u>RETURN</u>
33	ACCEPT DATA = Y?	<u>RETURN</u>
34	INTERACTIVE = Y?	<u>RETURN</u>
35	DUPLICATIVE = Y?	<u>RETURN</u>
36	INITIALLY SPOOLED = N?	<u>RETURN</u>
37.1	AUTO REPLY = N?	<u>RETURN</u>
38	DRIVER NAME = HIOTERM1?	<u>RETURN</u>
43	DEVICE CLASS = TERM?	<u>RETURN</u>



Table 7-3. Terminal Types Supported by MPE V/P and V/E

TERMINAL TYPES	DESCRIPTION
4	HP 2600A or Datapoint 3300 Keyboard Display Terminal (10/15/30/60/120/240 cps). This terminal type is only supported by the ADCC for MPE V/P.
6	HP 2762A/B (General Electric Terminet 300 or 1200), or Data Communications terminal, Model B (10/15/30/120 cps) with Paper Tape Reader/Punch, Option 2. Note this terminal must be equipped for ECHO PLEX.
10	For HP devices. If ATP hardware is installed, 1920 CPS is also possible.
12	HP 2645K Katakana/Roman Data Terminal.
13	Message switching network or other computer.
14	Multipoint Terminal.
15	HP 2635A Printing Terminal. 8-bit protocol (for second character set).
16	HP 2635A Printing Terminal. 7-bit protocol (standard character set).
18	For non-HP devices. Only provides XON/XOFF protocol data-handling. All application printers.
19	HP 2631B or HP 2631B-compatible Remote Spooled Printers.
20	8-bit Remote Spooled Printer (not supported with subtype 15).
21	Remote Spooled Printer with embedded escape sequences allowed. HP 2631B or 2631B-compatible printers.
22	8-bit Remote Spooled Printer with embedded escape sequences allowed (not supported with subtype 15). Specific to HP 2631B or 2631B-compatible printers with 8-bit data, no parity.

For further information refer to the Data Communications Handbook (5957-4634).

Table 7-4. Terminal Subtypes for Device Type 16

SUBTYPE	DESCRIPTION
0	Directly connected terminals requiring speed sensing. Not recommended for use with modems.
1	Asynchronous full duplex modems. Compatible with Bell 103, 202T, 212A, and CCITT V.21 modems requiring speed sensing. ATP and ADCC (HIOTERM2) require Data Set Ready (RS-232-C "CC", CCITT 107) and Data Carrier Detect (RS-232-C "CF", CCITT 109) to be ON.
4	Identical to subtype 0 except that automatic speed sensing is disabled. This subtype is intended for operation with leased-line full duplex modems which can be configured to operate without control signals (i.e., 202T). (Not supported for MPE V/E.)
5	Identical to subtype 1 except that automatic speed sensing is disabled. (Not supported for MPE V/E.)
9	ATP only — Asynchronous CCITT modem that requires monitoring circuit 108 (clear to send); otherwise identical to subtype 1.

Table 7-5. Terminal Line Speeds for the ATP and ADCC

LINE SPEED	CHARS/SEC	ATP HIOTERM1 SENSED	ADCC HIOTERM2 SENSED/SPECIFIED	ADCC HIOTERM0 SENSED/SPECIFIED
150	15	N	N / Y	Y / Y
300	30	Y	Y / Y	Y / Y
600	60	Y	Y / Y	N / Y
1200	120	Y	Y / Y	Y / Y
2400	240	Y	Y / Y	Y / Y
4800	480	Y	Y / Y	N / Y
9600	960	Y	Y / Y	N / Y
19200	1920	Y	N / N	N / N

Table 7-6. Printer Port Speeds for the ATP and ADCC

Line Speed	Chars/Sec	ATP	ADCC
150	15	N	Y
300	30	Y	Y
600	60	Y	Y
1200	120	Y	Y
2400	240	Y	Y
4800	480	Y	Y
9600	960	Y	Y
19200	1920	Y	N

Table 7-7. Serial Application Printers

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>32</u>
13	SUB TYPE?	<u>14</u> or <u>15</u> Subtype 14 is direct connect. Subtype 15 is modem connect.
14 E/F.00.00	TERM TYPE?	<u>18</u>
14 G.00.00	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME]?	<u>18</u> (terminal type). Refer to the Workstation Configurator Reference Manual (30239-90001) for information on creating a user-defined terminal type.
15	SPEED IN CHARACTERS PER SECOND?	Refer to Table 7-5.
30	RECORD WIDTH?	<u>40</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>H10TERM0</u> ADCC (MPE V/P) <u>H10ASLP2</u> ADCC (MPE V/E) <u>H10ASLP0</u> ATP (MPE V/E)
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Configuring Your System

Enter responses as underlined (e.g., 8). If you make an error in a response continue responding to the rest of the questions in the table, then repeat the table giving the correct responses.

Table 7-7A. HP2687 Printer

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	LDEV#
8.1	DEVICE NAME?	<u>HPPCLATP</u>
9	DRT #?	STANDARD ATP37: <u>8</u> ADD-ON ATP37: <u>24</u>
10	UNIT #?	PORT UNIT#
11	SOFTWARE CHANNEL = 0?	<u>RETURN</u>
12	TYPE = 32?	<u>RETURN</u>
13	SUB TYPE = 14?	<u>RETURN</u>
14	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME] = (TTPCL22.PUB.SYS)	<u>TTPCL18.PUB.SYS</u>
15	SPEED IN CHARACTERS PER SECOND = 960?	<u>RETURN</u>
30	RECORD WIDTH = 66?	<u>RETURN</u>
31	OUTPUT DEVICE = 0?	<u>RETURN</u>
32	ACCEPT JOBS/SESSIONS = N?	<u>RETURN</u>
33	ACCEPT DATA = N?	<u>RETURN</u>
34	INTERACTIVE = N?	<u>RETURN</u>
35	DUPLICATIVE = N?	<u>RETURN</u>
36	INITIALLY SPOOLED = Y?	<u>RETURN</u>
37.1	AUTO REPLY = N?	<u>RETURN</u>
38	DRIVER NAME = HIOASLPD?	<u>RETURN</u>
43	DEVICE CLASS = LP?	<u>RETURN</u>



Table 7-8. Serial Spooled Printers

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>32</u>
13	SUB TYPE?	<u>14</u> or <u>15</u> Subtype 14 is direct connect. Subtype 15 is modem connect.
14 E/F.00.00	TERM TYPE?	<u>19</u> , <u>20</u> , <u>21</u> , or <u>22</u> (Refer to Table 7-3.)
14 G.00.00	ENTER [TERM TYPE], [DESCRIPTOR FILENAME]?	<u>19</u> , <u>20</u> , <u>21</u> , or <u>22</u> (terminal types). Refer to the Workstation Configurator Reference Manual (30239-90001) for information on creating a user-defined terminal type.
15	SPEED IN CHARACTERS PER SECOND?	Refer to Table 7-6.
30	RECORD WIDTH?	<u>66</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>YES</u>
37	INPUT OR OUTPUT?	<u>IN</u> or <u>OUT</u>
38	DRIVER NAME?	<u>HIDTERM0</u> ADCC (MPE V/P) <u>HIDASLP2</u> ADCC (MPE V/E) <u>HIDASLP0</u> ATP (MPE V/E)
43	DEVICE CLASSES?	<u>devclass[, devclass...]</u>

Configuring Your System

Enter responses as underlined (e.g., 8). If you make an error in a response continue responding to the rest of the questions in the table, then repeat the table giving the correct responses.

Table 7-8A. HP2932A, HP2933A, HP2934A or HP2686 Printer

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	LDEV#
8.1	DEVICE NAME?	<u>HPPCLATP</u>
9	DRT #?	STANDARD ATP37: <u>8</u> ADD-ON ATP37: <u>24</u>
10	UNIT #?	PORT UNIT#
11	SOFTWARE CHANNEL = 0?	<input type="text" value="RETURN"/>
12	TYPE = 32?	<input type="text" value="RETURN"/>
13	SUB TYPE = 14?	<input type="text" value="RETURN"/>
14	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME] = (TTPCL22.PUB.SYS) t	<input type="text" value="RETURN"/>
15	SPEED IN CHARACTERS PER SECOND = 960?	<input type="text" value="RETURN"/>
30	RECORD WIDTH = 66?	<input type="text" value="RETURN"/>
31	OUTPUT DEVICE = 0?	<input type="text" value="RETURN"/>
32	ACCEPT JOBS/SESSIONS = N?	<input type="text" value="RETURN"/>
33	ACCEPT DATA = N?	<input type="text" value="RETURN"/>
34	INTERACTIVE = N?	<input type="text" value="RETURN"/>
35	DUPLICATIVE = N?	<input type="text" value="RETURN"/>
36	INITIALLY SPOOLED = Y?	<input type="text" value="RETURN"/>
37.1	AUTO REPLY = N?	<input type="text" value="RETURN"/>
38	DRIVER NAME = HIQASLPD?	<input type="text" value="RETURN"/>
43	DEVICE CLASS = LP?	<input type="text" value="RETURN"/>

Enter responses as underlined (e.g., 8). If you make an error in a response continue responding to the rest of the questions in the table, then repeat the table giving the correct responses.

Table 7-8B. HP2601 or HP2602 Printer

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	LDEV#
8.1	DEVICE NAME?	<u>HPLPATP</u>
9	DRT #?	STANDARD ATP37: <u>8</u> ADD-ON ATP37: <u>24</u>
10	UNIT #?	PORT UNIT#
11	SOFTWARE CHANNEL = 0?	<input type="text" value="RETURN"/>
12	TYPE = 32?	<input type="text" value="RETURN"/>
13	SUB TYPE = 14?	<input type="text" value="RETURN"/>
14	ENTER [TERM TYPE#], [DESCRIPTOR FILENAME] = (19) ?	<u>18</u>
15	SPEED IN CHARACTERS PER SECOND = 240?	<input type="text" value="RETURN"/>
30	RECORD WIDTH = 66?	<input type="text" value="RETURN"/>
31	OUTPUT DEVICE = 0?	<input type="text" value="RETURN"/>
32	ACCEPT JOBS/SESSIONS = N?	<input type="text" value="RETURN"/>
33	ACCEPT DATA = N?	<input type="text" value="RETURN"/>
34	INTERACTIVE = N?	<input type="text" value="RETURN"/>
35	DUPLICATIVE = N?	<input type="text" value="RETURN"/>
36	INITIALLY SPOOLED = Y?	<input type="text" value="RETURN"/>
37.1	AUTO REPLY = N?	<input type="text" value="RETURN"/>
38	DRIVER NAME = HIOASLPD?	<input type="text" value="RETURN"/>
43	DEVICE CLASS = LP?	<input type="text" value="RETURN"/>

Table 7-9. Line Printers

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>32</u>
13	SUB TYPE?	<u>4</u> -HP2608A <u>5</u> - HP2631A/B <u>2</u> - HP261X
30	RECORD WIDTH?	<u>66</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u> or <u>YES</u>
38	DRIVER NAME?	<u>HIQLPRT0</u> - HP2608A <u>HIQLPRT1</u> - HP2631A/B <u>HIQLPRT2</u> - HP261X
43	DEVICE CLASSES?	<u>devclass1,devclass...1</u>

Table 7-10. HP2608S, 2563A Line Printers

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>32</u>
13	SUB TYPE?	<u>9</u> - feature access <u>13</u> - transparency
30	RECORD WIDTH?	<u>66</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>YES</u> or <u>NO</u>
38	DRIVER NAME?	<u>HIDCIPRO</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Table 7-11. HP2680A, 2688 Laser Printing Systems

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>32</u>
13	SUB TYPE?	<u>8</u>
30	RECORD WIDTH?	<u>66</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>YES</u>
37	INPUT OR OUTPUT?	<u>IN</u> or <u>OUT</u>
38	DRIVER NAME?	<u>H10PPRT0</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Table 7-12. Card Reader

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>8</u>
13	SUB TYPE?	<u>0</u>
30	RECORD WIDTH?	<u>40</u>
31	OUTPUT DEVICE?	<u>ldev</u> or <u>devclass</u> of listing device
32	ACCEPT JOB/SESSION?	<u>YES</u>
33	ACCEPT DATA?	<u>YES</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u> or <u>YES</u>
38	DRIVER NAME?	<u>HIOCDRDO</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Table 7-13. Nine-Channel Magnetic Tape Units

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>24</u>
13	SUB TYPE?	<u>0</u> or <u>8</u> (auto-reply) * HP7970E <u>1</u> or <u>9</u> (auto-reply) * HP7976A <u>3</u> or <u>11</u> (auto-reply) * HP7974A <u>2</u> or <u>10</u> (auto-reply) * HP7978
30	RECORD WIDTH?	<u>128</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>YES</u> or <u>NO</u>
33	ACCEPT DATA?	<u>YES</u> or <u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIDTAPE0</u> - HP7970E <u>HIDTAPE1</u> - HP7976A <u>HIDTAPE2</u> - HP7974A, 7978A
43	DEVICE CLASSES?	<u>devclass1,devclass...1</u>

* To enable auto-reply beginning with release G.01.00, refer to Step 37.1 of the Configurator Dialogue.

Table 7-14. HP 9140 Integrated Cartridge Tape Units

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>3</u>
13	SUB TYPE?	<u>0</u>
30	RECORD WIDTH?	<u>128</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIDCTAP0</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>
44	IS <i>devclass</i> A SERIAL DISC CLAS	<u>YES</u>

Table 7-14A. HP 9144A Tape Unit

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>3</u>
13	SUB TYPE?	<u>3</u>
30	RECORD WIDTH?	<u>128</u>
31	OUTPUT DEVICE	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIOCTAP1</u>
43	DEVICE CLASSES?	<i>devclass [,devclass...]</i>
44	IS <i>devclass A</i> SERIAL DEVICE CLASS?	<u>YES</u>



Table 7-15. HP9895 Flexible Disc

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>2</u>
13	SUB TYPE?	<u>0</u>
30	RECORD WIDTH?	<u>128</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIOFLOP0</u>
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Table 7-16. Discs

CONFIGURATOR STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
12	TYPE?	<u>0</u> - HP7906A, 792X <u>3</u> - HP791X, 793X, 794X
13	SUB TYPE?	<u>10</u> HP7906 (removable platter) <u>11</u> HP7906 (fixed platter) <u>12</u> HP7906 (both platters) <u>1</u> HP7911 <u>2</u> HP7912 <u>4</u> HP7914 <u>8</u> HP7920, 7933, 7935 <u>9</u> HP7925 <u>5</u> HP7945
30	RECORD WIDTH?	<u>128</u>
31	OUTPUT DEVICE?	<u>0</u>
32	ACCEPT JOB/SESSION?	<u>NO</u>
33	ACCEPT DATA?	<u>NO</u>
34	INTERACTIVE?	<u>NO</u>
35	DUPLICATIVE?	<u>NO</u>
36	INITIALLY SPOOLED?	<u>NO</u>
38	DRIVER NAME?	<u>HIOMDSC1</u> - HP7906A, 792X <u>HIOMDSC2</u> - HP791X, 793X, 7945
43	DEVICE CLASSES?	<u>devclass[,devclass...]</u>

Table 7-16A. HP7945A Disc Drives (For Systems With Two Disc Drives)

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	LDEV#
8.1	DEVICE NAME?	<u>HP7945</u>
9	DRT #?	<u>34</u>
10	UNIT #?	<u>1</u>
11	SOFTWARE CHANNEL = 0?	<u>RETURN</u>
12	TYPE = 3?	<u>RETURN</u>
13	SUB TYPE = 5?	<u>RETURN</u>
30	RECORD WIDTH = 128?	<u>RETURN</u>
31	OUTPUT DEVICE = 0	<u>RETURN</u>
32	ACCEPT JOBS/SESSIONS = N?	<u>RETURN</u>
33	ACCEPT DATA = N?	<u>RETURN</u>
34	INTERACTIVE = N?	<u>RETURN</u>
35	DUPLICATIVE = N?	<u>RETURN</u>
36	INITIALLY SPOOLED = N?	<u>RETURN</u>
37.1	AUTO REPLY = N?	<u>RETURN</u>
38	DRIVER NAME = HIOMDSC2?	<u>RETURN</u>
43	DEVICE CLASSES = DISC?	<u>DISC, SPOOL</u>

Once you have performed the above dialogue, skip to Step 133 of the Configurator Dialogue.

Table 7-16A. HP7945A Disc Drives (For Systems With Two Disc Drives) Continued

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE #?	<u>RETURN</u>
46	MAX # OF OPEN SPOOLFILES = 10 (MIN=0, MAX=1009)?	<u>RETURN</u>
47	LIST I/O DEVICES?	<u>RETURN</u>
49	TERMINAL TYPE CHANGES?	<u>RETURN</u>
57	CLASS CHANGES?	<u>RETURN</u>
69	LIST I/O DEVICES?	<u>RETURN</u>
4	I/O CONFIGURATION CHANGES?	<u>RETURN</u>
77	SYSTEM TABLE CHANGES?	<u>RETURN</u>
97	MISC CONFIGURATION CHANGES?	<u>RETURN</u>
112	LOGGING CHANGES	<u>RETURN</u>
119	DISC ALLOCATION CHANGES?	<u>Y</u>
120	MAX DIRECTORY SIZE (SECTORS) = 3000 (MIN = 3000, MAX = 65000, USED = <i>nnn</i>)?	<u>RETURN</u>
121	LIST VOLUME TABLE?	<u>Y</u>
*	VOLUME # NAME LOG DEV # 1 MH7945U0 1	
122	DELETE VOLUME?	<u>RETURN</u>
124	ADD VOLUME?	<u>Y</u>
125	ENTER VOLUME NAME?	<u>MH7945U1</u>
125	ENTER VOLUME NAME?	<u>RETURN</u>

Table 7-16A. HP7945A Disc Drives (For Systems With Two Disc Drives) Continued

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
126	LIST VOLUME TABLE?	<u>Y</u>
*	VOLUME # NAME LOG DEV # 1 MH7945U0 1 2 MH7945U1 0	
127	VIRTUAL MEMORY CHANGES?	<u>Y</u>
128	LIST VIRTUAL MEMORY DEVICE ALLOCATION?	<u>Y</u>
*	VOLUME NAME LDEV # VM ALLOCATION MH7945U0 1 10 MH7945U0 0 0	
129	ENTER VOLUME NAME, SIZE IN KILOSECTORS?	<u>MH7945U1, 10</u>
129	ENTER VOLUME NAME, SIZE IN KILOSECTORS?	<u>(RETURN)</u>
130	VIRTUAL MEMORY CHANGES?	<u>Y</u>
128	LIST VIRTUAL MEMORY DEVICE ALLOCATION?	<u>Y</u>
*	VOLUME NAME LDEV # VM ALLOCATION MH7945U0 1 10 MH7945U1 0 10	
129	ENTER VOLUME NAME, SIZE IN KILOSECTORS?	<u>(RETURN)</u>
130	VIRTUAL MEMORY CHANGES?	<u>(RETURN)</u>
131	MAX# OF SPOOLFILE KILOSECTORS = 128 (MIN = 0, MAX = 7777)?	<u>(RETURN)</u>
132	# OF SECTORS PER SPOOLFILE EXTENT = 384? (MIN = 128, MAX = 32764)?	<u>(RETURN)</u>

Table 7-16B. HP7945A Disc Drive (For Systems with One Disc Drive)

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
8	LOGICAL DEVICE?	<u>RETURN</u>
46	MAX # OF OPEN SPOOLFILES = 128 (MIN = 0, MAX = 1011)?	<u>RETURN</u>
47	LIST I/O DEVICES?	<u>RETURN</u>
49	TERMINAL TYPE CHANGES?	<u>RETURN</u>
57	CLASS CHANGES?	<u>RETURN</u>
69	LIST I/O DEVICES?	<u>RETURN</u>
4	I/O CONFIGURATION CHANGES?	<u>RETURN</u>
77	SYSTEM TABLE CHANGES?	<u>RETURN</u>
97	MISC CONFIGURATION CHANGES?	<u>RETURN</u>
112	LOGGING CHANGES?	<u>RETURN</u>
119	DISC ALLOCATION CHANGES?	<u>N</u>

Once you have performed the above dialogue proceed to Step 133 of the Configurator Dialogue.

ENDING THE SYSDUMP DIALOGUE

To end the SYSDUMP configurator dialogue, perform the dialogue steps below.

Table 7-16C. Ending the Sysdump Dialogue

STEP NO.	CONFIGURATOR DIALOGUE	USER RESPONSE
133	SCHEDULING CHANGES?	<u>RETURN</u>
134	SEGMENT LIMIT CHANGES?	<u>RETURN</u>
142	SYSTEM PROGRAM CHANGES?	<u>RETURN</u>
144	SYSTEM SL CHANGES?	<u>RETURN</u>
153	ENTER DUMP DATE?	<u>0</u>
154	ENTER DUMP FILE SUBSET (S)	<u>@.@.@</u>
155	LIST FILES DUMPED?	<u>RETURN</u>

1. Ensure that the COLDLOAD tape is "write-enabled" by assuring that the arrow points away from "SAFE". Insert the COLDLOAD tape in the tape drive. The tape drive will now prepare the tape as before. When the READY light turns off, proceed to the next step.
2. The following will then be displayed:

```
time/pin/Vol <unlabeled> mounted on LDEV# 7
```

```
?time/job/31/LDEV# FOR "DUMP" ON TAPE (NUM), WRITE RING? (Y/N)
```

The second message is a tape request; the system will now wait for you to reply to the tape request. Take the LDEV# from the first message (in this example, 7) and the *pin* number from the second message (the *pin* number is the number directly after the second "/", in this example, 31). (The LDEV# in the first message that you see and the *pin* number in the second message that you see will likely vary from this example.) In this example case, you would type REPLY 31,7,Y. Use the REPLY command and the numbers you have read from the messages to reply in the same format:

```
:REPLY pin,ldev,Y
```

The BUSY light will turn on as the system will then begin to write information to the COLDLOAD tape.

3. When the BUSY turns off, press the EJECT button and remove the tape.
4. Ensure that the COLDLOAD tape is "write-disabled" by assuring that the arrow points toward "SAFE". Re-insert the tape one more time. Again, the tape will be automatically prepared as in the previous sections.

5. Type in the following command:

```
:BYE
```

The following will then be displayed:

```
CPU=n. CONNECT=n. date, time  
time/job/pin/LOGOFF ON LDEV#n
```

6. While holding down the CONTROL key, type the letter A. The = prompt will now be displayed at the console.

Type in the following command:

```
=SHUTDOWN
```

This command will cause the computer to shut down its processing in preparation for restarting. The following will be displayed:

```
time/pin/ALL JOBS LOGGED OFF  
SHUT  
HALT 15
```

```
1-NORMAL  
H for help ->
```

7. Re-insert the COLDLOAD tape. Again, the tape will be automatically prepared as in the previous sections.
8. Type in the following command:

```
H for help ->COLD
```

The computer will automatically perform a "COLDSTART" of your Series 37 Computer System. This will take about 25 minutes. Progress messages will be displayed, then the time and date will be displayed for you to accept or reject.

Once you have set the date and time the system will be up and running and your additional devices will be operational.

SUGGESTED PARAMETER SETTINGS

Choosing an appropriate set of configuration parameters is an important part of tuning an HP 3000. In general, the various parameters should be as small as possible while still providing sufficient resources to process the required work load. The following guidelines are offered to help the System Manager make an intelligent choice of parameters for each particular system. The absolute minimum and maximum configuration settings are listed in Table 7-17 and Table 7-18.

The guidelines presented here assume that users are using only the standard capabilities; sites using the process handling (PH) or extra data segment (DS) capabilities should make additional allowances for the extra resources required. The following terms are used:

Jobs	The maximum number of jobs that will be run at any given time.
Sessions	The maximum number of sessions that will be run at any time.
Users	The maximum number of jobs and sessions that will be run at any given time.
Terminals	The number of configured terminals.

1. MAX # OF OPEN SPOOLFILES

This is the maximum number of spool files that may be in the OPEN state at any one time; it does not affect spool files in the ACTIVE or READY states. When a spool file is opened, MPE creates a "virtual device" of the required type by filling in an unused logical device entry with the appropriate values. This parameter tells MPE how many virtual device numbers to reserve for spooling. A spooled or streamed job requires at least two opened spool files, one for \$STDIN and one for \$STDLIST. In addition, each user requires an open spool file for each access to a spooled device.

2. CST

The Code Segment Table (CST) is used for all permanently allocated MPE and subsystem code segments (those listed in the LOADMAP) plus all code segments that come from any segmented library (SL). MPE needs a minimum of 128 entries to operate. Facilities doing program development, and those which have large SL's, need more CST entries. If the CST is underconfigured, some programs will not run when the system is heavily loaded. If overconfigured, main memory space is wasted. For the Series 40, 44, and 64, 192 entries, the maximum number allowed should be used in most cases. For the Series 39, 42, and 48, 68 2048 entries, the maximum number allowed should be used. The recommended number of CST entries is: $(4 * _\#_ \text{of users}) + 256$.

3. EXTENDED CST

This table, the CSTX, is used for all program code segments which are assigned dynamically via the :RUN command or allocated permanently via the :ALLOCATE command. MPE needs at least 32 entries to operate. Large programs with many code segments require more table entries. The number of additional CSTX entries is dependent on the number of users and the number and size of different application which are running. If the extended CST is underconfigured, some programs will not run when the system is heavily loaded. (The :ALLOCATE command should be used cautiously if there is a limited amount of space in the CSTX). The recommended number of entries is 10 per user.

4. DST

The Data Segment Table is used to reference all data segments, including MPE and user data stacks, etc. The recommended number of DST entries is $(8 * _\#_ \text{of users}) + 64$. Programs which use many extra data segments, or which have many open files, require more entries. If underconfigured, some programs may not run when the system is heavily loaded.

5. PCB

The Process Control Block contains the status of each process on the system. Each entry consumes 21 words, and there is 1 entry per process. The recommended number of PCB entries is: 2.5X maximum number of jobs and sessions with minimum of 32. If process handling is used, add more entries to the above configuration value. If underconfigured, a system failure may result.

6. DISC REQUEST TABLE

The Disc Request Table (DRQ) is used to hold request parameters and queries for pending I/Os. In general, the configuration value will be a function of the number of processes and the number of discs with caching. If underconfigured, disc requests will wait for free entries, and performance will be affected.

7. I/O QUEUE

This single queue is used to hold all I/O requests on the system, except disc requests. Allow 4 entries for each system user. If underconfigured, nondisc requests will wait for free entries, and performance will be affected.

8. TERMINAL BUFFERS PER PORT

Terminal buffers are used for all buffered terminal I/O. Use 5 buffers per active terminal user. If mostly block mode applications are to be run on the system (i.e. V/3000), configure the maximum 1024 buffer on all Series. If underconfigured, terminal response will be slow to the screen.

9. SYSTEM BUFFERS

System buffers are used by the message system to handle console messages and by the communications subsystems. The average configuration size is 8 buffers. If the system has many interactive users and a large number of streamed jobs, you will need a larger number of buffers to handle the logons and logoffs. Heavy usage of :TELLDP or :TELL, or using private volumes without issuing the Console command :VMDUNT ON,AUTO, will require more system buffers. One additional buffer is needed for each multipoint line. If underconfigured, system response may be very slow.

10. SWAP TABLE

The Swap Table is used by the Memory Manager to determine which segments need to be brought into memory in order for an absent process to run. The suggested number of entries is 5 times the number of PCB entries configured in the system for MPE V/P and 8 times the number of PCB entries configured in the system for MPE V/E. If the PCB table is configured to its maximum size, the maximum swaptable size is 5 times the number of PCB entries. If underconfigured, System Failure 602 may occur.

11. PRIMARY MESSAGE TABLE

The Primary Message Table is used to buffer message contents for pending messages transmitted within the system, using the internal message facility during the execution of critical areas of system code. The suggested number of entries is one per Process Control Block (PCBJ). The number of Primary Message Table entries configured should be greater than the configured number of System Buffers. This number of entries must also be less than the number of configured Secondary Message Table entries. The minimum recommended is:

$$\frac{\text{PCB configured} + 1}{1}$$

12. SECONDARY MESSAGE TABLE

The Secondary Message Table is used to buffer message contents for pending messages transmitted within the system, using the internal message facility. If the Secondary Message Table becomes full, processes requiring it will be impeded until entries become available. The suggested number of entries is:

$$\frac{\text{PCBs} + 7}{8}$$

13. SPECIAL REQUEST TABLE

The Special Request Table is used to temporarily buffer the parameters for segment expansion and to form the queue for devices waiting for a segment to arrive in memory. The suggested number of entries is 25, for MPE V/P. The suggested entries for MPE V/E is 50 or one entry per configured PCB plus one per configured logical device.

14. ICS

The Interrupt Control Stack is used to process all interrupt requests. Allow at least 768 words for MPE V/P. The suggested number of entries for MPE V/E is at least 1024 words. If under-configured, the system may fail with a HALT.

15. UCOP REQUEST QUEUE

This is the request queue for the User Controller Process. UCOP is responsible for deleting processes, changing priorities, and expanding or contracting stacks. Allow approximately two times the number of users. Add more if process handling (PH) is used.

16. TIMER REQUEST LIST

The Timer Request List is used for the memory logging facility, calls to PAUSE, timed terminal I/O, and various other timings such as modem turn around. Allow approximately two times the number of terminals or two times the number of users.

17. BREAKPOINT TABLE

The Breakpoint table is used to hold the information needed for DEBUG breakpoints. Allow at least 16 entries to aid in troubleshooting, and add more if DEBUG is used extensively.

18. MAX # OF USER LOGGING PROCESSES

Normally one process per application is sufficient. The maximum number of user logging processes is 64. This can only be changed on a RELOAD.

19. MAX # OF USERS PER LOGGING PROCESS

The number of users who need to access a logging file. The maximum number of users for each process is 256.

20. # OF RINS

This parameter is the total number of Resource Identification Numbers available to the system. It includes global RINs, local RINs, and file RINs which are used whenever dynamic file locking is requested. The number of RINs needed depends on the users' applications, but there should be at least one per user, to allow for the dynamic file locking used by subsystems such as the SEGMENTER and SYSDUMP.

21. # OF GLOBAL RINS

This parameter is used to allocate the space needed to save the user names, account names, and passwords associated with global RINs. Since this parameter can only be changed on a RELOAD, it is a good idea to allow a few more than you expect to need.

22. # OF SECONDS TO LOGON

Whenever a terminal is speed-sensed to begin a logon, MPE starts a logon timeout. If the time expires before the logon is complete, the port is reset to its initial state. This is particularly important with modems to prevent a wrong number from hanging a port indefinitely. The time should be as short as possible so that improper logons can be reset promptly, but it must be long enough so that the slowest typist can log on successfully. Sixty seconds is usually adequate.

23. MAX # CONCURRENTLY RUNNING PROGRAMS

24. MAX # OF CONCURRENTLY RUNNING SESSIONS

25. MAX # OF CONCURRENTLY RUNNING JOBS

These parameters limit the number of interactive sessions and batch jobs allowed on the system at one time. The number of sessions is limited by the number of configured terminals, and by the number of PCB entries. There is at least 1 PCB entry for each session or job. Setting the job and session limits is important in load management, and will vary according to the applications. Generally, the more sessions/jobs, the greater the system load. Do not underconfigure the session and job values; control them by using the :LIMIT command up to the value specified in the configuration. The :LIMIT command may be used to dynamically adjust job/session the mix, up to the configured maximums.

26. DEFAULT JOB CPU TIME LIMIT

This parameter may be used to establish a default limit on the number of CPU seconds that a job may use. This default will be used whenever the TIME= *opusecs* parameter is omitted from a !JOBstatement. If this parameter is 0, no default limit will be imposed.

27. LOG FILE RECORD SIZE (SECTORS)

28. LOG FILE SIZE (RECORDS)

These parameters specify how log files are to be built.

29. VIRTUAL MEMORY

Virtual memory may be allocated on any system domain disc volume. This area is used only for data segments since code segments are read directly from the program file or segmented library. When virtual memory space is allocated, enough space is reserved to hold the largest size allowed for the data segment. In the case of a process's data stack, this is the value of MAXDATA that was specified when the program was prepared. The amount of virtual memory required is highly dependent on the users' applications as well as the number of users. Values of 4 and 8 are usually sufficient, but large numbers of data segments or large data segment sizes may require more space. The virtual memory allocated to system domain volumes may be changed on any restart except a WARMSTART. Logical Device 1 may have memory size changed only during RELOAD.

30. DIRECTORY

A formula for estimating the amount of directory space required is provided in Section V. Like virtual memory, the directory size can only be changed during a RELOAD.

31. MAX # OF SPOOLFILE KILOSECTORS

This parameter allows the System Manager to specify the maximum amount of disc space that may be used by the spooler. If this amount of space is exceeded, all spooling queues will be shut until they are opened by the System Operator. Many sites may choose to set this value large enough so that the effective limit on disc space is the amount of free space in the device class SPOOL.

32. # OF SECTORS PER SPOOLFILE EXTENT

Spool files use a special type of variable length records with trailing blanks stripped. An extent size of 384 sectors will allow an output file of approximately 25,000 print lines. If your system has more than 1.5 megabytes of memory, you should configure an extent size greater than 384 sectors, because DPAN5 (the dump analysis utility) may produce a spool file longer than 25,000 print lines.

33. MAX CODE SEGMENT SIZE

34. MAX STACK SIZE

35. MAX EXTRA DATA SEGMENT SIZE

These three parameters are used to limit the amount of resources that can be used by any one process. Their sizes are application-dependent.

The recommended maximum code segment size is between 8K and 16K words. This configuration size will restrict the programmer to segment sizes which can be most efficiently managed by the system.

The recommended configuration value for the maximum stack size is 31232, the maximum size allowed by MPE.

The recommended extra data segment size is 8K words.

- 36. MAX # OF CODE SEGMENT PER PROCESS
- 37. MAX # EXTRA DATA SEGMENTS PER PROCESS

These parameters are used to limit the amount of resources that can be used by any given process. If the system's users are conscientious about using the minimum resources required for a given task, these parameters may be set to the maximum allowed, thereby giving the users the maximum freedom. Otherwise, limits may be imposed; these are system-wide limits that apply to all users.

- 38. STANDARD STACK SIZE

This is the default stack size used if the STACK= parameter is not included in the :PREP and :RUN commands. Since the amount of stack space needed is highly application-dependent, users should be encouraged to tune their applications, and use an explicit STACK=, declaration instead of relying on a default value.

Table 7-17. Absolute Minimum and Maximum Configuration Settings for E/F.00.00

CONFIGURATOR DIALOGUE	UNIT OF MEASURE	MINIMUM VALUE	MAXIMUM VALUE
MAX# OF OPEN SPOOLFILES=XXX.? (0,1023-J)	---	0	255
CST=XXX.? (80, 2048)	ENTRIES	128*	192
EXTENDED CST=XXX.?	ENTRIES	32*	8191
DST=XXXX.?	ENTRIES	128*	1024
PCB=XXX.?	ENTRIES	24*	256
DISC REQUEST TABLE=XXX.?	ENTRIES	32	256
I/O QUEUE=XXX.?	ENTRIES	20	256
TERMINAL BUFFERS PER PORT=XXX?	BUFFERS	1**	99**
SYSTEM BUFFERS=XXX.?	BUFFERS	8	253
SWAP TABLE=XXX.?	ENTRIES	128	2048
PRIMARY MESSAGE TABLE=XXX.?	WORDS	10	255
SPECIAL REQUEST TABLE=XXX.?	WORDS	10	255
ICS=XXX.?	WORDS	128*	2048
UCOP REQUEST QUEUE=XXX.?	ENTRIES	1*	256
TIMER REQUEST LIST=XXX.?	---	1*	128
BREAKPOINT TABLE=XXX.?	ENTRIES	4	1024
MAX# OF USER LOGGING PROCESSES	PROCESS	2	64
MAX# OF USERS PER PROCESS	PROCESS	1	128
# OF RINS=YYY.?	---	5	1024
#OF GLOBAL RINS USED=YYY.MAX=XXXX.?	---	0	1024
#OF SECONDS TO LOGON=XXX.?	SECONDS	10	600
MAX# OF CONCURRENT SESSIONS=XXX.?	SESSIONS	1	96
MAX# OF CONCURRENT RUNNING JOBS=XXX.?	JOBS	1	30
DEFAULT JOB CPU TIME LIMIT=XXXXX.?	---	0	32767
LOG FILE RECORD SIZE (SECTORS)=X.?	SECTORS	1	8
LOG FILE SIZE (RECORDS)=XXXXX.?	---	16	32767 ²
VIRTUAL MEMORY=XXXXX.?	SECTORS	1024	.
DIRECTORY USED=XXX.MIN=384 MAX=XXXX.?	SECTORS	384	6000
MAX# SPOOLFILES KILOSECTORS=XXXXXX.?	KILO-SECTORS	0	262143 ³
#SECTORS PER SPOOLFILE EXTENT=XXXX.?	SECTORS	128	32767 ⁴
MAX CODED SEGMENT SIZE=XXXXX.?	WORDS	8000*	16384
MAX STACK SIZE=XXXXX.?	WORDS	1200*	31232
MAX EXTRA DATA SEG SIZE=XXXXX.?	WORDS	0	32764
MAX# OF CODE SEGMENTS/PROCESS=XXX.?	---	0*	63
MAX# EXTRA DATA SEGMENTS/PROCESS=XXX.?	---	0	255
STD STACK SIZE=XXXX.?	WORDS	1200	4096

*MPE, subsystems, and utilities may require values larger than these minimum values to function.

**Minimum and maximum table size. Table size is calculated by multiplying value entered in response to prompt X number of ports.

1. Base value on 6 times the number of concurrent terminal users.
2. Maximum value allowed is 65535 sectors for LDEV 1.
3. Depends on number and size of discs and planned spooling load.
4. Maximum spool file size is 32 times the number of sectors per extent. Choose value according to anticipated size of largest spool file; 384 usually adequate.

Table 7-18. Absolute Minimum and Maximum Configuration Settings for G.00.00

CONFIGURATOR DIALOGUE	UNIT OF MEASURE	MINIMUM VALUE	MAXIMUM VALUE
MAX# OF OPEN SPOOLFILES=XXX.?	---	0	1024
CST=XXX.?	ENTRIES	128*	192/2048**
EXTENDED CST=XXX.?	ENTRIES	32*	8191**
DST=XXXX.?	ENTRIES	128*	4096
PCB=XXX.?	ENTRIES	24*	1024
DISC REQUEST TABLE=XXX.?	ENTRIES	32	900
I/O QUEUE=XXX.?	ENTRIES	20	1300 ¹
TERMINAL BUFFERS=XXX.?	BUFFERS	32	256 ¹
SYSTEM BUFFERS=XXX.?	BUFFERS	8	253
SWAP TABLE=XXX.?	ENTRIES	128	5400
PRIMARY MESSAGE TABLE=XXX.?	WORDS	10	1023
SECONDARY MESSAGE TABLE=XXX.?	WORDS	10	1023
SPECIAL REQUEST TABLE=XXX.?	WORDS	10	2048
ICS=XXX.?	WORDS	128*	4096
UCOP REQUEST QUEUE=XXX.?	ENTRIES	1*	1024
TIMER REQUEST LIST=XXX.?	---	1*	1023
BREAKPOINT TABLE=XXX.?	ENTRIES	4	1024
MAX# OF USER LOGGING PROCESSES	PROCESS	2	64
MAX# OF USERS PER PROCESS		1	256
# OF RINS=YYY.?	---	5	1024
#OF GLOBAL RINS USED=YYY.MAX=XXXX.?	---	0	1024
#OF SECONDS TO LOGON=XXX.?	SECONDS	10	600
MAX# OF CONCURRENT RUNNING PROGRAMS=XXX.?	JOBS	1	512
MAX# OF CONCURRENT SESSIONS=XXX.?	SESSIONS	1	500
MAX# OF CONCURRENT RUNNING JOBS=XXX.?	JOBS	1	500
DEFAULT JOB CPU TIME LIMIT=XXXXX.?	---	0	32767
LOG FILE RECORD SIZE (SECTORS)=X.?	SECTORS	1	8
LOG FILE SIZE (RECORDS)=XXXXX.?	---	16	32767 ²
VIRTUAL MEMORY=XXXXX.?	SECTORS	1024	.
DIRECTORY USED=XXX.MIN=384 MAX=XXXX.?	SECTORS	384	8000
MAX# SPOOLFILES KILOSECTORS=XXXXXX.?	KILO-SECTORS	0	262143 ³
#SECTORS PER SPOOLFILE EXTENT=XXXX.?	SECTORS	128	(%77777D) ⁴ 32767 ⁴
MAX CODE SEGMENT SIZE=XXXXX.?	WORDS	8000*	16384
MAX STACK SIZE=XXXXX.?	WORDS	1200*	31232
MAX EXTRA DATA SEG SIZE=XXXXX.?	WORDS	0	32767
MAX# OF CODE SEGMENTS/PROCESS=XXX.?	---	0*	63/255**
MAX# EXTRA DATA SEGMENTS/ PROCESS=XXX.?	---	0	255
STD STACK SIZE=XXXX.?	WORDS	1200	4096

*MPE, subsystems, and utilities may require values larger than these minimum values to function.

**The expansion of these tables, requires new microcode for the Series 39/40/42, and 44/48.

1. Base value on 6 times the number of concurrent terminal users.
2. Maximum value allowed is 65535 sectors for LDEV 1.
3. Depends on number and size of discs and planned spooling load.
4. Maximum spool file size is 32 times the number of sectors per extent. Choose value according to anticipated size of largest spool file; 384 usually adequate.

An asterisk denotes a changed value.

Table 7-18A. System Table Default Sizes (G.01.00)

	S/6X	S/4X	S/37
MAX # OF OPEN SPOOLFILES (0,1023-J)	72	32	10
CST (80,2048)	224	*192	*192
EXTENDED CST (16,8191)	225	200	*160
DST (70,4096)	*1024	*1024	*512
PCB (12,1024)	150	90	48
I/O QUEUE (20,1300)	256	96	*36
DISC REQUEST TABLE (20,900)	*512	512	*128
TERMINAL BUFFER (1,PERPORTMAX)	3	3	3
SYSTEM BUFFERS (8,256)	8	8	8
SWAP TABLE (128,5400)	1024	*1024	*512
PRIMARY MESSAGE TABLE (10,1023)	64	32	25
SECONDARY MESSAGE TABLE (10,1023)	64	32	25
SPECIAL REQUEST TABLE (10,2048)	64	64	64
IOS (256,4096)	1024	1024	1024
LOADER SEG TABLE SIZE (2048,32760)	16384	16384	16384
UCOP REQUEST QUEUE (1,1024)	150	60	32
TIMER REQUESTLIST (6,1023)	150	60	32
BREAKPOINT TABLE (1,1024)	32	32	16
MAX # OF USER LOGGING PROCS (2,64)	*10	*7	*5
MAX # OF USERS/LOGGING PRODC (1,256)	3	3	3
<u>MISC CONFIGURATION CHANGES</u>			
# OF RINS (MINRIN, 1024)	48	48	48
# OF GLOBAL RINS (MINGRIN, 1024)	16	16	16
# OF SECONDS TO LOGON (10,600)	120	120	120
MAX # OF CON RUN SESS (1,500)	60	*40	*7
MAX # OF CON RUN JOBS (1,500)	*6	*6	*2
DEFAULT JOB CPU TIME LIMIT (0,32767)	0	0	0
<u>LOGGING CHANGES</u>			
LOG FILE RECORD SIZE (SECTORS) (1,8)	2	2	2
LOG FILE SIZE (RECORDS) (16,32767)	1023	1023	1023

*MPE, subsystems, and utilities may require values larger than these minimum values to function.

**The expansion of these tables, requires new microcode for the Series 39/40/42, and 44/48.

Table 7-18A. System Table Default Sizes (G.01.00) (Continued)

	S/6X	S/4X	S/37
<u>DISC ALLOCATION CHANGES</u>			
MAX DIRECTORY SIZE (SECTORS) (65000)	*6000	*4000	*3000
MAX # OF SPOOLFILES KILOSECTS (0,777777)	128	128	128
# OF SECT/SPOOLFILE EXT (128,32764)	384	384	384
<u>SEGMENT LIMIT CHANGES</u>			
MAX # OF CON RUN PROG (1,511)	64	*64	10
MAX CODE SEGMENT SIZE (1024,16384)	*12288	*12288	*12288
MAX # CODE SEG PER PROCESS (1,255)	63	63	63
MAX STACK SIZE (256,31232); MAX EXTRA DATA SEG SIZE (0,32767)	31232 *32767	31232 *32767	31232 *32767
MAX # EXTRA DATA SEG PER PROC (0,255)	8	*8	4
STANDARD STACK SIZE (256,4096)	1200	1200	1200
CONFIGURED TERMINALS	60	*40	*7
MAX # OF CONC JOBS	*6	*6	*2
INP _s	4	4	0
MRJE	2	2	0
Spooled Devices	1	1	2
User Logging Processes	*10	*7	*5

*MPE, subsystems, and utilities may require values larger than these minimum values to function.

**The expansion of these tables, requires new microcode for the Series 39/40/42, and 44/48.

NOTE

These changes reflect the limitations and features of the systems. The default CST value takes into account the CPS board not being present. Directory size was increased to reflect larger discs available. Maximum code segment size and maximum extra data segment size were increased due to V/3000.

OPTIONS FOR MODIFYING THE SYSTEM

The System Supervisor can choose one of two methods to alter the I/O configuration and critical system parameters: the SYSDUMP/Configurator dialogue or the Initiator/User dialogue. The two methods vary in the following ways: when they can be used, how they are engaged, the range of parameters you can modify with each, and how the modifications take effect.

Table 7-19, which begins on the following page, summarizes the options available to you to modify the system. Each option, listed in the leftmost column, may be modified during one or more of the restart procedures (WARMSTART, COOLSTART, COLDSTART, RELOAD, or UPDATE) or during the SYSDUMP/Configurator dialogue.

In addition to the different range of options you may modify, there is an important difference in the way the modifications are introduced into the system. Any parameters you change during the Initiator/User dialogue take effect immediately. Any modifications to MPE entered during the SYSDUMP/Configurator dialogue, however, are not immediate. Instead, the information is copied to the backup medium (usually a magnetic tape or serial disc, selected with a :FILE command preceding :SYSDUMP), and only takes effect when you restart the system from the tape or serial disc.

Table 7-19. Options For Modifying The System

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
SPREAD					X	
COMPACT					X	
RESTORE					X	
ACCOUNTS					X	
NULL					X	
SYSTEM DISC DRT						X
LOAD MAP			X	X	X	X
ANY CHANGES	X		X	X	X	X
SYSTEM ID	X					
MEMORY SIZE	X		X	X	X	X
I/O CONFIG CHANGES	X		X	X	X	X
LIST I/O DEVICES	X		X	X	X	X
LIST CS DEVICES	X		X	X	X	X
HIGHEST DRT	X		X	X	X	X
LOGICAL DEVICE	X		X	X	X	X
MAX #OPEN SPOOLFILES	X		X	X	X	X
TERMINAL TYPE CHANGES	X		X	X	X	X
LIST TERMINAL TYPE FILES	X		X	X	X	X
DELETE TERMINAL TYPE FILES	X		X	X	X	X

Table 7-19. Options For Modifying The System (Continued)

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
FILES	X		X	X	X	X
ADD TERMINAL TYPE FILES	X		X	X	X	X
FILE NAMES	X		X	X	X	X
CLASS CHANGES	X		X	X	X	X
LIST CLASSES	X		X	X	X	X
DELETE CLASSES	X		X	X	X	X
ADD CLASSES	X		X	X	X	X
ADDITIONAL DRIVER CHANGES	X		X	X	X	X
SYSTEM TABLE CHANGES	X		X	X	X	X
CST	X		X	X	X	X
EXTENDED CST	X		X	X	X	X
DST	X		X	X	X	X
PCB	X		X	X	X	X
I/O QUEUE	X		X	X	X	X
DISC REQUEST TABLE	X		X	X	X	X
TERMINAL BUFFERS	X		X	X	X	X
SYSTEM BUFFERS	X		X	X	X	X

Configuring Your System

Table 7-19. Options For Modifying The System (Continued)

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
SWAP TABLE	X		X	X	X	X
PRIMARY MESSAGE TABLE	X		X	X	X	X
SECONDARY MESSAGE TABLE	X		X	X	X	X
SPECIAL REQUEST TABLE	X		X	X	X	X
ICS	X		X	X	X	X
LOADER SEGMENT TABLE	X					
UCOP REQUEST QUEUE	X		X	X	X	X
TIMER REQUEST LIST	X		X	X	X	X
BREAKPOINT TABLE	X		X	X		X
RECOVER LOST DISC SPACE			X	X		X
DISC VOL. CHANGES			X	X	X	X
LIST VOLUME TABLE	X		X	X	X	X
DELETE VOLUME	X				X	
ADD VOLUME	X		X	X	X	X
LIST DEFECT TRACKS			X	X	X	X
DELETE TABLE			X	X	X	X

Table 7-19. Options For Modifying The System (Continued)

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
*VIRTUAL MEMORY CHANGES	X		X	X	X	X
LIST V.M. DEV. ALLOCATION	X		X	X	X	X
DISABLE LOGGING			X	X	X	X
MAX #OF SPOOLFILES KILOSECTORS	X		X	X	X	X
MAX #SECTORS/SPOOL-FILE EXTENT	X		X	X	X	X
MAX #OF USER LOGGING PROCESSES	X					
MAX #OF USERS PER LOGGING PROCESS	X					
MISC CONFIG CHANGES	X					
LIST GLOBAL RIN'S	X					
DEL GLOBAL RIN'S	X					
#RIN'S MIN MAX	X					
#GLOBAL RIN USED MAX	X					
#SECONDS TO LOGON	X					
MAX #CONCUR SESSIONS	X					

*Virtual memory for ldev 1 (the system disc) can be changed only during a RELOAD or a SYSDUMP.

Configuring Your System

Table 7-19. Options For Modifying The System (Continued)

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
MAX #CONCUR JOBS	X					
DEFAULT JOB CPU LIMIT	X					
MESSAGE CAT CHANGES	X					
SOFTDUMP COMMAND CHANGES	X					
LOGGING CHANGES	X					
LIST LOGGING STATUS	X					
CHANGE STATUS	X					
LOG FILE RECORD SIZE	X					
LOG FILE SIZE	X					
DIRECTORY USED MIN MAX	X					
DISC ALLOC CHANGES	X					
SCHEDULING CHANGES	X					
SEGMENT LIMIT CHANGE	X					
MAX #CONCUR PROGRAMS	X					
MAX CODE SEG SIZE	X					
MAX #CODE SEG/PROCESS	X					

Table 7-19. Options For Modifying The System (Continued)

OPTION	SYSDUMP	WARMSTART	COOLSTART	COLDSTART	RELOAD	UPDATE
MAX STACK SIZE	X					
MAX EXTRA DATA SEG SIZE	X					
MAX #EXTRA DATA SEG PER PROCESS	X					
STD STACK SIZE	X					
SYSTEM PROGRAM CHANGE	X					
SYSTEM SL CHANGES	X					
LIST LIBRARY	X					
DELETE SEGMENT	X					
REPLACE SEGMENT	X					
ADD SEGMENT	X					



SPECIAL CONSIDERATIONS FOR PERIPHERAL DEVICES

SECTION

VIII

The use of peripheral devices, such as printers, discs, and tape cartridges, can greatly enhance the power of the MPE operating system. This section details issues which must be considered when using certain peripheral devices. The HP 2563A and the HP 2688A are only supported beginning with the G.00.00 release of MPE V.

THE HP 268X LASER PRINTERS: SPECIAL CONSIDERATIONS

The HP 2680A and HP 2688A are laser printers. These printers have several special features, some of which need special operator attention:

- Format control of the page size, character fonts, forms and other printed requirements of the HP Laser Printing System.
- Automatic job recovery for spooled jobs, after a power fail or paper jam.
- Job-to-job integrity and separation. Each spool file prints independently of the features which were programmed for the previous job.

Format Control of the HP 2680A and HP 2688A

The environments of the HP 2680A and 2688A are created with IFS/3000. The specifications in the environment file include: page size, character fonts, forms, logical pages, and other printed requirements. After the files are in the system, they may be accessed through the ENV= parameter of the :FILE command or the FOPEN intrinsic. The environment files are created specifically for either the HP 2680A or the HP 2688A and therefore, are not directly compatible. For more information on creating environment files, refer to the IFS/3000 Reference Guide (36580-90001).

Automatic Recovery of the HP 2680A and HP 2688A

The HP 2680A and 2688A are configured as spooled devices. Therefore, the spooler is able to automatically recover print jobs in progress. Some operator intervention may be required in some cases before automatic recovery can take place.

The MPE software allows the spooler process to automatically recover from unexpected events such as power failures or paper jams, and allows the operator to go back or forward any number of logical pages within the currently active print job. This feature is useful, for example, in the case of a paper jam, where perhaps several pages may have been reported as "good" status, but were actually lost due to the jam. In this case, you would issue a :RESUMESPOOL command, using the BACK option, for as many pages as necessary. The maximum number of pages possible in one command is 256.

MPE keeps track of the actual logical pages printed in the device by means of an environmental status block from the device. This status block is programmatically set to be returned by the device at every logical page, or every "n" logical pages.

Special Considerations for Peripheral Devices

The environmental status block contains information which relates directly to the spooled file. For example, it returns the actual logical page just printed, and other information such as the exact place a particular environment has been loaded into the device. This technique is called "checkpoint recovery".

When some unexpected event occurs, such as a power failure or paper jam, MPE reads the environmental status to determine the last complete logical page printed, and determines whether an environment was present in the printer at the time of the event. If an environment was present, a backward search is made of the saved status blocks to determine when the environment was loaded. When found, the printer is instructed to "silent run", i.e., to resend the data as though printing were going to take place, but not actually print the data. Thus, the file is resent, including the environment, silent running up to the point where the last complete logical page was printed. The device resumes printing when the data is received for the first page for which no checkpoint was received.

Job-to-Job Integrity

The purpose of using an environment file specification is to allow the user job-to-job control of the printers without the need for operator intervention. The HP 2680A and HP 2688A always clear the printing environment at the end of every print job. This means that it returns to the configured environment of the HP 2680A and 2688A.

If a special environment has been specified, multiple copies of the spool file can be printed correctly, even if other, higher priority jobs print in between. This is because the environment for each print job is actually contained in the spool file, thus ensuring that every individual job will print using the correct environment for that job.

HOW TO SWITCH BETWEEN PRIMARY AND SECONDARY CHARACTER SETS

Default primary and secondary character sets are specified by switch settings on the front panel. The default primary and secondary character sets are selected whenever the HP 2608A/S, 2563A or the HP 268X is powered on or reset.

The user may programmatically switch back and forth between default primary and secondary sets (and only those sets), by using a "shift-out/shift-in" protocol. Following a shift-out (%16) in the data stream, all characters will access the secondary character set, until a shift-in (%17) is detected, or until the printer is reset. At the end of an output listing, the printer is reset. Note that a shift-out or shift-in should not be the last character in a line. If it is desired that the shift-out or shift-in follow the last printed character in a line, add a blank character after the shift-out or shift-in.

If power is lost in the middle of a printjob, and if the operator restarts the printing at some point in the job beyond the original shift-out (%16), the remainder of the job will be printed in the primary character set, instead of the secondary set. This can be avoided by restarting interrupted jobs at the beginning. Alternatively, the application could be written to include a shift-out/shift-in pair, with each line to be printed containing secondary set characters.

THE HP 2608A/S AND HP 2563A PRINTER: SPECIAL FEATURES

The HP 2563A is plug-compatible with the HP 2608S. Being plug-compatible means that it requires minimal software changes to be supported on MPE. In addition the HP 2563A supports compressed printing and the ability to print bar codes. The HP 2608S and HP 2563A have several special software-controlled features, some of which will affect a System Operator's duties:

- Two system default modes: FEATURE and TRANSPARENT.
- Job-to-job integrity and separation. This is the same feature as for the HP 2680A and HP 2688, if the :FILE command or FOPEN is used.
- Automatic electronic VFC and left margin control without operator intervention.
- Automatic job recovery for spooled jobs, after power failure or paper jam. This the same as for the HP 2680A and HP 2688A, if the :FILE command or FOPEN intrinsic is used.

FEATURE and TRANSPARENT Access Modes

The HP 2608S and HP 2563A support two system default modes. These are FEATURE and TRANSPARENT access.

FEATURE access is a means for the user to implement full control embedded in data which is to be printed on the HP 2608S and HP 2563A. Control consists of character controls (such as backspace, shift-in, shift-out, vertical tab, etc.), as well as supported escape sequences. These controls are executed in the HP 2608S and HP 2563A as commands to the printing mechanism. When the device is configured as FEATURE access default, MPE will ensure this default state at the start of every print job.

TRANSPARENT access is a means for the user to restrict data so that control characters and escape sequences embedded in the data are not executed. Instead, they are printed as a part of the data stream just like any other printable character. This access will make the HP 2608S and HP 2563A very similar to all other printers supported on HP 3000 systems.

One difference for this mode occurs between the HP 2608S/2563A and the HP 2608A. The HP 2608S and HP 2563A will not execute backspace, shift-in, or shift-out in the TRANSPARENT mode. The HP 2608A, however, does execute these control characters in the normal course of operation. There are no selectable modes for the HP 2608A.

Automatic VFC

In some printers, vertical tabulation is accomplished by inserting a loop of paper tape into the printer. This paper tape has holes punched in various columns (called "channels") corresponding to lines on the page. If a program issues "skip to channel n", the tape and paper are slewed (advanced at high speed) until the printer detects a hole in channel n. These tapes are called VFC tapes or VFU tapes, which stand for Vertical Format Control and Vertical Format Unit, respectively. The HP 2608A/S and HP 2563A use "electronic VFCs", which are programmatically downloaded into the printer before a print job begins.

The HP 2608A/S and HP 2563A printers allow users to set a specified electronic left margin in the file created for environment loading. This feature allows the user to offset the beginning left column of each print line up to 16 spaces from the real left margin. In addition, the HP 2608S and HP 2563A offers full left and right indentation through the use of escape sequences in the FEATURE mode.

User-created VFC files can be downloaded to the HP 2608A/S and HP 2563A by use of the operator :DOWNLOAD command. Hewlett-Packard recommends that VFCs be downloaded to the HP 2608S and HP 2563A by the user through the use of the "ENV=" keyword parameter of the :FILE command or FOPEN intrinsic without any operator intervention. The environment entered with the :FILE command will override any environment entered with the :DOWNLOAD command or the FOPEN intrinsic. The HP 2608S and HP 2563A automatically reset to the default mode and VFC after each print job completes. Even if the user does not specify a special VFC, there is still no operator intervention required. Refer to the :DOWNLOAD command in Section III in this manual for more information.

Downloading VFC

If your system has an HP 2608A line printer, you may receive a forms message requesting specific FORMS and/or the Vertical Format Control (VFC) needed for printing a particular job/session.

If your system has an HP 2608S or HP 2563A printer, the users can specify an environment file for their output without operator intervention. Only these printers allow the user to directly control VFC, left margin and printer mode. A user-created file containing the VFC specifications is entered in the "ENV=" parameter of the :FILE command or the FOPEN intrinsic. The environment file for the HP 2608S and HP 2563A is different from the environment file of the HP 2680A/S or HP 2688. The file is not an IFS/3000 file; it is an editor file. Using the HP 2608S and HP 2563A environment file with the :FILE command or FOPEN intrinsic, allows job-to-job integrity and automatic recovery procedures the same as for the HP 2680A and HP 2688A.

To change the format of output from your 2608A printer, a user-created file may be downloaded, via the :DOWNLOAD command, by the operator at run time. The HP 2608S and 2563A will also support certain programs which use the :DOWNLOAD command intended for an HP 2608A.

To utilize this file, the user should:

- Create the file with EDIT/3000 or an equivalent, and store it.
- Include in the application program a FORMS message (HP 2608A only), instructing the operator to download the file using a :DOWNLOAD command and, if applicable, to set up special forms in the printer. The user may also include a FORMS message for the HP 2608S or HP 2563A if special forms are to be used with the environment file.
- At print time, MPE will display the FORMS message for appropriate action by the operator.

For the HP 2608A, the job will be printed and completed. Complete all other jobs requiring the currently downloaded VFC and margin. Then, simply remove any special forms, and download a standard VFC, such as VFC8, or VFC6, or any other appropriate VFC and margin. Refer to Tables 8-1 and 8-2 for details of VFC6 and VFC8. A full list of octal codes and associated carriage actions are given in Table 8-3.

For the HP 2608S and HP 2563A, the job will be printed and completed. If a special FORMS message has been received and forms mounted, the next job output will ask you to remove the special forms.

As mentioned above, the HP 2608S and HP 2563A will accept and act on a :DOWNLOAD command. Nevertheless, Hewlett-Packard recommends using an environment file to supply the required formatting information, as well as other data used by the HP 2608S.

CAUTION

A :DOWNLOAD command should be issued to an HP 2608S or HP 2563A printer only when a "FORMS ALIGNED OK?" prompt is displayed. A :DOWNLOAD issued any other time may cause the printer to hang. A WARMSTART must be performed before it can be used again. DO NOT ISSUE A :DOWNLOAD COMMAND TO AN HP 2608S OR 2563A except when "FORMS ALIGNED OK?" is displayed.

Format of the Editor File

The Editor file consists of 80-character records (lines). There are three parameters which can be specified: MARGIN=, MODE=, and VFC. MODE= cannot be used in a 2608A VFC file. These parameters are placed on separate lines at the beginning of file. MARGIN= and MODE= are optional but, if used, should appear before VFC. All text in the Editor file should begin in column 1.

This is the format of the three parameters:

MARGIN=*nn*

The value *nn* is an integer between 1 and 16, inclusive, and specifies the left margin indentation. MARGIN= is valid for the HP 2608A/S and the HP 2563A.

The HP 2608A hardware documentation discusses a "margin offset" which varies from 0 to 15. This offset is not the same as the MARGIN= parameter, because the software compensates for the hardware offset of *nn*+1.

MODE= [TRANSPARENT]
[FEATURE]

TRANSPARENT specifies that control characters and escape sequences, which are embedded in the data, are not executed. FEATURE allows the printer to act on these control characters and escape sequences. MODE= is valid only on the HP 2608S and the HP 2563A. The default is the MODE specified by the system-configured SUBTYPE.

VFC,*x*,*y*,*string*

The value of *x* is either 6, 8, or blank, and specifies print density in lines per inch. Default (blank) is six lines per inch; if a blank is used, a comma (,) must be used as a place holder. Note that a comma must also always follow "VFC".

The value of *y* is an integer between 0 and 127, inclusive, and specifies the number of lines (rows) in the VFC pattern. If "0" is specified, the printer will reset its internal VFC to the default state, including lines and pages.

The *string* is an optional comment field that may be used to describe the VFC file. If used, it must be separated from *y* by a comma.

Special Considerations for Peripheral Devices

Note that the first record consists of the string `MARGIN=nn`, where *nn* is between 1 and 16, inclusive. The next record (or the first, if no `MARGIN`) identifies the following records of the file as a VFC image. It consists of a record of 80 bytes, with the string `VFC` in columns 1 through 3. Column 5 contains either a 6, 8 or a blank, indicating the number of lines per inch; the default is 6 lines per inch. Following the lines per inch is the number of print lines per page. This number must be between 0 and 127, inclusive. If 0 is specified, the printer resets its internal VFC to the default state. All the parameters are separated by commas. A blank, or a zero in a column, indicates a 0, or no-punch. Column 1 of the record corresponds to channel 1, column 2 to channel 2, and so on up to channel 16. Each record corresponds to a line position on the page.

The "`MODE=`" parameter can only be used with the HP 2608S or HP 2563A. If the "`MODE`" parameter is `:DOWNLOADED` to an HP 2608A, it will not cause an error condition, but will be ignored.

The first record can be a string containing the keywords "`MARGIN=`", "`MODE=`" (for the HP 2608S or HP 2563A) or "`VFC`". Ordinarily, for the HP 2608S or HP 2563A, you would specify "`MODE=`" in the first record, then "`MARGIN=`" in the second record and "`VFC`" in the third record. For the HP 2608A, it would be "`MARGIN=`" in the first record and "`VFC`" in the second. The optional column punch information would be in the records following.

VFC must be the last parameter. It identifies the records which follow as VFC information for each line on the page. A blank or zero in a column indicates a 0, or no-punch. Column 1 of the record corresponds to channel 1, column 2 is channel 2, and so on, up to channel 16.

Several VFC channels are used by MPE. If you or a user change their specification, unexpected behavior may result. The following description, together with Table 8-3, explains these dependencies for each device:

HP 2608A:	Channel 1.	Top of form button on the printer. Opening or closing a printjob or a printfile within a printjob. Specifying a carriage-control directive of "1" (%61).
	Channel 3.	The previous request was in pre-space mode with a nonzero count, the current request is in post-space mode, and automatic page eject is in effect. The skip to channel 3 is applied to the pre-space mode data.
	Channel 4.	The request specifies a carriage-control directive of "0" (%60) and automatic page eject is in effect.
	Channel 5.	The request specifies a carriage-control directive of "-" (%55) and automatic page eject is in effect.
HP2608S: HP2563A:	Channel 1.	Opening or closing a printjob or a printfile within a printjob. Specifying a carriage-control directive of "1" (%61). (The top of form button on the printer ejects a physical page, whose length is displayed on the printer control panel. This length is independent of both VFC Channel 1 and the length of the logical page. The latter length is defined by the number of lines in the VFC.)
	Channel 3.	The previous request was in pre-space mode with a nonzero count, the current request is in post-space mode, and automatic page eject is in effect. The skip to channel 3 is applied to the pre-space mode data. In FEATURE mode (by default, by use of <code>MODE=FEATURE</code> in a VFC file, or when set by an <code>FDEVICECONTROL</code> call), with automatic page eject in

effect, a request specifying a carriage-control directive of "0" (%60) is changed to two skips to channel 3. A directive of "-" (%55) is changed to three skips to channel 3. This achieves true double or triple spacing, and also skips the page perforation if it occurs during the skip.

- Channel 4. The request specifies a carriage-control directive of "0" (%60) and automatic page eject is in effect.
- Channel 5. The request specifies a carriage-control directive of "-" (%55) and automatic page eject is in effect.
- Channel 11. The request specifies a carriage-control directive of "2" (%62).

Here are examples of various VFCs:

- A standard VFC for 6 lines per inch:

```
VFC,6,0
```

- A standard VFC for 8 lines per inch:

```
VFC,8,0
```

- A standard VFC for 6 lines per inch with the MODE feature set to FEATURE access:

```
MODE=FEATURE
VFC,6,0
```

- A standard VFC for 8 lines per inch with MODE feature set to TRANSPARENT access:

```
MODE=TRANSPARENT
VFC,8,0
```

- A standard VFC for 6 lines per inch, left margin set to 6, and MODE set to FEATURE access:

```
MODE=FEATURE
MARGIN=6
VFC,6,0
```

- The same example as above, with records 1 and 2 reversed:

```
MARGIN=6
MODE=FEATURE
VFC,6,0
```

- A special VFC with 6 lines per inch, a page length of 24 lines, MARGIN=6, and MODE=FEATURE. The VFC image defines channel 1 to be top of form, channel 2 to be bottom of form, channel 3 to be single spacing, channel 4 to be every second line, channel 5 to be every third line and channel 13 selects line 8, as well as line 1. Line 1 has all but one channel set. Lines 19 through 24 define a 6 line per skip area (outside of the form defined by channels 1 and 2). Channels 6 through 16, except channel 13, are all set to top of form:



1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1 1 1 1 1 1 1

(Columns in Editor file
 represent VFC channels)

MODE = FEATURE

** First line of Editor file **

MARGIN = 6

VFC , 6 , 24

```

1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    
```

** line 1 of VFC image **

** line 10 **

** line 20 **

** line 24 **

The standard form of the VFC is a ten-inch form area on an 11-inch page with 60 lines possible. The following example illustrates an eight-line-per-inch format shifted to a six-line-per-inch format, with all sixteen channels used:

MARGIN = 1

** First line of Editor file **

VFC , 6 , 66

```

1 0 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 1 0 0 0 0 0 0 0 1 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 1 0 0 0
0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 1 0
    
```

** line 1 of VFC image **

** line 10 **

Special Considerations for Peripheral Devices

```
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 0
** line 20 **
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 1 0 0 0 0 0 0 1 1
0 0 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 1 0 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
** line 30 **
0 0 1 1 1 1 1 1 0 0 0 0 0 1 1 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 1 0
0 0 1 1 1 0 0 0 0 0 0 0 0 0 1 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
** line 40 **
0 0 1 1 0 0 0 1 0 0 0 0 0 0 1 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 1 1 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 1 0 1 0 0 0 0 0 0 0 1 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 1 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0
** line 50 **
0 0 1 1 0 0 0 1 0 0 0 0 0 0 1 0
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 1 0 0 0 0 0 0 0 0 1 0 0
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0
0 0 1 1 0 0 0 0 0 0 0 0 0 1 0 0 1
0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0
0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0
** line 60 **
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
** line 66 **
```

If no channel specifications appear below line 66, then an end-of-file can occur after record 66, as in the above example. Also, blanks and zeros are interchangeable.

NOTE

If all entries in a column are blank or zero, and a program issues a skip to the corresponding channel, the printer will advance paper until the number of lines in the VFC specification has been exceeded.

- A special VFC for 8 lines per inch. Channel 1 is top of page. There are 88 lines per page, and channel 9 is skip to line 13. Channel 2 defines bottom of page, and channel 3 is skip one line:

```

V F C , 8 , 8 8
1 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1 0 0 0 0 0 1
0 0 1
:
:
:
0 1 1

```

** line 88 **

Table 8-1. Standard Six Line Per Inch Format

CHANNEL	FUNCTION	LINE POSITIONS OF LOGICAL ONE*
1	Slew to top of next form	0
2	Slew to bottom of form	59
3	Single space	0,1,2,...59
4	Slew to next double space line	0,2,4,...58
5	Slew to triple space line	0,3,6,...57
6	Slew to half page line	0,30
7	Slew to next quarter page line	0,15,30,45
8	Slew to next tenth line	0,10,20,...50
9	Slew to bottom of form	59
10	Slew to one line previous to bottom of form	58
11	Slew to one line previous to top of next form	65
12	Slew to top of next form	0
13	Slew to next seventh line	0,7,14,...56
14	Slew to next sixth line	0,6,12,...54
15	Slew to next fifth line	0,5,10,...55
16	Slew to next fourth line	0,4,8,...56

*Logical one is similar to the hole in a paper tape or destination point for that channel.

NOTE: A ten-inch printed form area on an 11-inch page with 60 lines possible is assumed.

Table 8-2. Standard Eight Line Per Inch Format

CHANNEL	FUNCTION	LINE POSITIONS OF LOGICAL ONE*
1	Slew to top of next form	0
2	Slew to bottom of form	79
3	Single space	0,1,2,...79
4	Slew to next double space line	0,2,4,...78
5	Slew to triple space line	0,3,6,...77
6	Slew to half page line	0,40
7	Slew to next quarter page line	0,20,40,60
8	Slew to next tenth line	0,10,20,...70
9	Slew to bottom of form	79
10	Slew to one line previous to bottom of form	78
11	Slew to one line previous to top of next form	87
12	Slew to top of next form	0
13	Slew to next seventh line	0,7,14,...77
14	Slew to next sixth line	0,6,12,...78
15	Slew to next fifth line	0,5,10,...75
16	Slew to next fourth line	0,4,8,...76

*Logical one is similar to the hole in a paper tape or destination point for that channel.

NOTE: A ten-inch printed form area on an 11-inch page with 80 lines possible is assumed.

Table 8-3. Carriage-Control Directives

OCTAL CODE	ASCII SYMBOL	CARRIAGE ACTION
%40	" "	Single space (with or without automatic page eject).
%53	"+"	No space, return (next printing at column 1). This cannot be used more than once on the HP 2608 without losing data.
%55	"-"	Triple space (with or without automatic page eject).*
%60	"0"	Double space (with or without automatic page eject).*
%61	"1"	Conditional page eject (form feed) is performed by the software. If the printer is not already at the top of the form, a page eject is performed. Ignored if: Post-space mode: The current request has a transfer count of 0 and the previous request was FOPEN, FCLOSE, or FWRITE which specified a carriage-control directive of %61. Pre-space mode: Both the current request and the previous request have transfer counts of 0, and the current request and previous request are any combination of FOPEN, FCLOSE or FWRITE specifying a carriage-control of %61.
%62		Skip to one line before top of form. This specification is valid only for HP 2608S and HP 2563A printers.
%63		A conditional page eject form (form feed) is performed by the printer. If the printer is not already at the top of form, perform a page eject. This specification is valid only for HP 2608S and HP 2563A printers.
%2nn (nn is any octal number from 0 through 77)		Space nn lines (no automatic page eject).
%300 - %313		Select VFC Channel 1 - 12 (2619).
%300 - %317		Select VFC Channel 1 - 16 (2608 A/S).

*Note: If these codes are selected with automatic page eject in effect (by default or following an Octal Code of %102 or %402), the resulting skip is to a location absolute to the page. A code of %60 is replaced by %303 and %55 is replaced by %304. Thus, the resulting skip may be less than two or three lines, respectively.

If automatic page eject is not in effect, a true double or triple space results, but the perforation between pages is not automatically skipped. For the HP 2608S and 2563A, if auto eject and feature mode are in effect, a code of %60 will be replaced by two codes of %302, and a code of %55 is replaced by three codes of %302. The resulting skip will be double or triple space with auto-reject, respectively.

Table 8-3. Carriage-Control Directives (Continued)

OCTAL CODE	ASCII SYMBOL	CARRIAGE ACTION
NOTE		Channel assignments shown below are the Hewlett-Packard standard defaults.
%300		Skip to top of form (page eject).
%301		Skip to bottom of form.
%302		Single spacing with automatic page eject.
%303		Skip to next odd line with automatic page eject.
%304		Skip to next third line with automatic page eject.
%305		Skip to next 1/2 page.
%306		Skip to next 1/4 page.
%307		Skip to next 1/6 page.
%310		Skip to bottom of form.
%311		User option (HP 2619), skip to one line before bottom of form (HP 2608).
%312		User option (HP 2619), skip to one line before top of form (HP 2608).
%313		User option (HP 2619), skip to top of form (HP 2608).
%314		Skip to next seventh line with automatic page eject.
%315		Skip to next sixth line with automatic page eject.
%316		Skip to next fifth line with automatic page eject.
%317		Skip to next fourth line with automatic page eject.
%320		No space, no return (next printing physically follows this).
%2 - %37		
%41 - %52		
%54		
%56-%57		Same as %40.
%62-%77		
%104-%177		
%310-%317 (2607)		
%314-%317 (2618/19)		
%321-%377		
%400 or %100		Sets post-space movement option; this first prints, then spaces. If previous option was pre-space movement, the driver outputs a line with a skip to VFC Channel 3 (automatic page eject in effect) or a one line advance (equivalent to an octal code of %201; without automatic page eject) to clear the buffer.
%401 or %101		Sets pre-space movement option; this first spaces, then prints.
%402 or %102		Sets single-space option, with automatic page eject (60 lines per page).
%403 or %103		Sets single-space option, without automatic page eject (66 lines per page).

THE HP 2619 PRINTER: CHARACTERISTICS

These are operational characteristics of an HP 2619 line printer in an HP 3000 system environment:

- While listing to the line printer, if the operator presses the alarm button, a " NOT READY " message will appear on the System Console, and the VF LED on the printer will light. The operator must realign the paper and reload the VCF tape. When the printer is put back on line, a line of data may be lost.
- While listing to the line printer, if the operator opens the yoke without first pressing the offline button, a " NOT READY " message will appear on the console. When the yoke is closed, and the printer is put back on line, a " POWERFAIL " message will appear on the System Console. One or more lines of data will be lost.
- If you power up first on the system, and then on the line printer, one page will be ejected. If the line printer is powered up first, two pages will be ejected. This will happen only once per system startup.

PREVENTING PRINTER DATA LOSS

Occasionally, a possibility of data loss is detected on the HP 2619 line printer. This triggers an alarm light on the printers' control panel, and the device goes offline. This situation may be caused by a power failure, paper jam, paper out, or other similar condition.

When the printer detects the possible data loss, the System Operator should issue a :SUSPENDSPOOL command for the device, then :RESUMESPOOL. Use the BACK option to reset the spool file prior to the point where the possible data loss occurred. The maximum number of pages possible in one command is 256. The following example illustrates:

```
:SUSPENDSPOOL 6  
:RESUMESPOOL 6; BACK 3 PAGES
```

THE HP 7933 AND 7935 DISC DRIVES: SPECIAL CONSIDERATIONS

The HP 7933 and HP 7935 are 404-megabyte moving-head disc drives. They are equipped with internal offline diagnostics, which are accessed with the keypad and display on the front panel. They also have built-in controllers which assign spare sectors and spare tracks, as requested by the SPU (System Processing Unit). They can be used as a system disc or a serial disc. The HP 7935 can be used as a private volume.

The HP 7933 and HP 7935 have features which were not available on previous HP disc drives, so it is necessary to become familiar with the procedure for "unloading" the disc. It consists of unloading the heads and "spinning down", or stopping the disc's rotation, as described below. The HP 7933 disc pack is not removable; the HP 7935 is. "Unloading" the disc refers only to retracting the heads, not to physically removing the disc pack.

UNLOADING A SYSTEM DISC

It is necessary to **=SHUTDOWN** the operating system (MPE) before attempting to **UNLOAD** or "spin down" a disc in the system domain. If the **LOAD/UNLOAD** button (or **ONLINE/OFFLINE** switch for 792x disc drives) on the disc drive is inadvertently pressed while the system is running, the system disc will refuse to **UNLOAD**. The **ACTIVITY** panel will indicate "BUSY", momentarily, and the following message will appear on the System Console:

```
UNLOAD ON LDEV #n DENIED. =SHUTDOWN MUST PRECEDE AN UNLOAD ON A SYSTEM DISC
WARNING: REPOSITION BUTTON BACK TO LOAD POSITION.
```

Note that if the **LOAD/UNLOAD** button is not repositioned to the **LOAD** position, and a powerfail occurs, the drive will spin down, and a "NOT READY " message will appear on the System Console. At this point, it is necessary to reposition the **LOAD/UNLOAD** button back to the **LOAD** position in order to spin the drive up.

If the system is shut down before the **LOAD/UNLOAD** button is repositioned (set to the "in" position), it is necessary to reposition the button to the **LOAD** position, then again to the **UNLOAD** position, since the first **UNLOAD** request was denied by the system.

UNLOADING A NONSYSTEM DISC

Private volumes, serial, and foreign discs cannot be unloaded when in use. If the **LOAD/UNLOAD** button is pressed on a nonsystem disc while it is in use, the following error message will be displayed on the System Console:

```
UNLOAD ON LDEV #n DENIED. NON-SYSTEM DISC IN USE!
WARNING: REPOSITION BUTTON BACK TO LOAD POSITION.
```

It is then necessary to reposition the button back to the **LOAD** position, and wait until the disc is no longer in use, before depressing the button again. If the private volume is "disc cached", turn disc caching off to that volume before unloading.

Note that, as with the system disc, if you forget to reposition the **LOAD/UNLOAD** button after receiving the above warning, and a powerfail occurs, the disc will spin down (unload). It will then be necessary for you to restart the disc by resetting the **LOAD/UNLOAD** button to the **LOAD** (in) position.

HP 9144 TAPE CARTRIDGE MEDIA LIFE CONSIDERATIONS

The media life of the HP 9144 serial tape cartridge is 125 full tape backups. The serial tape drive will signal the operator when it is about to wear out by flashing the **WRITE PROTECT LED** during the **UNLOAD** sequence.

At the completion of the Unload sequence, the tape cartridge is unlocked and the **BUSY LED** goes out. At this time the **WRITE PROTECT LED** can begin flashing. If it does flash, this indicates to the user that the tape cartridge has exceeded its useful life and will begin to wear out soon (and rapidly). The **WRITE PROTECT LED** will continue to flash until the tape cartridge is removed from the drive.

Just before the cartridge is unlocked, two items in the USE log are incremented: the AUToload count and the count of blocks accessed. Two conditions will cause the WRITE PROTECT LED to flash:

1. When the AUToload count exceeds the media life limit of 2000.
2. When the count of blocks accessed exceeds the media life limit of the equivalent of 125 full tape backups (2,048,000 for the Short Tape, 8,192,000 for the Long Tape).

CAUTION

Commands are not disabled when the WRITE PROTECT flashes. It is still possible to reload the tape and perform reads and writes. However, it is **STRONGLY** suggested that the operator replace the media when the media life limit is signaled.

If the serial tape is WRITE PROTECTED, the USE log will not be updated. Therefore, an accurate count of AUToload or of blocks accessed will not be maintained. If the operator continues to use this tape to boot from then eventually it will wear out (with NO warning from the drive via the media monitor).

NOTE

The end of media life can also be detected by a sudden increase of recoverable or marginal data errors. If this is the case then the heads should be cleaned and the media replaced.

TAPE CARTRIDGE UNIT: CONTROLS AND INDICATORS

The UNLOAD button, located on the front panel of the cartridge tape portion of the HP 7911, HP 7912, or HP 7914 disc drive, or on the front panel of the HP 9144 cartridge tape unit, initiates the rewind and unload sequence unless the device is in use as a serial disc. The tape's error and use logs are updated, if applicable. Then the tape rewinds. (Note that if the write-protect arrow is turned to the SAFE position, the error and use logs will not be updated, since the cartridge is write-protected.) When the unload is complete (30-55 seconds for the 150-foot, 16.7 megabyte tape), an audible buzz from the latch mechanism indicates that the cartridge is free and can be removed. If the UNLOAD button is pushed during an autoloading, the autoloading will stop and the tape will unload.



MPE MESSAGE SYSTEM

SECTION

IX

ERROR MESSAGES

The System Failure messages, MPE system error messages, cold load error message, and the MPE message system are included in this section.

System Failures result in messages, followed by a halt. These failures do not occur during system initialization; MPE must be operating to receive these messages. When a halt occurs, a software dump should be initiated. These failures are referenced in Table 9-1.

The MPE system messages are issued to the System Console, while the system is still running. The errors are referenced in Table 9-2.

Cold load errors occur when the System Operator is doing a cold load. A cold load error message is generated, after which the system halts. The error messages are numbered, in most cases. They require the System Operator to take an action based on the individual message. The error messages with numbers are referenced in Table 9-3, and those without numbers are referenced in Table 9-4.

In some cases communication lines may cause an irrecoverable error message to occur. These messages are always followed by "(DSERR)". For information on communication errors, refer to the Fundamental Communications Handbook (5997-4634).

All the MPE error messages can be found in CATALOG.PUB.SYS. The catalog is divided into different message sections to find the messages more easily. The online Help subsystem is CICAT.PUB.SYS. A user can also modify and expand the "CATALOG.PUB.SYS" and "CICAT.PUB.SYS" with the program "MAKECAT".

Categories of System Failures

System Failures typically fall into eight categories:

NUMBER	TYPE	MODULE
1-199	SYSTEM INTERNALS	CHECKER, HARDRES, INCLHARD, LOG, UTILITY, FILEACC, FILEIO, LABSEG, KERNELD, DEBUG, KERNELC, ININ, MISCSEGC
200-299	I/O SYSTEM	INCLHARD, HARDRES, ININ, NRIO, CACHESEG
300-399	PROCESS AND USER RELATED	MORGUE, PROCSEG, RINS, ABORTDMP, CIMAIN, LOAD, LOADER1, ALLOCATE, NURSERY, OPCOMMND, PROGEN, SPOOLCOMS
400-499	FILE SYSTEM	DIRC, FILEACC, PROGEN, PVSYS, DFS, FILEIO, IPC

MPE Message System

500-599	USER INTERFACE	JOBTABLE, CIMGR, CIMAIN, UDC
600-799	KERNEL	KERNELC, PCREATE, INCLHARD, PORT, INCLVMC, SOFTIO, ININ, CACHESEG, KERNELD, BIPC, ADCCINIT, ATPINIT, TICINIT, TERMUTIL, ATPDRIVR, FILEIO, IMANAGER
900-999	DATA COMM	COMSYS1, COMSYS3, COMSYS4, COMSYS5, COMSYS6, FILEIO, DS, MRJE, KERNELC, ININ, DSN, DSCOMPLETE
1000-1999	DISC CACHING	CACHESEG, INCLCDEF

When a System Failure occurs, a message appears on the System Console in the following format:

```
****SYSTEM FAILURE #enum  
      STATUSsnum  
      DELTAppnum
```

where:

enum is the error number that identifies the type error.

snum is the code segment number from which the system failure was called.

pnum is the program counter (Delta-P) offset into the code segment.

The System Failure List in Table 9-1 gives the failure numbers, the names of the modules in which the failure was detected, the cause of errors, and what action you should take in response to the messages. Other system failures may abnormally occur, without a System Failure message. When a system fails in this manner, use the following steps to determine the failure:

1. Perform a memory dump.
2. Perform a WARMSTART.

Table 9-1. System Failure List

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
0	KERNELC/TAKEOFFARL	Request size is greater than size of bank.	Perform a memory dump and WARMSTART the system.
1	CHECKER/REQUOP	UCOP request list full.	Enlarge the UCOP request queue. See your System Manager.
3	HARDRES/TIMEREQ	Timer request list full.	Enlarge the table. See your System Manager.
4	KERNELC/PSEUDOINT	Illegal pseudo interrupt or bad parameters.	Perform a memory dump and WARMSTART the system.
8	ININ/TESTCRUNCH	Nonresponding module when MPE code executing.	Perform a memory dump and WARMSTART the system.
9	ININ/TESTCRUNCH	Illegal address in MPE.	Perform a memory dump and WARMSTART the system.
10	ININ/TESTCRUNCH	Bounds violation.	Perform a memory dump and WARMSTART the system.
13	ININ/DATAPARITY	Data parity error.	Hardware problem, run diagnostic.
	MISCSEGC/THUSCPU	Invalid CPU type.	Hardware problem, run diagnostic.
15	ININ/GHOST	Interrupt from unconfigured device or undefined internal interrupt.	Hardware problem, run diagnostic.
16	ININ/DSTVIOLATION	DST violation internal interrupt.	Perform a memory dump and WARMSTART the system.
24	HARDRES/ABORTTIMER	Invalid timer request list Index.	Perform a memory dump and WARMSTART the system. See your System Manager.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
25	HARDRES/TIMEREQ	Invalid free list for timer request list.	Perform a memory dump and WARMSTART the system. See your System Manager.
26	HARDRES/TIMEREQ	Invalid requester.	Perform a memory dump and WARMSTART the system.
27	HARDRES/OLDTICK	TRL entry is zero.	Perform a memory dump and WARMSTART the system.
28	HARDRES/ ABORTTIMEREQ	An attempt was made to return a free entry to the free list (TRL Table).	Perform a memory dump and WARMSTART the system.
29	INCLHARD	Try to perform fetch I/O segment for a segment already frozen.	Perform a memory dump and WARMSTART the system.
30	LOG (PROCESS)	Process awakened with nonfull buffer to be written.	Perform a memory dump and WARMSTART the system.
31	LOG (PROCESS)	Want to switch to other buffer, but it is not empty.	Perform a memory dump and WARMSTART the system.
33	UTILITY/LOG	Invalid log record parameter type number.	Perform a memory dump and WARMSTART the system.
35	UTILITY/LOG	System logging error.	Perform a memory dump and WARMSTART the system.
50	FILEIO	Tried to unlock FCB that is locked by another PIN, or is not locked.	Perform a memory dump and WARMSTART the system.
51	FILEACC	No CSCLOSE, 3270 <i>plabel</i> .	Perform a memory dump and WARMSTART the system.
52	FILEACC	DS error.	Check for misconfigured I/O devices such as terminals or RJE.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
53	FILEIO	I/O completed for 3270, but 3270 not installed in system.	Check for misconfigured I/O devices, such as terminals or RJE.
54	FILEACC	Volume Table Index associated with the <i>ldev</i> is zero.	Perform a memory dump and WARMSTART the system.
59	FILEIO	Bad CB address in Vector Table.	Perform a memory dump and WARMSTART the system.
60	FILEIO	Unexpected zero word count in FCB.	Perform a memory dump and WARMSTART the system.
61, 62, 63, 64	FILEIO	Bad FCB size.	Perform a memory dump and WARMSTART the system.
86	LABSEG	Data inconsistency in the Tape Label Table.	Perform a memory dump and WARMSTART the system.
124	KERNELD/RELDATASEG	Attempt made to release a system-defined (permanent) DST.	Perform a memory dump and WARMSTART the system.
160	KERNELD/ABORTDSEG	Attempt to decrement JDT reference counter for shared extra data segment below zero.	Perform a memory dump and WARMSTART the system.
199	DEBUG/KERNELC	Cannot lock Break Point Table.	Perform a memory dump and WARMSTART the system.
201	HARDRES/TIP	I/O Failure, nonresponding device on start I/O Instruction (frequent cause, misconfiguration).	Reconfiguration needed; otherwise it may be a hardware problem, so run diagnostic.
205	HARDRES/GIPHPIB INITIO	Set mask failed.	Verify channel configuration.
206	HARDRES/ATTACHIO	Invalid logical device number.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
249	HARDRES/CHECKINDEX	Invalid TBUF, SBUF, IOQ, DRQ Index. Return IOQ, DRQ already free.	Perform a memory dump and WARMSTART the system.
250	NRIO/GETSYSBUF	Bad SYSBUF Free List.	Perform a memory dump and WARMSTART the system.
251	HARDRES/ RETURNSYSBUF	Bad SYSBUF Index.	Perform a memory dump and WARMSTART the system.
252	HARDRES/ RETURNSYSBUF	Bad SYSBUF Index.	Perform a memory dump and WARMSTART the system.
260	HARDRES/SIODM	Bank wrap around on data transfer.	Contact your HP customer engineer. Perform a memory dump and WARMSTART the system.
261	HARDRES/CACHESEG	Attempt to complete IOQ, DRQ, LDR that is already complete.	Perform a memory dump and WARMSTART the system. Check for a peripheral hardware problem.
271	NRIO/IOMESSPROC	Driver asked for reply from operator, but failed to supply a DST number for the reply.	Perform a memory dump and WARMSTART the system.
278	INCLHARD/ GETDRT/PUTDRT	Invalid DRT.	Perform a memory dump and WARMSTART the system.
289	ININ/TRACE	Invalid STT entry.	Perform a memory dump and WARMSTART the system.
299	HARDRES/SIODM	Bad return from IOUNFREEZE.	Perform a memory dump and WARMSTART the system.
300	MORGUE/EXPIRE	FREELOCRIN failed, RIN locked.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
301	MORGUE/EXPIRE	UCOP did not kill process.	Perform a memory dump and WARMSTART the system.
302	PROCSEG/ABORTPROG	Main process does not have a son when in BREAK mode.	Perform a memory dump and WARMSTART the system.
303	RINS/FREELOCRIN	Global RIN in local RIN list.	Perform a memory dump and WARMSTART the system.
310	ABORTDMP/ABORT	System process aborted.	Perform a memory dump and WARMSTART the system.
311	ABORTDMP/ABORT	Process aborting while critical.	Perform a memory dump and WARMSTART the system.
314	MORGUE	Process terminating with SIR.	Perform a memory dump and WARMSTART the system.
315	CIMAIN	CI command completion with SIR locked.	Perform a memory dump and WARMSTART the system.
341	LOAD/Load program	Bad LST, segment entry not found.	Perform a memory dump and WARMSTART the system.
343	LOAD/ ADDSEGDATA'SLDB	Bad LST, no seglist entry.	Perform a memory dump and WARMSTART the system.
344	LOADER 1/SUMSEGS	Bad LST, segment entry not found.	Perform a memory dump and WARMSTART the system.
345	LOADER 1/UNLOAD	Bad LST, segment entry not found.	Perform a memory dump and WARMSTART the system.
346	LOADER 1/ADJSEG	Bad LST, segment entry not found.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
347	LOAD LOADER1/LOADER	RECEIVMSG failed.	Perform a memory dump and WARMSTART the system.
348	LOADER1/ UPDATESEGTABLE	Bad Loader Segment Table, master entry not found.	Perform a memory dump and WARMSTART the system.
349	LOADER1/ UPDATESEGTABLE	Load Loader Segment Table, segment entry not found.	Perform a memory dump and WARMSTART the system.
350	LOAD/SATISFY	Segment number not allocated.	Perform a memory dump and WARMSTART the system.
	ALLOCATE/ ALLOCENTRY	Error expanding XDD.	Perform a memory dump and WARMSTART the system.
	NURSERY/ ALLOCATE'JMAT	Error expanding JMAT.	Perform a memory dump and WARMSTART the system.
351	ALLOCATE/ DEALLOCENTRY LOADER1/Load Procedure	Error contracting XDD. Bad LST, master entry not found.	Perform a memory dump and WARMSTART the system.
	NURSERY/ ALLOCATE'JMAT	Error contracting JMAT.	Perform a memory dump and WARMSTART the system.
352	ALLOCATE/ SRELINKODD	Logical device not found in ODD head entries.	Perform a memory dump and WARMSTART the system.
	LOADER1/ UNLOADPROC	Bad LST, master entry not found.	Perform a memory dump and WARMSTART the system.
353	ALLOCATE/SPUTXDD	Logical device not found in XDD head entries.	Perform a memory dump and WARMSTART the system.
354	ALLOCATE/SLINKXDD, DELINKENTRY	Bad XDD, invalid links, invalid subentry.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
360	ALLOCATE/GETCLASS	Bad Device Class Table pointer.	Perform a memory dump and WARMSTART the system.
361	ALLOCATE/ALLOCATE	Invalid Device Class Table pointer.	Perform a memory dump and WARMSTART the system.
362	ALLOCATE/ALLOCATE	Bad LDT or LPDT for first device in class.	Perform a memory dump and WARMSTART the system.
363	ALLOCATE/ALLOCATE	LDEV 0 specified, or LDT/LPDT for specified device.	Perform a memory dump and WARMSTART the system.
364	ALLOCATE/ALLOCATE	Invalid Device Class Table Index.	Perform a memory dump and WARMSTART the system.
365	ALLOCATE/GETCLASS	Illegal combination of procedure parameters.	Perform a memory dump and WARMSTART the system.
366	ALLOCATE/ DEALLOCATE	Negative use count (in LDT) upon device deallocation.	Perform a memory dump and WARMSTART the system.
367	ALLOCATE/GETCLASS	Missing required parameter(s).	Perform a memory dump and WARMSTART the system.
370	SPOOLCOMS/ INITSPoolING	Unable to create spooler process during system startup.	Perform a memory dump and WARMSTART the system.
371	OPCOMMAND/DELETJOB	:ABORTJOB failed when the job was in EXEC, INIT, or SUSP state.	Perform a memory dump and WARMSTART the system.
372	PROGEN/ CONSSHUTDOWN	Unable to stop spooler.	Perform a memory dump and WARMSTART the system.
373	PROGEN/CHECK 'FOR' MESSAGE	Receive message failed.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
374	PROGEN	JMAT destroyed, cannot WARMSTART.	COOLSTART the system.
400	DIRC	Directory I/O error.	Perform a RELOAD.
401	DIRC	Bad directory DST number.	Perform a memory dump and WARMSTART the system.
402	DIRC	Error in directory data segment buffer.	Perform a memory dump and WARMSTART the system.
404	FILEACC	Directory error while searching for group entry.	Perform a memory dump and WARMSTART the system.
406	DIRC	Internal directory error while logging on or off.	Perform a memory dump and WARMSTART the system.
407	DIRC	Internal directory bit map error while allocating or deallocating space.	Perform a memory dump and WARMSTART the system.
408	DIRC	Internal directory is corrupt.	Perform a RELOAD.
418	DIRC	Internal directory error when binding/unbinding a group to its home volume set.	Perform a memory dump and WARMSTART the system.
419	PVSYs	Error in MVTAB.	Perform a memory dump and WARMSTART the system.
421	DFS	Disc Free Space problems: 1. Error on logical/physical mount/dismount of disc. 2. Internal data structure inconsistency. 3. Free space bit map error 4. Accessing nonexistent free space. 5. I/O error accessing bit map.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
422	DFS	Disc Free Space internal error; for example, page I/O error.	Perform a memory dump and WARMSTART the system.
423	DFS	DFS page I/O error or device is not a disc.	Perform a memory dump and WARMSTART the system.
455	FILEIO/POST'ACB'ERROR	Corrupted ACB or AFT.	Perform a memory dump and WARMSTART the system.
465	FILEACC/FCREATECB	Attempt to create duplicate CB DST.	Perform a memory dump and WARMSTART the system.
466	FILEACC/FCREATECB	Illegal strategy (bad parameter) in finding room in the control block table.	Perform a memory dump and WARMSTART the system.
468	FILEIO	Error allocating/ deallocating disc space.	Perform a memory dump and WARMSTART the system.
469	FILEACC/FOPENDA	Cannot deallocate disc space.	Perform a memory dump and WARMSTART the system.
470	FILEACC/FOPEN	Cannot deallocate disc space.	Perform a memory dump and WARMSTART the system.
471	FILEACC/FCLOSE	Cannot deallocate disc space.	Perform a memory dump and WARMSTART the system.
475	FILEIO/FCONV BLK	Condition Code is > or < from FCLEAR.	Perform a memory dump and WARMSTART the system.
478	FILEIO/FNOBUF	Condition Code is > or < from FCLEAR.	Perform a memory dump and WARMSTART the system.
479	FILEIO/GETREC	WAITFORIO error.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
480	FILEIO/FQUIESCEIO	WAITFORIO error.	Perform a memory dump and WARMSTART the system.
481	FILEIO/FBREAK	BREAK on \$NULL.	Perform a memory dump and WARMSTART the system.
483	FILEIO/FRESETEOF	Corrupted ACB/AFT entry.	Perform a memory dump and WARMSTART the system.
484	FILEACC/FOPEN	DIRECFINDFILE error.	Perform a memory dump and WARMSTART the system.
486	FILEIO	DS error.	Perform a memory dump and WARMSTART the system.
487	FILEIO/IOWAIT	WAITFORIO error.	Perform a memory dump and WARMSTART the system.
488	FILEACC/FRENAME	Cannot remove temporary file from JDT.	Perform a memory dump and WARMSTART the system.
489	FILEACC/FCLOSE	Error releasing disc space for \$OLDPASS.	Perform a memory dump and WARMSTART the system.
490	FILEACC/FCLOSE	Error (Not I/O) from DirecPurge file.	Perform a memory dump and WARMSTART the system.
495	IPC	Message file access error.	Perform a memory dump and WARMSTART the system.
500	JOBTABLE/REMJTENTRY	Failure to contact JDT.	Perform a memory dump and WARMSTART the system.
501	JOBTABLE/ XADDJTENTRY	Invalid JDT pointer.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
502	CIMGR/ CXNEWACCT, CXNEWVSET	Directory cannot be purged.	Perform a memory dump and WARMSTART the system.
503	CIMGR/ CXNEWACCT, CXNEWVSET	Duplicate entry in directory.	Perform a memory dump and WARMSTART the system.
504	CIMGR/CXNEWGROUP CXNEWUSER, CXALTGROUP, CXALTUSER, CXALTVSET	Cannot find account logged on.	Perform a memory dump and WARMSTART the system.
505	CIMGR/CXNEWGROUP, CXNEWVSET, CXALTGROUP, CXALTVSET, CXALTUSER	Nonexistent name in directory search.	Perform a memory dump and WARMSTART the system.
506	CIMAIN/CYDIRERR	Catastrophic directory error.	Perform a RELOAD.
509	CIMAIN	Error returned by Command Interpreter Log Table during :C) COMMAND LOGON or logoff.	Perform a memory dump and WARMSTART the system.
535	UDC/INITUDC	UDC directory data segment is corrupted.	Perform a memory dump and WARMSTART the system.
600	KERNELC/ GENSPECREQ PUTDEVONOBJMPQ	Ran out of entries in Special Request Table (only if an ICS in MPE IV or MPE V/P).	Configure more entries.
601	KERNELC/ STARTOBJWRITE, FETCHOBJECT	Ran out of entries in Disc Request Table.	Configure more entries.
602	PCREATE/ PROCREATE, FLAGPROCABSENT	Ran out of swappable (SLL) entries (only if on ICS).	Configure more entries.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
603	KERNELC/ RELSYSTABENTRY, REL'PHY'CST	Entry out of range or al- ready released.	Perform a memory dump and WARMSTART the system.
604	KERNELC/WAIT	Event has already occurred.	Perform a memory dump and WARMSTART the system.
605	KERNELC/ GETSYSTABENTRY, RELSYSTABENTRY	System Table not core resident.	Perform a memory dump and WARMSTART the system.
606	KERNELC/ UNLOCKSEG' UNFREEZESEG'	Attempt to unlock or un- freeze a segment which is not locked or frozen.	Perform a memory dump and WARMSTART the system.
607	KERNELC/ LOCKSEG', FREEZESEG'	Attempt to lock or freeze a segment when on ICS.	Perform a memory dump and WARMSTART the system.
608	KERNELC/ ABORTPROCESS	Not supported.	Perform a memory dump and WARMSTART the system.
	QUEUEPROC	Invalid PIN number.	Perform a memory dump and WARMSTART the system.
610	KERNELC/AWAKE	Attempt to unexpectedly awaken process from criti- cal event wait.	Perform a memory dump and WARMSTART the system.
611	KERNELC/ EXCHANGEDB, RESETDB	Illegal DB placement.	Perform a memory dump and WARMSTART the system.
612	KERNELC/ UNDEFEROBJSMPQ, PROCESSINITMSG,	Object not in processor's SLL. Problem with size in region header.	Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
612	PUTDEVONOBJSMPQ	SRT integrity problem.	Perform a memory dump and WARMSTART the system.
613	KERNELC/ PROCESSCOMPMSG, PROCESSINITMSG,	Synchronization problem with In-Motion-In mechanism.	Perform a memory dump and WARMSTART the system.
	OBJWRITECOMPLETOR,	DST already written out. Bad DRQ pointer in region header.	Perform a memory dump and WARMSTART the system.
	OBJREADCOMPLETOR,	Segment was already present. Segment was not In-Motion-In.	Perform a memory dump and WARMSTART the system.
	PUTPROCONOBJSMPQ	Processor's SLL already says In-Motion-In.	Perform a memory dump and WARMSTART the system.
614	KERNELC/ RELEASEREGION, CLEANREGION, RECOVEROC, PROCESSCOMPMSG,	Bad region size: 1. Size in header is greater or less than the size in trailer. 2. Size of region is greater than bank size. 3. Invalid region size.	Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system.
	MAKEROOM, COLLECTGARBAGE,	Object identifier in region header is invalid.	Perform a memory dump and WARMSTART the system.
	PROCESSCOMPMSG	Inconsistency in Region Assignment State.	
	615	MAKEROOM	Cannot make room for critical MPE segment.
616	KERNELC/MAKEOC	Attempting to make resident locked, frozen, or I/O frozen segment into overlay candidate.	Perform a memory dump and WARMSTART the system.
617	KERNELC/ FETCHOBJ, ISOBJABSENT, ISOBJIMI, ISOBJROC	Request access of an unallocated DST, CST.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
618	KERNELC/ CLEANREGION, RECOVEROC, FETCHOBJECT	Problem with DST post to disc: 1. DRQ for write already queued. 2. Cannot abort DRQ for write. 3. No DRQ for segment write.	Perform a memory dump and WARMSTART the system.
619	KERNELC/RESERVEREG BUILDOBJD/ ADJUSTLOCALITY, ADDTOLOCALITY/ ADJUSTLOCALITY, FETCHOBJECT, PROCESSSCHDMSG, DISP/LAUNCH	Memory management integrity problem: 1. Error in available region list. 2. Request region is greater than bank size. 3. Cannot find available region. 4. Invalid parameter. 5. Inconsistency in SLL flags word. 6. Tried to fetch object with size and region address of zero. 7. Bad message received from RECEIVMSG. 8. DB segment absent when launch process.	Perform a memory dump and WARMSTART the system.
620	PORT KERNELC/ PROCESSSCHDMSG	Low-level message system integrity problem: 1. Corrupted MSG Harbor Table. 2. Bad message frames. 3. Bad message queue structure. RECEIVMSG error	Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system.
621	PORT	Bad port DST number.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
622	PORT	Bad message length, bad parameter, bad destination PIN, bad subqueue.	Perform a memory dump and WARMSTART the system.
623	KERNELC/AWAKE	Awake of an invalid PCB.	Perform a memory dump and WARMSTART the system.
624	KERNELC/FETCHIOSEG	Tried to fetch unallocated object.	Perform a memory dump and WARMSTART the system.
625	KERNELC/ EXCHANGEDB	Tried to set DB to unallocated DST.	Perform a memory dump and WARMSTART the system.
629	KERNELD/ RELCODESEG	Tried to release a system code segment.	Perform a memory dump and WARMSTART the system.
630	KERNELD/ RELDATASEG	Attempt to release memory resident segment.	Perform a memory dump and WARMSTART the system.
631	KERNELD/ RELDATASEG	Attempt to release I/O frozen segment.	Perform a memory dump and WARMSTART the system.
632	KERNELD, INCLVMC	Cannot release Virtual Memory for DST or bad VM data structure.	Perform a memory dump and WARMSTART the system.
633	KERNELD/ ALTPXFILESIZE	Error contracting PXFILE area.	Perform a memory dump and WARMSTART the system.
634	KERNELC, KERNELD	Pdisabled count is greater than zero.	Perform a memory dump and WARMSTART the system.
635	SOFTIO/ CPR'SHUTDOWN	Invalid parameter/markers when you SHUTDOWN CIPER printer.	Perform a memory dump and WARMSTART the system.
640	ININ/STACKOVERFLOW	Second stack overflow while pdisabled.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
641	ININ/STACKOVERFLOW	Critical stack overflow and no more stack.	Perform a memory dump and WARMSTART the system.
642	ININ/STACKOVERFLOW	Stack overflow while I/O frozen and disabled/pdisabled.	Perform a memory dump and WARMSTART the system.
643	ININ/STACKOVERFLOW	Stack overflow on resident, frozen, or locked in memory.	Perform a memory dump and WARMSTART the system.
644	ININ/ CODEABSENCE DATAABSENCE	Absence trap while pdisabled.	Perform a memory dump and WARMSTART the system.
645	ININ/ CODEABSENCE	Code absent and Delta-P is bad.	Perform a memory dump and WARMSTART the system.
646	ININ/STACKOVERFLOW	Stack overflowed out of the memory region that it currently resides in.	Perform a memory dump and WARMSTART the system.
650	KERNELC/ OBJREADCOMPLETOR	Segment read disc I/O error (detects the defective track).	Perform a memory dump and WARMSTART.
651	KERNELC/ OBJWRITECOMPLETOR	Segment write disc I/O error (detects the defective track).	Perform a memory dump and WARMSTART.
654	KERNELC/ UPDATEDISCCOPY	ATTACHIO returned I/O error code (detects the defective track).	Perform a memory dump and WARMSTART.
660	INCLHARD	Attempt to queue disc request that is already queued.	Perform a memory dump and WARMSTART the system.
661	INCLHARD	Detection of integrity problem with disabling disc request.	Perform a memory dump and WARMSTART the system.
663	INCLHARD	Current request flag already set in next disc request selected for device.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
671	KERNELC/ CACHESEG	Synchronization problem handling Cached Domains: <ol style="list-style-type: none"> 1. Problem with Cached Domain assignment state/Flags. 2. READ completes, but CD already present. 3. WRITE completes, but CD was not In-Motion-Out. 4. CD object not found in processors locality. 	Perform a memory dump and WARMSTART the system.
672	KERNELC/CACHESEG, HARDRES	Integrity problem handling Cached Domains: <ol style="list-style-type: none"> 1. Bad cache Domain list. 2. Bad return from measurement interface. 3. Cached region linked/unlinked when it should not be. 4. DRQ for Mapped Cache Domain is zero. 5. Invalid size of Cached Domain. 6. Error in serial write queue manager. 	Perform a memory dump and WARMSTART the system.
680	KERNELC, KERNELD	<ol style="list-style-type: none"> 1. Invalid send message. 2. Abort bit set on object read completion. 3. Fetch object and try to lock mapped Cached Domain. 4. Try to launch process with DB below DL. 5. Cannot clear virtual memory for a stack. 	Perform a memory dump and WARMSTART the system.
681	KERNELC, HARDRES	<ol style="list-style-type: none"> 1. Try to access PIN 0. 2. Bad PCB impeded list. 3. Write complete interrupt for object not DST or Cached Domain. 4. Attempt to disable/abort current request. 5. Attempt to abort LDR. 	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
690	BIPC	Internal IPC problem.	Perform a memory dump and WARMSTART the system.
700	ATPINIT, INCLDFSC DFS	DB placement bad (not at SYSGLOB). Invalid page number, word number, map or disc address.	Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system.
701	ADCCINIT, ATPINIT, TICINIT, TERMUTIL	Invalid CPU.	Perform a memory dump and WARMSTART the system.
703	ATPINIT, TICINIT	Cannot initialize Port for the System Console.	Verify that the System Console has been configured correctly, otherwise perform a memory dump and WARMSTART the system.
704	ATPINIT	Failure to allocate the System Console.	Perform a memory dump and WARMSTART the system.
705	ADCCINIT, ATPINIT	Cannot build internal tables.	Perform a memory dump and WARMSTART the system.
706	ADCCINIT, ATPINIT, TICINIT	Cannot load ADCC, ATP, or ATP37 software.	Verify that all the required terminal segments are present. If not perform an UPDATE. If all the segments are present, perform a memory dump and attempt a RELOAD.
708	ADCCINIT, ATPINIT, TICINIT	DST could not be frozen in memory.	Reduce the number of terminal ports configured and/or reduce the system resources (i.e. the number of CST, DET, TBUF), or perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
709	ATPINIT	Cannot access Bank 0 Table or cannot load ATP software.	Perform a memory dump and WARMSTART the system.
710	ADCCINIT, ATPINIT, TICINIT	Invalid MPE table or inconsistent internal table.	Verify that the device type is appropriate for the driver configured. If it is correct, perform a memory dump, then attempt a RELOAD. If the RELOAD fails, start troubleshooting the processor's hardware.
711	TERMUTIL	Bad TBUF link pointer in the returned TBUFs.	Perform a memory dump and WARMSTART the system.
712	TERMUTIL	Bad TBUF Table.	Perform a memory dump and WARMSTART the system.
713	ATPINIT	Cannot write a message to the System Console.	Perform a memory dump and WARMSTART the system.
714	ATPDRIVR	Hardware Error or no interrupt bit was set.	Begin troubleshooting via off-line diagnostics.
715	TERMUTIL	Port error on the System Console.	After verifying that the System Console is operating correctly, perform a memory dump and WARMSTART the system.
716	ATPDRIVR	An I/O Instruction failure occurred (RIOA, RIOG, WIOA, WIOG).	Troubleshoot the hardware outside of the terminal subsystem, then perform a memory dump and WARMSTART the system.
717	ADCCINIT, ATPINIT, TICINIT, IMANAGER	Corrupted IMANAGER code; therefore the terminal type information could not be accessed.	Perform a memory dump and UPDATE from tape.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
718	ADCCINIT	Invalid <i>ldev</i> specified.	Perform a memory dump and WARMSTART the system.
719	ADCCINIT, TICINIT	Corrupted device sort.	Perform a memory dump and WARMSTART the system.
720	ADCCINIT, TICINIT	Inconsistency between the MPE tables and hardware.	Perform a memory dump and WARMSTART the system.
721	ADCCINIT, TICINIT	The wrong driver specified for the wrong controller.	Check the driver name to match the controller. Perform a memory dump and WARMSTART the system.
722	TERMUTIL	Cannot load INIT code.	Perform a memory dump and WARMSTART the system.
723	TERMUTIL	Invalid controller type.	Check the tape that you are using to update the system.
777	FILEIO	CSIOWAIT missing.	Reconfigure.
900	COMSYS1/ CSIOWAIT COMSYS4/CREAD, CWRITE	I/O request no longer with caller's process.	Perform a memory dump and WARMSTART the system.
902	COMSYS3/ CSDRIVERLOCK	Unable to freeze or unfreeze segment in main memory.	Perform a memory dump and WARMSTART the system.
903	COMSYS3/ CDRIVERLOCK, CRELEASE COMSYS5/ CCONTROL, CPOLLIST COMSYS6/ CDELETETRACE- AREA	Unable to lock or unlock segment in main memory.	Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system. Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
904	COMSYS5/ CCONTROL	Unable to increase data segment size.	Perform a memory dump and WARMSTART the system.
905	COMSYS6/ CDELETETRACE- AREA	Unable to decrease data segment.	Perform a memory dump and WARMSTART the system.
906	COMSYS3/ CDRIVERUNLOCK COMSYS6/CPOLLIST	Unable to unfreeze segment in main memory.	Perform a memory dump and WARMSTART the system.
907	COMSYS3/ CDRIVERUNLOCK	Unable to unlock segment in main memory.	Perform a memory dump and WARMSTART the system.
909		Invalid pointer to pollist area	Perform a memory dump and WARMSTART the system.
910		Unable to find IOQ in CS Table.	Perform a memory dump and WARMSTART the system.
911	FILEIO	IOWAIT to CS.	Perform a memory dump and WARMSTART the system.
912	DS/DSSEG1, DSSEG4	RFA buffer size less than zero.	Perform a memory dump and WARMSTART the system.
913	DS/IODS0	DSW and DSWR count disagree.	Perform a memory dump and WARMSTART the system.
914	DS/IODS0, IODSTRM0	DS use count is less than zero.	Perform a memory dump and WARMSTART the system.
915	DS/DSMON	Bad data and DEBUGON, 3.	Perform a memory dump and WARMSTART the system.
916	DS/DSMON	DEBUGON, 3 and DS error.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
917	DS/DSSEG2	Unable to locate DS line control block.	Perform a memory dump and WARMSTART the system.
918		Virtual PIN corresponding to a real PIN not found.	Perform a memory dump and WARMSTART the system.
919		Real PIN corresponding to a virtual PIN not found.	Perform a memory dump and WARMSTART the system.
920	MRJE/IOMCONSO	Irrecoverable buffer state.	Contact your System Applications Organization (AEO).
921	MRJE/IOMCONSO	Irrecoverable buffer state.	Contact your AEO.
930	SNA LINK	SNA/Transport internal error.	Perform a memory dump and WARMSTART the system.
940	SNA LINK	Translator, internal data element failure.	Perform a memory dump and WARMSTART the system.
941	SNA LINK	Translator, no free element available.	Perform a memory dump and WARMSTART the system.
980	DSCOMPLETE/DSIOM	IOQ index not found in the DIT queue.	Perform a memory dump and WARMSTART the system.
981	DSCOMPLETE/DSIOM	IOQ index too large.	Perform a memory dump and WARMSTART the system.
999	KERNELC/ MAPPEDCSTTOPHY	Bad call.	Perform a memory dump and WARMSTART the system.
	ININ/CODEABSENCE	Bad CST number.	Perform a memory dump and WARMSTART the system.

Table 9-1. System Failure List (Continued)

ERR. NO.	MODULE/ PROCEDURE NAME	CAUSE	ACTION
1001	INCLCDEF	Bad CDT entry number.	Perform a memory dump and WARMSTART the system.
1002	CACHESEG	CDT Table uninitialized.	Perform a memory dump and WARMSTART the system.
1003	CACHESEG	Invalid CDT entry number.	Perform a memory dump and WARMSTART the system.
1004	CACHESEG	Invalid LDR index.	Perform a memory dump and WARMSTART the system.
1005	CACHESEG	Bad state in CDT Mapped Domain Entry.	Perform a memory dump and WARMSTART the system.
1006	CACHESEG	CDT Table is full.	Perform a memory dump and WARMSTART the system.
1007	CACHESEG	Bad CDT/LDR queue structure, or bad state in CDT Mapped Domain Entry upon LDR completion.	Perform a memory dump and WARMSTART the system.
1008	CACHESEG	Out of DRQ entries.	Perform a memory dump and WARMSTART the system.
1009	CACHESEG, INCLCDEF	CDT entry is already assigned or unassigned when it should not be.	Perform a memory dump and WARMSTART the system.
2001	KERNELC/ PUTPROCONOBJMPQ	Object not in processor's SLL.	Perform a memory dump and WARMSTART the system.
10,000	DEBUG/VALIDATE	Invalid segment.	Perform a memory dump and WARMSTART the system.

Table 9-2. Console Messages

MESSAGE	MEANING	ACTION
<i>message</i> (MAX CHARS= <i>num</i>)?	A message was sent to you by the PRINTOPREPLY intrinsic.	:REPLY/=REPLY to the message.
ACCESS TO <i>vsname</i> . <i>group.acct</i> BY <i>user.acct</i> (Y/N)?	A user asked you to verify access to the specified disc volume (<i>vsname</i>) that is mounted.	<u>=REPLY <i>pin</i>, YES</u> or <u>=REPLY <i>pin</i>, NO</u>
ALL JOBS LOGGED OFF	You aborted all executing jobs with =LOGOFF or you shut down the system (=SHUTDOWN).	You must enter the =LOGDN command to re-establish the pre-logoff limits or restart the system if it is shutdown.
AVAILABLE DRIVES ON LDEV# <i>ldevlist</i>	The last users of a volume set has just performed a dismount on the specified logical device.	You can physically dismount the volumes and the drive can be made available for other requests.
CAN'T INITIALLY SPOOL LDEV# <i>nnn</i>	An <i>ldev</i> was configured to be initially spooled. You did not specify either a legitimate spooler (<i>ldev</i>) or a <i>ldev</i> that was job/session accepting or data-accepting.	This indicates a system configuration error. The device specified cannot be spooled. The :ACCEPT[<i>JOBS</i> , <i>ldev</i>] or the :ACCEPT[<i>DATA</i> , <i>ldev</i>] command can be used to allow the : <i>JOBS</i> or : <i>DATA</i> command if the device is legitimate spooler, then use :STARTSPOOL <i>ldev</i> to start the spooler.
DATA COMMAND ERROR <i>number</i> , <i>number</i> ON LDEV <i>nnn</i>	A data command error was detected on the indicated device. The bracketed numbers are the command interpreter error numbers.	The system detected an invalid : <i>DATA</i> command. Correct syntax for command is : <i>DATA</i> [<i>jobname</i>], [<i>user</i> [/ <i>userpass</i>]], [<i>acct</i> [/ <i>acctpass</i>]], [<i>filename</i>]. The most common errors are undefined user or account specified, or the group name was specified (not required).
DATA IN INVALID DEVICE, LDEV# <i>nnn</i>	A user input : <i>DATA</i> on a nondata-accepting device.	If not a user error, use <u>=ACCEPT <i>DATA</i>, <i>ldev</i></u> to allow : <i>DATA</i> from this device.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
DEFERRED JOB INTRODUCED ON LDEV# <i>nnn</i>	A user entered a job on a logical device (<i>ldev</i>) whose input priority is less than or equal to the currently defined job fence.	You must intervene by either lowering the job fence or raising the job's input priority.
DIAL REMOTE <i>number</i>	The communications link has been initially established.	Dial the number shown in the message, and complete the connection. This message is printed only if the SSLC is configured as a dial-up (not a leased) line.
DISMOUNT ON LDEV <i>nnn</i>	A drive in the nonsystem domain, not in use, was switched off line.	Information only. This message indicates that the drive went off line, but was not in use. Otherwise, "LDEV <i>nnn</i> NOT READY" will appear.
DRIVES FOR <i>vcname.group.acct</i> BY <i>user.acct</i> (Y/N)?	A private volume mount mechanism needs more drives to satisfy its current request. You are asked if the rescan for the drives should be performed.	If you <u>=REPLY <i>pin</i>, YES</u> , the drives already reserved are kept, and the scan for the remainder of the drives continues. If you <u>=REPLY <i>pin</i>, NO</u> , the drives already reserved are released, and a mount request is rejected, due to lack of drives.
FILE LABEL ERROR: LDEV= <i>nnn</i>	During FOPEN the file system found an invalid file label on the disc.	The file cannot be accessed or purged unless you perform a COOLSTART.
FORMS: <i>formsmsg</i>	A user has requested special forms to be mounted on a line printer. The device file and job number are printed on the following device assignment request by the PIN (Process Identification Number).	Information only.
HELLO ON INVALID DEVICE, LDEV <i>nnn</i>	A user input :HELLO either on a nonjob-accepting device or on a noninteractive device.	If not a user error, enter <u>:ACCEPT JOBS, <i>ldev</i></u> to enable :HELLO from this device. The device must be configured as job/session accepting.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
IN-USE SERIAL DISC DISMOUNTED ON LDEV <i>nnn</i>	A serial disc that you were using was dismounted.	Put the original disc back on line.
IN-USE VOLUME DISMOUNTED ON LDEV <i>nnn</i>	A disc volume that you were using was dismounted.	Put the drive back on line.
INVALID PASS FOR <i>user.acct,group</i> ON LDEV <i>nnn</i>	A user specified an illegal password.	If the accessor is a legitimate user of the system, instruct the user to specify the proper password.
IS FILE <i>filename</i> ON LDEV= <i>nnn</i>	You are asked by the system whether the specified file is on the specified <i>ldev</i> .	You are required to <u>*REPLY <i>pin</i>, YES</u> or <u>*REPLY <i>pin</i>, NO</u> .
JOB ON INVALID DEVICE, LDEV= <i>nnn</i>	A user input a :JOB on a nonjob-accepting device.	If not a user error, enter :ACCEPT JOBS, <i>ldev</i> . Device must be configured as job/session accepting device.
(The following messages were formerly called Job Overload messages.)	It was not possible to initiate a job or session because there are insufficient system resources, as indicated by the <i>message</i> . The <i>nnn</i> denotes the logical device from which the attempted job/session initiation took place.	Recovery of this type of overload is automatic. However, if the condition occurs frequently, it indicates a chronic condition that should be remedied. The System Manager can enlarge the table entries using the :SYSDUMP Configurator Dialogue in Section VII of this manual. When \$STDLIST and \$STDIN cannot be allocated, the spooling queues have shut or the system has exceeded the configured MAX # OF OPEN SPOOLFILES. Check the device of the jobs in the WAIT state with :SHOWDEV <i>n</i> to see if it is unavailable (queue shut). If so, reopen the spool queue with :OPENQ. If there is a lack of disc space, you may have to store off spool files, or COOLSTART with the RECOVER LOST DISC SPACE option, before using :OPENQ.
LDEV <i>nnn</i> , NO PROCESS CONTROL BLOCK AVAILABLE	No Process Control Block (PCB) available.	
LDEV <i>nnn</i> , UNABLE TO ALLOCATE STACK	No Data Segment Table (DST) available for stack or not enough virtual memory.	
LDEV <i>nnn</i> , UNABLE TO ALLOCATE JOB INFORMATION TABLE	No DST available for Job Information Table (JIT).	
LDEV <i>nnn</i> , UNABLE TO ALLOCATE JOB DIRECTORY TABLE	No DST available for Job Directory Table (JDT).	
LDEV <i>nnn</i> , NO JOB PROCESS COUNT TABLE ENTRY AVAILABLE	No Job Process Count Table (JPCNT) entry available.	

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
LDEV <i>nm</i> , UNABLE TO ALLOCATE FILE SYSTEM DATA SEGMENT	No DST available for File System Data Segment Table.	Recovery of this type of overload is automatic. However, if the condition occurs frequently, it indicates a chronic condition that should be remedied. The System Manager can enlarge the table entries using the :SYSDUMP Configurator Dialogue in Section VII of this manual. When \$STDLIST and \$STDIN cannot be allocated, the spooling queues have shut or the system has exceeded the configured MAX # OF OPEN SPOOLFILES. Check the device of the jobs in the WAIT state with :SHOWDEV <i>nn</i> to see if it is unavailable (queue shut). If so, reopen the spool queue with :OPENQ. If there is a lack of disc space, you may have to store off spool files, or COOLSTART with the RECOVER LOST DISC SPACE option, before using :OPENQ.
LDEV <i>nm</i> , UNABLE TO ALLOCATE \$STDLIST	\$STDLIST not able to be allocated.	
LDEV <i>nm</i> , UNABLE TO ALLOCATE \$STDIN	\$STDIN not able to be allocated.	
NO PROCESS CONTROL BLOCK AVAILABLE FOR <i>Jnn</i> FOR WAITING	No process Control Block (PCB) available.	
UNABLE TO ALLOCATE STACK FOR <i>Jnn</i> JOB WAITING	No Data Segment Table (DST) available for stack or not enough virtual memory.	
UNABLE TO ALLOCATE JOB INFORMATION TABLE FOR <i>Jnn</i> JOB WAITING	No DST available for Job Information Table (JIT).	
UNABLE TO ALLOCATE JOB DIRECTORY TABLE FOR <i>Jnn</i> JOB WAITING	No DST available for Job Directory Table (JDT).	
NO JOB PROCESS COUNT TABLE AVAILABLE FOR <i>Jnn</i> JOB WAITING	No Job Process Count Table (JPCNT) entry available.	
UNABLE TO ALLOCATE FILE SYSTEM DATA SEGMENT FOR <i>Jnn</i> JOB WAITING	No DST available for File System Data Segment Table.	
UNABLE TO ALLOCATE \$STDLIST FOR <i>Jnn</i> JOB WAITING	\$STDLIST not able to be allocated.	
UNABLE TO ALLOCATE \$STDIN FOR <i>Jnn</i> JOB WAITING	\$STDIN not able to be allocated.	

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
LDEV# <i>nnn</i> DIAL <i>number</i> ANSWER (Y/N)?	A user's program did a PHNUM= on DS 3000 or RJE.	Dial the number and enter =REPLY <i>pin</i> , YES or =REPLY <i>pin</i> , NO if dialing was unsuccessful.
LDEV# FOR <i>filename</i> ON <i>classname</i> (NUM)?	You are asked by the system to identify the logical device in <i>classname</i> where <i>filename</i> resides.	You are required to =REPLY with a <i>ldev</i> (If =REPLY is 0 (zero) the request is denied).
LDEV# <i>nnn</i> FORMS ALIGNED OK (Y/N)?	You are asked by the system, following the printing of the standard "forms alignment image," if the forms are positioned correctly on the specified <i>ldev</i> .	You are required to enter =REPLY <i>pin</i> , YES or =REPLY <i>pin</i> , NO. If the image is correctly positioned, =REPLY <i>pin</i> , YES and the requesting program will continue. If the image is not correctly positioned, reposition the forms and =REPLY <i>pin</i> , NO. This will cause the alignment image to be printed again, and the question will be reissued.
LDEV# <i>nnn</i> IN USE BY DIAGNOSTICS	You have attempted to bring up a device without first taking it from diagnostics.	Get the device from diagnostics with the :TAKE command, then bring the device up with the :UP command.
LDEV# <i>nnn</i> IN USE BY FILE SYSTEM	You have attempted to assign a device to diagnostics without taking the device off line.	Using the :DOWN command, take the device off line then assign the device to diagnostics using the :GIVE command.
LDEV# <i>nnn</i> IN USE, DOWN PENDING	You have issued a =DOWN command, but the device is in use by the file system.	As soon as the use count goes to zero, the device will be down and you will be notified.
LDEV# <i>nnn</i> INVALID HOLLERITH COL# <i>column number</i> , HOPPER# <i>number</i>	The data from a defective card was not transferred. The error applies only to a card reader.	Fix the card, put it back into the specified hopper, and ready the device.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
LDEV# <i>nnn</i> NOT READY	You did not ready the indicated device.	Place the device online.
LDEV <i>nnn</i> NOT READY OR NOT A SERIAL DISC	The serial disc on LDEV# <i>nnn</i> has not been automatically recognized, or the disc on LDEV# <i>nnn</i> is the wrong disc (not a serial disc).	Cycle the disc drive off/on when the message repeats, then mount the correct disc pack.
LDEV# <i>nnn</i> NO WRITE RING	Writing is required and you did not put a write ring on the tape. If LDEV# <i>nnn</i> is a serial disc, you replied "N" to the "WRITE RING?" question during device allocation, or failed to respond (assumed "N").	For magnetic tape, you must remove the reel, put on a write ring, remount the reel and ready the unit to allow the process to continue. To abort the I/O request, ready the unit without putting in a write ring. For serial disc you are prompted "WRITE RING (Y/N)?" =REPLY, <i>pin</i> , Y to continue or =REPLY, <i>pin</i> , N to abort the I/O request.
LDEV# <i>nnn</i> OFFLINE	You are trying to access a device that is no longer available to the file system.	If the device is functional, enter :UP <u><i>ldev</i></u> to place device on line.
LDEV# <i>nnn</i> PAPER OUT	You ran out of paper on the indicated device.	Install the paper, press PAGE EJECT, and ready the device.
LDEV# <i>nnn</i> QUEUE EMPTY	You attempted an =ABORTIO and no requests were pending on the device.	Information only.
LDEV# <i>nnn</i> READ CHECK HOPPER# <i>number</i>	The data from a defective card was not transferred. The error applies only to a card reader.	Fix the card, put it back into the specified hopper, and ready the device.
LDEV# <i>nnn</i> UNIT FAILURE	Bad status was returned from the specified logical device.	Retry. If the problem persists call your System Engineering Organization (SEO).
LDEV# <i>nnn</i> WRITE RING? (Y/N)	The "WRITE RING" response to a serial disc request in the =REPLY statement was "NO WRITE RING" ("NO" is the default). The user is attempting to write on the serial disc.	Enter =REPLY <i>pin</i> , YES to allow writing and continue. Enter =REPLY <i>pin</i> , NO to abort the request.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
LOCKSEG FAILURE	LOCKSEG intrinsic failure. Internal software problem.	Contact your System Engineering Organization (SEO).
LOGON FOR: <i>jobname</i> ON LDEV# <i>nnn</i>	A job has logged on.	Information only.
LOGOFF ON LDEV # <i>nnn</i>	A job has logged off.	Information only.
LOG FILE NUMBER <i>number</i> ON	The System Supervisor created a new log file. This message always appears before the *WELCOME* message after cold load. When this message appears while the system is running, it indicates that the previous current log file has been closed. File name is LOG <i>xxxxx</i> where <i>xxxx</i> is numeric with leading zeros.	Information only.
LOG FILE NUMBER <i>number</i> IS 1/2 FULL	The total space now occupied by the log file data is half the allotted file size.	Information only.
LOG FILE NUMBER <i>number</i> IS 3/4 FULL	The total space now occupied by the log file data is 3/4 the allotted file size.	Information only.
LOG FILE NUMBER <i>number</i> LOGGING RESUMED	You successfully executed a :RESUMELOG command.	Information only.
LOG FILE NUMBER <i>number</i> ERROR # <i>number</i> LOGGING STOPPED	A fatal log file error occurred. Logging is disabled. Refer to the error numbers explained in Section V of this manual.	To re-enable logging after this error you must shut the system down and COOLSTART the system.
LOG FILE NUMBER <i>number</i> ERROR # <i>number</i> LOGGING SUSPENDED	A recoverable log file error occurred. Logging is temporarily suspended. Most likely errors are log file space problems or duplicate log file names. Refer to the error numbers explained in Section V of this manual.	To re-enable logging, the System Manager or a user with System Supervisor (OP) capability must enter the :RESUMELOG command.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
MAX SPOOFLE KILOSECTORS IN USE, ALL QUEUES SHUT	The configured maximum number of spooled device file kilosectors are in use. MPE shut all output queues (equivalent to <code>:SHUTQ ldev</code>), on all <code>ldevs</code> and <code>:SHUTQ devclass</code> on all device classes), so users are automatically prevented from creating new spooled device files.	When space becomes available, you may reopen the queues with the <code>:OPENQ ldev</code> command.
MEMORY ERROR LOGGING INITIATED	Memory error logging was initiated.	Information only. Occurs when the system comes up.
MEMORY LOGGING ERROR# <i>errnum</i> LOGGING STOPPED.	<p>You signaled the initiation of memory error logging. The errors are internal MEMLOGP errors ranging from 1 through 10:</p> <ul style="list-style-type: none"> 1= FLOCK error on MEMLOG file. 2= FUNLOCK error on MEMLOG file. 3= TIO error. Error logging hardware went not ready. 4= CIO error during copy operation from logging array. 5= RIO error during scan of logging array. 6= Timeout on TIO (lower 128K logging board). Memory logging board did not respond before software Timeout (0.3 second). 7= Timeout on TIO (upper 128K logging board). Memory logging board did not respond before software Timeout (0.3 second). <p>Range 20 through 500 are file system errors involving MEMLOG file. (All file system errors encountered by MEMLOGP are fatal to the process and will cause it to terminate).</p>	<p>You can run the MEMLOGAN utility to read and interpret the logged error information. You can also modify the time interval between successive memory log updates with the MEMTIMER utility (Refer to the MPE V Utilities Reference Manual (32033-90008).)</p>

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
MISSING ACCT FOR <i>user.acct</i> ON LDEV <i>nnn</i>	A user specified a nonexistent account.	If the accessor is a legitimate user of the system, instruct the user to specify the proper account name.
MISSING GROUP FOR <i>user.acct,group</i> ON LDEV <i>nnn</i>	A user specified a nonexistent group.	If the accessor is a legitimate user of the system, instruct the user to specify the proper group.
MISSING USER FOR <i>user.acct</i> ON LDEV <i>nnn</i>	A user specified a nonexistent user.	If the accessor is a legitimate user of the system, instruct the user to specify the proper user name.
MOUNT NEXT REEL ON LDEV# <i>nnn</i>	You are asked to mount the next tape or serial disc for multi-reel files on the magnetic tape drive, serial disc drive, or paper tape reader.	You need to mount the media on the indicated device and ready the unit.
MOUNT REEL# <i>nnn</i> ON LDEV# <i>nnn</i>	You are asked to mount the next indicated tape or serial disc required on the indicated device for restoring multiple reels. The REEL# is the sequence number (2 for second, 3 for third, etc.).	You need to mount the media on the indicated device and ready the unit.
MOUNT FOR <i>user.acct</i> REJECTED (VMOUNT OFF)	A user attempted to use the Private Volumes Facility, but no :VMOUNT ON command has been issued.	Information only. To allow future mount requests to succeed, enter :VMOUNT ON with desired parameters.
MOUNT <i>vcname.group.acct</i> ON LDEV# <i>nnn</i> (Y/N)?	You are asked to mount the specified disc volume on the indicated device.	Mount the requested disc volume on the specified logical device and =REPLY <i>pin</i> , YES.
MOUNT TAPE VOLUME <i>valid</i>	A user is trying to open a labeled tape file, but the tape is not mounted.	Mount the requested volume without any reply; or =REPLY <i>pin</i> , <i>ldev</i> to specify a different volume; or =REPLY <i>pin</i> , 0 to reject the opening of the file.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
MOUNT VOL _n OF VOLUME SET <i>valid</i> ON LDEV # <i>nnn</i>	A file spans more than one volume, making it necessary to switch volumes.	Mount the specified volume on the specified logical device. No reply is necessary.
MPE TABLE DISC REQUEST HAS OVERFLOWED	The MPE Disc Request Queue is full in HARDRES segment.	Increase the size of the Disc Request Table during next SYSDUMP.



Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
NEW TAPE REQD. ON LDEV# <i>nnn</i> IS TAPE MOUNTED?	You did not mount the tape on the indicated device.	You need to put a new tape in the paper tape punch and <u>=REPLY <i>pin</i>, YES.</u>
NO ACCT TIME FOR <i>user.acct,group</i> ON LDEV# <i>nnn</i>	A user attempted to log on, but the CPU or connect time for the account has exceeded the amount specified.	The System Manager must :RESETACCT or increase the account limits.
NO GROUP TIME FOR <i>user.acct,group</i> ON LDEV <i>nnn</i>	The user attempted to log on, but the CPU or connect time for the group has exceeded the amount specified.	The System Manager must :RESETACCT or increase the group limits.
NO HOME GROUP FOR <i>user.acct</i> ON LDEV <i>nnn</i>	No default home group was assigned when this user was added to the system, and the user did not specify a logon group.	If the accessor is a legitimate user of the system, instruct the user to specify a group name.
NO MORE SPACE IN SPOOL CLASS, ALL QUEUES SHUT	No more space exists in the (disc) class SPOOL. MPE shut all output queues (equivalent to :SHUTQ <i>ldev</i> on all <i>ldevs</i> and :SHUTQ <i>devclass</i> on all device classes), so users are automatically prevented from creating new spooled device files.	When space becomes avail- able, you may reopen the queues with the :OPENQ <i>ldev</i> command.
NO SYSTEMS BUFFER FOR SIGNOFF	A SIGNOFF command failed because no system buffers are available.	To print lost data: 1. :DOWN all MRJE pseudo card readers. 2. Clear all host printers and punches. 3. Enter the :MRJE SIGNOFF [<i>hostid</i>] command. 4. Contact your System Engineering Organization (SEO).
OK TO WRITE ON UNEXPIRED VOL ON LDEV# <i>nnn</i> (Y/N)	A labeled, unexpired tape was opened as unlabeled; or an unexpired, labeled tape was mounted for a write operation.	<u>=REPLY <i>pin</i>, YES</u> causes the tape to be overwritten. <u>=REPLY <i>pin</i>, NO</u> causes the user's write request to be rejected.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	RECOVERY PROCEDURE
OK TO WRITE ON EXPIRED VOL ON LDEV <i>nnn</i> / (Y/N)	A labeled, expired tape was opened as unlabeled, or an expired, labeled tape was mounted for a write operation.	A =REPLY <i>pin</i> , YES causes the tape to be overwritten. =REPLY <i>pin</i> , NO causes the user's write request to be rejected.
REQUEST REQUIRING OPERATOR REPLY FOR PIN <i>pin</i> HAS BEEN ABORTED	A request for operator response (i.e. =REPLY) for <i>pin</i> is no longer pending.	Information only.
SCRATCH VOLUME ON LDEV# <i>nnn</i>	The nonsystem domain disc mounted on the drive specified by <i>ldev</i> is a scratch volume. It has been fully conditioned and designated by the >SCRATCH command of the VINIT Subsystem.	The volume is available for assignment to a volume set by the System or Account Manager.
SERIAL DISC ON LDEV# <i>nnn</i>	A serial disc volume has been mounted and recognized on the specified nonsystem domain device.	Information only.
SP# <i>nnn</i> / # <i>nnnn</i> DEFERRED	The output spooler on the specified <i>ldev</i> has deferred the spooled device file with the specified device file identification (# <i>nnnn</i>), due to some action taken by you (for example, refusing a spooler's forms request).	To allow the deferred device file to print from the beginning enter :ALTSPoolFILE # <i>nnnn</i> ;PRI= <i>k</i> (where <i>k</i> is a value above the current out fence).
SP# <i>nnn</i> / # <i>nnnn</i> DEFERRED, SPOOFLE I/O ERROR	The output spooler on <i>ldev</i> has encountered an error while opening or reading the spooled device file with identification # <i>nnnn</i> . The spooler has deferred the file.	To allow the deferred device file to try to print again use :ALTSPoolFILE # <i>nnnn</i> ;PRI= <i>k</i> (where <i>k</i> is a value above the current out fence). To delete the file, enter :DELETESPOOLFILE command.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
SP# <i>nnn</i> / <i>#Innn</i> DELETED, SPOOFLE I/O ERROR	The input spooler on the specified spooler <i>ldev</i> has deleted spooled device file <i>#Innn</i> due to a disc I/O error, or a problem obtaining disc space.	Ensure that a sufficient space exists for the spooled device file. The System Operator should enter <u>:RUN FREES.PUB.SYS.</u> Check free space for all SPPOOL class discs. Delete unreferenced spooled device files if possible. Allow output spoolers to free up space and try input operation again. Try to recover lost disc space by doing a COOLSTART, if trouble is not indicated.
SP# <i>nnn</i> / IS <i>jobnum</i> ; <i>filename</i> ON LDEV# <i>nnn</i> (Y/N)?	You are asked to verify that you did request <i>jobnum</i> ; <i>filename</i> forms on the device (<i>ldev</i>) indicated.	Enter <u>=REPLY <i>pin</i>,YES</u> to confirm that forms were requested or <u>=REPLY <i>pin</i>,NO</u> to reject the request.
SP# <i>nnn</i> / LDEV#FOR : <i>jobnum</i> ; <i>filename</i> ON <i>devclass</i> (NUM)?	You requested device assignment (or rejection 0) following a forms request for spooled device files.	Enter <u>=REPLY <i>pin</i>,<i>ldev</i></u> to assign the correct printer, with forms to the requesting job/session.
SP# <i>nnn</i> / <i>#Onnn</i> PREVIOUS FORMS ASSUMED	The output spooled device file with the indicated device file identification is about to be copied to the spooler <i>ldev</i> , but it was previously deferred while forms were mounted. The spooler assumes these forms are currently mounted on the indicated device (<i>ldev</i>).	If correct forms are not mounted, physically stop the printer and enter <u>:ALTSPPOOLFILE <i>ldev</i>,DEFER.</u> Mount the correct forms and resume output with <u>:ALTSPPOOLFILE#<i>Onnn</i>; PRI=14.</u>

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	RECOVERY PROCEDURE
SP# <i>nnn</i> /SPOOLED IN	The spooler on the specified spooler <i>ldev</i> has begun input spooling.	Information only.
SP# <i>nnn</i> /SPOOLED OUT	The spooler on the specified spooler <i>ldev</i> has begun output spooling.	Information only.
SP# <i>nnn</i> /STOPPED	A normal termination of a spooler on the specified spooler <i>ldev</i> is confirmed.	Information only.
SP# <i>nnn</i> /STOPPED, NO SUCH DEVICE	You attempted to initiate a spooler on an undefined spooler <i>ldev</i> .	Information only.
SP# <i>nnn</i> / <i>#Innn</i> STOPPED, SPOOFLE I/O ERROR	The input spooler on the specified spooler <i>ldev</i> has detected a disc I/O error or a problem obtaining disc space for a spooled device file. The spooler stops, and the active device file is deleted.	Ensure that sufficient space exists for the spooled device file. Have the System Manager :RUN <u>FREE5,PUB,SYS</u> to check the free space for all SPOOL class discs. Delete unreferenced spooled device files if possible. Allow output spoolers to free up space and try input operation again. If the trouble is not disc space, then a disc I/O error is indicated.
SP# <i>nnn</i> /STOPPED, SPOOLEE I/O ERROR	The spooler on the indicated spooler <i>ldev</i> has detected an error in attempting to read, write, or control its spooler. The spooler stops immediately; an input spooler will delete any currently ACTIVE spooled device file, while an output spooler will defer any currently ACTIVE spooled device file (set OUTPRI to 0). May be attempting a rewind on a magnetic tape device without a tape mounted. This generally indicates a hardware problem, but can also occur in response to an =ABORTIO command.	Try and restart the spooler :STARTSPOOL, <i>ldev</i> . If problem persists, the device or the medium (cards,magnetic tape,etc.) is faulty. If device is magnetic tape, check that a tape is mounted.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
SP# <i>nnn</i> /STOPPED, SPOOLEE NOT ACCEPTING	The specified <i>ldev</i> is neither :JOB nor :DATA accepting, causing the input spooler to stop. It cannot recognize further :JOB or :DATA commands.	Use the :ACCEPT JOBS, <i>ldev</i> command or the :ACCEPT DATA, <i>ldev</i> command and :STARTSPOOL, <i>ldev</i> to restart the input spooler.
STANDARD FORMS	You have special forms mounted on a device, and a device file not requiring special forms is assigned to the device.	Reply to the message by entering either =REPLY <i>pin</i> , YES when standard forms are mounted or =REPLY <i>pin</i> , NO when special forms are mounted and printing is to be deferred.
STANDARD FORMS REQUIRED FOR \$STDLIST:LDEV <i>nnn</i> READY (Y/N)?	You are asked if the specified logical device (<i>ldev</i>) is ready to mount the standard forms required for \$STDLIST.	You are required to enter =REPLY <i>pin</i> , YES or =REPLY <i>pin</i> , NO. If the <i>ldev</i> is ready to have forms mounted, =REPLY <i>pin</i> , YES. If the <i>ldev</i> is in use, =REPLY <i>pin</i> , NO.
SYSTEM VOLUME ON LDEV# <i>nnn</i>	A system volume is mounted on the specified <i>ldev</i> which is a nonsystem domain device.	
UNFORMATTED VOLUME ON LDEV# <i>nnn</i>	An unconditioned volume has been mounted on the specified nonsystem domain device.	The volume can be conditioned on line using the VINIT subsystem.
UNLOCKSEG FAILURE	The UNLOCKSEG intrinsic failed. Internal software device.	<ol style="list-style-type: none"> 1. COOLSTART the system (to reclaim the line monitor's stack). 2. Contact your System Engineering Organization (SEO).
UNREADABLE LABEL ON LDEV# <i>nnn</i>	The volume mounted on the nonsystem domain device <i>ldev</i> contains a media error which prevents its label from being read.	
<i>vosname.group.acct</i> IN USE BY <i>user.acct</i>	The specified private volume set/class is being used by the user specified.	Information only.

Table 9-2. Console Messages (Continued)

MESSAGE	MEANING	ACTION
<i>vname</i> OF <i>vcname.group.account</i> ON LDEV# <i>nnn</i>	A Private Volume disc has been mounted on the drive specified by <i>ldev</i> . The volume has been fully conditioned and assigned to a volume class/set.	Information only.
(VOLUME DISMOUNTED) <i>vname</i> OF <i>vcname.group.account</i> ON LDEV <i>ldn</i>	A 7911/12/14/45 private volume disc has been mounted on the drive specified by <i>ldn</i> following an offline power fail which occurred since the last system startup. The message is displayed when the disc is powered on line again. There is no effect on the operation of the private volume.	Information Only.
VOLUME ID FOR <i>filename</i>	A labeled tape was opened but no volume header information is supplied; or an unlabeled tape was mounted for a write operation when a labeled tape was expected.	Supply a six-character alphanumeric volume header which will be written on the tape as identification (for example, <u>=REPLY pin,VOL02</u>).
VALID FOR VOL <i>n</i> OF VOLUME SET <i>valid</i> ON LDEV# <i>nnn</i>	An unlabeled tape is mounted.	Supply a six-character volume identification which will be written on the tape for identification.
VOL <i>valid</i> (ANSI) MOUNTED ON LDEV# <i>nnn</i>	The recognized tape has an ANSI-standard label.	Information only.
VOL <i>valid</i> (IBM) MOUNTED ON LDEV# <i>nnn</i>	The recognized tape has an IBM-standard label.	Information only.
VOL UNLABELED MOUNTED ON LDEV# <i>nnn</i>	The recognized tape has no label.	Information only.
WRONG REEL ON LDEV# <i>nnn</i> ANOTHER AVAILABLE (Y/N)?	When performing multi-reel restores, you allocated tapes in the wrong order, or you mounted a tape which was not in this tape set.	If another reel is available, you need to <u>=REPLY pin,YES</u> and mount the new reel on the logical device specified in the message. If not, <u>=REPLY pin,NO</u> .
ZSIZE ERROR	The ZSIZE intrinsic failed. Internal software error.	Contact your AEO.

Cold Load Error Messages With Numbers With Numbers

Cold load messages are divided into number ranges specified by the following classifications:

Number Range	Classification
1-34	Input/Output(I/O)
100-137	Configuration
200-205	Volume Table
225-237	Defective Tracks
250-254	I/O Table Initialization
275-277	Directory
300-305	Table
325-335	Disc Space Management
350-374	Memory Management
375-379	Restore
400	Internal Traps
450-452	File System
500-501	CS-80 Sparing

Table 9-3. Cold Load Error Messages With Numbers

ERR#	MESSAGE	ACTION
1	NON-RESPONDING DEVICE CONTROLLER DRT <i>nn</i>	An I/O instruction returned a condition code of CCL, meaning the device controller did not respond. This could be due to a configuration problem. If the I/O configuration is correct, contact your Customer Engineer.
2	CHANNEL PROGRAM FAILURE - DRT <i>nmn</i>	An I/O instruction returned a condition code of CCL or CCG. This could be due to a configuration problem. If the I/O configuration is correct, contact your Customer Engineer.
3	CHANNEL PROGRAM ABORTED - CPVA <i>%status</i>	<p>%140000 DMA abort</p> <p>%164000 Channel program aborted due to an address rollover.</p> <p>%162000 Channel program aborted due to an HP-IB parity error.</p> <p>%161000 Channel program aborted due to a status change in the HP-IB interface.</p> <p>%160400 Channel program aborted due to a device clear during channel program.</p> <p>%160200 Channel program aborted due to a FIFO handshake abort.</p> <p>%160100 Channel program aborted due to a serial poll error.</p> <p>%160040 Channel program aborted due to an illegal CSRQ.</p> <p>%160020 Channel program aborted due to a memory parity error.</p> <p>%160010 Channel program aborted due to a nonresponding IMB module.</p> <p>%160004 Channel program aborted due to a channel hardware timeout.</p> <p>%160002 Channel program aborted due to a data chain error.</p> <p>%160001 Channel program aborted due to an invalid instruction.</p>
4	IOP ERROR	An impossible status indication was returned by the tape controller, indicating a failure in the controller or the input/output processor. At this time it is advisable to request assistance from your Customer Engineer. It is possible to try the requested cold load operation again. The system may commence normal operations, but could be extremely unreliable. File integrity could be lost. It is better to have your Customer Engineer check out the system before you try again.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
5	TAPE I/O CMD REJECTED	This error, reported by the magnetic tape controller, implies that there is a bad tape controller. If you have more than one drive on your system, check to ensure that only one drive is on line and the proper unit has been selected (Unit 0). Also ensure the tape drive is configured correctly. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
6	TAPE TRANSFER ERROR	This error, reported by the magnetic tape controller, implies either a defective tape or a defective tape controller. Try a backup tape after cleaning the tape heads.
7	TAPE PARITY ERROR	A parity error was detected while reading the magnetic tape. Try a backup tape after cleaning the tape heads.
8	TAPE TIMING ERROR	This error, reported by the magnetic tape controller, implies a defective tape controller. Contact your Customer Engineer.
9	READING BLANK TAPE	This error, reported by the magnetic tape controller, implies either a defective tape or a defective tape controller. Try a different backup tape after cleaning the tape heads. If that fails and the same error is printed, contact your Customer Engineer.
10	COLD LOAD TAPE READ ERROR	A tape-read error was detected during the cold load operation. This may be a magnetic tape hardware problem. Clean tape heads and try again. If the error persists, temporarily use a different system backup tape and try to load. If this fails, contact your Customer Engineer immediately.
11	IRRECOVERABLE PARITY ERRORS	This error, reported by the magnetic tape controller, implies either a defective tape or a defective tape controller. Try a different backup tape after cleaning the tape heads. If that fails and the same error is printed, contact your Customer Engineer immediately.
12	ILLEGAL CMD	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
13	CYLINDER COMPARE ERROR	This is an error returned by the disc controller. Retry the operation; if it fails, with the same error message, contact your Customer Engineer.
14	UNCORRECTABLE ERROR	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
15	HEAD SECTOR COMPARE ERROR	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
16	SIO PROGRAM ERROR	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
17	END OF CYLINDER	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
18	OVERRUN	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
19	POSSIBLE CORRECTABLE ERROR	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
20	ILLEGAL ACCESS TO SPARE TRACK	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
21	DEFECTIVE TRACK	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
22	HEAD MOVING DURING OPERATION	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
23	DISC DRIVE ERROR	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
24	ATTEMPT TO PROTECT DEFECTIVE TRACK	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
25	DRIVE UNAVAILABLE	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
26	DRIVE ATTENTION	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
27	BAD DISC ADDRESS	An address greater than the available number of sectors on the disc was passed to the disc driver. Attempt a COLDLOAD. If this fails, attempt a RELOAD. If this fails, contact your Customer Engineer.
28	BAD FILE ADDRESS	An attempt was made to write outside the range of one of the system files. A RELOAD should be attempted. If the system disc does not have enough space to hold all system files, this error will occur again. If another, larger capacity disc is available, use it as the system disc.
29	HP-IB INTERFACE	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
30	CS'80 DRIVER ERROR NUMBER <i>nnn</i>	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, try a different backup tape and try to load. If the error persists, contact your Customer Engineer.
31	DRIVER COMMAND STACK OVERFLOW, LDEV <i>nnn</i> DRT# <i>nn</i> UNIT <i>nnn</i>	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
32	NUMBER OF RETRIES EXCEEDS MAX LDEV <i>nnn</i> DRT <i>nn</i> UNIT <i>nnn</i>	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
33	TRANSFER SIZE TOO LARGE LDEV <i>nnn</i>	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
34	INVALID DRIVER CALL LDEV <i>nnn</i>	This is an error returned by the disc controller. Retry the operation; if it fails with the same error message, contact your Customer Engineer.
100	PREVIOUS RELOAD ABORTED - MUST RELOAD	The last cold load was a RELOAD that was aborted. Therefore, the next cold load must be a RELOAD.
101	PREVIOUS TAPE COLD LOAD ABORTED - MUST COLD LOAD FROM TAPE	The last cold load was a COLDSTART or UPDATE, and was aborted. Therefore, this cold load must be a COLDSTART, UPDATE or RELOAD.
102	USER SPECIFIED MAX DRT IS <i>nnn</i>	At least one device has been defined with a DRT number higher than the specified maximum. Increase the value for the highest DRT number configured.
103	SYSTEM DISC MUST BE UNIT ZERO	The I/O configuration is incorrect. Change the I/O configuration so that ldev1 is unit 0.
104	SYSTEM DISC MAY ONLY BE CONFIGURED ON RELOAD	The type and subtype on the disc label do not match the type and subtype of the system disc in the I/O configuration. Change the I/O configuration or use the correct system disc.
105	LDEV ONE MUST BE SYSTEM DISC	The I/O configuration is incorrect. Change the I/O configuration so that ldev1 is the system disc.
106	WRONG DRT FOR SYSTEM DISC	This error happens only during an UPDATE. The disc label is incorrect for the system disc (ldev1), the disc is not on line, or the device is not a disc. Change the I/O configuration or use the system disc with the correct DRT on the disc label.
107	NO DEVICE IN CLASS DISC	At least one system disc must be in class "DISC".

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
108	COLD LOAD DEVICE MUST BE CONFIGURED	A cold load is being performed from a cold load device which is configured incorrectly or not included in the current I/O configuration. Configure the device using the appropriate DRT number.
110	SYSTEM CONSOLE MUST BE IN DRT EIGHT UNIT ZERO	Change the I/O configuration so that ldev 20, the System Console, is DRT 8 unit 0.
111	IMPROPER SPEED FOR SYSTEM CONSOLE	The terminal speed configured may not be supported for the System Console. Change the I/O configuration for ldev 20 so the terminal speed matches specifications.
112	LDEV <i>nnn</i> TERMINAL UNIT MUST BE ZERO	The terminal controller does not support multiple units. Usually occurs when trying to configure ADCC terminals. When configuring ADCC terminals use increasing DRT numbers.
113	LDEV <i>nnn</i> TERMINAL DRT MUST BE UNIQUE	The terminal controller does not support multiple units.
114	ILLEGAL MASTER DEVICE	Specified value is not the logical device number of a configured communications interface (INP). When configuring a communications driver or virtual terminal you must assign the logical device number (preceded by "#") of the associated communications interface.
115	UNDEFINED CLASS <i>devclass</i> USED AS OUTPUT DEVICE BY FOLLOWING DEVICES	The I/O configuration is incorrect. The <i>devclass</i> name mentioned must be used as a device class name for the appropriate logical device in the configuration.
116	NO OUTPUT DEVICE FOR LOGICAL DEVICE <i>nnn</i>	Refer to the Initiator-User Dialogue, Section VII.
117	OUTPUT CLASS FOR DEVICE <i>nnn</i> NO LONGER EXISTS	Refer to the Initiator-User Dialogue, Section VII.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
118	DEVICE CLASS <i>devclass</i> CANNOT BE OUTPUT DEVICE	The I/O configuration is incorrect. An invalid device class is being used as an output device. An invalid device class contains logical devices with device types 0-7 direct access; 8-15 serial input; 24-31 noncurrent I/O access range. Change the device class of the output device name or delete the invalid logical devices from the device class.
119	LOGICAL DEVICE <i>nmn</i> CANNOT BE OUTPUT DEVICE	The I/O configuration is incorrect. An invalid logical device number is being used as an output device. Invalid logical devices are defined by device types (see action in #118 for values). Change the output device in the I/O configuration.
120	LOGICAL DEVICE <i>nmn</i> DOES NOT EXIST	Refer to the Initiator-User Dialogue, Section VII.
121	LDEV <i>nmn</i> AND LDEV <i>nmn</i> ON SAME DRT AND UNIT	Refer to the Initiator-User Dialogue, Section VII.
122	DEVICES OF DIFFERENT TYPE RANGES IN CLASS <i>devclass</i>	Refer to the Initiator-User Dialogue, Section VII.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
123	ILLEGAL TYPE COMBINATIONS IN CLASS <i>devclass</i>	Refer to the Initiator-User Dialogue, Section VII.
124	CONFIGURED MEMORY SIZE EXCEEDS PHYSICAL MEMORY AVAILABLE	The value displayed is not physically present. Reduce the value.
125	CANNOT RECOVER DISC SPACE OF SPOOLFILE # <i>Omnn</i>	Information only.
126	DISC DRIVER DOES NOT EXIST	A load has been attempted on a disc with a type or subtype not known to the system. This usually indicates an error internal to the system. If you have inserted user-written drivers into the system, try deleting them from the I/O configuration on a COLDSTART, or try a RELOAD from system backup tape which contains the driver in PUB.SYS. If this fails, contact your Customer Engineer.
127	DIFFERENT DEVICE DRIVES CONFIGURED FOR DRT <i>nn</i> .	The I/O configuration is incorrect. With the exception of RS232 devices, terminals, or data communication devices, devices using different drivers may not be configured on the same DRT number. Change the DRT number(s) of these devices in the I/O configuration making appropriate hardware connections if necessary.
128	HIGHEST DRT SUPPORTED BY THIS CPU IS <i>nn</i>	The highest CPU supported is 127 for Series 39 or Series 4x; 511 for Series 37; and Series 6x. Change the I/O configuration so that all the logical device DRT numbers are less than or equal to the maximum for the corresponding CPU type.
129	FOLLOWING DRTS MUST BE CHANGED LDEV <i>nn</i> DRT <i>ccc</i> LDEV <i>nn</i> DRT <i>ccc</i> . . .	The I/O configuration is incorrect. The ldev numbers listed are configured on DRT numbers greater than the highest DRT supported by the CPU, or greater than the configured maximum. Increase the value for the maximum DRT allowed, or change the DRT numbers of these devices.
130	NOT A SUPPORTED SPEED	The terminal speed entered is not valid. Enter a supported terminal speed according to specifications for the device.
131	LDEV <i>nnn</i> TERMINAL SPEED NOT SUPPORTED BY HARDWARE	ADCC terminals are configured with terminal speeds greater than 9600. Reduce the terminal speed for these devices in the I/O configuration.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
132	NON RESPONDING BOARD FOR TERMINAL ON LDEV <i>nnn</i> DRT <i>nn</i>	Check the DRT number of the terminal or RS232 device. If correct and the same error message is printed, contact your Hewlett-Packard CE.
133	WRONG BOARD FOR TERMINAL ON LDEV <i>nnn</i> DRT <i>nn</i>	Check the DRT number of the terminal or RS232 device. If correct and the same error message is printed, contact your Hewlett-Packard CE.
134	CHANGE LDEV <i>nnn</i> TO DRT <i>nn</i>	The terminals listed must be configured on the corresponding DRT number. Change the I/O configuration accordingly.
135	LDEV <i>nn</i> DRTS #125-127 RESERVED BY HP1B INTERFACE	Because DRT numbers 125, 126, and 127 are reserved, change the DRT number of the ldev listed.
136	CHANNEL ON HP1B INTERFACE CANNOT BE ZERO, ONE OR FIFTEEN	The I/O configuration is incorrect. Change the I/O configuration.



Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
137	HIGHEST SUPPORT DISC LDEV IS <i>nnn</i>	Reconfigure disc drives with ldev numbers greater than maximum ldev number shown.
200	VOLUME TABLE FULL	You tried to configure more than 64 volumes.
201	VOLUME TABLE DESTROYED - MUST RELOAD	The Volume Table maintained on the system disc has been overwritten; RELOAD system.
202	MDUNT CORRECT VOLUMES OR RELOAD	The volumes specified in the Volume Table do not agree with the mounted volumes.
203	ALL VOLUMES MUST BE MOUNTED	The volumes specified in the Volume Table cannot be found among the mounted discs. Mount the appropriate volumes or reload.
204	DEVICE <i>nnn</i> VOLUME <i>volname</i> NOT DEFINED IN TABLE	A system volume not declared in the Volume Table is mounted on this logical device. Add volume name to Volume Table or delete this logical device and power off the disc drive.
205	VOLUME NAME <i>volname</i> ON DEVICE <i>nnn</i> ALREADY IN USE	Two volumes are mounted with the same name. You will be requested to assign the volume a new name.
225	DEFECTIVE TRACKS TABLE FULL	The table can hold a maximum of 120 deleted or reassigned tracks.
226	NO ALTERNATES AVAILABLE	There are no alternate tracks available to reassign a track.
227	IN RESERVED AREA - CANNOT DELETE	Track is either the first 400 sectors of the disc, or the Disc Free Space Table.
228	IN DIRECTORY - CANNOT DELETE	Information only.
229	ALTERNATE TRACK - CANNOT DELETE	This alternate track is the target of a reassigned track, and therefore cannot be deleted.
230	IN SYSTEM AREA - CANNOT DELETE	Information only.
231	SYSTEM TABLE ON DEFECTIVE TRACKS - CANNOT WARMSTART	At least one of the tables (DST Descriptor Table, JMAT, IDD or ODD), which must be recovered for a WARMSTART, is located on defective tracks. Either a COOLSTART, COLDSTART, or RELOAD may be attempted. The Initiator will then lead you to the defective track, as outlined in the dialogue. You will be requested to take some action on the defective track.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
232	FLAGGED TRACK IN RESERVED AREA - MUST REINITIALIZE PACK	A defective track is illegal in the first 400 sectors of the disc or in the Disc Free Space Table. Information only.
233	NO MORE REASSIGNS ALLOWED IN THIS BOOT	Information only.
234	INVALID DISC LABEL ON LDEV <i>nnn</i>	Information only.
235	INVALID DEFECTIVE TRACKS TABLE ON LDEV, <i>nnn</i>	Information only.
236	IN A SYSTEM DISC RESIDENT TABLE- CANNOT DELETE	Information only.
237	IN DISC FREE SPACE MAP- CANNOT DELETE	Information only.
250	TERMINAL INITIALIZATION PROGRAM TOO LARGE	This usually indicates an error internal to the system. Contact your Customer Engineer.
251	TERMINAL CHANNEL PROGRAM TOO LARGE	This usually indicates an error internal to the system. Contact your Customer Engineer.
252	DIFFERENT PROCESSES SPECIFIED FOR DRT <i>nn</i>	This usually indicates an error internal to the system. Contact your Customer Engineer.
253	INITIATOR, COMPLETOR FOR LDEV <i>nnn</i> SUPPOSED TO BE CORE RESIDENT	This usually indicates an error internal to the system. Contact your Customer Engineer.
254	MORE THAN ONE PRIMARY INTERRUPT HANDLER FOR DRT <i>nn</i>	This usually indicates an error internal to the system. Contact your Customer Engineer.
275	INVALID DIRECTORY ENTRY - ENTRY LEVEL WRONG OR MISSING AT ACCOUNT, GROUP OR FILE LEVEL	Bad directory. RELOAD.
276	INVALID DIRECTORY ENTRY - ENTRY LEVEL WRONG OR MISSING AT ACCOUNT OR USER LEVEL	Bad directory. RELOAD.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
277	DIRECTORY ERROR A= <i>a</i> ,B= <i>b</i>	An error occurred while accessing the directory. The directory software, part of the operating system, is included in the Initiator in slightly modified form. Errors which occur for Initiator are the same type of errors that occur when the system is operational. The Initiator cannot recover these errors because it isn't as sophisticated as the operating system. All directory software errors are listed below. Some errors are not possible in the Initiator because they are illogical at this point.
300	OUT OF CST ENTRIES	The Initiator has run out of Code Segment Table (CST) entries for the system. Rebuild the system tape through the :SYSDUMP command, increasing the number of entries in this table or COOLSTART and make the appropriate System Table change. Refer to the Step 79 of the Configurator/ User Dialogue.
301	OUT OF DST ENTRIES	The Initiator has run out of Data Segment Table (DST) entries for the system. Rebuild the system tape through the :SYSDUMP command as described in action #300. See Step 80 of the Configurator/User Dialogue.
302	OUT OF PCB ENTRIES	The Initiator has run out of Process Control Block (PCB) table entries for the system. Rebuild the system tape through the :SYSDUMP command as described in the action for #300. See Step 81 of the Configurator/User Dialogue.
303	OUT OF WSTAB ENTRIES	The Initiator has run out of working test table entries for the system. Rebuild the system tape through the :SYSDUMP command, increasing the maximum number of concurrently running programs allowed on the system. See Step 135 of the Configurator/User Dialogue.
304	OUT OF CSTBLK ENTRIES	The Initiator has run out of extended CST table (XCST) entries for the system. Rebuild the system tape through the :SYSDUMP command, increasing the number of entries in this table or COOLSTART and make the appropriate System Table change. See Step 79 of the Configurator/User Dialogue.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
325	DISC SPACE ERROR	A conflict exists between the disc free space map and the space used as defined in the directory. A RELOAD should be attempted. If the RELOAD fails, attempt to format all packs, and then attempt a RELOAD. If that fails, contact your Customer Engineer.
326	OUT OF DISC SPACE ON LDEV <i>nnn</i>	Attempt a RELOAD and configure on additional system disc in order to provide more disc space for files being restored.
327	OUT OF BOOTSTRAP DISC SPACE	The 400 sectors of the system disc allocated to the bootstrap program and certain tables has been exceeded. This is an error internal to the system. A RELOAD should be attempted. If that fails, contact your Customer Engineer for assistance.
328	DISC SPACE ERROR - WHILE RESTORING SPACE	See action for #325.
329	DISC SPACE ERROR - WHILE GETTING SPACE	See action for #325.
330	OUT OF VIRTUAL MEMORY ON LDEV <i>nnn</i>	The system tables are too large. Use a previous SYSDUMP tape with unaltered system table values and COLDLOAD.
331	LDEV <i>nnn</i> HAS NOT BEEN CONVERTED TO NEW DISC FREE SPACE MAP	Run the conversion program "CONFVP.CREATOR.SYS" for system domain drives and "PVCONFVP.CREATOR.SYS" for Private Volume drives.
332	DISC FREE SPACE MAP HAS BEEN FLAGGED AS BAD, CANNOT ALLOCATE SPACE ON LDEV <i>nnn</i> , TRY RECOVER LOST DISC SPACE.	COOLSTART and answer <u>yes</u> to the question "RECOVER LOST DISC SPACE". If this fails, RELOAD.
333	DISC FREE SPACE MAP FOR LDEV <i>nnn</i> IS ON A DEFECTIVE AREA OF THE DISC, MUST RELOAD	RELOAD.
334	RETURNING SPACE NOT IN THE RESERVED AREA	Attempt an UPDATE. If this fails, COLDLOAD. If this fails, RELOAD. If all these attempts fail, contact your Customer Engineer.
335	RETURNING SPACE ALREADY FREE IN THE RESERVED AREA	See action for #334.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGE	ACTION
350	OUT OF MEMORY	The total amount of main-memory needed to build the resident portion of the system has been exceeded. You can decrease the size of core resident tables through :SYSDUMP. Refer to "RECOMMENDED PARAMETER SETTINGS" in Section 7. This error can also be caused by too many core resident code segments, although unlikely.
351	OUT OF BANK ZERO	Core-resident tables must be resident in the first 64k words (128K bytes) of memory. You can delete some I/O devices, or decrease the size of core resident tables through :SYSDUMP. Refer to "RECOMMENDED PARAMETER SETTINGS" in Section 7.
352	BANK WRAP-AROUND	You configured too many devices during the I/O configuration. You should delete un-needed devices.
374	FATAL ERROR <i>mm</i>	This usually indicates an error internal to the system. Contact your Customer Engineer.
375	IMPROPER TAPE FORMAT	The information on a tape used for a LOAD does not agree with the format of tapes produced by the :SYSDUMP command. Double check all tape reels to ensure they are properly marked as store or SYSDUMP tapes.
376	NOT A RELOAD TAPE	Either the tape label is not 40 words long, or the label identification is incorrect. Mount the correct tape, and proceed.
377	TAPE NOT A MEMBER OF THIS SET	The creation date in the tape label is incorrect for this tape to be a member of this RELOAD set. Mount correct tape, and proceed.
378	WRONG TAPE SET - MUST HAVE EARLIER DATE	The creation date in the tape label exceeds the date of the RELOAD. Mount an earlier dated tape and proceed.
379	WRONG REEL	The reel identification in the tape label does not match what the system expected to be mounted. Mount the correct reel and proceed.

Table 9-3. Cold Load Error Messages With Numbers (Continued)

ERR#	MESSAGES	ACTION
400	NON-RESPONDING MODULE INTERRUPT	This error can occur from referencing a nonexistent I/O channel or memory controller. Check your configuration of I/O devices for invalid DRTs and your configured memory size. If configuration is correct, contact your Customer Engineer.
450	FILE LABEL CHECKSUM ERROR	This error message is generated when a system file has a file label checksum error. Try to LOAD again. If this fails use an earlier system backup tape set.
451	TAPE FILE LABEL CHECKSUM ERROR	This error message is generated when the new system file from tape or serial disc has a file label checksum error. Try to LOAD again. If this fails use an earlier system backup tape set.
452	DEFECTIVE FILE LABEL	This error message is generated whenever there is a volume number in the file label that does not exist on the system.
500	NO MORE SPARING ALLOWED THIS BOOT	Information only.
501	DATA LOST DURING SPARE LDEV nnn, SECTOR nn - nn	Information only.

Table 9-4. Cold Load Error Messages Without Numbers

MESSAGE	ACTION
DISC READ ERROR ON LDEV# <i>nnn</i> STATUS=	A disc error has occurred on the specified logical device. The System Operator should cold load again, and take action on the bad track.
DISC WRITE ERROR ON LDEV# <i>nnn</i> STATUS=	A disc error has occurred on the specified logical device. The System Operator should cold load again, and take action on the bad track.
DISC SEEK ERROR ON LDEV# <i>nnn</i> STATUS= % <i>status</i> ADDR=% <i>addr</i> WORDS= <i>words</i>	A disc error has occurred on the specified logical device. The System Operator should cold load again, and take action on the bad track.
EOF	An attempt has been made to read past the end of one of the system files. Try an UPDATE or COLDSTART from tape. If this fails, a RELOAD should be attempted. If this fails, use an earlier system backup tape and RELOAD. If that fails, contact your Customer Engineer.
FILE <i>filename</i> .PUB.SYS NOT ON DISC	The specified file was needed, but was not found in the directory. Obtain another system backup tape, and UPDATE. If no current system tape is available, and the filename mentioned is a driver in the I/O configuration, delete the device(s) from the configuration during an UPDATE and then contact the Software Engineering Organization (SEO) for a current copy of the system.
TAPE UNIT WENT NOT READY	This error, reported by the magnetic tape controller, implies either that the tape controller is defective or you switched the tape unit off line during an operation.
LDEV <i>nnn</i> , FUNC <i>xx</i> , DISCADR <i>xx</i> , CPADR <i>xx</i> *** STATUS DISPLAY *** ----- -----	An error, reported by the disc controller, for CS-80 devices, gives the status of the bits at the occurrence of the error. Attempt the LOAD again. If this fails, contact your Customer Engineer.

MESSAGE CATALOG

The MPE message system consists of a message catalog (CATALOG.PUB.SYS), the HELP subsystem catalog (CICAT.PUB.SYS), user message catalogs, a program for building message catalogs (MAKECAT.PUB.SYS), and the GENMESSAGE intrinsic.

The message catalog (CATALOG.PUB.SYS) is a numbered Editor file containing message sets. The sets serve to break the catalog into manageable portions, so that each set contains a particular type of error message. The sets are numbered in ascending order.

The message catalog contains a system and a user message facility. The user facility is for application programmers. It can be accessed through the GENMESSAGE intrinsic with MAKECAT.PUB.SYS. In this case, the MAKECAT.PUB.SYS program is used without parameters.

Messages in both catalogs can be of any length and can contain up to five parameters. Continuation of a message is indicated with either a percent sign (%) or an ampersand (&) at the end of the line to be continued. The percent sign (%) indicates that the message is continued on the next line. The ampersand (&) indicates that the message is continued on the same line with no carriage return or line feed. Message numbers need not be contiguous, but must be in ascending order.

The position of parameters in a message is indicated by an exclamation point (!). For the system message catalog, the back slash (\) is also a parameter, reflecting a logical device number. The message is routed to the user associated with that logical device through the :ASSOCIATE command. Message sets are indicated by "\$SET n", starting in column 1; the rest of the line is a comment. The maximum value for n is 63, and the minimum value is 1. Comments can be inserted in the catalog by placing a dollar sign (\$) in column 1. After processing by the MAKECAT.PUB.SYS program, the user catalog file contains 80 byte records, a blocking factor of 16, and 32 extents. For the system message catalog the extent size is one, but all other file specifications are the same. The format of the message catalog is as follows:

```

$SET 1 SYSTEM MESSAGES

1 LDEV #! IN USE BY FILE SYSTEM
2 LDEV #! IN USE BY DIAGNOSTICS
.
.
.
$ MESSAGE 57 DELETED
.
.
.
204 FILE COMMAND REQUIRES AT LEAST TWO PARAMETERS, INCLUDING THE FORMAL
NAME OF THE FILE (CIERR 204)

```

Each message set is reserved for a particular type of error message. Refer to Table 9-5 on the following page for a listing of the message sets and their designated error message categories.

Table 9-5. CATALOG.PUB.SYS

```

$SET 1 - SYSTEM MESSAGES FORMER MESSAGE CATALOG
$SET 2 - CIERROR MESSAGES
$SET 3 - MISCELLANEDOUS ABORT MESSAGES
$SET 4 - PROGRAM ERROR ABORT MESSAGES
$SET 5 - INTRINSIC ABORT MESSAGES
$SET 6 - RUN-TIME ABORT MESSAGES
$SET 7 - CI GENERAL MESSAGES
$SET 8 - FILE SYSTEM ERROR MESSAGES
$SET 9 - LOADER ERROR MESSAGES
$SET 10 - CREATE ERROR MESSAGES
$SET 11 - ACTIVATE ERROR MESSAGES
$SET 12 - SUSPEND ERROR MESSAGES
$SET 13 - MYCOMMAND ERROR MESSAGES
$SET 14 - LOCKGLDRIN ERROR MESSAGES
$SET 15 - PRIVATE VOLUME ERROR MESSAGES
$SET 16 - DS/3000 ERROR MESSAGES
$SET 17 - HELP ERROR MESSAGES
$SET 18 - *NOT USED*
$SET 19 - SERIAL DISC ERROR MESSAGES
$SET 20 - USER LOGGING
$SET 21 - ASDCTABL.PUB.SYS MESSAGES
$SET 22 - 268X PAGE PRINTER MESSAGES
$SET 23 - NOT USED
$SET 24 - NOT USED
$SET 25 - 2680A ERROR MESSAGES
$SET 26 - DISC FREE SPACE MESSAGES
$SET 27 - SYSTEM INTERNAL ERROR MESSAGES
$SET 28 - CIPER DEVICE MESSAGES
$SET 29 - STORE/RESTORE MESSAGES

```

MAKECAT PROGRAM

The MAKECAT program formats and installs CATALOG and the HELP subsystem catalog "CICAT". The program has the following entry points:

- Beginning of program (no entry point) -Builds a new temporary file, and renames any old temporary catalog CATxxxxxx. Thus, the catalog can be verified without actually installing it, and users can create their own message catalogs.
- BUILD - Reads input file (formal designator INPUT), installs, and formats this file as a new catalog. This can be done while the system is running. You must log on as MANAGER.SYS to use this entry point.
- DIR -Installs a previously formatted CATALOG.PUB.SYS .
- HELP - Reads an input file (formal designator INPUT) and formats the file into a help catalog (formal designator HELPCAT).

To modify and then install CATALOG with MAKECAT, you must be MANAGER.SYS. The procedure is as follows:

1. Log on as System Manager (MANAGER.SYS).
2. Text the file (CATALOG.PUB.SYS) into the Editor.
3. Make the change.
4. Keep the file under a new name and exit the Editor.
5. Enter the following file equation:

```
:FILE INPUT=newname
```

6. Perform one of the following:

- a. :RUN MAKECAT.PUB.SYS,BUILD

If everything is satisfactory, MAKECAT prints:

```
XX NEW CATALOG INSTALLED
```

Purge old catalog CAT~~mmn~~, where *nnnn* is an archival number, CAT0001, CAT0002, etc..

- b. Run MAKECAT by performing a SYSDUMP. A new catalog is placed on the SYSDUMP tape. The user must answer "YES" to the "MISC. CONFIGURATION CHANGES" prompt and "YES" to the "MESSAGE CATALOG CHANGES" prompt in the SYSDUMP dialogue. Refer to the SYSDUMP dialogue in Section VII of this manual.

MAKECAT Examples

The System Manager changes or adds a few messages to CATALOG.PUB.SYS, and keeps it in file "NEWCAT".

```
:FILE INPUT=NEWCAT  
:RUN MAKECAT.PUB.SYS,BUILD
```

The System Manager restores CATALOG.PUB.SYS from magnetic tape. This is restored only if the file CATALOG.PUB.SYS no longer exists on the system. In the following example, :RUN MAKECAT,DIR will install the previously formatted catalog file.

```
:RESTORE *T;CATALOG.PUB.SYS  
:RUN MAKECAT.PUB.SYS,DIR
```

A user could create his own message catalog and keep it in a file "MYMSGs".

```
:FILE INPUT=MYMSGs  
:RUN MAKECAT.PUB.SYS  
:SAVE CATALOG
```


HELP Subsystem Catalog

The HELP subsystem catalog (CICAT) contains descriptions of all MPE commands. A typical command entry in the catalog is in the following format:

```

778  \ENTRY=ABORT,PARMS,OPERATION,EXAMPLE
780      :ABORT
782
784  Aborts current program or operation.
786
788  SYNTAX
790
792      :ABORT
794
796  \ITEM=PARMS
798  PARAMETERS
800
802  None
804
806  \ITEM=OPERATION
808  OPERATION
810
812  After you suspend a program or MPE command operation by pressing the
814  BREAK key, the :ABORT command immediately terminates that program or
816  operation. Note that the :ABORT command is available only from a
818  session and only during a break. An :ABORT command results in the
820  Job Control Word (JCW) being set to the SYSTEM 0 state.
822
824  \ITEM=EXAMPLE
826  EXAMPLE
828
830  To abort the current operation, enter:
832
834      :ABORT

```

MPE commands in the catalog are indicated by "\ENTRY". Subparameters (parameters, operation, example) are indicated by "\ITEM" or "\SUBITEM". The entry "\STOPHELP" causes HELP to skip over any subsequent lines until "\STARHELP" is encountered. The entry "\STARHELP" causes HELP to start displaying again. With "\SUBSET" placed at the beginning of the file, MAKECAT builds a file that omits the lines between "\STOPHELP \STARHELP" pairs, making the HELP file smaller.

To modify the HELP Subsystem Catalog (CICAT) with MAKECAT perform the following steps:

1. Log on as System Manager (MANAGER.SYS,PUB).
2. Text the file (CICAT.PUB.SYS) into the Editor.
3. Make the change or addition.

4. Keep the file under the new name CATNEW .
5. Enter the following file commands:

```
:FILE INPUT=CATNEW  
:FILE HELPCAT=CATNEXT  
:RUN MAKECAT,HELP
```

```
:FILE CICAT.PUB.SYS=CATNEXT  
:HELP
```

```
:PURGE CICAT.PUB.SYS  
:RENAME CATNEXT,CICAT.PUB
```

```
** Creates a new help catalog  
called CATNEXT. **  
** Check the modifications. **  
** If the modifications are  
correct, the old CICAT  
is replaced. **
```



PRIVATE VOLUMES OVERVIEW

The Private Volumes Facility allows users who have the Use Volumes (UV) capability to access removable disc volumes on HP 7920, HP 7925, and HP 7935 discs, as well as on the nonremovable HP 7911, HP 7912, HP 7914, HP 7933 and HP 7945. (The cartridge tape on the HP 7911, HP 7912, and HP 7914 disc drives cannot be used as a private volume.) Users access a file using a fully qualified designator which causes the system to access (and logically mount, if necessary) the appropriate set of volumes on which the file resides. The System Manager and Account Managers who have the Create Volumes (CV) capability can define, alter, and delete private volume sets and classes.

Some of the features of private volumes are:

- Quick recovery from system failures.
- Access to files on removable media.
- Disc packs that are transportable between HP 3000 computer systems.
- Automatic volume recognition.
- Disc packs that can be formatted on line.
- Disc packs that can be condensed on line. This feature enables you to reclaim free space on a disc volume by making occupied portions of the disc contiguous.

The following text presents an operational overview of the Private Volumes Facility.

Private Volumes Applications

Private volumes, with the capability of mass data storage and fast data recovery, have many applications. Some typical applications are presented in the following paragraphs.

Consider an environment in which a computer system is being used by two or more different types of users. For example, one group of users may consist of members of an engineering department who are using the HP 3000 for calculations and to write and execute programs which demonstrate the feasibility of certain functions. This group may consist of several interactive users, each with moderately large data bases which are used in mathematical model testing.

A separate group with a different application on the same system could be an accounting department or a manufacturing department, each with the large data bases necessary for payroll, order processing, inventory control, etc.

If, let's say, both the engineering and manufacturing departments are simultaneously contending for system resources, the resources will be used inefficiently. A larger number of disc drives will have to be physically mounted and configured and more disc file space will be utilized by the system than if the departments contended for resources separately, at different times. More efficient use of the

system's resources does occur by using Private Volumes because they allow a separate contention of system resources. Observe the following procedures to see how this is done:

1. Configure the system so that a suitable number of disc drives are allocated for Private Volume use.
2. Establish two accounts: one for engineering and one for manufacturing.
3. Define two private volume sets and assign the groups in each account to a separate volume set.
4. Assign a different time period for each group of users to access the computer system.

Thus, each group of users would load their private volume disc packs on the system at the beginning of their time period, access their files for the duration of this period, and unload the disc packs at the end of the time period.

A second application could be where a program periodically (once a week or once a month) updates a large data base. If such a data base is left on the system, otherwise usable disc space is not available. Rather than store the files offline on magnetic tape, the files and the program could reside on a private volume set. Then, when the files are to be updated, the private volume set can be mounted and the program run.

Disc Domains

All disc drives are divided into two domains at configuration time: the system domain and the nonsystem domain. The system domain may be occupied by up to eight discs. The master volume of the system domain must use Logical Device Number 1 (one). The system domain is used for system and user files, for spooling (spool files), and for virtual memory.

The drives used for system domain discs cannot be used by nonsystem domain discs. Disc drives from the system domain can be reconfigured to the nonsystem domain only during a RELOAD. However, disc drives can be added to either domain during COOLSTART, COLDSTART, or UPDATE.

The nonsystem domain contains all disc drives to be used for private volumes, serial discs, or foreign discs. The Private Volumes Facility allows users to keep files on removable media (discs). Keeping files on private volumes protects them if disc drives go down during system failure. If a system failure destroys system information or the directory on a system domain disc, a RELOAD is necessary to bring the system back up. However, if the system information is destroyed or if the private volume directory is destroyed, you can restore your files, allowing online recovery from the crash.

Drives are determined to be system or nonsystem domain devices according to the contents of the Volume Table. This table lists the volume names and respective logical devices of the volumes that are mounted on the system domain drives; therefore, the system assumes that each volume the System Manager adds to the Volume Table resides on a system domain drive. Each time the system is cold loaded, the Initiator checks that all volumes in the Volume Table are physically present on the system and assigns all other drives that were configured into MPE to the nonsystem domain. The additional drives are available for private volumes, foreign, and serial discs. These nonsystem domain discs cause volume table entries to be dynamically added and deleted as the devices are physically mounted and dismounted. These volume table entries are temporary, however, and are not included in the Initiator's permanent version of the Volume Table.

SYSTEM DOMAIN DEVICES. System domain devices are considered by the operating system to be permanently mounted. The domain can consist of drives which do not have removable packs and/or those with removable packs which the System Manager does not wish to have used as private volume devices. The system disc is always mounted on a system domain device.

NONSYSTEM DOMAIN DEVICES. Nonsystem domain devices may or may not have removable media. They are allocated by the System Manager for private volumes and other nonsystem uses, and those which have removable media can be mounted and dismounted during normal system operation. Private volumes, foreign discs, and serial discs can only be mounted on nonsystem domain drives.

ALLOCATING DRIVES TO A DOMAIN. When allocating a drive to a domain, one of the following distinct situations exists:

- A new drive will be added to the nonsystem domain of the current operating system.
- A new drive will be added to the system domain of the current operating system.
- A new drive will not be introduced into the I/O configuration. Volumes can, however, be added to or deleted from the Volume Table; doing so will alter the number of devices in each domain.

These procedures are summarized in the following paragraphs. Specific instructions are given in the appropriate areas of the configuration dialogues in Section VII.

ADDING A NEW PRIVATE VOLUME DISC. To add a private volume disc to the nonsystem domain, perform the following steps:

1. Have the new disc "powered on", but offline. A pack does not have to be mounted on the drive.
2. Cold load the operating system using any option (except a WARMSTART) that allows I/O configuration changes to be made.
3. Configure the drive into the I/O system as you would any other device (refer to step number 4 in the MPE Initiator dialogue). Do not, however, add the device to the Volume Table (Refer to step number 80 of the dialogue). (Only devices that are defined in the system volume set are assumed to be mounted on a system domain device. Any additional drives are allocated to the nonsystem domain.)
4. After the system has come up and is running, place the drive with a disc pack on line.
5. If necessary, using the VINIT utility, format and initialize the pack that resides on the drive (refer to "THE VINIT SUBSYSTEM" later in this section).

ADDING A NEW SYSTEM DISC. You can add a device to the system domain on any cold load except WARMSTART. The volume name of this new disc also may be changed. Use the following procedure:

1. Use the =SHUTDOWN command to close down the operating system.
2. Have the new disc "powered on" and on line.
3. Format the disc pack, if necessary, using the standalone SLEUTHSM program. (Refer to "FORMATTING SYSTEM DISC PACKS" in this section.)
4. Start up the operating system using the COOLSTART, COLDSTART, RELOAD, or UPDATE options.
5. During the MPE Initiator dialogue, configure the drive into the I/O system, being sure to add the device to the Volume Table. This adds a device in the system domain.
6. One of the following messages will appear if the volume name does not match the volume you added when you formatted the disc pack in Step 3:

```
NONSYSTEM VOLUME ON DEVICE ldev
ADD TO SYSTEM VOLUME SET?
```

or

```
VOLUME xxxxxx NOT IN TABLE
ADD TO SYSTEM VOLUME SET?
```

If such is the case, reply with "YES" and the device name you gave in Step 5.

CONVERTING A SYSTEM DISC TO A PRIVATE VOLUME DISC. To make a system domain device available for private volume use, perform the following steps:

1. Be sure the system is fully locked up.
2. Close down the operating system with the =SHUTDOWN command.
3. Have the disc "powered on", but off line.
4. Use the RELOAD option to restart the system.
5. Request I/O configuration changes and remove the name of the system volume (previously residing on the drive) from the Volume Table. This removes the device from the system domain and makes it available for private volume and serial disc use.
6. After the system has come up and is running, place the device on line.
7. Use the VINIT utility, described later in this section, to initialize a pack for private volume use. You can also scratch a pack; for example, you could make a system pack a private volume pack if you scratch the label. Refer to "THE SCRATCH COMMAND" later in this section.

CONVERTING A PRIVATE VOLUME DISC TO A SYSTEM DISC. To remove a device from the nonsystem domain, perform the following steps (also see Figure 10-1, which illustrates converting a private volume disc to a system disc):

1. Close down the operating system with the =SHUTDOWN command.
2. Have the disc "powered on" and on line.
3. Restart the system using the COOLSTART, COLDSTART, RELOAD, or UPDATE options.
4. During the MPE Initiator dialogue, change the I/O configuration, being sure to add the device to the Volume Table. This removes the device from the nonsystem domain, and allocates it to the system domain.



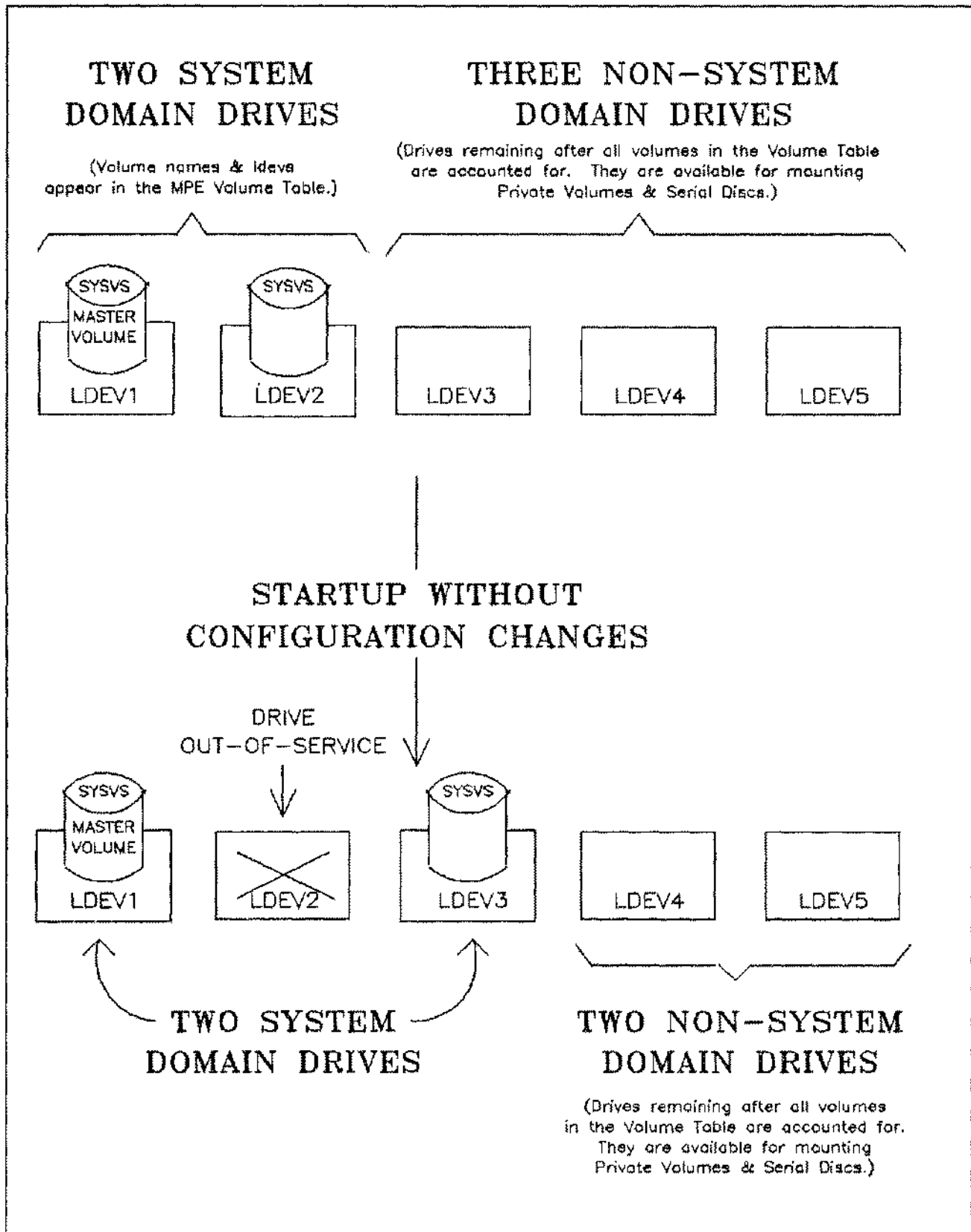


Figure 10-1. Example of Domain Reassignment During System Startup

5. The MPE Initiator detects the presence of any pack that is initialized for private volumes use and prints the following message if the volume name does not match the volume you added in Step 4:

```
NON-SYSTEM VOLUME ON DEVICE ldev
ADD TO SYSTEM VOLUME SET?
```

or

```
VOLUME xxxxxx NOT IN TABLE
ADD TO SYSTEM VOLUME SET?
```

If such is the case, reply with "YES" and the device name you gave in Step 4.

Disc Volume Conditioning

Before users can access any disc, it must first be conditioned. The conditioning process includes three steps:

1. Formatting - placing addressing information on the disc.
2. Initializing - configuring the Free Space and Defective Tracks Tables on the disc.
3. Labeling - giving the volume a name.

The standalone program named SLEUTHSM formats packs off line for use as system or nonsystem volumes; the VINIT utility formats, initializes, and labels private volume packs on line. VINIT can be used either to condition private volume packs already formatted with the SLEUTHSM program or to format private volume packs not previously formatted by SLEUTHSM.

SYSTEM VOLUME CONDITIONING. System domain discs are always formatted off line. That is, the operating system must be shut down. They are formatted by a standalone program named SLEUTHSM, without the presence of the MPE operating system. (SLEUTHSM is discussed in detail later in this section.)

System discs are initialized during a system RELOAD when the Initiator organizes the Defective Tracks Table.

Discs can be labeled during any system restart, except WARMSTART. When the Initiator detects an unlabeled pack, you are prompted for a volume name.

PRIVATE VOLUME CONDITIONING. Private volume packs are conditioned online, when the operating system is up and running. This means that domains have been established, volume sets have been defined, and accounts and groups exist with the necessary attributes and capabilities when conditioning occurs.

Users with System Supervisor (OP) or System Manager (SM) capabilities may invoke the VINIT subsystem. That is, they may condition a pack mounted on a nonsystem domain drive that has been removed from normal system use via :DOWN.

The VINIT utility is used to condition packs on line. It provides a >FORMAT command so users can format new discs or reformat discs with track problems, an >INIT command which is used for initializing and labeling private volume packs, a >SCRATCH command for making packs "scratch" discs, plus numerous other commands.

The VINIT subsystem allows you to format and initialize private volumes (for example, to initialize the directory on a master volume) in the interactive mode.

Refer to "PRIVATE VOLUMES SUMMARY" later in this section for an example of creating and conditioning a private volume disc.

Mounting and Dismounting Private Volumes

There are two different types of mount/dismount functions: physical and logical. The physical mount of a private volume disc makes the disc "visible" to the system. The MPE :DSTAT command will display the status of the private volume disc, including the name of the volume. The volume set can be accessed when all members of the volume set or class are physically mounted.

To access files on a private volume, a logical mount operation of the volume set or class must be performed.

The logical mount/dismount can be done implicitly through either the File System (FOPEN/FCLOSE) or the MPE commands :NEWACCT or :NEWGROUP. Refer to "LOGICAL MOUNT" AND "LOGICAL DISMOUNT" to see how explicit mount/dismount requests are made.

PHYSICAL MOUNT/DISMOUNT. A pack should never be mounted or dismounted while the system is being cold loaded. A system domain drive should never be taken off line while the system is running. A nonsystem domain drive can be taken off line, and removable-type packs can be mounted and dismounted without interfering with the operating system, but only if the drive is not logically mounted (private volumes) or owned by a process (serial or foreign disc).

During normal system operation, a message is printed on the System Console each time you start or stop a disc drive. If a private volume is mounted, the online message includes the name of the volume and the name of the set to which the volume belongs. If a user was accessing a volume on the drive taken off line, a "IN-USE VOLUME" message is printed. If this occurs, immediately place the drive on line again. To avoid this situation, :DOWN the drive, and wait until any DOWN PENDING is resolved before taking the drive off line.

LOGICAL MOUNT. It is important to understand that "mounting" a volume class/set is a logical operation. It attaches a particular volume class/set to the set of disc devices that are recognized by the operating system. The system does not consider a volume class/set to be mounted simply because one or all of its member volumes are physically mounted on a spindle. Rather, the system must receive a volume class/set mount request, and the System Operator must ultimately grant or reject the request.

In order for users to access private volumes, the Private Volumes Facility must be enabled with the :VMOUNT console command. This command can also be used for disabling the Private Volumes Facility. Mount requests are generated explicitly either by the user :MQUNT command or by the operator :LMQUNT command. Requests are also generated implicitly by the operating system when a user attempts to access files that are stored on a private volume. In this case, the user may not even

be aware that a private volumes facility exists. :LMOUNT commands entered from the console override all users' mount requests.

Whether a volume set can be mounted largely depends on the individual states of discs in the nonsystem domain. At any point, a device used as a private volume can be in one of the following states, which can be determined with the :DSTAT command:

- **DOWN** or **DOWN PENDING** - The logical device is out of service. It is not a candidate for assignment to a volume set.
- **OFFLINE** - The logical device is "up", but no pack is physically mounted.
- **AVAILABLE** - The logical device is "up". It is available for assignment (i.e. for logical mounting).
- **MOUNTED** - The logical device is "up" and a volume set/class is currently mounted.

States differ for system and nonsystem domain devices. System domain devices can only be **MOUNTED**. They can never be **DOWN** or **AVAILABLE** because they are always owned by the operating system. Nonsystem domain devices change state with the :UP, :DOWN, :MOUNT, :DISMOUNT, :LMOUNT, and :LDISMOUNT commands.

When the system is cold loaded, nonsystem discs are **OFFLINE** or **AVAILABLE** for satisfying logical mount requests. A subsequent mount request causes an appropriate console message. If the required volume is not in place on the spindle of a device, physically place the pack containing the requested volume on the logical device named in the message and reply if it is requested. The system will recognize the volume, grant the request, mount the volume, and place the drive (or drives) in the **MOUNTED** state.

MANAGING PRIVATE VOLUMES. From the discussion of states, it becomes apparent how you can selectively control mount requests without disabling the Private Volumes Facility. :UP and :DOWN commands place a particular logical device in the **AVAILABLE** or **DOWN** state, causing mount requests to be satisfied or rejected at the device level. :LMOUNT and :LDISMOUNT commands place a device in the **AVAILABLE** or **MOUNTED** state, also causing mount requests to be satisfied or rejected; but this time at the volume set/class level.

The System Manager and those Account Managers who have the Create Volumes (CV) capability can create, alter, and purge volume sets. Once defined with a :NEWSET command, a volume set/class definition remains in the system directory until explicitly deleted by a :PURGEVSET command.

Private volumes users can back up files using the :STORE and :RESTORE commands. These commands function the same for both system and nonsystem volumes, except that with private volumes, users must always issue an explicit mount request (except on :SYSDUMP) if files are restored to or stored from a group other than the logon group (refer to "THE MOUNT COMMAND" later in this section).

Any user with the System Supervisor (OP) capability can back up any private volume with the >COPY command of the VINIT utility.

LOGICAL DISMOUNT. As with mount requests, dismount requests can be generated by users and by the System Operator. Users generate the requests explicitly with the :DISMOUNT command;

implicitly through their programs, or by logging off the system. :LDISMOUNT cancels LDMOUNT. Users can still :DMOUNT/:DISMOUNT, or do so implicitly via :FOPEN/FCLOSE. `dismounted.`

Obtaining Information About Private Volumes

You can list the users who currently have one or more volume sets mounted with the :VSUSER command. This command displays job/session numbers, the names of mounted volume sets/classes, and the fully qualified names of users associated with each.

You can list the volumes that physically reside on each drive with the :DSTAT command. The information displayed includes: logical device number, device type, device state, and the name of the currently mounted volume. If the device resides in the nonsystem domain, the name of the volume set to which the mounted volume belongs and the volume generation number is also displayed. (The volume generation number can be assigned to a nonsystem domain device when it is initialized via the VINIT >INIT command; this number is used to denote different versions of the same data on separate discs.

The :LISTVS command produces a formatted listing of volume set information as well.

REPORT ;VS=

The :REPORT command can be used to report the directory on a private volume. List the private volume, group and account:

```
REPORT ;VS=PUDISCI.PUB.SYS
VOLUME SET WAS NOT PREVIOUSLY MOUNTED (CIERR 1108)
```

Moving a Volume Set from One System to Another

One of the advantages of private volumes is that they are transportable between HP 3000 computer systems, provided the following conditions are met:

- The second system must have sufficient drives of the type required to hold all the volumes of a volume class or set.
- The volume set must be defined on the second system, via the :NEWVSET command, and must be associated with the same group and account as on the first system.
- For the files that will be accessed, accounts, groups, and users must exist with the same attributes and capabilities as on the first system.

Perform the following steps to prepare to use the same private volume set on one or more HP 3000 systems:

1. Create the same volume set definition on all HP 3000 systems which are to share the private volume set.
2. Establish an account with the same name on all HP 3000 systems which are to share the private volume set.

Subsystems and Utilities

3. On one of the HP 3000 systems, span the account and create and span all groups to the private volume set, so that entries for the account and all its groups are entered in the volume set's directory.
4. Create the same groups on the other HP 3000 systems and use the `VS = volset` parameter without the `:SPAN` option with the `:NEWGROUP` command to specify the volume set definition. The groups should have the same home volume set on each system. However, the groups and accounts need be spanned only once to create the entries in the volume set's directory.

The master volume of a volume set (or class) must be mounted when an account or group is being spanned. Refer to "SPANNING ACCOUNTS" later in this section.

Once the above four steps are completed, the volume set is recognizable to each of the HP 3000 systems, and can be transported between any of the systems.



Volume Sets and Volume Classes

A system or account manager uses the `:NEWVSET` command to combine individual removable volumes into logical units known as volume sets or volume classes. The system references these units when users request access to private volumes. The system also uses volume set or volume class names in all operator commands, console messages, and operator replies concerning volume mounting. A manager can subsequently change volume class/set definitions with the `:ALTVSET` command and delete definitions entirely with the `:PURGEVSET` command.

VOLUME SETS. A volume set is a set of not more than eight removable disc volumes which share a common file directory. Each volume set has a master volume, which includes not only the accounting directory but also a table of the volumes defined as members of the set. The member named in a `:NEWVSET` command that has the same name as the volume set name becomes the set's master volume.

Private volume sets and classes are assigned and allocated at the group level within an account. Each group is assigned to only one volume set: its home volume set. However, a volume set, if so defined, may be shared by more than one group within an account, or even among several accounts. Each volume in a volume set has a unique name (which consists of up to eight alphanumeric characters, beginning with a letter) which designates the volume itself. The name of the volume is followed by the name of the group and account to which the volume belongs (*volumentname.groupname.accountname*).

As mentioned previously, every volume set has as one of its members a volume designated as the master volume of the set. This volume contains a directory of the volume set. Each volume set has its own accounting directory analogous to the system directory for the system volume set. The directory contains such information as a list of all accounts and groups sharing the volume set, a list of all files within the volume set. The files of a volume set are unique to that volume set and cannot be shared among other volume sets. For example, if a volume set is defined with the name "VOLSET1", then one of the members of this volume set must be the master volume and must be named "VOLSET1". Volume sets can be divided into subdivisions, called volume classes. One of the volumes of a volume class must be the master volume of the set.

VOLUME CLASSES. A volume class is a subset of the volumes in a volume set and must include the master volume of the set. It is accessed as a unit and is identified by a unique volume class name. It is the smallest volume unit that can be referenced by a user. A single volume can be referenced only if it is the master volume for the set or class. When a user references a volume class, he is, therefore, notifying MPE that only a portion of a defined volume set need be mounted to satisfy his anticipated file access requests. If a volume class consists of more than one volume, all volumes must be mounted in order to access the volume class.

When a user with the Create Volumes (CV) capability defines members of a volume set, he may also assign a subset of those same members to a volume class. A volume set may contain several volume classes, each with a unique name. Each volume class must include the set's master volume. When a user references a file in a group assigned to a volume class, the system checks that all volumes assigned to the class are mounted before granting the file access request.

Because all members of a volume set need not be mounted in order for users to access the set, the number of volumes in a set may exceed the number of physical drives available in the nonsystem domain. However, because all members of a volume class must be mounted in order for users to

access the class, the number of volumes in a class may not exceed the number of drives in the nonsystem domain.

HOME VOLUME SET. A home volume set is the volume set assigned to a group when the group is either created with the `:NEWGROUP` command or altered with the `:ALTGROUP` command. Files belonging to the group are located on the home volume set. The home volume set is the set implicitly referenced when a user logs on under the group. The home volume set for the group, however, need not be mounted until such time as when a user attempts to access file space in the set. At this time, MPE generates a console request for the System Operator to mount the set.

It is possible for a group's home volume set to be mounted but not "bound" for that group; that is, the volume set may be mounted but the system may be unaware that the volume set exists, unless it is bound. Technically speaking, binding links the group entry in the volume set directory with the group entry in the system directory, so that files belonging to that group can be accessed, and new files created by that group will be assigned to the volume set. (Refer to "SPANNING ACCOUNTS" later in this section to see how binding is accomplished.) For example, group A may have volume set A mounted and bound. Group B, however, even though volume set A is also its home volume set, cannot access volume set A until it mounts and binds the volume to its group. This is accomplished with an explicit or implicit mount request. An explicit mount request is generated with the `:MOUNT` command. The `:MOUNT` command causes the volume set to be mounted (possibly only logically; it may already be physically mounted) and bound for the group that issued the command. The command remains in effect until it is explicitly released with a `:DISMOUNT` command. Implicit requests to mount a group's home volume set are invoked any time the user attempts to access file space on that volume set. Implicit requests cause the volume set to be mounted and bound only for the duration of the operation which generated the request. Implicit mounts are generated by the following operations: running a program, opening a file, and the following commands: `:STORE`, `:RESTORE`, `:EDITOR`, `:BUILD`, `:PURGE`, `:LISTF`, `:NEWACCT`, `:ALTACCT`, `:NEWGROUP`, `:ALTGROUP`, `:REPORT`, `:PURGEACCT`, `:PURGEGROUP`, and `:RENAME`. Refer to the MPE V Commands Reference Manual (32033-90006) and "USER COMMANDS FOR PRIVATE VOLUMES", later in this section, for a description of user mount and dismount requests.

Any temporary files will be built on the home volume set, requiring that the set be physically mounted. Also, certain MPE commands (such as `:SHOWJOB`, `:STORE`, and `:RESTORE`) build temporary files; these commands can only be used if the volume set is mounted.

VOLUME SET/CLASS DEFINITION. Volume sets and classes are defined, or created, by System Managers or Account Managers who have the Create Volumes (CV) capability. Each volume set and volume class within the set is distinguished by a unique name assigned with the `vsname` (volume set name) and `vcname` (volume class name) parameters of the `:NEWVSET` command. Once defined, a volume set or volume class can be referenced and used by users with the Use Volumes (UV) capability.

The syntax of the `:NEWVSET` command is:

```
:NEWVSET vsname
      [ ;MEMBERS=vname:type [, vname:type [, ...]] ]
      [ ;CLASS=vcname:vname [, vname [, ...]] ]
```

Subsystems and Utilities

where:

<i>vsname</i>	Specifies the volume set name, consisting of from one to eight alphanumeric characters, beginning with a letter.
<i>vname:type</i>	Names the members of the volume set and the types of devices on which the members will reside (a maximum of eight volume names may be specified).
<i>vcname</i>	Specifies the volume class name, consisting of from one to eight alphanumeric characters, beginning with a letter.
<i>groupname.acctname</i>	Specifies the names of the group and account to which the volume set/class is to be assigned.

Let's define a volume set with the following characteristics (remember, you must have Create Volumes (CV) capability): group (GRP1), account (ACCT1), volume set name (USERSET1), members (MEM1, MEM2, USERSET1), type (HP7920), and classes (CLASS1:MEM1, USERSET1). You would log on with:

```
username.ACCT1.GRP1
```

and enter:

```
:NEWSET USERSET1;MEMBERS=USERSET1:HP7920, MEM1:HP7920, &  
:MEM2:HP7920;CLASS=CLASS1:USERSET1, MEM1
```

To create a volume set definition named PRIVOL1, log on as MANAGER.SYS (or as Account Manager if you have CV capability) and enter:

```
:NEWSET PRIVOL1;MEMBERS=PRIVOL1:HP7920, SLAVE1:HP7920, &  
:SLAVE2:HP7920
```

This defines a private volume set named PRIVOL1.PUB.SYS, with a master volume PRIVOL1, and two slave volumes, SLAVE1 and SLAVE2. In the MEMBERS list, note that one member, and one member only, must have the name of the volume set. It is this member that is, by definition, designated to be the master volume of the set. The name can appear anywhere in the MEMBERS list.

The foregoing :NEWSET command creates an entry in the system directory for volume set PRIVOL1.PUB.SYS. The group (PUB) and account (SYS) are merely part of the identifying name for the volume set, signifying the logon group and account under which the definition was created. This group and account do not imply that files on this volume set must belong to the PUB.SYS group and account.

If volume classes are to be defined, you could enter:

```
:NEWSET PRIVOL1;MEMBERS=PRIVOL1:HP7920, SLAVE1:HP7920, &  
:SLAVE2:HP7920;CLASS=PV1CL1:PRIVOL1, SLAVE2
```

One of the members of a volume class must be the master volume of the volume set; thus, note that in the class PV1CL1 above, PRIVOL1 is a member.

ALTERING A VOLUME SET DEFINITION. To modify an existing volume set definition, use the :ALTVSET command. The syntax of the :ALTVSET command is:

```
:ALTVSET vname
      [ ;ADDCLASS=vname:vname [, vname [, ...]] ]
      [ ;EXPANDCLASS=vname:vname [, vname [, ...]] ]
      [ ;EXPANDSET=vname:type [, vname:type [, ...]] ]
```

To alter home volume set USERSET1 to add a new class, CLASS1, with a new member, MEM4, you would log on with:

```
username.ACCT1.GRP1
```

and enter:

```
:ALTVSET USERSET1;ADDCLASS=CLASS3:USERSET1,MEM4;EXPANDSET=&
:MEM4:HP7920
```

DELETING A VOLUME SET DEFINITION. To delete the volume set USERSET1, you would enter:

```
:PURGEVSET USERSET1
```

MPE will request verification that USERSET1 is to be purged by displaying the following:

```
VOLUME SET/CLASS DEFINITION USERSET1 TO BE PURGED (YES/NO)?
```

You must answer "YES" to continue the operation. The volume set will not be purged if any member is in use when the :PURGEVSET command is entered.

Spanning Accounts

The SPAN parameter of the :NEWACCT, :NEWGROUP, :ALTACCT, and :ALTGROUP commands enters the accounting information in the system directory and creates an account entry in the volume set's directory. This is called "spanning"; that is, an entry is created in both the system directory and the volume set's directory (the system directory is "bound" with the volume set's directory). The purpose of spanning is to tell the system of the volume set so the system may access that volume set. The master volume of a volume set, or class, must be mounted physically when spanning an account into a volume set directory.

To create a new account named PVUSER, you could enter:

```
:NEWACCT PVUSER,MGR;CAP=AM,AL,GL,SF,ND,UV,CV,IA,BA;&
:VS=PRIVOL1.PUB.SYS:SPAN
```

The above :NEWACCT command creates a new account named PVUSER with one user named MGR and a home group named PUB. Included in the capability list are the Use Volumes (UV) and Create Volumes (CV) capabilities. The SPAN parameter of the command enters this account in the system directory and creates an account entry in the volume set's directory.

To modify an existing account's capabilities to add Create Volumes (CV) and Use Volumes (UV) capabilities, you could enter:

```
:ALTACCT OLDACCT;CAP=AM,AL,GL,SF,ND,UV,CV,IA,BA;&  
:VS=PRIVDL1.PUB.SYS:SPAN
```

The above `:ALTACCT` command added the Create Volumes (CV) and Use Volumes (UV) capabilities to the account named `OLDACCT` and created an account entry in the `PRIVDL1` volume set's directory. The account still exists in the system directory; the `SPAN` parameter has no effect on this directory. Note that the only time you would use the `SPAN` parameter of the `:ALTACCT` or `:NEWACCT` command is when you plan to assign one or more of the account's groups to a private volume set or when you plan to create a new group in the account and assign it to a private volume set. An account may contain any mix of system domain groups and private volume groups. The only time a group's files are assigned to a private volume is when the group itself is assigned to that private volume, provided that the files do not already exist.

Assigning a Group to a Private Volume Set

Use the `:NEWGROUP` command (you must be the Account Manager) to create a new group and assign it to a private volume set. For example:

```
:NEWGROUP PVGROUP1;CAP=IA,BA;VS=PRIVDL1.PUB.SYS:SPAN
```

The above command both marks the group entry for group `PVGROUP1` in the system directory as a private volume group, and creates a group entry for the group in the `PRIVDL1` volume set's directory. Remember that the master volume of a volume set (or class) must be mounted physically when spanning a group into a volume set directory.

To create new users for `PVGROUP1` and assign Use Volumes (UV) capability, you could enter:

```
:NEWUSER JOHN;HOME=PVGROUP1;CAP=SF,ND,UV,IA,BA  
:NEWUSER JANE;HOME=PVGROUP1;CAP=SF,ND,UV,IA,BA
```

Thus, a new account, `PVUSER`, and a new group, `PVGROUP1` have been created and spanned into the private volume directory that is located on the master volume for volume set `PRIVDL1`. Figure 10-2 illustrates what happens when an account and group are spanned from the system directory into a private volume set directory.

To modify an existing group to assign the group to a private volume set, use the `:ALTGROUP` command. For example:

```
:ALTGROUP OLDGROUP;CAP=IA,BA;VS=PRIVDL1.PUB.SYS:SPAN
```

The above command modifies the existing group `OLDGROUP` (to mark its entry in the system directory as a private volume group) and creates a group entry in the `PRIVDL1` volume set directory. No files are transferred to the private volume set. An existing group that contains files cannot be spanned to a private volume set in this manner. It is possible, however, to transfer the files through a series of steps that includes the above command. Refer to "MOVING AN EXISTING GROUP WITH FILES TO A PRIVATE VOLUME SET", the next paragraph, to see how this is done.

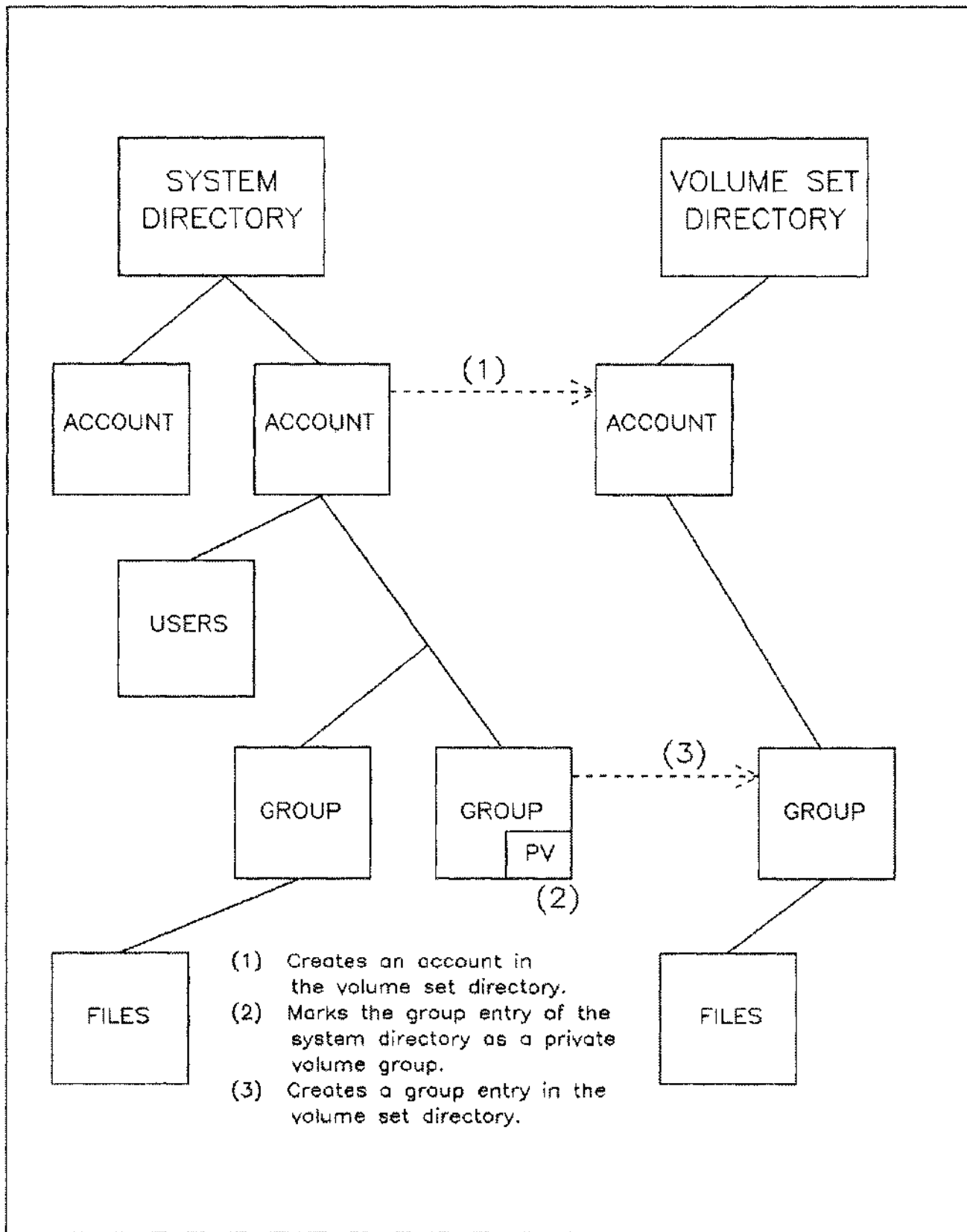


Figure 10-2. Spanning Groups and Accounts

Moving an Existing Group with Files to a Private Volume Set

To assign an existing group and its files to a private volume set, proceed as follows:

1. Store the group's files on tape or serial disc.
2. Purge the files from the group.
3. Enter an `:ALTACCT` command with the `SPAN` parameter to create an entry in the private volume set's directory for the account to which the group belongs.
4. Enter an `:ALTGROUP` command with the `SPAN` parameter to create an entry for the group in the private volume set's directory.
5. Restore the group's files.

For example:

```

:LISTF @.OLDGRP

FILENAME

PROLL  GFILE  PGUIDE

:FILE STOR;DEV=TAPE
:STORE @.OLDGRP;*STOR

FILES STORED=3
FILES NOT STORED=0

:PURGE PROLL
:PURGE GFILE
:PURGE PGUIDE
:ALTACCT OLDACCT;CAP=AM,AL,GL,SF,ND,UV,CV,IA,BA;*
:VS=PRIVOL1.PUB.SYS:SPAN
:ALTGROUP OLDGRP;CAP=IA,BA;VS=PRIVOL1.PUB.SYS:SPAN
:RESTORE *STOR;@.OLDGRP

FILES RESTORED=3
FILES NOT RESTORED=0

```

Purging Accounts and Groups on Private Volumes

The account or group entry can be purged from either the system directory or the private volume directory. The MPE `:PURGEACCT` command will remove the account entry from the system directory. You can purge the account entry from the private volumes directory by specifying the name of the volume set (`:PURGEACCT accountname;VS=volsetname`). Therefore, to completely remove the account entry from both directions, `:PURGEACCT` must be specified twice. The MPE `:PURGEGROUP` command performs the same functions for the group entry. Refer to the `:PURGEACCT` and `:PURGEGROUP` commands in Section 3 of this manual.

Private Volumes Summary

The complete procedure for establishing private volumes and providing users with the capability to access them is as follows:

1. Allocate one or more disc drives to the nonsystem domain during a RELOAD.
2. Create a volume set definition with the :NEWVSET command.
3. "Down" a nonsystem domain disc drive with the console :DOWN command.
4. Physically mount a disc volume on this downed device; refer to "USING THE VINIT SUBSYSTEM" later in this section.
5. Run the VINIT subsystem. Each member of the volume set must be conditioned with this subsystem. Refer to "THE VINIT SUBSYSTEM" later in this section for a detailed explanation of the VINIT commands.
6. "Up" the device with the console :UP command.
7. Give users the Use Volumes (UV) capability with the :NEWACCT and :NEWUSER commands or the :ALTACCT and :ALTUSER commands. If you use the :NEWACCT or :ALTACCT commands, include the SPAN parameter to create an entry in the private volume set's directory for the account to which the group belongs.

The following example illustrates the complete procedure. Assume that the disc drives have already been assigned to the nonsystem domain.

```
:VMOUNT ON,AUTO
:NEWVSET PRIVOL1;MEMBERS=PRIVOL1:HP7920,SLAVE1:HP7920,&
:SLAVE2:HP7920;CLASS=PV1CL1:PRIVOL1,SLAVE2
:DOWN 3
13:29/8/DISMOUNT ON LDEV#3
13:33/8/UNKNOWN VOLUME ON LDEV#3
```

```
:VINIT
VINIT C.01.00 (C) HEWLETT-PACKARD CO., 1978
>DSTAT ALL
  LDEV-TYPE      STATUS      VOLUME (VOLUME SET-GEN)
-----
  1-7920         SYSTEM      MH7920U0
  2-7925         AVAIL       USERVOL1 (USERVOL1.PUB.SYS-0)
  3-7920         DOWNED
  4-7920         AVAIL       SLAVOL1  (USERVOL1.PUB.SYS-0)
  5-7920         AVAIL       SLAVOL2  (USERVOL1.PUB.SYS-0)
```

```
>FORMAT 3
>INIT PRIVOL1,3,PRIVOL1.PUB.SYS
ENTER DIRECTORY SIZE (SECTORS): 500
>DSTAT ALL
  LDEV-TYPE      STATUS      VOLUME (VOLUME SET-GEN)
-----
  1-7920         SYSTEM      MH7920U0
  2-7925         AVAIL       USERVOL1 (USERVOL1.PUB.SYS-0)
  3-7920         DOWNED
  4-7920         AVAIL       SLAVOL1  (USERVOL1.PUB.SYS-0)
  5-7920         AVAIL       SLAVOL2  (USERVOL1.PUB.SYS-0)
```


Subsystems and Utilities

```
>EXIT
END OF SUBSYSTEM
:UP 3
:MOUNT P1VOL1.PUB.SYS
:NEWACCT PVUSER,MGR;CAP=AM,AL,GL,SF,ND,UV,CV,IA,BA;&
:VS=PRIVOL1.PUB.SYS:SPAN
:HELLO MGR.PVUSER
:NEWGROUP PVGROUP1;CAP=IA,BA;VS=PRIVOL1.PUB.SYS:SPAN
:NEWUSER JOHN;HOME=PVGROUP1;CAP=SF,ND,UV,IA,BA
:NEWUSER JANE;HOME=PVGROUP1;CAP=SF,ND,UV,IA,BA
```

The following points concerning private volumes are important to remember:

1. A private volume set consists of from one to eight volumes.
2. One of the members of a private volume set must be the master volume and must have the same name as the volume set.
3. One of the members of a volume class must be the master volume.
4. The volume class is the smallest volume unit that can be referenced by a user.
5. The master volume of a volume set (or class) must be mounted in order to access the volume set.
6. All members of a volume set (or class) must be mounted to span either an account or group into the volume set's directory.
7. No files are transferred when an existing group is assigned to a private volume set. Using an :ALTGROUP command to assign a group with a nonempty file domain to a private volume set is not allowed. A group's files must be stored off line, purged from the group, then restored after the group has been assigned to a private volume set.
8. These conditions must exist before a volume set can be accessed by a group:
 - A definition must exist for the volume set.
 - The group must be spanned into the volume set's directory.
 - All members of the volume set (or class) must be mounted.
 - The system directory must be "bound" to the volume set directory, either implicitly or explicitly with the :MOUNT command.

User Commands for Private Volumes

The five user commands relating to the use of private volumes are :MOUNT, :DISMOUNT, :LISTVS, :VSUSER, and :DSTAT. These commands are discussed below.

THE :MOUNT COMMAND. The :MOUNT command logically associates a user with a specific volume set, which must be physically mounted on the system. The syntax is:

```
:MOUNT [ * ] [ .groupname [ .acctname ] ]
      [ ;GEN=[genindex] ]
```

where:

- * Specifies either the home volume set for the specified group and account, or the logon group and account if *groupname.acctname* are not specified. Default.
- vcname* Specifies a previously defined volume class/set name.
- groupname.acctname* Specifies the group and account under which the volume set definition was created.
- genindex* Specifies a value from -1 to 32767 that determines which generation of the home volume set is to be mounted. A value of -1 indicates that any generation is permitted. If omitted, the system will ignore the generation when attempting to satisfy the :MOUNT request.

If you are logged on in the same group as the private volume group, the *groupname.acctname* parameter of the :MOUNT command can be omitted. If you are logged on in a group other than the private volume group, you must specify that group in the mount request so that the correct volume set will be mounted and bound.

If the :MOUNT command is entered in one of the following forms, the volume set is bound so that files of the volume set's group can be accessed.

```
:MOUNT *.groupname.acctname  ** Group/account for mounting if not logged on
                               in this group **

:MOUNT *                      ** If logged on in the group to be mounted **

:MOUNT                        ** Logged on in the group to be mounted **
```

As an example, if you want to bind group PUB.TEST, which resides on PRIVOL1.PUB.SYS, you would enter:

```
:MOUNT *.PUB.TEST
```

If you are logged on under group PUB, you could enter:

```
:MOUNT *
or
:MOUNT
```

If the actual volume set name is specified in the :MOUNT command, as in:

```
:MOUNT PRIVOL1.PUB.SYS
```

the operator will be requested to mount the volume set, but no groups will be bound.

THE :DISMOUNT COMMAND. The :DISMOUNT command allows dismounting a volume set previously mounted via a :MOUNT command. The syntax is:

```
:DISMOUNT [ * ] [.groupname [.acctname]]
           [vcname]
```

If you are not logged on in the group to be dismounted, the group and account must be specified with the :DISMOUNT command. If you are logged on in the group to be dismounted, you can enter the :DISMOUNT command in one of the following forms:

```
:DISMOUNT
```

or

```
:DISMOUNT *
```

THE :LISTVS COMMAND. The :LISTVS command produces a formatted listing of volume set definition information. Three different formats are available: ":LISTVS", ":LISTVS,1", and ":LISTVS,2". A volume class is indicated by a "(C)", a currently mounted volume set or class by an "*". These are illustrated in the following examples:

```
:LISTVS
ACCOUNT=SYS          GROUP=PUB
```

```
VOLSET
```

```
-----
UCLASS2(C)  USERVOL1  USERVOL2
```

```
:LISTVS,1
ACCOUNT=SYS          GROUP=PUB
```

```
VOLSET      MEMBERS    TYPE
-----
```

```
UCLASS2(C)  USERVOL2  HP7920
USERVOL1    USERVOL1  HP7920
USERVOL2    USERVOL2  HP7920
              SLAVOL2  HP7905
```

```
:LISTVS,2
ACCOUNT=SYS          GROUP=PUB
```

```
VOLSET      MEMBERS    TYPE      LDEV  STATUS
-----
```

UCLASS2(C)	USERVOL2	HP7920		
USERVOL1	USERVOL1	HP7920		
USERVOL2*	USERVOL2	HP7920	2	MOUNTED
	SLAVOL2	HP7920	3	MOUNTED

THE :VSUSER COMMAND. The :VSUSER command prints a listing of all users of a currently mounted volume set, as shown in the following example:

```

:VSUSER
VOLUME SET NAME      JOBNUM      JOB NAME
-----
USERVOL2.PUB.SYS    #532       TEST.MPE

```

If no volume sets are in use, :VSUSER returns the message:

```
NO VOLUME SETS IN USE
```

THE :DSTAT COMMAND. The :DSTAT command displays the current status of the disc drives on the system. The syntax of the :DSTAT command is:

```
:DSTAT [ldev]
        [ALL ]
```

where:

ldev Specifies the logical device number (an integer) of the disc drive whose status is desired.

ALL Causes the status of all disc drives, system and nonsystem, to be displayed.

The default, if no parameters are included, is that only nonsystem discs are displayed, for example:

```

:DSTAT
LDEV-TYPE      STATUS      VOLUME (VOLUME SET-GEN)
-----
2-7920(R)      MOUNTED     USERVOL2 (USERVOL2.PUB.SYS-0)
3-7920(R)      MOUNTED     SLAVOL2 (USERVOL2.PUB.SYS-0)

```

Operator Commands for Private Volumes

The three operator commands relating to the use of private volumes are :VMOUNT, :VSUSER, and :LDMOUNT. These commands are discussed below.

THE :VMOUNT COMMAND. The :VMOUNT command enables or disables the Private Volumes Facility. The syntax of the :VMOUNT command is:

```

:VMOUNT {ON[,AUTO]}
        {OFF      }
        [;ALL]

```

where:

ON , AUTO Sets the Private Volume Facility on. All valid requests are allowed. If the operator replies with "ON", the operator must reply to such requests. If the operator replies with "ON , AUTO", MPE attempts to satisfy such requests without operator intervention; no message is sent to the Console.

If the specified volume set, or class, is physically mounted, MPE logically mounts it. If the specified volume set, or class, is not physically mounted, the mount request is denied.

OFF Sets the Private Volumes Facility off. All requests, explicit and implicit, are rejected. Requests, even though they cannot be satisfied, are still printed on the Console.

ALL Causes all private volumes related messages to be printed on the Console, including those not requiring operator intervention.

THE :LMOUNT COMMAND. The :LMOUNT command logically mounts a private volume set or class. No binding occurs with this command. The syntax of the :LMOUNT command is:

```
:LMOUNT vcname.groupname.acctname
      [ ;GEN=genindex ]
```

THE :LDISMOUNT COMMAND. This command logically dismounts a Private Volume set or class. It is used to dismount nonsystem domain discs while the system is on line. The dismount remains pending until any files being accessed on the disc volume are closed. The LDISMOUNT syntax is:

```
:LDISMOUNT vcname.group.account
```

Examples Of User Mounts and Dismounts

User and console messages and commands are combined in some of the examples that follow. Read through these examples, noting when to reply as a user and when to reply as an operator.

If the System Operator enters the command :VMOUNT ON;ALL, all private volume generated messages are displayed on the Console. In addition, the operator must respond to all mount requests.

```
:VMOUNT ON;ALL
:DSTAT
```

LDEV-TYPE	STATUS	VOLUME (VOLUME SET-GEN)
2-7920(R)	AVAIL	USERVOL2 (USERVOL2.PUB.SYS-0)
3-7933	AVAIL	SLAVOL2 (USERVOL2.PUB.SYS-0)

If the user enters a :MOUNT command, a message is displayed on the Console and the operator is required to answer "YES" or "NO".

```
:MOUNT
15:33/#576/19/ACCESS TO USERVOL2.PUB.SYS BY MGR.MPETEST (Y/N)
:REPLY 19,Y
:DSTAT
LDEV-TYPE          STATUS      VOLUME (VOLUME SET-GEN)
-----
2-7920(R)          MOUNTED    USERVOL2 (USERVOL2.PUB.SYS-0)
3-7920(R)          MOUNTED    SLAVOL2  (USERVOL2.PUB.SYS-0)
```

1

2

3

4

When a `:DISMOUNT` command is entered, no intervention is required of the operator, but the following message is displayed on the Console:

```
:DISMOUNT
15:33/#S76/19/AVAILABLE DRIVE ON LDEV# 2,3
```

An implicit mount request resulting from the Editor `"/ADD"` command requires operator intervention (because the Editor builds a work space file in the user's file domain).

```
:EDITOR
HP32201A.7.16 EDIT/3000 TUE, OCT 25, 1983, 4:51 PM
(C) HEWLETT-PACKARD CO. 1982
/ADD
?16:51/#S76/23/ACCESS TO USERVOL2.PUB.SYS BY MGR.MPETEST (Y/N)
:REPLY 23,Y
  1  //
...
/END
16:52/#S76/23/AVAILABLE DRIVE ON LDEV #2,3
```

END OF SUBSYSTEM

When the Editor is exited, MPE indicates that the drives are available.

The `:BUILD` command generates an implicit mount request requiring operator intervention. The volumes are mounted only for the duration of the `:BUILD` command, then MPE displays the device available message.

```
:BUILD FILE1
15:34/#S76/19/ACCESS TO USERVOL2.PUB.SYS BY MGR.MPETEST (Y/N)
:REPLY 19,Y
15:35/#S76/19/AVAILABLE DRIVE ON LDEV# 2,3
```

Calling the `FOPEN` intrinsic generates an implicit mount request. This is demonstrated in the following example:

```
:RUN FCOPY.PUB.SYS
.
.
.
15:35/#S76/23/ACCESS TO USERVOL2.PUB.SYS BY MGR.MPETEST (Y/N)
:REPLY 23,Y
.
.
.
END OF PROGRAM
15:35/L#S76/23/AVAILABLE DRIVE ON LDEV# 2,3
```

Note that, again, the mount only lasts for the duration of the operation which generated the implicit mount request and the drive available message is displayed when the `dismount` occurs.

Subsystems and Utilities

A user who does not want to be delayed while the operator responds to every mount request should enter the :MOUNT command at the beginning of the session and leave the volume set mounted until no longer needed, as shown in the following example:

```
:MOUNT
:DSTAT
LDEV-TYPE          STATUS          VOLUME (VOLUME SET-GEN)
-----
2-7920(R)          MOUNTED          USERVOL2 (USERVOL2.PUB.SYS-0)
3-7920(R)          MOUNTED          SLAVOL2  (USERVOL2.PUB.SYS-0)
:EDITOR
HP3220TA.7.16 EDIT/3000 TUE, OCT 25, 1983,  4:51 PM
(C) HEWLETT-PACKARD CO. 1982
/ADD
  1
  2//
...
/E
END OF SUBSYSTEM

:BUILD FILE1
:RUN FCOPY.PUB.SYS
.
.
.
END OF PROGRAM

:DISMOUNT
16:55/#534/16/AVAILABLE DRIVE ON LDEV# 2,3
```

Note that operator intervention was not necessary when the :EDITOR, :BUILD, and :RUN commands were entered.

THE VINIT SUBSYSTEM

The VINIT (Volume INITIALization) subsystem allows you to condition, copy, and verify disc packs, serialized flexible discs (diskettes), and cartridge tape media from the HP 7911, 7912, 7914, and 9144 cartridge tape drives. Unlike the SLEUTHSM program, which can only be run off line while the system is down, VINIT is run on line while the system is up and running.

VINIT can be used to condition disc packs formatted previously with the SLEUTHSM program, to format and condition disc packs not formatted previously, or to perform other limited functions on diskettes or HP 7911, 7912, 7914, and 9144 cartridge tapes. Refer to individual commands to determine which functions of VINIT are applicable to which media.

The VINIT subsystem is accessed with the :VINIT command. You must have System Supervisor (OP) or System Manager (SM) capability to use the VINIT subsystem. The syntax for :VINIT is:

```
[ :FILE filename=VINLIST;DEV=listdevice ]
:VINIT [ * filename ]
```

(If you want your output sent to another device besides the standard list device, you can use a file equation, in which case, in the above example, your output would be sent to *listdevice*.)

Once accessed, VINIT displays a "greater than" prompt (>) and awaits a command from you. The VINIT subsystem uses the following commands (brief descriptions of the commands are specified):

- >COND condenses free disc space holes and recovers lost disc space for private volumes.
- >COPY copies the contents of one volume to another.
- >DSTAT gives status of disc drives.
- >DTRACK processes suspect tracks in the Defective Track Table and defective sectors in the Defective Sectors Table. In doing so, you can either recover (i.e. ignore), delete, or reassign the defective tracks.
- >EXIT exits the VINIT subsystem.
- >FOREIGN makes a disc volume foreign by filling the label area of a volume with zeros.
- >FORMAT allows online formatting of disc packs.
- >HELP prints a listing of the VINIT commands, including syntax and descriptions.
- >INIT completes the conditioning of a private volume previously formatted by the SLEUTHSM program or the >FORMAT command.
- >PDEFN lists the specified volume set.
- >PDTRACK prints the contents from the Defective Tracks Table or the Defective Sectors Table.
- >PFSPACE prints the Disc Free Space Map.
- >PLABEL prints the disc label.
- >SCRATCH writes (resets) a scratch-type label.
- >SERIAL writes a serial-type label.
- >VERIFY verifies (reads) data.

A detailed description of the VINIT subsystem commands (including the syntax of each command) is presented in alphabetical order in the following paragraphs. Then, at the end of this section, an example showing how to run the VINIT subsystem is given.

The COND Command

The >COND command will condense all free space referenced in a volume's Disc Free Space Map (DFSM) into one contiguous area. The RECOVER option operates like the "Recover lost disc space" option of INITIAL, in that it reclaims free unused space not referenced by the DFSM. The syntax of the VINIT >COND command is:

```
>COND ldev  
[;RECOVER]
```

where:

ldev Specifies the logical device number of the device on which the volume to be condensed is mounted. It requires all volumes in the volume set (not the volume class) to be physically mounted.

RECOVER Is equivalent to the "Recover lost disc space" option of INITIAL. This option is for private volumes only.

A condense operation can be performed on either a system volume or a private volume; serial volumes or foreign volumes cannot be condensed. If a private volume is to be condensed, the whole volume set (not just the volume class) that includes that private volume must be mounted. You must do this because as extents are moved, pointers to them in file labels must be updated.

Areas that contain open permanent files, temporary files, new files (including \$OLDPASS), and defective tracks cannot be moved. In addition, if any temporary files were open when a system failure occurred, those areas will not be reclaimed by >COND *ldev*. Such space can only be recovered by either the "Recover lost disc space" option of INITIAL for system volumes or by >COND *ldev*;RECOVER for private volumes. The latter option, however, requires that the user of VINIT is the only one running a session or job on the system; if system logging is enabled during a condense operation, >COND will temporarily disable logging until the condense is finished and an appropriate message will then be displayed on the System Console. The >COND *ldev*;RECOVER option also requires that the user has no temporary files. If any open permanent file is encountered, the RECOVER option will be rejected.

Once a condense operation has started, the VINIT subsystem cannot be aborted until the operation is complete. Interruption of a condense by any event will leave the disc in an unusable state; always back up a disc before condensing it.

A >COND *ldev*;RECOVER operation has three phases:

1. Initialize the Disc Free Space Map (DFSM) to its initial state (no files).
2. Recover space for all permanent files.
3. Condense the disc.

When phase two is finished, a message is printed informing you that the file disc space has been recovered, and the condense operation will begin. If a system failure should occur before the message is printed, the volume does not need to be reinitialized, nor do the files need to be restored. When the system is brought up again, you must re-enter VINIT and do the >COND *ldev*;RECOVER operation again. If a system failure should occur during phase three, no action is necessary. However, there will be a loss of disc space.

The condense function also checks that there are no suspect tracks on any member of the volume set (system volume set or private volume set). Any such tracks must be processed either by the VINIT >DTRACK command for private volumes or by INITIAL for system volumes.

The >COND command locks directories (system, private volumes) so that no one can open or close files.

The >COND *ldev*;RECOVER operation tries to move files to lower addresses on the disc in order to create large contiguous blocks of free space. By its very nature, however, this process may create many small fragments of free space.

The COPY Command

The >COPY command copies the contents of one volume to a second volume. It will copy only used portions of the disc. Volumes with either a scratch disc label (refer to the >SCRATCH command) or foreign volumes are copied entirely. This command is applicable to discs, diskettes, and HP 7911, 7912, 7914, and 9144 cartridge tapes. The syntax is:

```
>COPY fromldev,toldev
```

```
    [;GEN=genindex]  
    [;VER[ify]]  
    [;BUF=size]
```

where:

<i>fromldev</i>	Denotes the logical device number of the device containing the volume to be copied from. The device must be in the DOWN state, with the exception of system domain discs. (Refer to the ;DOWN command in Section III.)
<i>toldev</i>	Indicates the logical device number of the device containing the volume to be copied to. The device must be in the DOWN state.
<i>genindex</i>	Indicates a value from 0 to 32767, specifying the generation index of the medium. If not specified, the generation index of the to-volume will be one greater than that of the from-volume. You may specify a generation index for the to-volume that is different than that of the from-volume. Valid only for private volumes.
VER[ify]	Verifies any bad data which is encountered during the copy process (that is, this option tries to recover a track; if the track is unrecoverable, the option reassigns the track and then copies it again). The [VER[ify]] option checks only the readability of data on destination medium.
<i>size</i>	Signifies a value from 1 to 32 which specifies the internal buffer size in kilowords. (Default is 32.)

NOTE

No more than two of the options GEN, VER, or BUF can be specified at a time.

The following is an example of output generated by the >COPY command:

```
>COPY 2,3;VERIFY
Beginning Copy (20% of disc space)
UNREADABLE OR LOST DATA IN SECTORS 8075 - 8075 (TRACK: CYL 6 HEAD 11)
20% completed.
40% completed.
60% completed.
80% completed.
```

```
Beginning Verify
UNREADABLE OR LOST DATA IN SECTORS 8075 - 8075 (TRACK: CYL 6 HEAD 11)
```

```
-----
FILE                                LOST DATA (SECTORS)
                                PHYSICAL ADDRESS  LOGICAL ADDRESS
-----
JUNK.PUB.SYS                       8075                (3)
```

```
>
```

The following conditions must exist for the >COPY command to be successful:

- If you are not copying system domain discs, both the to-device and the from-device must be in the DOWN state or have a scratch medium mounted on them. If you are copying system domain discs, only the to-device must be in the DOWN state, only one user can be on the system, and no temporary files can exist. (VINIT will disable the logging facility.)
- Both devices must be of the same type (i.e., HP 7920A, etc.).
- If the to-device has deleted or suspected tracks, they will be reassigned or spared automatically.

The >COPY command allows you to copy system domain discs, private volumes, serial discs, and foreign discs. Except for foreign discs, only the used part of the disc is copied; i.e., the portion from the beginning of the disc to the highest used sector on the disc. If you decide to copy the entire disc image, you must scratch the media. (Refer to the >SCRATCH command.)

Several special conditions apply when you are copying system domain discs: you cannot down the device; to preserve data integrity, there can be only one user on the system, and there must be no temporary files on the system. The >COPY command will place an image of the from-volume on the to-volume. No compaction or other reorganization of the file space on the volume will be performed.

The >COPY command operates on only one from-volume at a time. Thus, in order to back up a multi-volume set, multiple >COPY operations have to be performed. It would be of little practical value to back up only one member of a multi-volume set, since the volume set directory is located only on the master volume of a set. In the case of private volumes, the volume set need not be mounted. However, if the volume set is not mounted and an I/O error resulting in the loss of data

from a file is encountered, the user will not be notified. Therefore, it is recommended that you mount the entire volume set.

This command is breakable, except when used with system domain discs.

The DSTAT Command

The >DSTAT command displays the status of one or more disc drives. The syntax is:

```

    [ldev]
    >DSTAT [ALL ]
    [ @ ]
  
```

where:

ldev Specifies the logical device number of a particular disc drive(s).

ALL or @ Displays the status of all system and nonsystem disc drives.

The default displays the status of all nonsystem disc drives.

An example of the >DSTAT command is:

```

    >DSTAT ALL
    LDEV-TYPE      STATUS      VOLUME (VOLUME SET-GEN)
    -----
    1-7933         SYSTEM     MH7933U0
    2-7920         MOUNTED   USERVOL2 (USERVOL2.PUB.SYS-0)
    3-7920         DOWNED
    4-7920         AVAIL     SLAVOL1  (USERVOL1.PUB.SYS-0)
    5-7920         AVAIL     SLAVOL2  (USERVOL1.PUB.SYS-0)
    6-7920         AVAIL     SLAVOL3  (USERVOL1.PUB.SYS-0)
  
```

Let's examine the "STATUS" of each logical device in the above example.

- The status "SYSTEM" for LDEV 1 means that the volume is a system disc with the volume name MH7933U0. This disc cannot be downed when the system is up.
- The status "MOUNTED" for LDEV 2 indicates that the volume is a private volume with the name USERVOL2. This disc, like the system disc (LDEV 1), is currently being accessed and should not be dismounted or downed.
- The status "DOWNED" for LDEV 3 denotes that this disc cannot be accessed.
- The status "AVAIL" for LDEVs 4, 5, and 6 indicates that the device is up and that a private volume is physically but not logically mounted; that is, the disc is on line, but there are no files being accessed in this volume.

The DTRACK Command

The >DTRACK command allows you to process defective tracks (from the Defective Tracks Table) and defective sectors (from the Defective Sectors Table). In doing so, you can either recover (i.e. ignore), delete, or reassign the defective tracks. The syntax is:

>DTRACK *ldev*

where:

ldev Specifies the logical device number of the device on which the volume is mounted. Private volumes only.

For HP 7911, 7912, 7933, 7935, and 7945 discs, >DTRACK will try to recover data in the suspect sector before the sector is spared. The user will be notified if data is lost. If a private volume is mounted, >DTRACK will also print the names of files which have lost data and will ask if the files should be purged or saved.

The EXIT Command

The >EXIT command exits the VINIT subsystem.

The FOREIGN Command

The >FOREIGN command allows you to create a foreign disc by filling the label area of a volume with zeroes, whether or not it was previously formatted. This command is not appropriate for the HP 7911, 7912, 7914, and 9144 Integrated Cartridge Tape. The syntax is:

>FOREIGN *ldev*

where:

ldev Specifies the device on which the volume is mounted. The device must be a nonsystem domain disc drive in the DOWN state. If the disc is subsequently mounted, the nonstandard label area (track 0, sector 0) will result in the disc being automatically recognized as a foreign disc.

The FORMAT Command

The >FORMAT command allows online formatting of disc packs (including foreign discs and diskettes and HP 7911, 7912, 7914, and 9144 cartridge tapes). Formatting is necessary only when a new, previously unused volume is to be initialized; when an irrecoverable pack error has been detected on a previously used volume; or when using an uncertified cartridge tape or diskette for the first time. The >FORMAT command performs the following functions, which are not performed by the SLEUTHSM program:

1. Writes a valid SCRATCH label. The >FORMAT command automatically calls in the procedures that are called in with the >SCRATCH command.

2. Sets the tracks above the logical pack size to the SPARE state. (HP 7920 and 7925 discs only.)
3. For HP 7920 and 7925 discs, the >FORMAT command builds a Defective Tracks Table (DTT) containing tracks that failed the verification part of the formatting process. The user is prompted to decide whether to reassign or recover each suspect track. The user may also request that certain tracks be reassigned if he or she knows they are defective, even though they passed the verification phase. These HP disc packs come with a list of tracks which have failed a long and extensive diagnostic test. It is conceivable that such tracks may pass the single test of the >FORMAT command, but these tracks should still be reassigned.

For the HP 7911, 7912, 7914, and 9144 Integrated Cartridge Tape Units and HP 7933, 7935, and 7945 discs, the >FORMAT command builds a Defective Sectors Table (DSCT) containing suspect sectors. The process of reassignment and recovery is automatic.

The syntax of the command is:

```
>FORMAT ldev
```

```
[ ; IBM : volid ]
```

where:

<i>ldev</i>	Specifies the logical device number of the device on which the medium to be formatted is mounted. This parameter must specify a nonsystem disc or cartridge tape drive which is in the DOWN state or a scratch volume.
IBM	Indicates IBM format (single-sided diskette only). Default is HP standard format.
<i>volid</i>	Denotes the IBM volume identifier. Default is IBMIRD. For single-sided diskette only.

NOTE

To format a disc pack, the FORMAT switch on the disc drive must be ON for the >FORMAT command to be effective. This switch is located behind the front door of the disc drive. Refer to the appropriate maintenance manual for the device if you have any questions.

The HELP Command

The >HELP command lists the VINIT commands, displaying the name, the syntax, and a brief definition of each. An example of the >HELP command is as follows:

```
>HELP
FORMAT ldev          <<writes a scratch label; sets up dti, spares>>
SERIAL ldev         <<writes a serial disc type label>>
FOREIGN ldev       <<makes disc volume foreign>>
```



```

INIT volumename, ldev,
    vsid.gname.aname[;GEN=xx] <<writes PV label>>
INIT volumename, ldev,
    [;GEN=xx] <<uses last VS from INIT or PDEFN>>
SCRATCH ldev[;RESET] <<writes (resets) a SCRATCH type label>>
VERIFY ldev[;DTT] <<verifies (reads) data>>
COPY fromldev,toldev
    [;GEN=xx][;VERI[;BUF=yy] <<copy disc-disc>>
COND ldev <<condenses disc space holes>>
COND ldev;RECOVER <<recovers lost disc space for PV>>
DSTAT [ALL!@!ldev] <<gives status of drives>>
PDEFN vsname.gname.acctname <<lists VS specified>>
PDEFN *.gname.acctname <<lists home VS of gname.acctname>>
PDEFN <<lists home VS of logon group
    or repeats last VS>>
FLABEL ldev <<prints disc label>>
PDTRACK ldev <<prints defective track label contents>>
PFSPACE ALL <<prints DFSM as histogram>>
PFSPACE ldev <<prints out DFSM as histogram for LDEV>>
PFSPACE ldev;ADDR <<prints out Disc Free Space Map (DFSM)>>
DTRACK ldev <<processes suspect tracks in defective
    track table>>

```

The INIT Command

The >INIT command is used to complete the conditioning of a private volume formatted previously either by the SLEUTHSM program or by the VINIT >FORMAT command. Do not use the >INIT command to label a disc pack destined for the system domain; this function is performed during cold load as the disc is configured into the system. The >INIT command is not applicable to foreign discs or HP 7911 or 7912, 7914, and 9144 cartridge tapes. The syntax of the >INIT command is:

```

>INIT vname, ldev [ vsname.groupname.acctname ]
    [;GEN=genindex]

```

where:

- vname* Specifies the name of the volume set member (volume) to be conditioned.
- ldev* Specifies the logical device number on which the volume is mounted. This parameter must specify a nonsystem disc drive that is in the DOWN state or the SCRATCH state.
- vsname.groupname.acctname* Specifies the name of the volume set. These parameters (although shown as optional above) must be specified if the volume set name has not been specified in a previous >INIT command. If *vname* specifies the master volume of a volume set, additional initializing is performed. Specifically, a table of volume members and a volume set file directory nucleus are placed on the volume.
- genindex* A value from 0 to 32767 specifying the generation index of the volume. If not specified, VINIT assigns an index of zero. All volumes of a volume set should be initialized with the same generation index to allow subsequent mountings to be successful.

Before a volume can be initialized, the following conditions must be met:

1. The volume set must have been defined previously by a `:NEWVSET` command.
2. The directory must be set up for a master volume of a volume set. If a master volume is being initialized, the user will be prompted for directory size.
3. The volume must be physically mounted on the device specified by *ldev*.
4. The logical device must be a nonsystem disc drive with a `SCRATCH` volume mounted, or it must be in the `DOWN` state. If it is `DOWN` but not in the `SCRATCH` state, the user will be prompted to verify that he wishes to destroy the old contents of the pack. This requirement for `DOWN` or `SCRATCH` is called "DOWN/SCRATCH".
5. The volume must have been formatted previously with the `SLEUTHSM` program or with the `VINIT >FORMAT` command.

For HP 7920 and HP 7925 discs, `VINIT` will construct a Defective Tracks Table (DTT) as a part of the initializing process. If defective tracks are encountered during initialization, a message indicating the number of detected suspect tracks is printed; `VINIT` will reassign any tracks designated by the user.

For the HP 7911, 7912, 7933, 7935, and 7945 `VINIT` will construct a Defective Sectors Table (DSCT) which will record suspect sectors. Defective sectors are spared automatically.

The `>INIT` command is not appropriate for the Foreign Disc Facility because foreign discs have no label and, therefore, no volume name (e.g., the *vname* parameter). This command is also not appropriate for serial discs.

The PDEFN Command

The `>PDEFN` command prints a listing from the system directory of the volume set definition of the specified volume set. The `>PDEFN` command is only applicable to private volumes. The listing contains the following information:

- Volume set definition.
- Number of volumes in the volume set.
- The index numbers, names, and device subtypes of all the member volumes.

This command is not applicable to foreign discs.

The syntax of the `>PDEFN` command is:

```
>PDEFN [ * .group.account ]
        [vname.group.account ]
```

where:

- * Specifies the home volume set for the specified group and account.
- vname* Specifies the volume set name.

If neither `*` nor *vname* is specified, the listing will be for the volume set specified in the last `>INIT` command.

An example of the >PDEFN command is:

```
>PDEFN USERVOL2.PUB.SYS
SET DEFINITION: USERVOL2.PUB.SYS MVTAB INDEX: 0
NUMBER OF VOLUMES: 2 VOLUME MASK: %000003
INDEX MEMBER SUBTYPE
-----
1 USERVOL2 4
2 SLAVOL2 4
```

The PDTRACK Command

The >PDTRACK command allows you to print a list of all suspected, reassigned, and deleted tracks referenced in the volume's Defective Tracks Table or Defective Sectors Table. This command is not appropriate for foreign discs or cartridge tapes. The syntax is:

```
>PDTRACK ldev
```

where:

ldev Specifies the number of the logical device on which the volume is mounted.

The PFSPACE Command

The >PFSPACE command prints a listing of the Disc Free Space Map in one of two formats: either as a table of free space areas or a report of the free space area addresses and sizes. This command is not appropriate for foreign discs. The syntax of >PFSPACE is:

```
>PFSPACE {ldev [ ;ADDR ] }
        { ALL } }
```

where:

ldev Specifies the logical device on which the volume is physically mounted. When this parameter is included, a table of the free space on the specified logical device is printed.

ADDR Displays the Disc Free Space entries (in free space address/free space size format) for the specified logical device.

ALL Displays the Disc Free Space Map in table format for all system and private volumes which are physically mounted.

The following examples illustrate the output from the >PFSPACE command:

```
>PFSPACE 1 ;ADDR
LDEV: 1
ADDRESS SIZE ADDRESS SIZE ADDRESS SIZE
36736 1 38454 1 43056 1
44620 1 70307 1 74696 158
75355 120245
```

```

NO. ENTRIES: 7
TOTAL VOLUME CAPACITY: 195600 SECTORS
TOTAL FREE SPACE AVAILABLE: 120408 SPACE
MAXIMUM CONTIGUOUS AREA: 120245 SECTORS

```

```

>PFSPACE 2
VOLUME DFST                                LDEV 2
LARGEST FREE AREA = 194444
SIZE      COUNT      SPACE      AVERAGE
>100000   1          194444     194444
>10000    0           0           0
>1000     0           0           0
>100      0           0           0
>10       0           0           0
>1        100        200         2
TOTAL FREE SPACE = 194644
*****

```

The PLABEL Command

The >PLABEL command lists the contents of the mounted volume's label on the specified logical device. If the volume is a scratch volume or serial volume, a message signifying such is printed. For all system or nonsystem discs which are not private volumes, only the device type and subtype are printed. Otherwise, the following information is printed for nonsystem private volumes:

- Volume name.
- Device type and subtype.
- Creation date and generation index.
- Volume set to which the volume belongs.
- Master volume set information.
- The names of the member volumes of the set.

This command is not appropriate for foreign discs. The information generated is incorrect and is not taken from the label. Instead, the following error message is generated:

```
INAPPROPRIATE OPERATION FOR FOREIGN DISC
```

The syntax of the >PLABEL command is:

```
>PLABEL ldev
```

where:

ldev Specifies the logical device number of the mounted volume's device.

The following example illustrates output from the >PLABEL command:

```
>PLABEL 2
LDEV NAME:  USERVOL2, TYPE:  0, SUBTYPE:  4
CREATE DATE: 1/20/83, GENERATION: 0
VS NAME:    USERVOL2, GROUP:  PUB    , ACCOUNT:  SYS
MASTER VOLUME INFORMATION -
  DIR. BASE: 48    , DIR. SIZE: 500
VOLUME DIRECTORY
  NAME      SUBTYPE
-----
USERVOL1   4
SLAVOL2    4
```

For private volumes only, the subtype listed under the volume directory is actually the device pseudo-subtype, which is: Pseudo-subtype=(16*type)+subtype.

The SCRATCH Command

The >SCRATCH command allows you to set an initialized volume to the SCRATCH state, thus making it available for assignment to a volume set. In addition, the RESET parameter of this command can be used to set a volume from scratch to nonscratch. This command is not appropriate for foreign discs, nor for the HP 7911, 7912, 7914, or 9144 cartridge tapes. The syntax is:

```
SCRATCH ldev
```

```
[ ;RESET ]
```

where:

ldev Specifies the logical device number of the device on which the medium to be scratched is mounted. Device must be in the DOWN state.

RESET Resets a volume from scratch to nonscratch.

The SERIAL Command

The >SERIAL command is used with all serial media (including HP 7911, 7912, 7914, and 9144 cartridge tapes, and diskettes). It changes the volume label to indicate that the volume is a serial medium. The syntax of the >SERIAL command is:

```
>SERIAL ldev
```

where:

ldev Specifies the logical device number of the device on which the medium is mounted. This parameter must specify a nonsystem serial medium which is in the DOWN/SCRATCH state.

The VERIFY Command

The >VERIFY command checks readability of data on discs or HP 7911, 7912, 7914, and 9144 cartridge tapes. It will verify only the used part of the medium, except in the case of scratch volumes or foreign discs, where the entire medium is examined. The syntax is:

>VERIFY *ldev*

[;DTT]

where:

ldev Specifies the logical device on which the medium is physically mounted.

DTT Only suspect sectors/tracks (as recorded in the Defective Sectors/Tracks Table) are verified. This option is not applicable to serial or foreign discs or cartridge tapes.

For mounted private volumes or configured system discs, any bad sectors/tracks which are encountered are checked against the File System. All files with bad data are reported.

The **>VERIFY** command locks the system directory when looking for files with bad data.

The command is breakable, but cannot be aborted.

Using the VINIT Subsystem

To condition (format and initialize) a private volume, perform the following steps:

1. Down the drive on which the volume will be conditioned (use the console **:DOWN** command).
2. Set the RUN-STOP switch on the disc drive to STOP.
3. Set the FORMAT switch (behind the front door of the disc drive) to ON.
4. Install the disc pack to contain the private volume on the disc drive.
5. Set the RUN-STOP switch on the disc drive to RUN.
6. Log on (you must have System Manager (SM) or System Supervisor (OP) capability).
7. Run the VINIT subsystem (**:VINIT** command).
8. Format the volume (VINIT **>FORMAT** command).
9. Initialize the volume (VINIT **>INIT** command).
10. Exit the subsystem (VINIT **>EXIT** command).
11. Up the disc drive (use the console **:UP** command).

The following example illustrates the above procedure. In the example, a previously used private volume mounted on logical device 3 is being formatted and initialized.

```

:DOWN
13:29/8/DISMOUNT ON LDEV# 3
13:33/8/UNKNOWN VOLUME ON LDEV# 3
:VINIT      ** Runs the subsystem **
VINIT G.01.00 (C) HEWLETT-PACKARD CO., 1978
>DSTAT ALL  ** Gives the statuses of the drives **
LDEV-TYPE  STATUS  VOLUME  (VOLUME SET-GEN)
-----
1-7920     SYSTEM  MH7920U0
2-7920(R)  AVAIL   USERVOL1 (USERVOL1.PUB.SYS-0)
3-7920(R)  DOWNED
4-7920(R)  AVAIL   SLAVOL1  (USERVOL1.PUB.SYS-0)
5-7920(R)  AVAIL   SLAVOL2  (USERVOL1.PUB.SYS-0)
6-7920(R)  AVAIL   SLAVOL3  (USERVOL1.PUB.SYS-0)
>FORMAT 3   ** Allows online formatting of disc packs **
>INIT PRIVOL1,3,PRIVOL1.PUB.SYS  ** Completes volume conditioning
ENTER DIRECTORY SIZE (SECTORS - 384 TO 65,000): 500
>EXIT      ** Exits the subsystem **
END OF SUBSYSTEM
:UP 3      ** Ups the disc drive **
:DSTAT ALL  ** Gives the statuses of the drives **
LDEV-TYPE  STATUS  VOLUME  (VOLUME SET-GEN)
-----
1-7920     SYSTEM  MH7920U0
2-7920(R)  AVAIL   USERVOL1 (USERVOL1.PUB.SYS-0)
3-7920(R)  AVAIL   PRIVOL1  (PRIVOL1.PUB.SYS-0)
4-7920(R)  AVAIL   SLAVOL1  (USERVOL1.PUB.SYS-0)
5-7920(R)  AVAIL   SLAVOL2  (USERVOL1.PUB.SYS-0)
6-7920(R)  AVAIL   SLAVOL3  (USERVOL1.PUB.SYS-0)

```

SERIAL DISCS

Serial discs are cartridge tapes or nonsystem domain discs treated as serial devices. To MPE, the discs appear to be magnetic tape drives and thus provide fast backup and recovery capability when used as an alternative to magnetic tape in :SYSDUMP, :STORE, and :RESTORE activities.

Cartridges can be configured as serial discs, either during a :SYSDUMP or during an initialization (cold load) dialogue. First, the disc is assigned to a class by logical device number, and then the class is designated a serial disc class in response to a special prompt.

The following devices are supported as serial discs: HP 7920, 7925, 7933, and 7935 disc drives, the HP 9144 cartridge tape, and the integrated cartridge tape of the HP 791X disc drive. Cartridge tapes are supported only as serial discs.

Media mounted on a serial disc device must be initialized for serial use by the System Operator using the VINIT subsystem. Initialization places a special mark in the disc label, which is subsequently used for identification by MPE. When MPE recognizes a medium with this mark, it sends a mount notification message to the System Console.

NOTE

The configuration dialogue of SYSDUMP or INITIAL allows the user to specify any moving-head disc supported by private volumes as a serial disc. However, the VINIT subsystem will only initialize media for serial use on supported serial disc devices. The configuration dialogue also does not restrict the user to a serial disc class for cartridge tape drives, but results are unpredictable if they are not so specified.

It is possible to configure a disc drive into two types of classes, one of which is a serial disc class and the other a private volume class. For example:

<u>CLASS NAME</u>	<u>LOGICAL DEVICE NUMBER</u>
PVDISC	5,6,7,8
SDISC	7,8

All of the above devices (LDEVs 5,6,7, and 8) can be used for private volumes or serial discs (provided that LDEVs 5,6,7, and 8 are not Integrated Cartridge Tape Units, which are treated only as serial disc devices, and that classes PVDISC and SDISC are in the nonsystem domain).

1

1

1

1

The device class SDISC (assuming that it has been configured as a serial disc class) can be used in the :FILE and :BUILD commands. For example:

```
:FILE filename;DEV=SDISC
```

This file equation will allocate devices 7 or 8. To use device 5 or 6 for a serial disc operation, you must specify the logical device number rather than the device class SDISC:

```
:FILE filename;DEV=5 or (6).
```

Conditioning Serial Disc Media

Before a medium can be used as a serial disc, it must be conditioned with the VINIT subsystem. The procedure is as follows:

1. Down the disc drive on which the medium will be conditioned (console :DOWN command).
2. Set the RUN-STOP switch on the disc drive to STOP. (Not applicable to the Integrated Cartridge Tape Unit.)
3. Set the FORMAT switch (behind the front door of the disc drive) to ON. (Not applicable to the Integrated Cartridge Tape Unit.)
4. Mount the volume on the disc drive or insert cartridge into drive and wait until it is loaded.
5. Log on (you must have System Manager (SM) or System Supervisor (OP) capability).
6. Run the VINIT subsystem (:VINIT command).
7. Format the medium (VINIT >FORMAT command).
8. Condition the volume as a serial disc (VINIT >SERIAL command).
9. Up the drive before accessing the medium (console :UP command).

Foreign Discs

The foreign disc is a type of nonsystem domain disc (similar to a serial disc and private volume) that enables nonprivileged users to access and alter data residing on any removable disc (including the flexible disc, or diskette) not in standard HP 3000 MPE format. For example, you can read or write HP 250, HP 300, or even IBM 3741 formatted diskettes provided that you know the disc and diskette formats. The data is written to or read from a disc volume as though it were a standard MPE file. All that you need to do is write your own programs to interpret (if reading) or format (when writing) the data. (Foreign disc operations are not applicable to the Integrated Cartridge Tape Unit.)

A query in SYSDUMP and INITIAL will allow the user to assign the device class "FOREIGN". Once a device class has been designated as a foreign class, it is then possible to mount any drive-compatible disc on the corresponding logical device and, by utilizing your own code, you can access and alter any and all information on that disc. Whenever you want to convert any disc format (i.e., serial disc format) to a foreign disc, VINIT is used.

To create a foreign disc on logical device 3, you would mount a diskette on the drive, down the drive, enter the VINIT subsystem, and enter:

>FOREIGN 3

Logical device 3 must be a nonsystem domain disc drive in the DOWN state. The action of this command is to fill the MPE disc label that either was or was not a previously formatted volume with zeros, since having all zeroes on a label is not a recognizable MPE label. (Any other nonrecognizable sector-zero content would do as well.) This volume will then be recognized as a foreign disc with all subsequent usage. (The MPE label area is track 0, sector 0.)

The status of the foreign disc on logical device number 3 can be displayed using the VINIT >DSTAT command.

The user command :DSTAT will also display the FOREIGN status of a disc; this command has the same format as the VINIT >DSTAT command. The operator command :FOREIGN is designed to enable the System Operator to intervene when necessary. For example, to label the disc mounted on LDEV 3 as foreign, you must first verify the status of this disc by entering:

:DSTAT 3

<u>LDEV-TYPE</u>	<u>STATUS</u>	<u>VOLUME (VOLUME SET-GEN)</u>
3-7902	SERIAL	*UNALLOCATED*

Then enter:

:FOREIGN 3

To verify the change, enter:

:DSTAT 3

<u>LDEV-TYPE</u>	<u>STATUS</u>	<u>VOLUME (VOLUME SET-GEN)</u>
3-7902	FOREIGN	*UNALLOCATED*

THE SOFTWARE DUMP FACILITY

The Software Dump Facility (SDF) gives you the capability of storing all of main memory to either a serial disc or magnetic tape. It operates in a standalone environment after a system failure has occurred or a system halt has been performed.

It is a wise precaution to have one or more backup copies of the SDF on a serialized medium. (Refer to "CREATING A BACKUP SDF" in this section.) Keep some serialized media on hand for taking dumps. Cartridges cannot be serialized after the system has crashed or hung.

To take a standard memory dump:

1. Mount a serial storage medium on a logical device specified by the device class DDUMP, then place the drive on line.

NOTE

Device class DDUMP can only be configured on one *ldev* at a time.

2. Series 37
 If the DCU prompt is not displayed on the System Console, turn keyswitch to position 2 or 3, then enter B^C. When the prompt H for help-> appears, enter DUMP.
- Series 39/40/42, & 44/48
 On the System Control Panel, set the DUMP thumbwheel switches to the channel and device address of the system disc. (Refer to SYSTEM CONTROLS AND SPECIAL FUNCTIONS, Section XI, for more information on thumbwheel switch settings.)

 Enable the CMP by pressing B^C. When you see the CMP prompt character (->), enter "DUMP" on the System Console or press the DUMP key on the control panel.
- Series 64/68
 If the DCU prompt (M>) is not already present on the System Console, enter B^C. When the prompt appears, enter "DUMP".
3. At this point, the SDF is loaded from the specified device and begins a serial execution of the SDF command file (SDFCOM.PUB.SYS), which contains SOFTDUMP commands and is located on the system disc.

The default SDFCOM file is:

```
PROMPT MOUNT DUMP MEDIA, AND PLACE DRIVE ON-LINE.
DUMP
WARMSTART
```

4. If the Software Dump Facility is loaded correctly, the following message will appear on the System Console:

```
***SOFTWARE DUMP FACILITY (VER xxx.xxx/xxx)***
```

The system will then execute the next instruction in the SDFCOM# file.

```
MOUNT DUMP MEDIA, AND PLACE DRIVE ON-LINE.
PRESS THE RETURN KEY TO CONTINUE EXECUTION OF SOFTDUMP.
```

NOTE

If a cartridge tape is being used, check to make sure it is not write protected, then insert the cartridge. When the cartridge has been loaded (the drive is no longer busy), check to ensure that the cartridge is firmly in place by pressing the eject bar.

5. Series 37

If a cartridge tape is being used, insert the cartridge. When the cartridge has been loaded (the drive is no longer active), check to ensure that the cartridge is firmly in place by pressing the eject bar. If the cartridge is correctly loaded, enter **RETURN**. The system will execute the DUMP. If the user enters **RETURN** while the drive is still active, the system will wait until the cartridge has been loaded. If a cartridge has not been inserted when entered, the user will be informed that the drive is not ready:

TAPE DRIVE NOT READY.

Check to see that the serial storage medium is on line and ready, then press the return key to continue execution of SOFTDUMP.

Series 39/40/42 & 44/48

Check to see that the serial storage medium is on line and ready, then press the RUN key on the System Control Panel or enter "RUN" in response to the CMP prompt.

Series 64/68

Check to see that the serial storage medium is on line and ready, then enter "RUN" in response to the DCU prompt on the console.

Main memory is then dumped to the serial storage medium, and the SOFTDUMP executes a WARMSTART command.

6. If the system halts while loading the SDF, the following error message will appear on the System Console:

***DUMP FAILED

This message indicates that an error has been detected, and the SDF is unable to execute. A backup software dump must be performed. (Refer to "CREATING A BACKUP SDF" in this section.)

7. If SDF prompts for a command by printing SOFTDUMP COMMAND>, enter any SDF command listed in Table 10-1.

8. If the SDF command file does not exist or has been corrupted, or if your serial storage medium is flawed, the following message may appear on the System Console:

```
SERIAL DEVICE I/O ERROR - You are now in  
SOFTDUMP INTERACTIVE MODE. Please mount  
new media, then type 'DUMP' in response to the  
prompt SOFTDUMP COMMAND>.
```

Entering Y^c on the System Console at any time while the SDF file is executing may cause SDF to abort the current command and place the user in interactive mode.

If you want to format and print the dump to a line printer, run the DPAN/DPAN5 utility program immediately after restarting the system. DPAN/DPAN5 is described in the MPE V Utilities Reference Manual (32033-90008).

Instructions for altering the SDF command file appear later in this section (refer to "CHANGING THE SDF COMMAND FILE".)

Creating a Backup SDF

Regardless of your system's configuration, it is a wise precaution to have one or more backup copies of the Software Dump Facility on serial disc or cartridge tape.

As previously mentioned, there may be times when a system failure or other system problem could cause the system disc or its files to be inaccessible. In this case you would need a backup copy of the SDF on a dedicated removable serial medium, such as a flexible disc or cartridge tape. If your system does not include a flexible disc or cartridge tape and does not have a nonsystem domain disc drive available for serial disc use, you cannot create a backup SDF. In such cases, contact your Hewlett-Packard Customer Engineer if an attempted memory dump fails.

NOTE

Remember that a backup SDF cannot be created after a software dump has failed; you must have one already on hand. A backup SDF disc or cartridge tape should be created when the system is initially configured, and you should create a new backup SDF each time you receive a software update. This will ensure that you have the correct version of SDF on your backup copy at all times.

You can create a backup copy of SDF by proceeding through the following steps:

1. If your serial disc or cartridge tape has not been previously serialized, or if you are not sure if it has, perform Steps 2 through 6. If your serial disc or cartridge tape is already serialized, simply mount it in your drive, close the door, then proceed to Step 7.
2. Mount a serial disc or cartridge tape in your drive and close the door.

3. In session mode, enter `:DOWN ldev` (where *ldev* is the logical device number of the serial disc drive or the cartridge tape unit).
4. Enter the VINIT subsystem (`:VINIT`).
5. The VINIT subsystem will prompt you with a greater-than sign (`>`). Enter:

```

>SCRATCH ldev      ** >SCRATCH is not appropriate for cartridge tapes **
>FORMAT ldev
>SERIAL ldev

```

6. Exit the VINIT subsystem (`>EXIT`).
7. Enter `:UP ldev`.
8. Log on and enter:

```

:FILE SDFLOAD = SDFLOAD.PUB.SYS
:FILE SDFBACK;DEV = ldev      ** Number of that device **
:RUN SDFGEN.PUB.SYS

```

9. When the program finishes, remove the serial medium and keep it for future use.

How to Perform a Backup Software Dump

When executing a backup software dump, you perform essentially the same functions as in a standard software dump, except that a serialized disc or cartridge tape is accessed rather than the system disc.

Note that once a software dump has failed, it may not be possible to get an accurate memory dump. If the backup software dump also fails, call your Hewlett-Packard Customer Engineer.

You can perform a backup software dump by following these steps:

1. Mount the medium which contains the backup SDF on the appropriate drive and put the drive on line, if applicable.

2. Series 37

If the DCU prompt `H` for `help->` is not already present on the System Console, enter `BC`. When the prompt appears, enter `DU[mp] [channel, device]`.

The optional parameters specify the channel number and device number from which the SDF will be loaded (the serial disc or cartridge tape drive).

- Series 39/40/42, & 44/48

On the System Control Panel, set the DUMP thumbwheel switches to the channel and the HP-IB device address of the drive. Refer to SYSTEM CONTROLS AND SPECIAL FUNCTIONS, Section XI, for more information on thumbwheel switch settings. If the DCU prompt (`->`) is not already present on the System Console, enter `BC`. When the prompt comes up, enter DUMP or press the DUMP key on the control panel.

Series 64/68

If the DCU prompt (C>) is not already present on the System Console, enter B^C. When the prompt appears enter:

DUMP *imb,channel,device*

The parameters specify the Intermodule Bus (IMB) number, channel number, and device number from which you want to load the SDF; i.e., the serial disc or cartridge tape drive.

3. If SDF is loaded correctly, the following message appears on the Console:

SOFTWARE DUMP FACILITY (VER *xxx.xxx/xxx*)

Because you are performing a backup rather than a regular software dump, SDF automatically enters interactive mode. The following question will appear on the System Console:

System Disc DRT?

Reply with a RETURN, then enter:

DUMPDEV *nm*

where *nm* is the DRT number of the device you wish to dump to. If no DUMPDEV command is entered, the SDF will dump to the device from which the SDF was loaded when the DUMP command is issued.

Now enter the following:

DUMP

4. If the system halts while attempting to load the SDF, the following error message may appear on the Console:

***DUMP FAILED

If this happens, call your Hewlett-Packard Customer Engineer.

5. Enter the WARMSTART command. Any of the system startup options described in the Five Startup Procedures in Section IV can be used.

Changing the SDF Command File

There are times when you may wish to change the records (SDF commands) in your SDF command file; for example, you might want to change the default SDF command file so that it will operate in interactive mode. Or, after taking a dump, you might want to restart your system with some option other than WARMSTART. (Refer to Table 10-1 for an explanation of the SDF commands.)

To make changes to SDFCOM, proceed as follows:

1. Use EDIT/3000 (or equivalent) to edit the existing SDFCOM file or to create a new file.
2. Keep the file (unnumbered) to a unique file name.
3. Enter this file name in response to the question "SOFTDUMP COMMAND FILE NAME?" in the following :SYSDUMP dialogue:

```
:SYSDUMP *dumpfile
ANY CHANGES? YES
SYSTEM ID=32033G.01.00? (RETURN)
MEMORY SIZE=cccc? (RETURN)
I/O CONFIGURATION CHANGES? (RETURN)
SYSTEM TABLE CHANGES? (RETURN)
MISC CONFIGURATION CHANGES? YES
LIST GLOBAL RINS? NO
DELETE GLOBAL RINS? NO
# OF RINS MIN=yy, MAX=cccc? (RETURN)
# OF GLOBAL RINS USED=yy, MAX=cccc? (RETURN)
# OF SECONDS TO LOG ON=cccc? (RETURN)
MAX # OF CONCURRENT RUNNING SESSIONS=cccc? (RETURN)
MAX # OF CONCURRENT RUNNING JOBS=cccc? (RETURN)
DEFAULT JOB CPU TIME LIMIT=cccccc? (RETURN)
MESSAGE CATALOG CHANGES? (RETURN)
SOFTDUMP COMMAND CHANGES? YES
SOFTDUMP COMMAND FILENAME? filename
```

At this point, :SYSDUMP runs a utility program (SDFCHECK), which checks the syntax of the input file. If there are no errors, the contents of the file specified by *filename* overwrite the contents of SDFCOM.

4. The SYSDUMP dialogue continues as follows:

```
NEW COMMAND FILE CREATED
LOGGING CHANGES? (RETURN)
DISC ALLOCATION CHANGES? (RETURN)
SCHEDULING CHANGES? (RETURN)
SEGMENT LIMIT CHANGES? (RETURN)
SYSTEM PROGRAM CHANGES? (RETURN)
SYSTEM SL CHANGES? (RETURN)
ENTER DUMP DATE? (RETURN)
END OF SUBSYSTEM
```

The new command file is written on the device you specified in the SYSDUMP file equation.

5. Perform a cold load with the tape or disc created by the above SYSDUMP to incorporate the new SDF command file into your system.

Table 10-1. Software Dump Facility Commands

COMMAND SYNTAX	FUNCTION
COMMENT <i>string</i>	Defines the comment string.
CONSOLE <i>drt</i>	Changes the Console's channel address and device address.
DEBUG	Causes SDF to enter the HELP debugging routine. (Valid only in interactive mode.)
DUMP [<i>bank</i>]	Dumps main memory to the dump device. The parameter <i>bank</i> specifies the highest bank to dump. If this value is omitted, all banks are dumped.
DUMPDEV <i>drt</i> [, <i>unit</i>]	Changes the dump device's channel address and device address. If this command is not entered, SDF will dump to the device class DDUMP, except in backup mode.
HALT	Causes SDF to halt its execution. (SDF's execution may be continued either by pressing the RUN key or by issuing the RUN command to the CMP or DCU.)
HELP [<i>command name</i>] [, <i>command name</i>]	Prints a brief explanation and syntax of the specified commands. Default: If no command name is input, all commands will be explained.
INTERACTIVE	Obtains any remaining SDF commands from the Console. The SDF prints the " > " prompt character when it is ready for another console command. Commands which cause output to either the dump device or the line printer may require you to change volumes or paper. The SDF will prompt you by issuing the appropriate message on the System Console.
PROMPT <i>string</i>	Prints string on Console then waits for operator to press <u>RETURN</u> before continuing.
WARMSTART	Executes the microcode WARMSTART instruction. This SDF command cannot be executed when SDF has been loaded from a backup medium. Manually start the system using any of the system startup options described in Section IV.

THE DIAGNOSTIC UTILITY SYSTEM (DUS)

The Diagnostic Utility System (DUS) is memory resident and allows you to run diagnostic and utility programs such as SADUTIL and SLEUTHSM (which is discussed later in this section). Refer to the MPE V Utilities Reference Manual (32033-90008) for more information. The DUS is on a stand-alone serial medium and is loaded onto a shut down system. The following steps show you how to load the DUS.

1. Mount the medium containing the Diagnostic Utility System on the appropriate drive and place the drive on line, if applicable.

2. Series 37 Enter B^C on the System Console to enter Control-B mode.

Enter the LOAD command in response to the > prompt. Specify the channel and device on which the medium is mounted.

Series 39/40/42 & 44/48

On the System Control Panel, set the LOAD thumbwheel switch to the channel address and device address of the drive containing the DUS. Refer to SYSTEM CONTROLS AND SPECIAL FUNCTIONS, Section XI, for more information on thumbwheel switch settings.

On the System Control Panel: Press the HALT key, then press the LOAD key.

or

From the CMP: Press RETURN. When the CMP prompt (->) appears on the System Console, enter "HALT ". When another prompt is printed, enter "LOAD ".

Series 64/68

If the DCU prompt (C>) is not already present on the system Console, depress RETURN. When you see the prompt, enter "HALT ". When another prompt appears, enter "LOAD ".

If you wish to cold load from a device other than the present default device, enter the IMB number, channel number, and the device number, separated by commas after "LOAD "; e.g.:

C>LOAD imb,channel,device

Once you have overridden the default cold load device in this way, however, the new values become the default until power is cycled on the system. In this case, the default values initially set by the factory take effect.

3. At this point the medium containing the DUS is read into memory, and the following message appears on the System Console:

```
DIAGNOSTIC/UTILITY SYSTEM  REVISION 3000.3000
ENTER YOUR PROGRAM NAME    (Type HELP for program information.)
:
```

USING SLEUTHSM TO FORMAT SYSTEM PACKS

The following procedure describes how to use SLEUTHSM (the SLEUTH SiMulator), which is part of the Diagnostic Utility System (DUS), to format system disc packs. As previously mentioned, the DUS is on a standalone serial medium and is loaded onto a shut down system.

The HP 7911, 7912, and 7914 Integrated Tape Cartridge Unit and 7933 and 7935 disc drives have an internal mechanism for flagging defective tracks. SLEUTHSM can be used to format these discs, but not to flag defective tracks.

1. Load the Diagnostic Utility System as previously described. All entries for SLEUTHSM must be in upper case.
2. Enter "AID" on the Console and press RETURN.

The following message will appear on the Console:

```
AID xxx.xxx
>10
```

3. As an optional step, enter "LOAD IOMAP" on the Console; to execute, press RETURN. This enables you to determine the channel number, the device number, and, for Series 64 and 68, the IMB number of the discs to be formatted in steps five and seven.
4. Enter "LOAD SLEUTHSM" on the Console and press RETURN.

SLEUTHSM is loaded into memory. The System Console displays the next line number in the program, and you are ready to enter the dialogue necessary to format a disc pack.

5. Enter the following statements to format any disc on the HP 3000 (in line 5000, you must supply the channel number, the device number, the maximum number of errors to observe before the program terminates (designated "20" in this example), the unit number of the drive, and, for Series 64 and 68, the Intermodule Bus number of the drive on which the disc pack is mounted):

```
Series 37, 39/40/42 & 44/48 >5000 DEV 0,channel,device,20, unit
>5010 FMT 0
>5020 RUN
```

```
Series 64/68 >5000 DEV 0,channel,device,20, unit,imb
>5010 FMT 0
>5020 RUN
```

6. After the disc is formatted, SLEUTHSM again prompts for input (>).
7. For flagging defective tracks, enter the program which corresponds to the type of disc pack you wish to flag:

Series 37,39/40/42 & 44/48 **7920 Disc Pack**

```

>5000 DEV 0,channel,device,10,0
>5010 DB AA,6144,0
>5020 RC0
>5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?"
>5040 INPUT A
>5050 PRINT "HEAD #?"
>5060 INPUT B
>5070 SEEK 0,A,B,0
>5080 IDI 0,AA(0),3,D
>5090 PRINT "CONTINUE? (YES/NO)"
>5110 INPUT &BB
>5110 IF &BB="YES" THEN 5020
>5120 RUN

```

7925 Disc Pack

```

>5000 DEV 0,channel,device,10,0
>5010 DB AA,8192,0
>5020 RC 0
>5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?"
>5040 INPUT A
>5050 PRINT "HEAD #?"
>5060 INPUT B
>5070 SEEK 0,A,B,0
>5080 IDI 0,AA(0),3,D
>5090 PRINT "CONTINUE? (YES/NO)"
>5100 INPUT &BB
>5110 IF &BB="YES" THEN 5020
>5120 RUN

```

Series 64/68

7920 Disc Pack

```

>5000 DEV 0,channel,device,10,0,imb
>5010 DB AA,6144,0
>5020 RC0
>5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?"
>5040 INPUT A
>5050 PRINT "HEAD #?"
>5060 INPUT B
>5070 SEEK 0,A,B,0
>5080 IDI 0,AA(0),3,D
>5090 PRINT "CONTINUE? (YES/NO)"
>5110 INPUT &BB
>5110 IF &BB="YES" THEN 5020
>5120 RUN

```

7925 Disc Pack

```
>5000 DEV 0,channel,device,10,0,imb
>5010 DB AA,8192,0
>5020 RC 0
>5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?"
>5040 INPUT A
>5050 PRINT "HEAD #?"
>5060 INPUT B
>5070 SEEK 0,A,B,0
>5080 IDI 0,AA(0),3,D
>5090 PRINT "CONTINUE? (YES/NO)"
>5100 INPUT &BB
>5110 IF &BB="YES" THEN 5020
>5120 RUN
```

The programs ask three questions for each defective track: In response to the first, "CYLINDER # TO BE FLAGGED DEFECTIVE?", enter the cylinder number of the defective track; in response to the second, "HEAD #?", enter the head number of the defective track (the cylinder and head numbers of defective tracks are listed on the "List of Defective Tracks" supplied with each new disc); to the third question, "CONTINUE? (YES/NO)", enter "YES" until you have entered all defective tracks, and then enter "NO".

8. After the defective tracks have been flagged, SLEUTHSM again prompts for input (>). Enter another program or halt the computer.

SYSTEM CONTROLS AND SPECIAL FUNCTIONS

SECTION

XI

The system controls for the HP3000 may consist of both hardware and software related controls, security level controls, and status indicator lights. There are switches and lights on the System Control Panel (Series 39/40/42 and 44/48 systems), and lights on the System Status and Display Panel (Series 64/68 systems). The switches are used to control the operation of the system, while the lights indicate conditions existing in the system.

The Control Maintenance Processor (CMP) and the Diagnostic Control Unit (DCU) allow the System Operator to control the functions of the Series 39/40/42/44/48 and the Series 64/68, respectively, from the System Console.

Series 37 SPU Front Panel

The four position keyswitch used to select the control modes and the power distribution of the SPU is shown in Figure 11-0. Indicator lights display which power configuration is active, and in which mode the system is running. The single-digit LED in the lower left-hand corner of the SPU Front Panel displays MPE status codes when MPE is running, (Table 11-0), and self-test and error detection codes when self tests are being executed. The display is blank when the system is executing operational software.

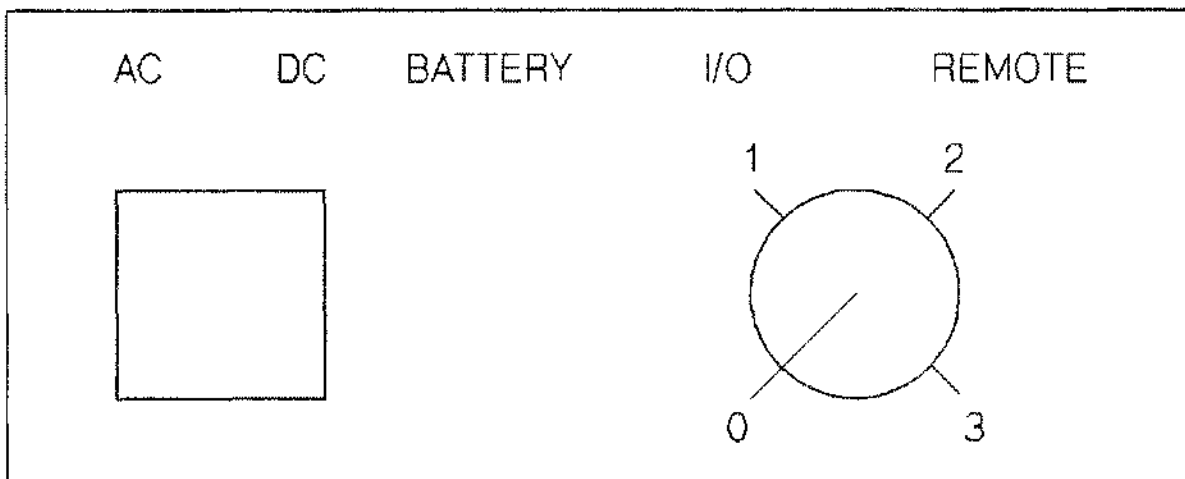


Figure 11-0. Series 37 Front Panel

Four-Position Keyswitch

The positions of the keyswitch have the following meanings:

Table 11-0. Series 37 Keyswitch

#	Condition	Meaning
0	Off	Power off.
1	Normal	Local Mode Console, B ^C (Control B Maintenance Mode) disabled. When the keyswitch is turned to this position, the modem port is a regular MPE port. Operator initiated self-test looping is disabled in this position.
2	Local	Local Mode Console. This position has two states: "From Normal" and "From Remote". From Normal: Same as normal <u>except</u> that B ^C and operator initiated Self Test mode looping are enabled. From Remote: The modem port is now a Remote Operator Port that echoes all local Console commands and responses so that a remote operator can observe them. B ^C and Self Test mode looping are enabled.
3	Remote	Remote Mode Console, B ^C , and Self Test mode looping are enabled. The modem port is now a Remote Operator Port. The local Console port echoes all commands and responses. (As the keyswitch is turned from position 2 to position 3, any previously existing MPE session on the modem port will be logged off for security reasons.)

NOTE

When the keyswitch is set at 3, a regular terminal will be dropped to accommodate a modem. This modem port may be used as a regular terminal port with the keyswitch set at 1 or 2.

When the keyswitch is turned "OFF", leave it in this position for a minimum of 5 seconds. This will allow the system memory to reset to an unpowered state.

When MPE is running, codes are displayed on the Series 37 SPU front panel:

Table 11-0A. MPE Status Code

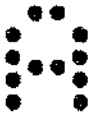

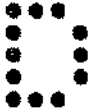
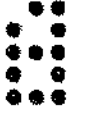
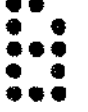
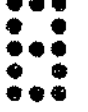
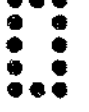
	—	Run Mode. Not processing interrupts and not executing the Pause instructions.
	—	Processing interrupts on the interrupt Control Stack (ICS).
	—	Executing the Pause instruction (idle).
	—	Looping between the conditions that display the A and C codes.
	—	Looping between the conditions that display the A and D codes.
	—	Looping among the conditions that display the A, C, and D codes.
	—	Looping between the conditions that display the C and D codes.

Table 11-0B. Control B Mode Commands

COMMAND	FUNCTION
AR	Re-attempt Auto Restart.
COL[dstart]	Perform COLDSTART with no dialogue.
COO[lstart]	Perform COOLSTART with no dialogue.
DI[sc]	Start from Disc. Same as Start with no parameters.
DU[mp]	[chan,dev] performs a dump to the specified device.
DW	Disable auto warmstart.
EW	Enable auto warmstart.
H[elp]	Display the available commands, parameters, and effects.
L[oad]	[chan,dev [, {P [erm]}], C [hange]}
NEW[system]	Asks, "WHICH OPTION <COLDSTART/RELOAD/UPDATE> ?" and enters INITIAL dialogue. Perform a RELOAD, option SPREAD, with no dialogue. This command assigns a volume name and virtual memory to the system disc. It is valid only for initial software installations on new systems.
PA[nel]	Allow the user to look at memory and software registers, and use the optional memory breakpoint board.
REL[oad]	Perform a RELOAD, option SPREAD, with no dialogue.
RUN	Run system after E ² halt.
SP[eed]	Allow System Operator to change Console speed.
ST[art]	[chan,dev [, {P [erm]}], C [hange]}
	Asks, "WHICH OPTION <WARMSTART/COOLSTART>?" and enters INITIAL dialogue.
TA[pe]	LOAD from tape.
TE[st]	Go to Self Test Mode.
UPD[ate]	Perform UPDATE with no dialogue.
WAR[mstart]	Perform WARMSTART using Start device with no dialogue.

For more information on Control B Mode Commands, refer to Section 4 of this manual.

Front Panel Status Indicators

The front panel status indicators display the state of the SPU:

- AC Lit if AC power is applied to the SPU. Power is always applied to the battery charger. This indicator is lit in all keyswitch positions.
- DC Lit if DC power is applied to the SPU. It is normally lit in keyswitch positions 1, 2 or 3.
- BATTERY Lit if the SPU is operating on battery backup power, and if AC power is not present. This condition can occur when the keyswitch is in position 1, 2 or 3.
- I/O Lit only when the Channel Program Service Request (CSRQ) signal is asserted. It is not lit if TIC(ATP37) or memory operations are being executed. During normal operation, it will flicker when TIC(ATP37) or memory diagnostics are run. It can be lit when the keyswitch is in position 1, 2 or 3.
- REMOTE Lit when a remote Console is in use. This allows a terminal connected to port 7 via a modem to control the system as a remote Console.

Front Panel LED

When the system is in self-test mode, the front panel LED displays a single hexadecimal error code that indicates what components are failing. There are two test modes: self-test and error detection. Self-test is run. If an error is detected, the error detection loop is executed.

The normal sequence of LED codes displayed is:

0, 1, 5, B, C, A

Valid hexadecimal codes and their meanings are shown in Table 11-0C:

Table 11-0C. Front Panel LED Codes

LED Codes	Description
0	Not used.
1	ROM code loads into WCS.
2	Not used.
5	Processor chip, WCS, RFILE tests executing. Flashing 5 indicates CPU test failed.
B	Steady 'B' means Memory test executing. Flashing 'B' means memory test failed.
C	Steady 'C' means Console TIC (Slot 1) being tested. Flashing 'C' means Console speed-sense failed. Confirm that the Console is connected and in REMOTE. '1' means Console TIC failed.
D	IOMAP
E	The ATP37 or PIC in the indicated extender slot has failed the 'E' and slot number flash alternately. A flashing digit (without the E) indicates that a card in that slot has failed. For example, a flashing 4 indicates that the card in slot 4 is bad.
A	All tests passed.
blank	Console operational, failure message (if any) will be on the System Console.

One digit at a time is displayed. If a two-digit error code is displayed, the digits of the code flash alternately.

If no error code is displayed, the SPU is executing operational software.

THE SYSTEM CONTROL PANEL

The following text explains system controls and special functions on the Series 39/40/42 and 44/48. Since the Series 39/40/42 systems are similar in appearance and function, and the Series 44/48 systems are similar to each other, each subset is discussed separately, where applicable.

Device Reference Table (DRT) Number For Series 37

The DRT number for the Series 37 is calculated in the same way as the Series 3X and 4X. The channel number, however, is determined differently. For channel number, cards in the Main card cage have the same channel number as their slot number (1=bottom slot, 5= top slot). Cards in the Extended card cage have a channel number equal to their slot number plus 8. For example, bottom slot = 9, top slot = 14).

For more information on calculating DRT numbers, refer to the DRT Number section for the 3X and 4X in this section.

Series 39/40/42

The System Control Panel is located behind the non-lockable, magnetic-latch door on the right front side of the System Processor Unit (SPU) (Figure 11-1).

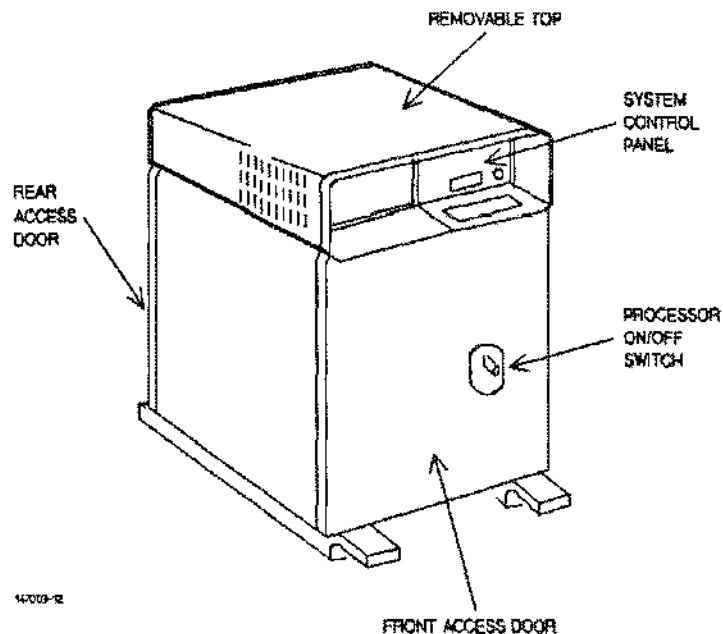


Figure 11-1. Series 39/40/42 System Processor Unit (SPU)



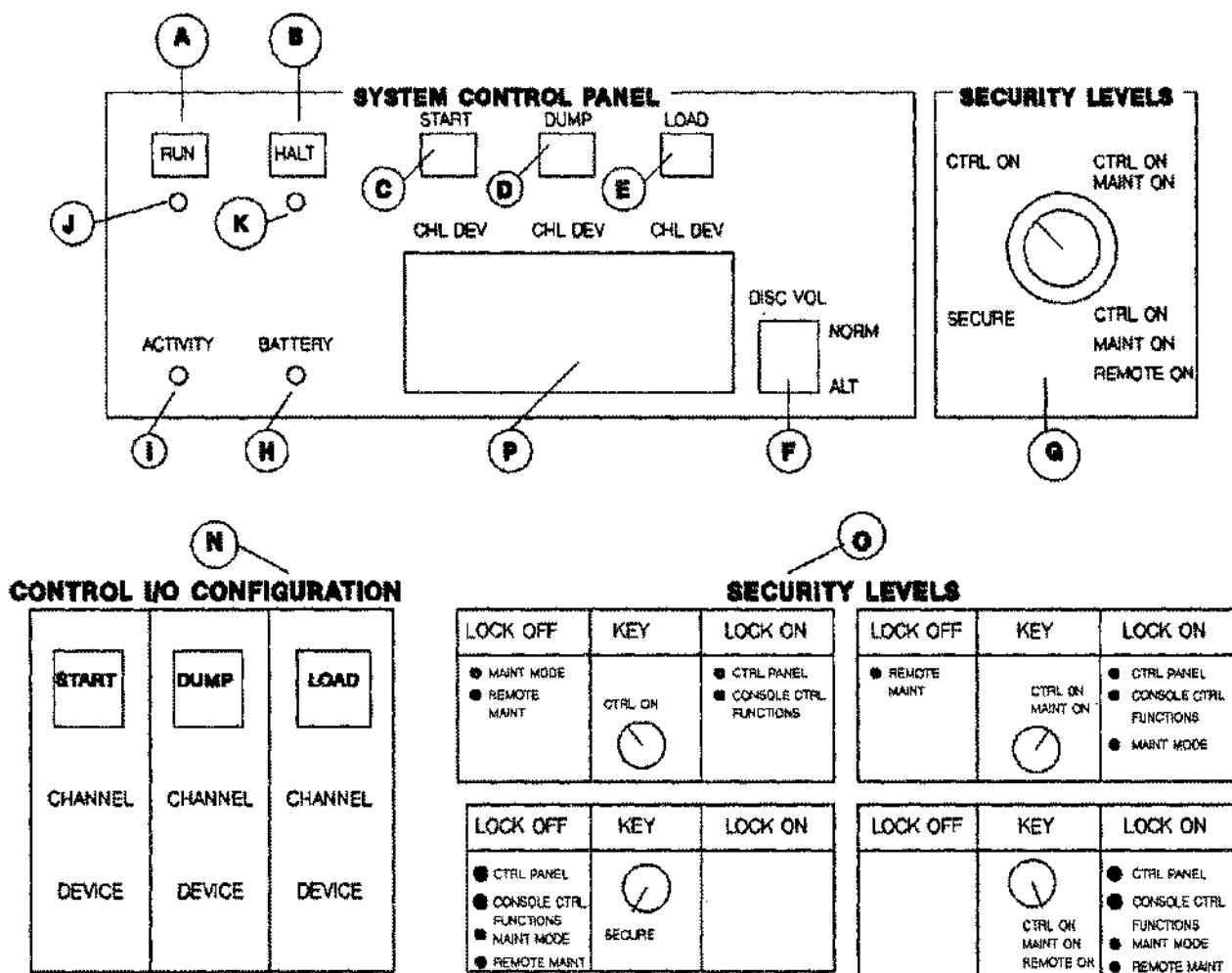


Figure 11-2. Series 39/40/42 System Control Panel Switch/Indicator Function

HARDWARE RELATED CONTROLS. The hardware related controls are the RUN and HALT switches. See Figure 11-2 for an illustration of each of the System Control Panel's switches and indicator lights.

- (A) RUN Pressing this switch causes the CPU to enter the RUN state from the HALT state. The switch has no effect when the CPU is already in the RUN state.
- (B) HALT Pressing this switch causes the CPU to enter the HALT state from the RUN state. The switch has no effect when the CPU is already in the HALT state.

SOFTWARE (MPE) RELATED CONTROLS. The software (MPE) related controls are the START, DUMP, and LOAD switches. The DISC VOL switch is used in conjunction with the START switch to configure the system disc. The thumbwheel switches, located directly below the START, DUMP, and LOAD switches on the System Control Panel, set the CHL (hardware channel) and DEV (HP-IB device) addresses, and are enabled when the respective switch is pressed.

- (C) **START** Pressing this switch initiates either a COOLSTART or a WARMSTART of the system. The CHL and DEV address are set in the thumbwheel switches directly below the START switch (Figure 11-2.)
- (D) **DUMP** Pressing this switch initiates a dump of the system's memory to a serial disc, cartridge tape, or magnetic tape. The CHL and DEV address of the system disc are set in the thumbwheel switches below the DUMP switch.
- (E) **LOAD** Pressing this switch initiates a cold load from the DEV and CHL address set in the thumbwheel switches directly below the LOAD switch. The COLDSTART, UPDATE, and RELOAD operations are begun with this switch.
- (F) **DISC VOL** This switch selects the NORMAL or ALTERNATE disc volume. The switch should always be in the NORM position.

SECURITY LEVEL CONTROL SWITCH. The SECURITY LEVEL CONTROL SWITCH is a four-position key-lock switch which controls the operational security of the system. The four levels are: SECURE, CTRL ON, CTRL ON/MAINT ON, and CTRL ON/MAINT ON/REMOTE ON. Each level is attained by turning the keyswitch to the desired position; the setting can be locked by removing the key. The magnetic-latch door cannot be closed while the key is in place.

(G) **SECURITY LEVELS**

The functions of the four positions are as follows:

1. **SECURE:** Disables the System Control Panel and the CMP. Maintenance Mode functions and the Tele-Support facility are also disabled.
2. **CTRL ON:** Enables the System Control Panel and allows use of CMP commands from the console with the exception of the DISPLAY command. Maintenance Mode functions and the Tele-Support facility are disabled.
3. **CTRL ON/MAINT ON:** Enables the System Control Panel and allows use of CMP commands from the console. Maintenance Mode capability from the console is also enabled. The Tele-Support facility from the remote console remains disabled.
4. **CTRL ON/MAINT ON/REMOTE ON:** Enables the System Control Panel, the CMP console control functions, Maintenance Mode functions, and the Tele-Support capability.

System Controls and Special Functions

STATUS INDICATOR LIGHTS. The System Control Panel has six status indicator lights; the **RUN**, **HALT**, **ACTIVITY**, **BATTERY**, **POWER**, and **REMOTE CONSOLE** (Figure 11-1.). The **POWER** and **REMOTE CONSOLE** LEDs are located in the nameplate.

- (H) **BATTERY LED** This is a red LED that indicates a power failure has occurred, and memory is being sustained by the backup battery.
- (I) **ACTIVITY LED** This yellow LED provides visual indication that the CPU is active.
- (J) **RUN LED** This yellow LED denotes that the CPU is in the **RUN** state.
- (K) **HALT LED** This red LED comes on when the CPU is halted. It indicates any of several conditions: the **HALT** switch was pressed, the **=SHUTDOWN** command was initiated, the **CPUHALT** instruction was executed, or there is a hardware fault.
- (L) **POWER LED** This yellow LED is visible when the power supplies are on.
- (M) **REMOTE LED** This yellow LED indicates when the **SECURITY** switch is set to enable the use of a remote console.

DECALS. The System Control Panel has two decals attached to the inside door. These decals indicate security levels or provide space for configuration information.

- (N) **CONTROL I/O CONFIGURATION** This is a decal attached to the inside of the System Control Panel door with space on which to write in the **CHL** and **DEV** number settings for the **START**, **DUMP** and **LOAD** thumbwheel switches.
- (O) **SECURITY LEVELS** This is a decal attached to the inside of the System Control Panel door which indicates the various security functions enabled or disabled by the four different positions of the security level control switch.

THUMBWHEEL SWITCHES. The thumbwheel switches are set to the hardware **CHL** and **DEV** addresses of the devices selected to perform a **START**, **DUMP**, or **LOAD**.

- (P) **THUMBWHEEL SWITCHES** These switches are composed of two elements, the hardware **CHL** and the **DEV** address.

Thumbwheel Switch Settings

The three pairs of thumbwheel switches located on the front panel, correspond with the **START**, **DUMP**, and **LOAD** functions of the machine. Each pair contains a hardware channel number (**CHL**) and an **HP-IB** device (**DEV**) address setting for the corresponding **START**, **DUMP**, and **LOAD** devices. See Figures 11-2(P) and 11-5(R). These switches are initially set by your Hewlett-Packard Customer Engineer when your system is installed. Although it is unlikely that you will need to change these settings, the following discussion and conversion table are provided so that, in the event of a major reconfiguration of your system, or the switches being accidentally changed, you can reset them.

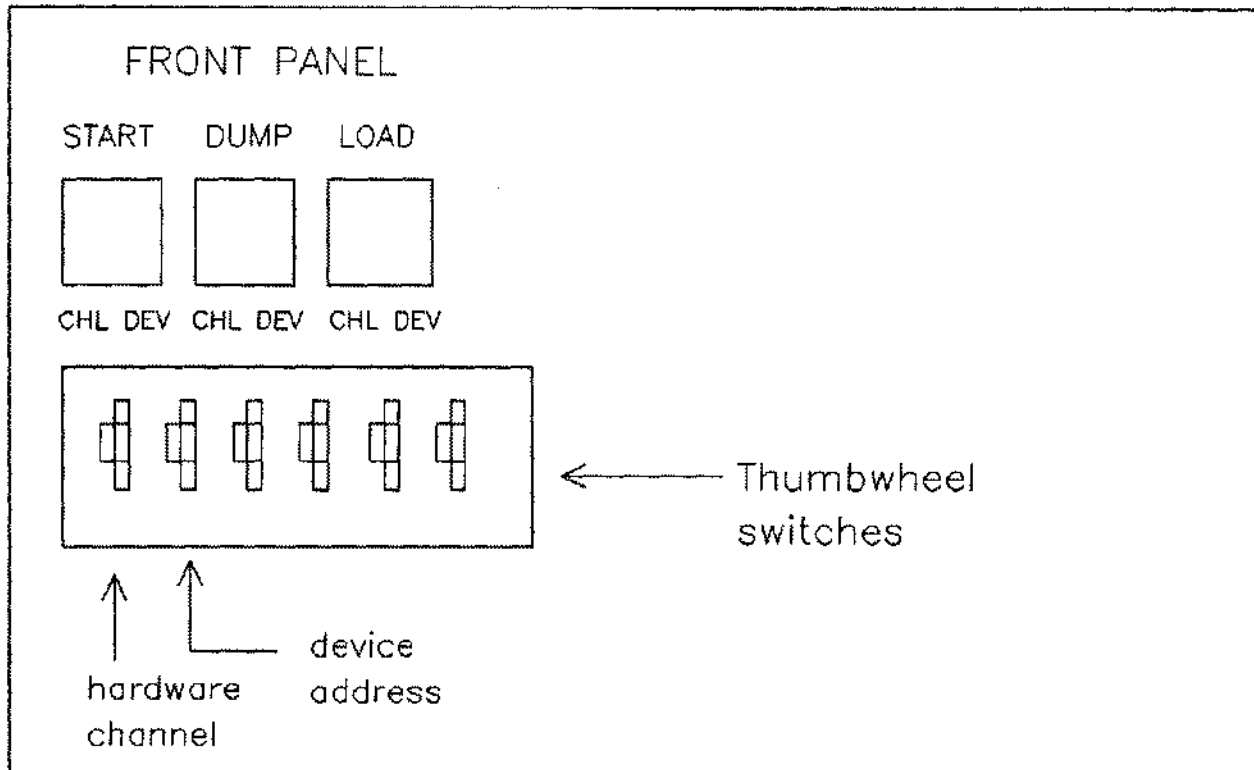


Figure 11-3. Series 39/40/42 and 44/48 Thumbwheel Switches

Device Address and Channel Address

The thumbwheel switches must be set to the hardware channel number and the HP-IB device address of the device selected to perform the START, DUMP or LOAD. If incorrectly set, the system is unable to execute the desired function. You must reset the thumbwheel switches to the correct setting and press the START, DUMP, or LOAD button, or re-enter the command via the Control Maintenance Processor (CMP). The following discussion will help you to determine the correct settings. The address for each of the three sets of thumbwheel switches is composed of two elements:

- CHL references the number assigned to the channel Printed Circuit Assembly (PCA) in the main cabinet of the system.
- DEV refers to the number assigned to the physical device controller which is connected via cables to the hardware channel board.

The hardware channel boards are numbered 4 through 11. Each board may have as many as eight device controllers connected to it; the first is 0, the last is 7.

If the system disc is connected to Channel 11, the CHL thumbwheel switch under the START button is set to 11. If the disc is wired to Device 0, the DEV thumbwheel switch is set to 0. Therefore, the address of the system disc which is accessed by the START button is 110.

Device Reference Table (DRT) Number

The combination of the channel and device address numbers is called the DRT (Device Reference Table) number of the device. This DRT number is expressed in two different ways on the system:

- The decimal representation is the number which identifies the device's DRT number in the system configuration listing.
- The "pseudo-octal" representation of the decimal DRT number of the device is the number on the thumbwheel switches. It is referred to as "pseudo-octal", since true octal (base eight) is represented as 0-7; the hardware channel boards and the channel address numbers range from 4 through 11.

You can easily convert one representation to another if you use the following formula:
Pseudo-octal to Decimal

1. Determine the Channel and Device numbers.
2. Multiply the channel number by eight.
3. Add the Device to the result of step 2. This is the decimal equivalent of the value on the thumbwheel switches.

For example:

$$\text{DRT\#} = (\text{Channel\#} \times 8) + \text{HP-IB Device\#}$$

$$\text{DRT\#} = (16) + 3$$

$$\text{DRT\#} = 19$$

Decimal to Pseudo-octal:

1. Check the system I/O configuration listing to find the decimal DRT number of the device.
2. Divide this number by eight to produce the channel number.
3. The remainder from step 2 is the device number.
4. The combination of the channel number and the device number is the pseudo-octal DRT# of the device. This number is entered on the thumbwheel switches.

For example, the decimal DRT number is 19, using the formula:

$$(\text{decimal DRT\#}) / 8 (\text{controllers}) = (\text{Channel\#})$$

$$(19) / 8 = 2$$

$$\text{remainder: } 3 (\text{HP-IB Device\#}) = 23 \text{ on thumbwheel switches}$$

To simplify conversion, refer to Table 11-1.

Table 11-1. Decimal/Pseudo-Octal Conversion of DRT Numbers

CH \ DEV	0	1	2	3	4	5	6	7
1	8	9	10	11	12	13	14	15
2	16	17	18	19	20	21	22	23
3	24	25	26	27	28	29	30	31
4	32	33	34	35	36	37	38	39
5	40	41	42	43	44	45	46	47
6	48	49	50	51	52	53	54	55
7	56	57	58	59	60	61	62	63
8	64	65	66	67	68	69	70	71
9	72	73	74	75	76	77	78	79
10	80	81	82	83	84	85	86	87
11	88	89	90	91	92	93	94	95
12	96	97	98	99	100	101	102	103
13	104	105	106	107	108	109	110	111
14	112	113	114	115	116	117	118	119
15	120	121	122	123	124	125	126	127

Series 44/48

The System Control Panel is located behind the lockable front door on the right-front side of the System Processor Unit (SPU) (Figure 11-4). Refer to Figure 11-5 for an illustration of each of the System Control Panel's switches and lights.

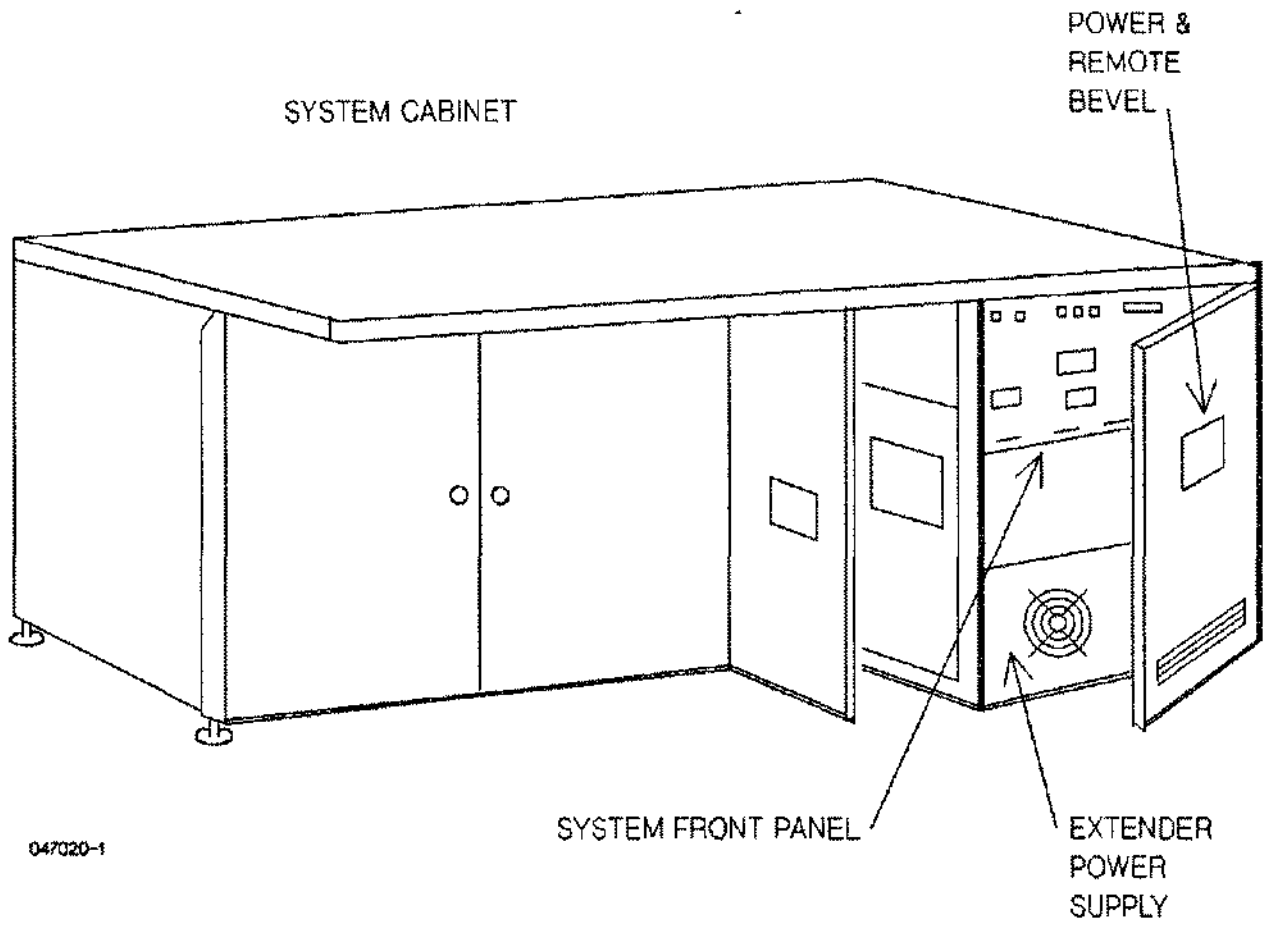


Figure 11-4. Series 44/48 System Processor Unit (SPU)

HARDWARE RELATED CONTROLS. The hardware related controls are the RUN and HALT switches and the REMOTE CONSOLE switch. While the system is running, the CPU responds only to the HALT switch, not to the RUN switch.

(A) RUN and HALT Pressing the RUN switch causes the CPU to enter the RUN state from the HALT state. Pressing the HALT switch causes the CPU to enter the HALT state from the RUN state.

(B) REMOTE CONSOLE This switch, when ON, indicates that the remote console (the terminal connected to Channel 1, Port 1) is in parallel with the System Console. This connection can be hardwired, or made over a dial-up modem. It is usually used for maintenance and diagnostics.

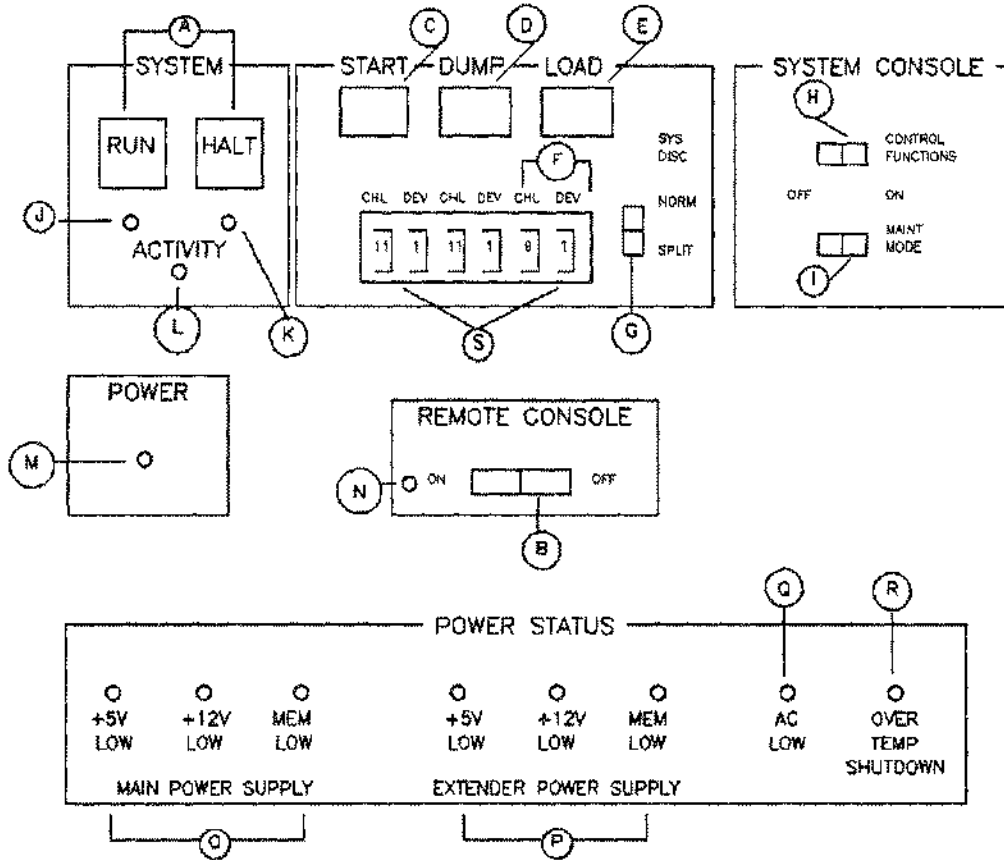


Figure 11-5. Series 44/48 System Control Panel Switch/Indicator Function

SOFTWARE (MPE) RELATED CONTROLS. The software (MPE) related controls are the START, LOAD and DUMP switches. COOLSTART and WARMSTART are available via steps involving the START switch. Other system startup options utilize the LOAD switch. The SYS DISC switch is used in conjunction with the START switch to configure the system disc. The three pairs of thumbwheel switches, (each pair is labeled CHL and DEV) are located directly beneath the software related controls. They set the channel and device addresses that are enabled when the respective switch is pressed. (Figure 11-5.)

System Controls and Special Functions

- (C) **START** Pressing this switch initiates either a COOLSTART or WARMSTART of the system. The device and channel address of the device from which the operation is to be performed are set in the thumbwheel switches directly below the START switch. Refer to "THUMBWHEEL SWITCH SETTINGS" in this section.
- (D) **DUMP** Pressing this switch initiates a dump of the system's memory to serial disc, cartridge tape, or magnetic tape. The channel and device address of the system disc (or other device from which the Software Dump Facility is being loaded) are set in the thumbwheel switches below the DUMP switch. Refer to "THUMBWHEEL SWITCH SETTINGS" in this section.
- (E) **LOAD** Pressing this switch initiates a cold load from the device and channel set in the thumbwheel switches directly below the LOAD switch. The COLDSTART, UPDATE, and RELOAD operations are begun with this switch. Refer to "THUMBWHEEL SWITCH SETTINGS" in this section.)
- (F) **CHL and DEV** Enables the channel (CHL) and device (DEV) addresses set into the thumbwheel switches and initiates COLDLOAD, WARMSTART, or DUMP.
- (G) **SYSTEM DISC (NORMAL or SPLIT)** This rocker switch allows either a LOAD or START to be performed from discs which have both fixed and removable portions, and from such discs such as the HP 7925, which is entirely removable without a fixed portion.
1. When the system disc has both fixed and removable portions, use the NORMAL position if (a) the disc is configured as one device, or (b) the disc is configured as two devices with COOLSTART or WARMSTART occurring from the removable portion. If the system disc is entirely removable without a fixed portion, or entirely fixed without a removable portion, the NORMAL position must be used.
 2. If the system disc is configured as two devices with COOLSTART or WARMSTART occurring from the fixed portion, then the SPLIT position must be used.

SECURITY LEVEL CONTROL SWITCHES. The security level controls are the CONTROL FUNCTIONS and MAINT MODE switches. These provide for system operation, system maintenance, and modification control by enabling or disabling the Control and Maintenance Processor (CMP). Once set, these controls can be secured by locking the panel door.

- (H) **CONTROL FUNCTIONS** This switch, when set to the ON position, enables the Control and Maintenance Processor (CMP), which allows you to enter commands which correspond to the controls on the System Control Panel via the System Console.
- (I) **MAINT MODE** This switch, when set to the ON position, enable the System Console Maintenance Mode.

STATUS INDICATOR LIGHTS. The Status Indicator Lights are the RUN light, HALT light, and the ACTIVITY light. Other indicator lights include the POWER indicator, and MAIN and EXTENDER POWER SUPPLY failure indicators. System warning lights include the AC LINE LOW indicator which shows a low AC power level, and OVERTEMP SHUTDOWN indicator, which warns that the system automatically shuts down.

- (J) RUN LED This yellow LED indicates the CPU is in the RUN mode.
- (K) HALT LED This red LED indicates any of several conditions: the HALT switch was pressed, the =SHUTDOWN command (or CMP HALT command) was initiated, the CPU HALT instruction was executed for the CPU to enter the HALT state, an overtemperature condition was sensed, or a hardware problem exists.
- (L) ACTIVITY LED This yellow LED provides a visual indication of CPU/BUS activity.
- (M) POWER LED This yellow LED indicates DC power integrity. If the LED is off, there may be a failure in one or more of the individual power supplies, an AC power failure, or an overtemperature condition.
- (N) REMOTE
 CONSOLE LED This yellow LED indicates that the REMOTE CONSOLE switch is set to enable use of the remote console.
- (O) MAIN POWER
 SUPPLY LEDs This group of red LEDs indicate status of the power supply for the main card cage. If a failure occurs in this particular power supply, the corresponding LED lights.
- (P) EXTENDER
 POWER SUPPLY
 LEDs This group of red LEDs indicate status of the power supply for the extender card cage. If a failure occurs in this particular power supply, the corresponding LED lights.
- (Q) AC LOW LED This red LED indicates a low AC line condition that will cause the power supplies to shut down. The LED lights when the system switches to battery backup power.
- (R) OVERTEMP
 SHUTDOWN LED This red LED indicates that the temperature has exceeded the threshold (approximately 135 degrees F or 57.3 degrees C) of any temperature transducer located across the top of either card cage. This indicator will remain lit until the overtemperature condition no longer exists, and power is cycled. The LED is reset by momentarily turning the AC circuit breaker OFF, then ON. The AC circuit breaker is located at the bottom right rear of the computer. It is not the processor ON-OFF switch.

THUMBWHEEL SWITCHES. The three pairs of thumbwheel switches (each pair is labeled CHL and DEV) are set to the channel and devices addresses of the devices selected to perform a START, DUMP, or LOAD.

- (S) THUMBWHEEL
 SWITCHES These switches are composed of two elements, the CHL (channel) and the DEV (device) address.

THE CONTROL AND MAINTENANCE PROCESSOR (CMP) FOR SERIES 39/40/42 AND 44/48

The Control Maintenance Processor (CMP) allows the System Operator to duplicate the function of the switches located on the System Control Panel from the System Console. The CMP makes available to the System Operator control functions to perform system startup, halt and memory dump and system maintenance aids to initiate a system self-test, print an and a maintenance display. It provides an acceptable level of system security because the System Control Panel remains behind the front door where the power and remote lights and switches are located. The System Operator is therefore able to perform system startup (HALT, RUN and DUMP) functions without accessing the front panel if the System Manager has set the CMP control functions switch to the ON position.

Accessing CMP

All communication with the CMP must take place from the terminal originally configured as the System Console (Channel 1, Device 0). When the system is running, the CMP will usually be inactive, and commands are entered via MPE in the usual manner (with the exception of the :SPEED command - refer to the CMP commands). However, when for any reason, you are unable to communicate with the operating system (MPE), by entering a B^C from the System Console, the CMP is enabled and automatically prompts you for a CMP command (->). In the event that the operating system is not functioning (as in the case of a System HALT), the CMP is accessed by simply entering a RETURN.

NOTE

You should be aware that when the CMP is enabled while MPE is operational (via the B^C character), any messages from users or from MPE which would normally be displayed on the System Console (such as :TELLDP, device status messages, etc.) are lost. This is because MPE has no way of knowing that the CMP is in control, and messages are not saved. It is therefore advisable to perform all CMP functions either before MPE is operational, or after a =SHUTDOWN of MPE.

CMP Commands

The following list gives the commands accepted by the CMP Operating System. CMP maintenance display commands are not included, since these commands are intended for use by HP service personnel only. (Refer to Diagnostics in this Section for a discussion on Maintenance commands).

- | | |
|------|--|
| HELP | Lists the CMP commands. In Maintenance Mode it also lists the Maintenance Display commands. |
| HALT | Halts the system. Causes the CPU RUN/HALT flip-flop to be set to HALT. (Performs the same function as the HALT button on the System Control Panel.) |
| RUN | Causes the CPU RUN/HALT flip-flop to be set to RUN. (Performs the same function as the RUN button on the System Control Panel.) |
| DUMP | Performs a dump of main memory to the device specified by the classname DDUMP in the system's configuration. (If using the interactive mode of the Software Dump Facility, |

any classname may be specified.) If the system is in the run state when this command is entered, the message "IS IT OK TO ABORT THE SYSTEM?" will be displayed. You must enter YES to perform a DUMP.

LOAD Performs a COLDLOAD (COLDSTART, RELOAD, or UPDATE), from the serial storage device whose channel and device address are set in the thumbwheel switches on the System Control Panel. If the system is in the run state when the command is entered, the message "IS IT OK TO ABORT THE SYSTEM?" will be displayed. You must enter YES to perform a LOAD.

START Initiates a WARMSTART or COOLSTART from the device specified by the control panel START thumbwheel switches. If the system is in the run state when the command is entered, the message "IS IT OK TO ABORT THE SYSTEM?" will be displayed. You must enter YES to perform a START.

SELFTEST Initiates a selftest of the system. If the system is running when the command is entered, the message "IS IT OK TO ABORT THE SYSTEM?" will be displayed. You must enter "YES" to continue the selftest. Note that if the system is running when the command is entered, only the CMP test is performed. (Refer to Series 37 Self Test in this section for more detailed information on SELFTEST).

CAUTION — This test should not be run when MPE is operating, as the system will halt after the test is performed. Data may be lost in this way.

LOG This command displays a log of actions performed or detected by the CMP. The items which are entered in the log are:

DISPLAY ON	DISPLAY command entered.
SELFTEST OK	CMP/SYSTEM SELFTEST passed.
SELFTEST FAILED	CMP/SYSTEM SELFTEST failed.
LOAD	LOAD command entered.
START	START command entered.
DUMP	DUMP command entered.
HALT	CPU went to HALT.
HALT command	HALT command was used.
IDMAP	IDMAP command entered.
RUN	CPU went to RUN.
SHUTTEST	Power shutdown test performed.
SHUTTEST FAILED	Power shutdown test failed.
POWER ON	Power-on reset to CMP when battery power was lost.
POWERFAIL/RESET	A powerfail occurred or the PON signal went low without loss of memory backup power.

System Controls and Special Functions

These events are listed, along with the elapsed time (not including power off time) since the event occurred. The last 63 events are shown in the event log. This log is retained during a power failure since it is stored in memory, which is on battery backup. An example event log is:

Event Log			
Days	Hrs	Min	Since Event
2	23	05	Power On
	3	20	Overtemp Shutdown
	3	20	Power On
	2	25	System Halted
	2	20	Start Failed
	2	05	System Halted
	2	03	Load Failed
	1	51	System Halted
	1	50	Cold Load
	1	50	Selftest Failed
		03	Load

DISPLAY This command causes the maintenance display to appear on the screen. (Refer to **DIAGNOSTICS** in this section for further information.)

SPEED This command allows the user to change the system console baud rates when MPE is not running. The receive and transmit baud rates are specified in the command, and must be identical. This command is identical in operation to the MPE **:SPEED** command. (Refer to the **:SPEED** command in the MPE V Commands Reference Manual (32033-90006).)

:SPEED When a colon (:) is entered before the **CMP SPEED** command, the speed is simultaneously changed for the **CMP** and **MPE**. This is used when **MPE** is running. Note that the **CMP** baud rate and the **MPE** baud rate must be the same in order for certain **CMP** failure messages to be printed. Also, this command should always be used when changing the speed at the System Console. Do not use the **MPE :SPEED** command.

Invalid command names will cause the message "INVALID COMMAND, USE HELP FOR INFO" to be displayed. Any equal signs or commas are treated as blanks. Both uppercase and lowercase characters are accepted.

SYSTEM STATUS AND DISPLAY PANEL (SERIES 64/68)

The Series 64/68, unlike the Series 39/40/42/44/48 systems, have no System Control Panel. All communication with the system is done through the Diagnostic Control Unit (DCU). However, the Series 64/68 has a System Status and Display Panel (SSDP) which shows the operating status of the system. The SSDP informs the user through several indicator LEDs, what the current system status is: run or halt, overtemperature, battery condition, and current instruction.

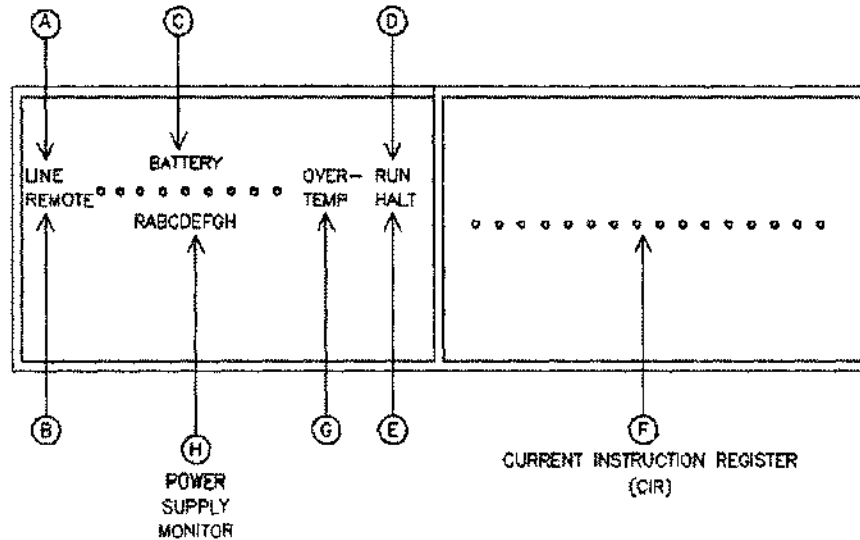


Figure 11-6. Series 64 System Status and Display Panel (HP 32460A)

The System Status and Display Panel is located on the front of the system below the system name plate (Figure 11-6, Figure 11-7). The panel functions pertain to the HP 32460A, 32460B, and 32468B, except where individually specified:

- | | |
|-------------------------|---|
| (A) LINE
(HP 32460A) | The LED, when lit, indicates that AC power is being supplied to the system. |
| (B) REMOTE | This LED, when lit, indicates MAINTENANCE switch is set to REMOTE and the remote mode is enabled. |
| (C) BATTERY | This is a three-mode LED (off, slow flash, and fast flash). Under normal conditions, the batteries are fully charged and the LED is off. The slow flash indicates batteries are being charged. Fast flash indicates batteries are being discharged. |
| (D) RUN | When LED is lit, the CPU is in the RUN state. |

- (E) HALT When LED is lit, the CPU has halted.
- (F) 16-bit LED readout This indicates the contents of the Current Instruction Register (CIR).
- (G) OVERTEMP This is a warning LED. When lit, internal temperature of system has exceeded exhaust temperature of 40 degrees C. An overtemperature warning message is also displayed on the System Console.
 (HP 32460A)
- OVERTEMP Same function as the Series 64 (HP 32460A) except that the overtemperature LED on SSDP is battery backed-up until AC power is renewed.
 (HP 32460B)
 (HP 32468B)

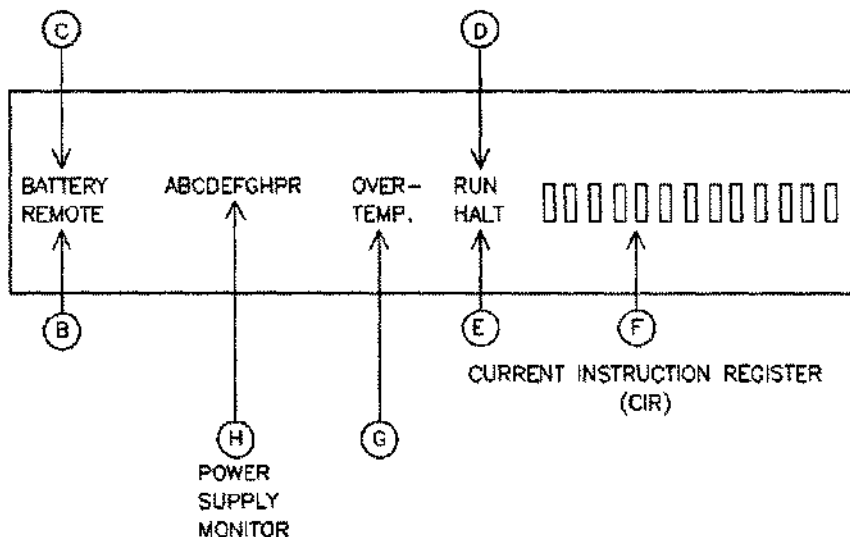


Figure 11-7. Series 64/68 (HP 32460B/32468B) System Status and Display Panel

- (H) POWER SUPPLY MONITOR Each power supply is monitored by a corresponding LED. Supplies one through eight have a corresponding A-H LED display. Supply nine has an R LED which corresponds to the DCU RESET. (See Figure 11-6).
 (HP 32460A)
- POWER SUPPLY MONITOR Each power supply is monitored by a corresponding LED (See Figure 11-7). When the LED is lit, the following condition exists:
 (HP 32460B)
 (HP 32468B)

A : Power Module A failure.
 B : Power Module B failure or a power failure (a low PON).
 C : Power Module C failure.
 D : Power Module D failure.
 E : Power Module E failure. (Aux I/O Bay)
 F : No +5VB available; battery voltage is available.
 G : DCU, PDM pair not communicating for more than 10 seconds.
 H : Transformer overtemperature, rectifier failure, or fan failure.
 P : Power ON (PON) is down.
 R : DCU is at reset; initial power up reset, AC low with PON set low.

CAUTION

Observe the G and H LEDs. If the G or H LED should turn on at any time, the operating system will continue to function normally. However, damage may eventually result.

THE DIAGNOSTIC CONTROL UNIT (DCU)

The DCU is a microprocessor-controlled board which interfaces the System Console to the Series 64/68. It provides access to all Printed Circuit Assemblies (PCAs) connected to the CPU Bay card cage backplane. The DCU has two ports which connect to the System Console and to an optional modem for remote diagnostics.

The DCU performs a variety of functions. Some of the major functions are:

- Performs self-test of the DCU board. A firmware program on the DCU is run to verify DCU operation. If a failure is detected, the DCU will output the error to the System Console, if possible will be displayed on the DCU PCA LED's.
- Checks for DCU commands from the console (if in the Maintenance Mode or Control Mode), or monitors the console commands for B^C, date commands, and SPEED commands if in System Console mode.
- Checks to see if the system has gone into a diagnostic halt by asserting SYSSTOP.
- Monitors the power system via the Power Supply Control (PSC) or the Power Distribution Monitor (PDM).
- Runs Fault Locating Diagnostics (FLDs) if in the Maintenance Mode with diagnostics invoked.

When the system is running, the DCU will usually be inactive, and commands are entered via MPE in the usual manner. However, when for any reason you are unable to communicate with the operating system (MPE), or any other time you want to execute a DCU function, you can enable the DCU by entering a B^C from the System Console. The DCU will then prompt you with a "C>" (Control Mode only), or "M>" (Maintenance Mode), depending on the position of the REMOTE/CONTROL/MAINT keyswitch. In the event of certain types of failures, such as a system halt, the DCU is accessed by simply entering a RETURN.

NOTE

When the DCU is enabled while MPE is operational (via the B^C character), any messages from users or from MPE which would normally be displayed on the System Console (such as :TELLDP, device status messages, etc.) are lost. This is because MPE has no way of knowing that the DCU is in control and messages are not saved. It is therefore advisable to perform all DCU functions either before MPE is operational, or after a =SHUTDOWN of MPE.

DCU Operation Modes

The DCU operates in four modes: Initialization, Control, Maintenance, and Idle.

The Initialization Mode occurs at auto-restart (following a power failure) or at power-on. In this mode, the DCU initializes itself, does a self-test on the DCU and shift strings, and checks for a power failure. The DCU then enters the Control or Maintenance Mode (depending on the setting of the REMOTE/CONTROL/MAINT keyswitch which is located in the PCM on the HP 32460A, or in the junction panel on the HP 32460B/32468B). When auto-restarting (after a power failure), the DCU enters the Idle Mode once the system is successfully restarted. If the auto-restart is unsuccessful, error messages are displayed on the console, and the DCU enters the Control or Maintenance Mode. If a power failure had not occurred, the DCU would have displayed a CONTROL or MAINTENANCE Mode prompt. The Remote Maintenance Mode provides full system control plus remote dial-up capabilities.

The Control Mode is enabled when the REMOTE/CONTROL/MAINT keyswitch is in the CONTROL position. When the System Operator types B^C on the System Console, the DCU sends "C>" prompt. The System Operator then enters one of the Control Mode commands. The Control Mode is also enabled after the Initialization Mode self-test. In the Control Mode, the System Operator can command functions such as RUN, HALT, LOAD, START, or DUMP. The System Operator can also control the status display and console speed, as well as display the DCU Log and all Control Mode commands. All communication with the DCU in Control Mode must take place from the terminal originally configured as the System Console (Channel 1, Port 0).

The Maintenance Mode is enabled when the REMOTE/CONTROL/MAINT keyswitch is in the MAINT position. The Remote Maintenance operation is enabled when in the REMOTE position (refer to the Remote Maintenance set-up later in this Section). Maintenance Mode is entered on initial power-on or when the System Operator types B^C on the System Console, and the keyswitch is in either the REMOTE or MAINT position. When MAINT mode is entered, the "M>" prompt is displayed on the Console. Maintenance Mode is a superset of the Control Mode command, and allows for greater control of the hardware. The system diagnostics are also run in this mode. Maintenance Mode should be entered only when it is permissible to shutdown the system. Many of the commands in this mode automatically micro-halt the system as part of their operation.

The Idle Mode is enabled whenever the System Operator exits the Control or Maintenance Mode via one of the terminating commands (RUN/LOAD, etc.) or exits from either the Control or Maintenance Mode via the EXIT command. In the Idle Mode, the DCU continually executes a DCU self-test, monitors the power system status, looks for the B^C interrupt that calls for one of the active modes, and checks to see if the DCU has been interrupted due to an error condition. If the DCU is interrupted after the cause of the interrupt is determined, then an error interrupt handler reads the

appropriate shift strings so the source of the interrupt is communicated to the System Operator. The DCU then returns either to the Control or Maintenance Mode depending on the position of the REMOTE/CONTROL/MAINT keyswitch.

CAUTION

When you are finished using the Control or Maintenance Mode, use an EXIT command before leaving the computer. The EXIT command will put the DCU in Idle Mode. If left in the Control or Maintenance Mode, MPE cannot output to the console, and the computer will eventually hang up.

DCU Control Mode Commands

The following list gives the commands accepted by the DCU in Control Mode. You are only required to enter the first two characters of any command. Maintenance Mode commands are not included here, as these commands should only be used under the direction of HP service personnel. Refer to Diagnostics in this Section for a discussion of Maintenance Mode.

C>HElp Lists all of the commands valid for the Control Mode.

```
AR - retry auto-start
DI - write console display heading
DU - dump from disc
    DU[MP][=][imb,]chan,device] RETURN
    [=]
    imb - DUMP device imb # (0-2). The default is 0.
    channel - DUMP device channel # (1-15).
    unit - DUMP device unit # (0-7).
```

NOTE

DU:[=][imb,]channel,device changes the DUMP device without actually doing a DUMP.

```
EX - exit control mode
HA - halt system
HE - help
LD - set DCU log -> MPE dump parameters
    LD time[,count]
LG - [= type] - list DCU status or Event log
LO - load from tape

LO[AD][=][imb,]chan,device] RETURN
    [=]
    imb - LOAD device imb # (0-2). The default is 0.
    channel - LOAD device channel # (1-15).
    unit - LOAD device unit # (0-7).
```


NOTE

LD:=[*imb*,*lchannel*,*device*] changes the LOAD device parameters without actually doing a LOAD.

PA - list DCU ROM part & new codes
RU - run system
ST - start from disc
ST[ART][=][*imb*,*lchan*,*device*] **RETURN**
[:=]
imb - START device *imb* # (0-2). The default is 0.
channel - START device channel # (1-15).
unit - START device unit # (0-7).

NOTE

ST:=[*imb*,*lchannel*,*device*] changes the START device parameters without actually doing a START.

SW - switch reg command
SW[!:] = *nnn* set switch register to *nnn*
SW[!:] = *x* set bit *n* to 0/1

maintenance mode help facility no longer on line

C>AR The AUTO RESTART command is valid only after the automatic auto-restart has failed. It allows the System Operator to try to bring up the system after an auto-restart attempt fails due to a disc drive problem. The System Operator may enter the AUTO RESTART command after the disc drive problem is corrected to continue with the auto-restart.

C>Display The DISPLAY command writes the System Status Display (sometimes referred to as the Console Banner) on the System Console. The status display consists of one line at the top of the System Console screen that is displayed in inverse video. The status display is protected by an automatic memory lock, so a manual memory lock should not be used by the System Operator when the display is on. The System Status Display is updated only when the DCU is in the Control or Maintenance Mode. The display is turned off when the Maintenance Mode displays strings, memory, or screens. The System Status Display has five fields: RUN/HALT, the octal display of the START, DUMP, and LOAD settings, and the 20-byte message window which contains messages such as OVERTEMP, REMOTE ENABLED, DCU SELFTTEST FAILURE, etc. An example on the Console Banner of the default condition is:

RUN START 0,2,1 DUMP 0,3,1 LOAD 0,3,1

C>DUmp The DUMP command causes the Software Dump Facility to be loaded. When loaded, the commands in the SDF command file (SDFCOM) are executed, and the system is dumped on the indicated dump device. If the system is running when this command is entered, the message " IS IT OK TO ABORT THE SYSTEM? " will be displayed. You must answer YES to continue. The DCU does not generate any

messages on completion of a successful DUMP, but will generate error messages if the DUMP is not successful. Refer to the System Load (MPL) Error Messages in this Section. The system remains in the Control Mode upon completion. Set the DUMP device address and perform a SYSTEM DUMP, as follows:

C>DU

This will perform a DUMP using current parameters.

C>EXIT The EXIT command exits Control Mode and puts the DCU in IDLE mode along with turning off the memory lock.

C>HALT The HALT command causes the system to execute internal machine instructions to bring the system to a halt state. When the system is halted, the DCU remains in the Control or Maintenance Mode.

C>LD The LOG DUMP command allows the System Operator to set up the parameters for dumping the DCU log to MPE. The System Operator sets the interval parameters as follows:

C>LD *ump interval* [*min log size*]

The *dump interval* is the minimum time between dump of the DCU log to MPE. Entering a zero value disables all dumping of the log to MPE. (Default is 12 hours.)

The *min log size* is the minimum number of entries which must be in the DCU log in order to transmit the log to MPE, 0-128, a zero value transmits all entries in the DCU log. (Default is 2 entries.)

C>LG The LG command displays the current contents of the DCU Event Log containing the last 128 computer events and the times they occurred. For Series 64A, there is also a DCU Status Log which displays temperature status and most recent power system voltages. The time stamp for the DCU Event Log will differ from the MPE connect time after a powerfail. The DCU maintains events in real time, while MPE does not update the connect time when the system is down.

C>LG [*type*]

The value for the *type* parameter is either STATUS or EVENT.

STATUS Displays current hardware status for the Series 64A only. For the Series 64B/68, the LG status command will refer the System Operator to the SSDP LEDs which displays the power system status.

EVENT This is command default. It displays the DCU Event Log and the time the events occurred. The following events are logged in the DCU logging RAMs:

RUN
SELFTEST
LOAD
START
DUMP
HALT

POWER (ON/FAIL/AUTO-RESTART))
OVERTEMP WARNING
MODE CHANGE (MAINT, CONTROL, ETC.)
SYSTEM HALT
POWER SUPPLY FAULT (DC OVER/UNDER VOLTAGE,
OVERCURRENT, AC OVER/UNDER VOLTAGE)

C>Load The LOAD command loads the MPE operating system from the indicated (or saved) LOAD device. This command requires the System Operator to HALT the system using the HALT command, before the LOAD command. If the system is running when the command is entered, the message " IS IT OK TO ABORT THE SYSTEM? " will be displayed. You must enter YES to perform the LOAD. The DCU does not generate any messages on completion of a successful LOAD, but will generate error messages if the load is not successful. Refer to the System Load (MPL) Error Messages in this Section. The LOAD command enables the DCU to set its internal timer to the DATE/TIME entered when MPE is loaded. The System Operator sets the LOAD device address to LOAD MPE as follows:

The command **C> LO:=[*limb*,*lchannel*,*device*** changes the LOAD device unit number without actually doing a LOAD.

C>PART The PART/REVISION command allows the System Operator to display the part numbers and revision level of all ROMs in the DCU.

C>RUN The RUN command causes the system to execute internal machine instructions to bring the system to a run state. The RUN command causes the system to exit Control Mode and returns control to MPE.

C>Start The START command loads MPE from the indicated (or saved) device. To use WARMSTART or COLDSTART requires the System Operator to HALT the system using the HALT command before the START command. If the system is running when this command is entered, the message " IS IT OK TO ABORT THE SYSTEM?) will be displayed. You must enter YES to perform the START. The DCU does not generate any messages on successful completion, but error messages are displayed if the START is not successful. Refer to the System Load (MPL) Error Messages in this Section. The START command enables the DCU to set its internal timer to the DATE/TIME entered when MPE is started. The System Operator sets the START device address and loads MPE as follows:

The command **ST:=[*limb*,*lchannel*,*device*** changes the START device unit number without doing a START.

C>SW The SWITCH REGISTER command allows the System Operator to alter the contents of the 16-bit Switch Register. This command sets or clears the 16-bit LOAD switches. Note that the load device number is destroyed when the Switch Register is altered. The system must be in microrun mode for this command to work. The operating system may also be halted. The System Operator sets or clears the Switch Register as follows:

C>SWI:]=*nnnn*

The "*nnnn*" represents the Switch Register contents.

System Controls and Special Functions

C>SW~~h~~[:] This command allows the System Operator to alter the content of an individual bit in the 16-bit Switch Register.
The System Operator sets or clears an individual bit in the following manner:

C>SW~~h~~[:]=x

The "n" represents an individual bit in the 16-bit Switch Register. It is the number of the bit to be altered or cleared. The number ranges from the most significant bit, 0, to the least significant bit, 15. The "x" represents the state or status of the bit, 0 (OFF) or 1 (ON).

1

2

3

4

Default Parameter Values

Default parameter values for the START, LOAD, and DUMP commands are preset at the factory before the system is shipped. These values are:

	IMB#	CHANNEL#	DEVICE#
START Device	0	3	1
LOAD Device	0	2	1
DUMP Device	0	3	1

When using the START, DUMP, and LOAD commands, you may override the default values for the device from which the function is to be performed by entering (in decimal) the Inter-Module Bus (IMB) number, channel number and device number of the new START, DUMP, or LOAD device after the command, e.g.:

```
C> LO[AD][:] = [imb,]channel,device
```

where the parameters have the following meanings:

<i>imb</i>	A number (0-2) indicating the IMB number of the START, LOAD, or DUMP device. (Default is 0.)
<i>channel</i>	A number (1-15) indicating the channel number of the START, LOAD, or DUMP device.
<i>device</i>	A number (0-7) indicating the device number of the START, LOAD, or DUMP device.

Note that when you override the default values for the START, LOAD or DUMP devices, the new values are saved and become the new defaults unless a battery powerfail should occur. In this case, the default values that are initially set by the factory will take effect.

DRT Calculation for Series 64/68

The Series 64/68 uses dual IMBs. Consequently, a nine bit Device Reference Table (DRT) number is required. To calculate the DRT number, use the following formula:

```
IMB1 = IMB#0
IMB2 = IMB#1
IMB3 = IMB#2
```

```
DRT# = (IMB# x 128) + (Channel# x 8) + HP-IB Device#
```

TELE-SUPPORT

Tele-Support increases the quality and productivity of the HP 3000 computer service by facilitating remote diagnosis of system problems and remote predictive support of the system for potential problems. With Tele-Support, Hewlett-Packard Service Representatives are able to examine memory locations, run diagnostics, down-load software patches, diagnostic or utility programs and maintain and distribute hard copy records from a remote location.

If a service call is necessary, the Hewlett-Packard Service Engineer (SE) can determine in advance what parts are needed at the customer site. Once there, the Hewlett-Packard Customer Engineer (CE) also has immediate access, via Tele-Support, to backup support from the Hewlett-Packard Technical Service Engineer (TSE). This is especially helpful when the CE is repairing particularly complex hardware problems or attempting to determine the cause of software failures.

Hardware Requirements

Hardware requirements for Tele-Support are:

- Two telephone lines: one voice line, and one voice grade data line dedicated to the Support Link modem.
- Support Link modem, or a previously qualified modem.
- Dedicated modem port which must be connected to Channel 1, Port 1 of the ADCC for Series 39/40/42 and 44/48; any ATP modem port on the Series 64/68, or a DCU modem port if there is no ATP port. The modem in a Series 37 is connected to channel 1, port 7. If a modem is not connected, port 7 may be used as a terminal port.
- Flexible disc drive, 1600 BPI mag tape drive or cartridge tape drive, used to load HP Diagnostic/Utility programs to the system.
- A Series 64/68 needs a flexible disc drive configured to the System Console.

Software Requirements

Tele-Support software requirements are:

- A Diagnostic Utility System (DUS) tape/disc.
- A Series 64/68 needs Fault Locating Diagnostics (FLDs) on a flexible disc.

Series 37

The Series 37 uses the modem port on the first TIC to provide the means for tele-support. The state of the hardware is controlled by the remote signal from the keyswitch and by the microcode control of the modem port.

To set up Tele-Support:

1. Do an MPE speed change to 1200 baud on the local Console to match the speed of the remote Console. If MPE is not up, the Control Module will initialize the TIC and display the H for help -> prompt. The B^C speed command can then be used to adjust the local Console speed to 1200 baud.
2. Move the keyswitch on the SPU front panel to position 2 to enable the remote Console. If there is an MPE session on port 7, it will be suspended while in remote mode.
3. Once the modem answers, the connect sequence is completed, the modem is downed, the REMOTE LED on the SPU front panel is lit, and control passes from the local to the remote keyboard. All input/output of the remote Console is echoed on the local Console, which becomes an output device.

Messages can be sent to and from both Consoles by toggling the keyswitch between LOCAL and REMOTE positions. Changing from the REMOTE to the LOCAL position, enables the local Console keyboard, and output is sent to both Consoles. The modem line connection is not affected.

Turning the keyswitch to NORMAL disconnects the remote Console and disables the two-way conversation capability.

4. To exit remote mode, set the keyswitch to the NORMAL position. Remote mode has been aborted, and the original modem connection has been aborted. Port 7 is no longer a remote Console.

Series 39/40/42 and 44/48

The remote Console operates in parallel with the local console. The Control and Maintenance Processor (CMP) firmware makes no distinction between remote and local commands. All events are displayed on both consoles. The modem must be connected to Channel 1, Port 1 of the ADCC as shown in Figures 11-8 and 11-9. To use remote:

1. Make sure the baud rate of the System Console is the same as the baud rate of the modem. Use the CMP `:SPEED` or `:SPEED` command to set the baud rate. Refer to the MPE `:SPEED` command in the MPE V Commands Reference Manual, (32033-90006).
2. Turn the keyswitch on the System Console Panel to the REMOTE position (Series 39/40/42). In a Series 44/48 system, three switches must be set to ON: REMOTE CONSOLE, CONTROL FUNCTIONS, and MAINT MODE.
3. Use the modem phone to call the CE, or wait for the CE to call into the modem. The modem LED will light to indicate when the connection is established.
4. To exit remote, reset the keyswitch to the original position (Series 39/40/42). In the Series 44/48, set the REMOTE CONSOLE switch to OFF, and set the CONTROL FUNCTIONS and MAINT MODE switches to their original positions. The baud rate may also need to be reset.

TERMINAL-TO-TERMINAL COMMUNICATION. The operators for both the local and the remote site can communicate over the data link by sending messages from one terminal to the other. Respond to the CMP prompt with a question mark "?" followed by the message. For example:

-> ?THIS IS AN EXAMPLE

Messages sent this way are not transmitted to the system.

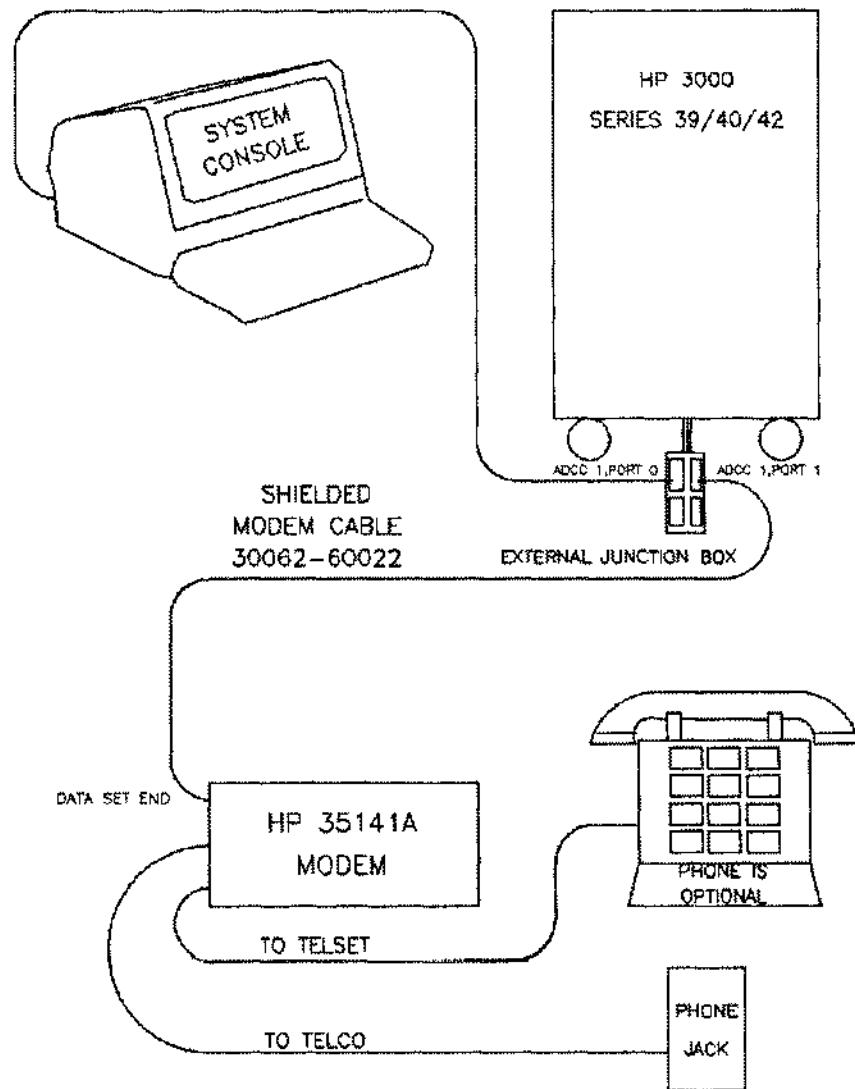


Figure 11-8. Local to Remote Cable Connections for Series 39/40/42

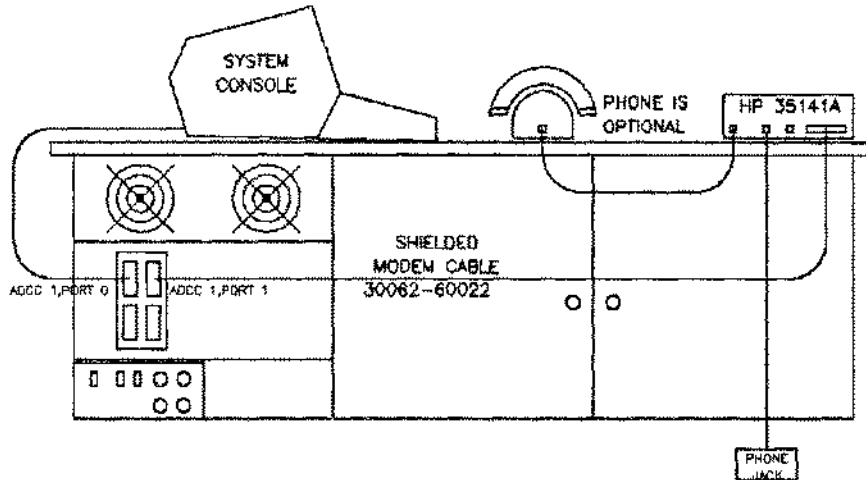


Figure 11-9. Local to Remote Cable Connections for Series 44/48

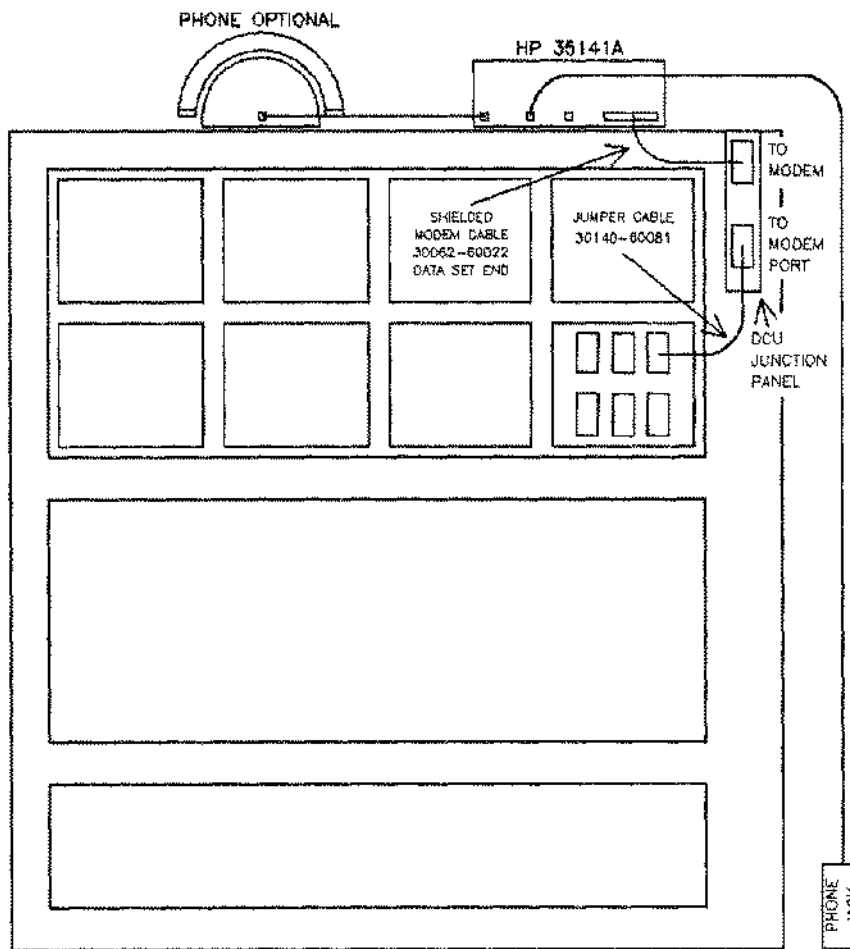


Figure 11-10. Local to Remote Cable Connections for Series 64/68

Series 64/68

When using the Tele-Support facility on a Series 64/68:

The modem must be connected to the top RS-232 port connection of the DCU Junction Panel (located on the right side of the Series 64/68), as shown in Figure 11-10.

The remote Console operates in parallel with the local console. The Diagnostic Control Unit (DCU) firmware makes no distinction between remote and local commands. All events are displayed on both consoles. To use remote:

1. Make sure the baud rate of the System Console is the same as the baud rate of the modem (300 or 1200 baud). If MPE is running, use the MPE :SPEED command to set the baud rate properly; refer to MPE V Commands Reference Manual, (32033-90006). If MPE is not operational, use the DCU SPEED command; refer to "DIAGNOSTICS" in this section.
2. For Series 64/68, turn the keyswitch, which is located in the Power Control Module (PCM), to the MAINT/REMOTE position for the HP 32460A, or on the DCU junction panel for the HP 32460B or HP 32468B.
3. Enter the RM command and RETURN following the DCU prompt (M>). The System Console Banner displays "REMOTE ENABLED".
4. Use the modem phone to call the SE, or wait for the SE to call into the modem, if it is auto-answer. When the connection is made, the System Console Banner will display "REMOTE ESTABLISHED" Banner, the REMOTE LED on the SSDP and the DTR LED on the modem will light. (Figure 11-6 or 11-7).
5. To exit remote, either the local or remote operator enters BYE in response to the DCU prompt. Reset the keyswitch to the original position. The baud rate may also need to be reset.

TERMINAL-TO-TERMINAL COMMUNICATION. The operators for both the System Console and the remote site can communicate over the data link by sending messages from one terminal to the other. This is accomplished by preceding the message with the word **TELL**, at the DCU prompt, as shown below:

```
M> TELL THIS IS AN EXAMPLE
```

Without the word **TELL**, any input will be interpreted as a command.

DIAGNOSTICS

Your Hewlett-Packard Customer Engineer (CE) or Systems Engineer (SE) may request that you run certain diagnostics on your system and report the results in order to assist in troubleshooting. These tests are available, via the CMP, on the Series 39/40/42, and 44/48 systems, and via the DCU, on the Series 64/68 systems.

Series 37 Self Test

Self Test checks for a functioning CPU, Memory, TIC, PIC, and Synchronous Intermodule Bus (SIMB), and verifies the cold load path in power-on (PON) mode and maintenance mode (Control B Mode)

Self Test executes:

- At power-on via the keyswitch.
- When initiated from the Console in Maintenance Mode.
- Restarting after power failure.

Table 11-0C lists the LED status codes and error conditions.

When all tests have been successfully completed, Control B mode is entered. The following prompt is displayed:

```
H for Help->
```

Control B Mode

Control B allows the System Operator to perform several functions. The major functions are **LOAD**, **START**, **DUMP** and **Self Test**. Table 11-0B contains the complete list of Control B commands.

LOAD and **START** load MPE from tape and disc respectively, and **DUMP** loads the dump software from the indicated device. The **TEST** command allows the System Operator to run the Power On Self Tests with failures displayed on the System Console. Tests can be looped with the count parameter. Count must be an integer between 1 and 9999, with 1 being the default.

The commands available in Self Test Mode are listed in Table 11-1A.

Table 11-1A. Self Test Mode Commands

ALL	Run all self tests 1-9999 times.
CHANNEL	Loop test of channel 1-9999 times.
CPU	Loop CPU test 1-9999 times
EXIT	Return to Control mode.
IOMAP	Loop IOMAP 1-9999 times.
MEMORY	Loop memory test 1-9999 times.
PON	Run (or loop) Power On Selftest.

Self Test mode is entered with the Control B mode TEST command. The Self Test mode allows each self test to be directed.

AL[L] [count]

All runs all of the manually directed self tests except the Power On (PON) self test in order:

1. CPU test
2. Memory test
3. Channel test
4. IOMAP

The test may be looped by specifying the desired number of loops in count, an integer between 1 and 9999. The default is 1. A space is required before specifying count.

CH[an] [count [,channel]]

The appropriate test (TIC, PIC, or none) is run for each card installed in the CPU. If a failure occurs, the failure code and the card description are printed on the System Console.

The test may be looped by specifying the desired number of loops in count, an integer between 1 and 9999. The default is 1. A space is required before specifying count. Whenever a specific channel is selected with channel, count must be specified. At the conclusion of the test, the Self Test prompt comes up.

CPU [count]

The CPU command executes tests of the CPU not run at Power ON. The following tests are run by this CPU test:

- P, D, S, A bank register testing
- LED display testing
- TOC RAM testing
- MPE timer counting verified.
- Watchdog Timer Force Condition verified.

The test may be looped by specifying the desired number of loops in count, an integer between 1 and 9999. The default is 1. A space is required before specifying count.

EXIT

The Self Test EXIT command returns execution to the Control B mode and displays the "H for help->" prompt.

HELP

The HELP command displays the full set of Control B mode commands.

I[omap] [count]

The IOMAP command executes a version of IOMAP which is contained in the Self Test ROM. This version of IOMAP displays the number of banks of memory physically installed in the system, and identifies all I/O cards installed in the system. All supported HPIB devices attached to the PIC are identified and their ID code is displayed with a device description.

This command runs the memory size portion of the memory test and displays the size of memory, lists the LOAD, START, and DUMP devices, and then displays the types of cards installed in the system.

The test may be looped by specifying the desired number of loops in count an integer between 1 and 9999. The default is one. A space is required before specifying count.

M[emory] [count]

The Self Test MEMORY command executes the Power On Memory Test, which first determines the amount of memory installed, initializes the memory, performs an Address Test, performs an Error detection and Correction Test (EDAC).

The full memory test is displayed, and a pass/fail message is sent to the System Console. If a failure occurs, the numbers of the failing section is displayed.

The test may be looped by specifying the desired number of loops in count, an integer between 1 and 9999. The default is 1. A space is required before specifying count.

At the conclusion of this test, the Self Test prompt is displayed.

```
1-NORMAL  
Self Test ->
```

```
PON [count]
```

The Self Test PON command executes the Power On Self Test *count* times. This command is similar to the ALL command, except that the manually directed CPU test and IOMAP are not executed. The PON test is initiated by toggling the PON line, not by jumping to address 0000 (hex) in WCS.

Series 39/40/42 and 44/48

The CMP is connected directly to the configured System Console at the lowest address (Channel 1, Device 0), and is the standard device for use by all diagnostics. If, under MPE, the console has been switched to a terminal other than the configured console, you must be aware that all communication and diagnostics with the CMP takes place from the terminal set at Channel 1, Device 0.

CMP COMMANDS FOR DIAGNOSTICS. Prior to invoking the CMP, =SHUTDOWN the system to ensure that no data will be lost. If MPE is operational, you can transfer control to the CMP by simultaneously depressing the CONTROL and B keys. The B character causes the CMP to print a prompt (->) on the system console. When you enter the desired Maintenance or Diagnostic command, the CMP will respond with the question " IS IT OK TO ABORT THE SYSTEM? " If MPE has not been previously =SHUTDOWN you must answer YES. When the =SHUTDOWN command is entered, the CMP prints the HALT message, and then prompts you for further input. MPE must not be operational when using the CMP for Maintenance and Diagnostics.

NOTE

The CMP will print the message " DISABLED " on the System Console if a CMP command is entered before the CONTROL FUNCTIONS switch on the System Control panel is set in the ON position, or if the CMP Maintenance functions are disabled when the DISPLAY or SHUTTEST command is entered. In this case, set the MAINT MODE switch on the System Control Panel to the ON position before re-entering the command.

SELFTEST

This command initiates the CMP/System Self-Test. If the CPU is in the RUN state when the command is entered, the message " IS IT OK TO ABORT THE SYSTEM? " will be displayed after the CMP portion of the test. Enter YES to continue the system portion of the test.



If the system is not aborted, only the sections of SELFTEST which do not affect the CPU operation will be performed. If the system is running, use the MPE =SHUTDOWN command to halt all current jobs/sessions and to ensure the system will halt without damaging files on disc.

To run SELFTEST, the function switch on the System Control Panel should be set to enable the CMP for testing to begin. Enter B^C to receive the CMP prompt (->), then enter the SELFTEST command.

A parameter may be specified with the SELFTEST command. The parameter is a decimal number, and is assigned a certain meaning. Your Hewlett-Packard Service Representative will let you know what, if any, parameter to use with the SELFTEST command. The use of parameters causes looping of any of the specified tests. Looping will continue until you type any character on the console keyboard, or a failure is detected in SELFTEST.

This command performs tests of the basic system. The self-test will display messages as it tests the various subsystems to indicate whether the test passed or failed:

"test description test passed"

"test description test failed"

Some tests will also display error numbers or messages.

The messages printed in a successful test are:

```
-> SELFTEST
CMP TEST
RAM test passed
ROM test passed
UART test passed

CMP-CPU Interface
SWITCH=00
  test passed

CPU TEST
0000
0400
0800
0000
1000
1400
E000
E400
E800
  test passed

CONTROL PANEL
STATUS=06 SYS DISC=NORM
  test passed

ADCC TRANSMIT test passed
```

ADCC RECEIVE test passed
 GIC TEST CHL=05 test passed
 GIC TEST CHL=06 test passed

SYSTEM TEST passed
 ->

SHUTTEST
 (Series 44/48
 systems only)

This command tests the powerfail and overtemperature shutdown circuits on the CMP and in the power supply. The message "CYCLE POWER TO RESTART SYSTEM" is printed, then all power to the system is shut off, except the memory supply. When the system shuts down, the OVERTEMP LED and the MEMORY LED on the backplane should be on. The POWER LED should be off. To bring the system back up after this test, cycle (turn off, then on) the main power breaker located at the right rear of the system. If the test fails, the CMP will print the message "TEST FAILED" on the console.

NOTE

The power failure and overtemperature protection systems cannot be tested on the Series 39/40/42 by using the CMP SHUTTEST command. Use of the SHUTTEST command on these systems is not recommended. However, if the command is entered, the resulting failure message should not be interpreted as an error in the system.

DCTEST

This command will invoke the RS-232 C signals on the CMP to be tested. The test requires that the Data Comm Test Adapter (30090-60052) be installed on the system between J3 of the CMP and the CMP cable. The test can only be performed when this adapter is present.

Enter DCTEST command to invoke this test. This test cannot be run in Remote Mode.

Error messages are in the form:

ERROR IN STEP *test#* *expected data* *actual data*

DISPLAY

This command causes the Maintenance Display to appear on the screen. The following table shows an example of the Maintenance Display. If your Hewlett-Packard Service Representative requests information from this display, you will be given detailed instructions for reading the Maintenance Display. This command is intended for maintenance use only.

System Controls and Special Functions

```

RA  2024  PR  000C      MAINTENANCE DISPLAY 1.0      NIR  EC8A0571AFFF
RB  1A4F   P  0AB3      DL  1BDA ABNK 0000  CSAR  1861
RC  31FA   PL 10AF      DB  1C58 BBNK 0001  UBUS  0000
RD  0006  PBNK 0001      Q  2A91 DBNK 0001  RUN   MHALT
R4  31FA  R16 0000  R28 0008  SM  3554 SBNK 0001  PARITY  UPDATE OFF
R5  0000  R17 269B  R29 0020  Z   3AA9           TIMEOUT  DISABLED
R6  297F  R18 0001  R30 FFFF  SWCH 0231
R7  297F  R19 0503  R31 36B8  STA  44DE           mitroCel
R8  000F  R20 10AF  R32 0023  SIR  200E           CSRO irq nrdi ddrn disp ICS SS
R9  00FF  R21 0200  R33 0000  SRR  1A5B
R10 0080  R22 0000  R34 A000  CIR  2138
R11 10A3  R23 36E8  R35 0002  CTR  0003           f1 f2 f3 f4
R12 2429  R24 0020  R36 FFFF  SPO  FFFF  MODE: WW
R13 3555  R25 0024  R37 000A  X    0000  STORBP  STOP
R14 0000  R26 0020  R38 FFCF  SR   0004  IMB: 013555
R15 0000  R27 3555  R39 4000  OPND 0006  BP   000000  BPTYPE: CSARBP

```

Figure 11-11. Maintenance Display

IOMAP

This command prints the current system configuration. The memory size, control panel switch settings, and all channels and devices in the system are identified. Invalid command names will cause the following message to be displayed "INVALID COMMAND, USE HELP FOR INFO". If you follow the IOMAP command with a parameter of 0 (IOMAP 0), looping will continue until you type any character on the System Console. If errors are detected, error messages are printed in inverse video. If error messages are printed, the data shown may be incorrect. Note that to invoke this microdiagnostic, the CMP must be enabled. The following is an example of an IOMAP display:

```

-> IOMAP
I/O CONFIGURATION
1024KB MEMORY
START 110
DUMP 110
LOAD 91
CHL=01 ID#8011 ADCC/EXTENDER
CHL=02 ID#8001 ADCC
CHL=10 ID#0000 GIC
  DEVICE#01 ID#2001 2608
CHL=11 ID#0002
  DEVICE#00 ID#0002 DISC(s)
  DEVICE#01 ID#4002 INP
  DEVICE#02 ID#2003 2617
CHL=09 ID#0000 GIC
  DEVICE#01 ID#0183 7970E

```

GENERAL CMP ERROR MESSAGES. The following error messages may be generated during system self-tests. Generally, serious error messages are shown in inverse video by the CMP. You may be requested to relay this information to your Hewlett-Packard Customer Engineer to aid in diagnosing problems on your system.

Table 11-2. General CMP Error Messages

ERROR MESSAGE	EXPLANATION
CAN'T MHALT	CPU cannot be microhalted.
CAN'T MS	CPU is frozen.
CAN'T READ	The CMP cannot read the channel or device switches on the System Control Panel.
CAN'T PS	The CPU cannot be program stepped because it is microhalted or program running.
CAN'T SET	The register specified cannot be set.
CMP FAILURE	A failure has been detected that is probably on the CMP. Additional information will be printed to further describe the source of the failure.
CPU BAD	During the CPU PROM test, the CPU did not execute NOP microinstructions properly.
CPU FROZEN	The CPU cannot execute NOP microinstructions.
CSRQ	While performing the GIC test, the GIC did not assert CSRQ properly.
DISABLED	The function requested has been disabled on the System Control Panel. Change the enable switches on the System Control Panel and re-enter the command.
DMA	While performing the GIC test, the GIC did not perform a good DMA transfer into memory.
DNV	While performing the GIC test, the GIC did not assert DNV correctly.
IRQ	While executing the GIC test, an error was found in the GIC'S assertion of IRQ.
NO ADCC	Channel 1 is not an ADCC. Consequently the ADCC loopback test cannot be performed.
NO IMB DEV	A timeout occurred on the IMB while reading/writing to memory or I/O.
NOT CONTROLLER	While performing the GIC test, the GIC was found to be configured not to be a controller. Therefore, the test was aborted.
NOT VERIFIED	The baud rate was not changed because the letters "MPE" were not read at the new baud rate.
OVER-TEMP SHUTDOWN	The System Control Panel indicates the system is overheating. Therefore, the CMP will assert PFW to cause main power supplies to turn off. (Does not apply to Series 38/40/42 systems.)
REG	During the GIC test, the pattern test of registers found a failure on the GIC.
SELFTEST FAILED	Somewhere during execution of self-test, a failure was found. Examination of prior messages should give a more specific message.
SYSTEM HALTED	The CPU is halted. The parameter printed, if present, gives the system halt or CPU self-test parameter.
TEST FAILED	The self-test step under execution failed.
TIMER FAILED	The CMP timer is not functional. The CMP will probably be unable to function properly.

Series 64/68 Maintenance Mode and Diagnostics

Your Hewlett-Packard Customer Engineer (CE) or Systems Engineer (SE) may request that you run certain diagnostics or perform certain maintenance functions and report the results in order to assist in troubleshooting. These tests are available via the DCU's Maintenance Mode. Your Hewlett-Packard Service Representative will tell you what steps to take to run these diagnostics. This section includes non-MPE error messages for the DCU, self-test error messages, System Load (Micro-Program, or MPL) errors, and SYSSTOP (hardware) errors.

Series 64/68 DCU Maintenance Mode Commands

The DCU is connected directly to the configured System Console at the lowest address (Channel 1, Port 0), and is the standard device for use by all diagnostics. If, under MPE, the console has been switched to a terminal other than the configured console, you must be aware that all communication with the DCU takes place from the terminal that is set to Channel 1, Port 0.

The Maintenance Mode is enabled when the REMOTE/CONTROL/MAINTENANCE keyswitch, which is located in the Power Control Module at the rear of the Series 64A (HP 32460A), or the DCU junction panel of the Series 64B/68B (HP 32460B, HP 32468B) is in the MAINT position. Maintenance Mode is entered on initial POWER ON, or when the operator enters a B^C character on the System Console providing that the keyswitch is in either the MAINT or MAINT/REMOTE position. The Maintenance Mode commands are a superset of the Control Mode commands, and allow greater control of the Series 64/68 system. In Maintenance Mode, you can perform certain maintenance functions and run diagnostics as directed by your Hewlett-Packard Customer Engineer. All Control Mode commands can be executed in Maintenance Mode as well.

Prior to invoking the DCU, perform an MPE SHUTDOWN on the system to ensure that no data will be lost. If MPE is operational, you can transfer control to the DCU by simultaneously depressing the CONTROL and B keys. The B^C character causes the DCU to print a prompt (M> in Maintenance Mode) on the System Console. If the system is running when the command is entered, the DCU may respond with the question " IS IT OK TO ABORT THE SYSTEM? ". If MPE has not been previously =SHUTDOWN, you must answer YES. When the =SHUTDOWN command is entered, the DCU prints the HALT message, then prompts you for further input. MPE must not be operational when using the DCU for Maintenance and Diagnostics.

CAUTION

Not all of the available Maintenance Mode commands are listed in this section. This is because those commands which are not listed are potentially destructive to the operating system, and must be used with extreme caution under the supervision of a Hewlett-Packard Service Representative who has been trained in their use. The HELP command (shown below) lists Control Mode commands. Consult your Hewlett-Packard Customer Engineer for instructions if you need to use other Maintenance Mode commands.

The Maintenance Mode commands available for use without the assistance of an Hewlett-Packard Service Representative are listed in the order they appear here. Any command may be entered with the first two characters of the command.

- M>HELP The HELP command lists all of the Control Mode commands which are valid. When entered in the Maintenance Mode, the HELP command lists Control Mode commands. The Maintenance Mode facility is no longer on line. For available Maintenance Mode commands, contact your Hewlett-Packard Systems Engineer.
- M>RX The RX (reset DCU hardware) command is equivalent to powering on after a power failure without doing an auto-restart. All of the DCU's internal status bytes and buffer pointers are initialized except the DCU Event Log.
- M>RM The RM (remote) command enables and tests the Tele-Support Facility.
- M>SPEED The SPEED command changes the DCU input and output speeds. The syntax for this command is as follows:
- M>SPEED *inspeed, outspeed*
- where *inspeed* and *outspeed* are the number of characters per second. Acceptable speeds are 10, 14, 15, 30, 60, 120, 240, 480, or 960.
- M>BYE The BYE command disables/disconnects the Tele-Support Facility.

SHIFT STRING DUMP—SERIES 64/68

The operator performs a shift string dump whenever a system failure occurs resulting in a system halt. A DCU prompt is displayed on the System Console. DCU Maintenance Mode commands are used to store the contents of specific CPU registers on the Floppy Disc Unit of the HP 3000 Series 64/68 System Console. Refer to Appendix A, "Quick Reference Guide" for step-by-step procedure.

OVERTEMPERATURE SHUTDOWN

A built-in safety feature of all HP 3000 computer systems is the overtemperature shutdown facility, which may prevent serious damage to the components and other electronic equipment in the computer due to overheating.

Series 37

When the internal temperature of a Series 37 reaches 51°C (+ or -) 4° , the OVERTEMP warning appears on the System Console in inverse video every 25 seconds. When the temperature drops to 43°C (+ or -) 4° , the system recovers and the OVERTEMP warning is turned off.

If the internal temperature reaches 66°C (+ or -) 4° , the OVERTEMP SHUTDOWN message appears only once on the System Console.

CAUTION

If there is a remote Console running at less than 1200 baud, the OVERTEMP SHUTDOWN message will not be displayed on the System Console.

Contact your Hewlett-Packard Customer Engineer (CE) before restoring power to the system. It is possible that some internal failure has caused the system to overheat. Your CE will instruct you in the steps to take.

Series 39/40/42

When the computer's internal temperature reaches approximately 55° C (131° F), a power failure is automatically simulated and the system is shut down. Power is still applied to the memory boards, memory controller, and mainframe fans. When an overtemperature shutdown takes place, the red BATTERY light on the System Control Panel (Figure 11-2) is lit until complete power is restored to the system. This feature protects all user files, spool files, and executing processes until the system is brought up again.

It is important to contact your Hewlett-Packard Customer Engineer (CE) before restoring power to the system, because it is possible that some internal failure has caused the system to overheat. Your CE will instruct you in the steps to take.

To return to a normal operating state after an overtemperature shutdown, power can be momentarily interrupted at the external power source outside the system (i.e., cycle the main power circuit for your installation by turning it off, then on; or disconnect the AC power cord from the wall socket, then reconnect it).



CAUTION

DO NOT turn off the SPU power switch located on the front of the Series 39/40/42 system cabinet (Figure 11-1), or the contents of main memory and the operating environment which existed prior to the shutdown will be lost.

Series 44/48

The red OVERTEMP SHUTDOWN LED indicates that the temperature has exceeded the threshold (approximately 57.3° C or 135° F) of any temperature transducer located across the top of either card cage. ("P" in Figure 11-4) This indicator is continually monitored by the Control and Maintenance Processor (CMP). If an overtemperature condition occurs, the CMP displays a message on the System Console stating that the system is being shut down because of overheating. Power to main memory is maintained to preserve the operating environment which existed prior to the shutdown. This ensures ensures that there will be no significant loss of data when power is restored.

It is important to contact your Hewlett-Packard Customer Engineer before restoring power to the system, as it is possible that some internal failure has caused the system to overheat. Your CE will instruct you in the steps to take.

Power can be restored to the system by cycling the main power switch, that is, turning the switch to the OFF position, and then to the ON position. The main power switch is located at the bottom right rear of the system (Figure 11-4). This step initiates the internal powerfail recovery routines, which brings the system back to the operating environment that existed before the shutdown occurred.

Series 64/68

The Series 64/68 has two sets of overtemperature sensors designed for either "low" (40° C/104° F) or "high" (50° C/122° F) overtemperature conditions. When a "low" switch opens, the following happens:

1. OVERTEMP LED on the front display lights. (Figure 11-6 or 11-7.)
2. OVERTEMP message is displayed on the System Console Banner.
3. The System Console "beeps" every ten seconds until the temperature drops below 30° C.

When a "high" overtemp switch opens, the following occurs:

1. OVERTEMP LED on the front display lights.
2. OVERTEMP message is sent to the System Console.
3. The System Console will "beep" once each second.
4. After one minute, the banner "OVERTEMP SHUTDOWN" flashes on the screen.
5. After 15 seconds, the system will automatically powerfail and shut down. At this time, power to the overtemp LED is interrupted, and the LED turns off. For the HP 32460B/32468B this is backed up by battery.

The Series 64/68 (HP 32460A) will signal an overtemperature failure by lighting the OVERTEMP LED on the System Status and Display Panel (SSDP); Series 64/68 (HP 32460B/32468B) signals an overtemperature failure by lighting the OVERTEMP LED or the "H" LED on the SSDP.

If your system overheats, you should immediately check for obstructions around the system. If the temperature continues to rise to 50° C, you should warn all users of the impending shutdown.

It is important to remember to contact your Hewlett-Packard Customer Engineer (CE) before restoring power to the system, because it is possible that some internal failure has caused the system to overheat. Your CE will instruct you in the steps to take.

The system will not restart until the temperature reaches normal and power is cycled (off, then on).

System Load (MPL) Errors (DCU ROM Date Code Earlier than 2403)

These are error messages which can be received on system load or micro-program load (LOAD, START, DUMP) commands. They apply only to DCU ROM date codes earlier than 2403. Use the PART command (refer to DCU CONTROL MODE COMMANDS in this section) to find out the DCU ROMS date codes. Each error is described along with possible clues to the problem:

- **INIT/IDENT FAILED** Was not able to successfully initialize memory or identify a device for the loading operation.
- **BAD INIT/IDENT DEVICE TYPE** Device specified was not a proper MPL device (HP 792X disc, 797X tape or 7933 disc).
- **DCU received no response from CPU (TIMEOUT).**
- **MPL FAILED** Could not load system microcode from specified device.

Microcode Program Load (MPL) Error Messages (DCU ROM Date Code Earlier than 2403)

These error messages from the DCU are printed on the System Console when loading system microcode. Table 11-3 applies only to DCU ROM date codes earlier than 2403.

Table 11-3. MPL Error Codes (DCU ROM Date Code earlier than 2403)

ERROR CODE	DESCRIPTION	ACTIONS
A001	Message timeout: either the message cannot be sent because the receiving module (IOA) is busy, or there is no response from receiving module.	1) Check cables between IOB and IMBI of the cold load device. 2) Run I/O microdiagnostics.
A002	Disc status not ready.	1) Check cold load device connected to proper channel. 2) Check system disc powered up and ready.
A003	The cold load channel cannot be brought on line as a controller-in-charge.	1) Check if right channel number is set on the channel. 2) Check if "SYS CTRL" is set on cold load channel. 3) Run I/O microdiagnostics. Run IOMAP and Loopback test of cold-load device to check if channel is responding.

Table 11-3. MPL Error Codes (DCU ROM Date Code earlier than 2403) (cont.)

ERROR CODE	DESCRIPTION	ACTIONS
A004	WCS/LUT checksum error.	1) Check if correct system firmware is installed on the cold load device 2) Run CPU micro-diagnostics to check WCS/LUT RAMs.
A005	CSRQ timeout after DMA completion.	1) Check switch on channel is set to "CPP PROCESSOR". 2) Run DMA exerciser.
A006	Abnormal DMA termination, or disc drive is off. WCS was not loaded correctly from disc, probably because disc data is not there, or is corrupt. DMA transfer is halted because of memory error or hardware timeout.	1) Run I/O micro-diagnostic. 2) Run DMA exerciser.
A007	No WCS/LUT on tape.	1) Check tape drive unit 0 is selected and on line. 2) Check if proper magnetic tape is mounted on the drive.
A008	Device Specified Jump Response not equal to zero.	1) Run loopback test of the device. 2) Run DMA exerciser.

System Load (MPL) Errors (DCU ROM 2403 and Later)

These are error messages which can be received on a system load (LOAD or START commands); they apply only to ROM date codes 2403 and later. Use the PART command (refer to DCU CONTROL MODE COMMANDS in this section) to find out the date codes for the DCU ROMS. Each error is described along with possible clues to the problem:

- INIT/IDENT FAILED Was not able to successfully complete the INITIALIZATION/IDENTIFICATION part of MPL.
- BAD INIT/IDENT DEVICE TYPE Device specified was not a proper MPL device (HP 7914 disc, 792X disc, 797X tape or 793X disc).
- MPL FAILED Could not load system microcode from specified device.
- DCU RECEIVED NO RESPONSE FROM CPU Timeout.
- MPL ERROR CODE = Annn System microcode bootstrap loader has detected a problem; error codes follow.

Microcode Program Load (MPL) Error Messages (DCU ROM Date Code 2403 and Later)

These error messages are printed on DCU console when loading system microcode. Table 11-4 applies only to DCU ROM date codes 2403 and later.

Table 11-4. MPL Error Codes (DCU ROM Date Code 2403 and Later)

ERROR CODE	DESCRIPTION	ACTIONS
A001	Message timeout - either the message cannot be sent because the receiving module (IOA) is busy, or because there is no response from the receiving module.	<ol style="list-style-type: none"> 1. Check the cables between the IOB and IMBI of the cold load channel. 2. Run I/O microdiagnostics.
A002	Disc status not ready.	<ol style="list-style-type: none"> 1. Check if the system disc is powered up and is ready. 2. Check HP-IB cables from GIC to the coldload disc. 3. Check the IMB number, channel number, and device number used to specify the coldload device. 4. Check if correct channel number is set on the coldload channel GIC. 5. Check if correct HP-IB address is set on the coldload device. 6. Run I/O microdiagnostics. Run IOMAP and DUS device diagnostics on the coldload disc.
A003	The coldload channel cannot be brought on line as a controller-in-charge.	<ol style="list-style-type: none"> 1. Check if correct channel number is set on the coldload channel GIC. 2. Check if "SYS CTRL" is set on the coldload channel. 3. Run I/O microdiagnostics. Run IOMAP and DUS GIC diagnostics on the coldload channel.
A004	WCS/LUT checksum error.	<ol style="list-style-type: none"> 1. Check to make sure the correct system firmware is installed on the coldload device. 2. Try another copy of the operating system if loading from tape. 3. Clean the heads on the coldload device if loading from tape. 4. Run DUS device diagnostics on the coldload device. 5. Run DMA exerciser. 6. Run FLDs to locate possible hardware error condition.
A005	No WCS/LUT on the tape.	<ol style="list-style-type: none"> 1. Check if the tape drive unit 0 is selected, and on line. 2. Check if the proper magnetic tape is mounted on the drive.

Table 11-4. MPL Error Codes (DCU ROM Date Code 2403 and Later) (cont.)

ERROR CODE	DESCRIPTION	ACTIONS
A006	Device Specified Jump Response not equal to zero. The coldload device has detected an error in the data sent to the system. Possible errors include parity, drive fault, power-fail, illegal disc address and read requested past end of file.	<ol style="list-style-type: none"> 1. Check to make sure the correct system firmware is installed on the coldload device. 2. If loading from a tape, verify that the tape is at the load point before attempting to load the system. 3. Check HP-IB cables to coldload device. 4. Clean the heads on the coldload device if loading from tape. 5. Run DUS device diagnostics on the coldload device. 6. Run DMA exerciser.
A007	CSRQ timeout after SIOP command. The channel program has not completed within the allowed time limit.	<ol style="list-style-type: none"> 1. Check if the switch on channel is set to "CPP PROCESSOR". 2. Run I/O microdiagnostics. 3. Run DMA exerciser.
A008	Channel Program Abort. The channel program used to read from the coldload device has aborted due to an error condition that it encountered. The reason for the abort is indicated by the error code in CPVA [0], the first channel program variable word in main memory at location 034C Hex.	<ol style="list-style-type: none"> 1. Check if the system coldload device is powered up and on line. 2. Check HP-IB cables to coldload device. 3. Run I/O microdiagnostics. 4. Run DUS device diagnostics on the coldload device. 5. Run DMA exerciser.
A009	CSB I/O ERROR. An error has been detected on a data transfer across the Central System Bus.	<ol style="list-style-type: none"> 1. Run FLDs to locate possible hardware error condition.

Table 11-4. MPL Error Codes (DCU Date Code 2403 and Later) (cont.)

ERROR CODE	DESCRIPTION	ACTIONS
A00A	Invalid module number. The MPL microcode has detected an attempt to access a module that does not exist.	<ol style="list-style-type: none"> 1. Check the IMB number used to specify the coldload device. 2. Run FLDs to locate possible hardware error condition.
A00B	Non-responding module. The MPL microcode has detected an attempt to access a module that does not respond.	<ol style="list-style-type: none"> 1. Check the IMB number used to specify the coldload device. 2. Run FLDs to locate possible hardware error condition.
A00C	Unimplemented channel opcode. The channel program interpreter has encountered an illegal channel program opcode while executing the channel program used to read from disc or tape.	<ol style="list-style-type: none"> 1. Run FLD memory diagnostics or DUS main memory diagnostics to test main memory banks zero and one. 2. Execute DCU self-test command ZS to verify that the DCU ROMs still checksum properly. 3. Run FLDs to locate possible hardware error condition.
A00D	Coldload device won't IDENT. The coldload device won't respond to an IDENT request with a valid identification code.	<ol style="list-style-type: none"> 1. Check if the system coldload device is powered up and ready. 2. Check HP-IB cables from GIC to the coldload device. 3. Check the IMB number, channel number, and device number used to specify the coldload device. 4. Check if correct channel number is set on the coldload channel GIC. 5. Check if correct HP-IB address is set on the coldload device. 6. Run I/O microdiagnostics. Run IOMAP and DUS device diagnostics on the coldload disc.

SYSSTOP Error Messages (Printed on DCU Console)

The error messages described in Table 11-5 indicate a specific hardware problem as detected by the DCU during normal startup and system operation. These errors are referred to as DCU hardware halts, but when these halts occur, the DCU enters the Maintenance Mode. Some of the errors can be caused by software, usually an address to non-existent memory. This forces an "INVALID ADDRESS" error message. Other errors can be forced by bad hardware, such as a double-bit memory error (an uncorrectable memory error). Run Fault Locating Diagnostics (FLDs) to further isolate the problem. the problem.

Table 11-5. SYSSTOP Error Messages

Hardware CBI Error n (n= 1/2/3/5/7)

Catastrophic hardware fault, as detected by the indicated CBI. The receiving CBI module is not necessarily the cause of the error.

WCS Parity Error

Catastrophic single-bit parity error. Generally caused by a faulty WCS PCA, which may be encountered when loading system microcode.

CPU Timeout

CPU has not received a required response from one of the other CSB modules in the allotted time.

CAC Error

The cache array controller has detected one or more cache conditions. In most conditions, I/O will be allowed to complete.

CMA Error

Single-bit cache memory array parity error.

Multi Bit Error

Multiple-bit memory errors have been detected in system memory. These errors are uncorrectable.

Invalid Address Module n (n= 1/2/3/5/7)

Detected by receiving CBI. Caused by a module (ie; I/O, CBI) sending an illegal memory address.

Invalid Address - CAC

Illegal addressing of CMA, as detected by the CAC.

Continuous DCUSTOR Error

Series 64/68 is generating continuous DCUSTOR interrupt to the DCU. The system is in an abnormal state, and the DCU had to disable this interrupt line.

LUT Parity Error

The system microcode LookUp Table has a parity error. Generally, this is caused by a faulty CIR PCA.

Unexpected Debug

This usually results from attempting to run diagnostics without the ED command. A special diagnostic microcode command "DEBUG" has been encountered. The DCU is not prepared to handle this.

Diag Stop Error

A hardware failure has forced the microcode to do "panic stop".

Mem Breakpoint at nnnn.nnnn

WCS Breakpoint at nnnn.nnnn

A memory or WCS breakpoint previously set in Maintenance Mode, has been reached.

System Halt Conditions

System Halt conditions listed in Table 11-6, are output to the DCU Console in the format of "SYSTEM HALT *number*". These are microcode halts; the DCU is responsible for printing the HALT number and message on the console.

Table 11-6. System Halt Conditions

HALT #	CONDITIONS
0	Unknown system halt
1	STT violation in Segment #1
2	Absent code segment while on ICS
3	Absent segment or trace in Segment #1
4	Stack overflow on ICS
5	CST length violation
6	Channel program timeout
7	Bootstrap channel program checksum
8	Bootstrap channel program abort
9	Pseudo-Enable violation (Q1-18) less than 0
10	Module send message timeout
11	Invalid module responding
12	Channel not system controller
13	Code segment violation in Segment #1
14	No channel responding
15	Channel 0 responding
16	Message interrupt w/o IRQ or CSRQ
17	Not able to put it to controller-in-charge
18	Receive message timeout
19	I/O error, parity/timeout
20	WCS checksum error
21	LUT checksum error
22	Bad DCU Command Code



GENERAL INSTRUCTIONS

OPERATOR FUNCTION: SYSTEM STARTUP (FOR SYSTEMS CONFIGURED WITH SINGLE DISC CONTROLLER.)

DESCRIPTION: These instructions apply to systems that are configured with only one disc controller.

A COLDSTART, UPDATE, OR RELOAD from a serial disc requires these standard instructions, when it is necessary to configure both the system disc and the start-up serial disc on the same controller.

STEP	PROCEDURE
1	Mount the MPE system disc on logical device number one (<i>ldev 1</i>). Set the unit number of <i>ldev 1</i> to an unused value. Place the drive on line.
2	Mount the serial disc on logical device number <i>n</i> (<i>ldev n</i>). Set the unit number of <i>ldev n</i> to zero (Unit 0). Place the drive on line.
3	Load the system using the opening steps of the COLDSTART, UPDATE, or RELOAD startup procedure, whichever is appropriate.
4	<p>The Initiator checks the system volume table and finds that the system disc is not mounted on <i>ldev 1</i>. It then prompts with the questions:</p> <pre> **WARNING** SYSTEM DISC AND COLD LOAD DEVICE ARE ON SAME DRT SYSTEM DISC MUST BE ONLY UNIT ZERO ON THIS DRT MAKE DISC UNIT # CHANGES NOW READY? NEW SERIAL DISC UNIT #? </pre> <p>Before you respond to this prompt, follow Steps 5 and 6 below:</p>
5	Set the number of <i>ldev n</i> back to its correct unit number, according to the MPE I/O configuration.
6	Set the unit number of <i>ldev 1</i> back to "0", as specified in the MPE I/O configuration.
7	Now, reply <u>YES</u> to the "READY?" prompt, and reply with the new unit number of <i>ldev n</i> .
8	The Initiator continues with progress messages, and the "DATE?" and "TIME?" prompts described in later steps of the COLDSTART, UPDATE, and RELOAD procedures.

CHANGING FORMS

OPERATOR FUNCTION: CHANGING FORMS ON A LINE PRINTER.

DESCRIPTION: This procedure describes how to respond to special forms messages on the console. A user's forms message is printed, along with requests to mount the forms and reply. Please note, the forms should be mounted before the reply is made.

Messages in the description are only examples, as they differ according to system configuration and each user's request.

STEP	PROCEDURE
1	<p>10:50/#S93/22/FORMS; PLEASE MOUNT MAILING LABELS ?10:50/#S93/22/SP#12/LDEV# FOR #S93; OUTFILE ON LP (NUM)?</p> <p>The first message includes instructions from the programmer. The second is a request from the system and requires a :REPLY.</p>
2	<p>:<u>REPLY pin,ldev</u> Allocates the output device.</p>
3	<p>?10:51/#S93/22/LDEV# 12 FORMS ALIGNED OK (Y/N)?</p> <p>This message gives the opportunity to mount a form and align it for printing. Each <u>NO</u> response causes a test line of characters to be printed on the line printer. When the test line is printed in the correct position, respond <u>YES</u>, and output to special forms begins.</p>
4	<p>:<u>REPLY pin, NO</u> or :<u>REPLY pin, YES</u></p>
5	<p>11:15/22/STANDARD FORMS ?11:15/#S98/22/SP#12/LDEV# FOR #S98;L ON LP (NUM)?</p> <p>The system displays forms messages when the spool file requesting them becomes ACTIVE. After special forms have been printed, the next spool file to become ACTIVE, which requests no special forms, will cause a "MOUNT STANDARD FORMS" message to be generated on the console. This occurs at the beginning of printing the next spool file, which could be some time after the special forms have finished printing.</p>
6	<p>:<u>REPLY pin,ldev</u></p>

ADDITIONAL DISCUSSION

Forms Message in Section IX

:SYSDUMP

OPERATOR FUNCTION: FILE AND SYSTEM BACKUP (:SYSDUMP)

DESCRIPTION: This procedure copies the operating system, the current directory and accounting information, and users' files.

STEP	PROCEDURE
1	Log onto the system: <u>:HELLO MANAGER.SYS</u>
2	Check for logged-on users: <u>:SHOWJOB</u>
3	Warn sessions of impending dump, and restrict new jobs/sessions: <u>:WARN@;message</u> <u>:LIMIT0,0</u>
4	After a reasonable length of time, abort any remaining sessions: <u>:ABORTJOB #Snnn</u>
5	Clear all outstanding allocation messages: <u>:REPLY pin,0</u> or <u>:REPLY pin,N</u>
6	Define the output file(s) where the system is to be copied: <u>:FILE <i>dumpfile</i>;DEV=<i>devclass</i></u> <u>:FILE <i>auxlistfile</i>;DEV=<i>devclass</i></u>
7	Initiate the dump and respond to the prompts: <u>:SYSDUMP *<i>dumpfile</i>, [<i>auxlistfile</i>]</u> ANY CHANGES? NO ENTER DUMP DATE? <u>(RETURN)</u> Dumps the I/O configuration and MPE. When this copy is used for a COLDSTART, the accounting structure and all files remain intact; when used for a RELOAD, the accounting structure and all files are lost. <i>future date</i> Dumps the I/O configuration, MPE, and the accounting structure, but no files. <i>backup date</i> (The date of the most recent SYSDUMP.) Dumps the I/O configuration, MPE, the accounting structure, and all files that have been modified since the specified date.
0	Dumps the entire system.

STEP	PROCEDURE
	ENTER DUMP FILE SUBSET(S)? <u>RETURN</u> (or any valid list of file subsets) LIST FILES DUMPED? <u>YES</u> or <u>NO</u> .
8	You are now requested to allocate the output device. After you reply, the system is copied to the backup medium. If multiple volumes are required, you receive mount requests at the appropriate times.
9	END OF SUBSYSTEM After the SYSDUMP termination, label the backup copy (or copies) clearly and store in a safe place.

COMMENTS

In the :SYSDUMP command, each file name is preceded by an asterisk (*) to indicate a back-referenced :FILE command.

When prompted to "ENTER DUMP FILE SUBSET(S)", entering a RETURN is equivalent to entering @.@.@, which is equivalent to a :FULLBACKUP command if "0" dump date is entered, i.e., all files in all accounts are dumped.

When the :SYSDUMP is complete, carefully and clearly label the backup volumes with volume names, volumes set names, generation date, etc., or develop your own numbering system to reference this information.

MPE provides three methods for backing up disc files: the :SYSDUMP command, the :STORE command, and the VINIT subsystem's >COPY command, both of which are explained in Section IV under "SYSTEM BACKUP AND RECOVERY". In general, the following are suggested:

- Use :SYSDUMP for daily system backup, because it provides a record of the latest accounting information.
- Use :STORE to backup only those files that belong to a particular set of groups or accounts.
- Use the >COPY command in the VINIT subsystem to create a copy of a particular private volumes disc.

NOTE

The ;LABEL= parameter cannot be used in the :FILE command for the dump file. An attempt to use this parameter will result in an error abort.

STARTUP STATE CONFIGURATOR

OPERATOR FUNCTION: RESET ANY SYSTEM-DEFINED DEFAULTS, STREAM SPECIAL JOBS, OPEN DS LINES, CREATE PROGRAMMATIC USER SESSIONS.

DESCRIPTION: This Startup State Configurator is maintained by the System Manager in a file, SYSSTART.PUB.SYS. System Manager capability is necessary to create this file. Startup commands supported include WARMSTART, CDDLSTART, COLDSTART, UPDATE, and RELOAD.

The G.01.00 software release includes a Startup State Configurator.

Operation

The Startup State Configurator processing is done after the date and time dialogue, but before a session is logged onto the Console.

NOTE

If no SYSSTART.PUB.SYS file exists, no processing occurs.

If SYSSTART exists, but its format is incorrect, the contents will be ignored, and an error message will be displayed. The startup will skip SYSSTART, and continue execution.

If a correctly formatted SYSSTART file exists, the following operations occur:

1. The type of startup is determined (e.g., WARMSTART, UPDATE).
2. The file is searched for two sections: the STARTUP section and the section whose name corresponds to the current startup method.
3. For a given startup, zero, one, or two sections are processed concurrently, depending on whether they exist in the file. If they exist, the STARTUP section, then the section corresponding to the current startup method are processed. Progress messages are printed on the Console as each section begins and completes processing.

The basic process consists of a loop:

1. Read a record from the startup file.
2. Remove passwords and lockwords from this record.
3. Echo the record without passwords and lockwords to the Console.

4. Check to ensure that the command is allowed. If it is not allowed, print a message and return to the top of the loop. The commands allowed in a SYSSTART file are listed below.
5. Pass the record, including passwords and lockwords, to the COMMAND intrinsic for execution.
6. Check for an error. If one occurred, print an error message.
7. Return to Step 1.

Example SYSSTART File

```
1          STARTUP
2          STREAMS 10
3          ALLOW @.@;COMMANDS=REPLY
4          ALLOCATE COBOLII.PUB.SYS
5          LIMIT 4, 16
6          JOBFENCE 4
7          DUTFENCE 5
8          DUTFENCE 12;LDEV=14
9          COMMENT A continuation record follows:
10         DSCONTROL 90;OPEN;RETRY=10;&
11         TRACE,ON,ALL,,60,WRAP
12         ***
13         WARMSTART
14         STARTSESS 20;MGR.ACCT;HIPRI;NOWAIT
15         STARTSESS 21;USER.ACCT
16         STARTSESS 22;USER.ACCT
17         STARTSESS 23;USER.ACCT
18         ***
19         COOLSTART
20         STARTSESS 20;MGR.ACCT;HIPRI;NOWAIT
21         STARTSESS 21;USER.ACCT
22         STARTSESS 22;USER.ACCT
23         STARTSESS 23;USER.ACCT
24         ***
```

In this example, commands in the STARTUP block will be executed every time the system is started. In addition to these commands, when a WARMSTART or COOLSTART is performed, the commands in the appropriate block are executed.

SOFTWARE DUMP - SERIES 37

OPERATOR FUNCTION: DUMPING MAIN MEMORY

DESCRIPTION: The Software Dump Facility (SDF) operates in a standalone environment and stores all of main memory to a serial storage medium. Perform a software dump after a system failure or system halt.

It is a wise precaution to have one or more backup copies of the SDF on a serialized storage medium. Remember that a backup SDF cannot be created after a software dump has failed; you must have one already on hand. A backup SDF should be created when the system is initially configured, and you should create a new backup SDF each time you receive a software update. This will ensure that you have the correct version of the SDF on your backup copy at all times. Refer to the discussion of Backup Software Dump procedures in Section X.

STEP	PROCEDURE
1	<p>Press the CONTROL key and B simultaneously (B^C). If the H for help-> prompt is not displayed on the Console, enter A^C (CONTROL A) to get the "=" prompt. Then enter B^C. If the "=" prompt is not displayed, Maintenance Mode must be entered by using a special switch on the ATP board.</p> <p style="text-align: center;">CAUTION</p> <p style="text-align: center;">This should be done only in consultation with a Hewlett-Packard AEO or CE as it involves opening the SPU box.</p>
2	<p>Welcome to Maintenance Mode</p> <p>2-LOCAL (from normal) H for help-> <u>DUMP</u> Do you want to abort the system (Y/N)? <u>Y</u> ***SOFTWARE DUMP FACILITY (VER 00.07/26)*** MOUNT DUMP, AND PLACE DRIVE ON-LINE. PRESS THE RETURN KEY TO CONTINUE EXECUTION OF SOFTDUMP.</p>
3	<p>Mount dump media, and place drive on line.</p>

STEP	PROCEDURE
4	<p>Press RETURN to continue execution of softdump.</p> <p style="text-align: center;">CAUTION</p> <p>Cartridge tapes must be serialized before being used as a dump medium. Using a non-serialized cartridge tape will cause the dump to fail.</p>
5	<p>The SDF program will create the dump, then initiate a WARMSTART:</p> <pre>DUMP WARMSTART HP32033G.01.00 WHICH OPTION <WARMSTART/COOLSTART>? <u>WARM</u> **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION WED, SEP 19, 1984, 7:22 PM? (Y/N) <u>Y</u> LOG FILE NUMBER 793 ON *WELCOME* :HELLO OPERATOR. SYS;HIPRI 19:23/#S1/15/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #20</pre>
6	<p>If the system halts while loading the SDF, the following error message will appear on the System Console:</p> <pre>***DUMP FAILED</pre> <p>This message indicates that an error has been detected, and the SDF is unable to execute. A backup software dump must be performed. Refer to "CREATING A BACKUP SDF" in Section X for step-by-step procedures.</p> <p>If the SDF command file does not exist or has been corrupted, the program automatically goes into interactive mode. The SDF prompts you for a command by printing a <code>SOFTDUMP COMMAND></code>, at which point you enter the desired SDF command (refer to Table 10-1).</p>

STEP	PROCEDURE
6 (cont.)	<p>If your serial storage medium is flawed, the following message may appear on the System Console:</p> <p>SERIAL DEVICE I/O ERROR - You are now in SOFTWARE INTERACTIVE MODE. Please mount new media, then type "DUMP" in response to the prompt "SOFTDUMP COMMAND>".</p>

WARMSTART - SERIES 37

OPERATOR FUNCTION: SYSTEM STARTUP (WARMSTART)

DESCRIPTION: This procedure loads the system from the system disc. It is the only restart procedure which results in recovery of incompletely processed spooled jobs and spooled device files.

WARMSTART should only be used to recover spool files and IMAGE transaction logging magnetic tape buffers.

STEP	PROCEDURE
1	Turn keyswitch to 2.
2	<p>If Automatic WARMSTART is enabled, a prompt will appear on the Console:</p> <pre> WARMSTART? (Y/N) <u>Y</u> *** Auto Warmstart *** HP32022G.01.00 ** PERFORMING A WARMSTART ** **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION MON, DEC 17, 1984, 10:39 AM? (Y/N) LOG FILE NUMBER 183 ON 10:40/2/LDEV #3 NOT READY *WELCOME* </pre> <div style="text-align: center; border: 1px solid black; width: fit-content; margin: 10px auto; padding: 2px 10px;">NOTE</div> <p>If the user enters anything other than <u>Y</u> (RETURN) or (RETURN), the system will abort the Automatic WARMSTART. If the user does not enter <u>Y</u> (RETURN) or (RETURN), the system will do an Automatic WARMSTART after 15 seconds. The Automatic WARMSTART is independent of the keyswitch position.</p>
3	<p>If Automatic WARMSTART is not enabled, the Console will display:</p> <pre> H for help-> </pre>

STEP	PROCEDURE
4	<pre> Enter <u>WARMSTART</u> HP32033G.01.00 ** PERFORMING A WARMSTART ** **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION WED, SEP 19, 1984, 7:22 PM? (Y/N) <u>Y</u> LOG FILE NUMBER 793 ON *WELCOME* :HELLO OPERATOR.SYS;HIPRI 19:23/#S1/15/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #20 : </pre>

COOLSTART - SERIES 37

OPERATOR FUNCTION: SYSTEM STARTUP (COOLSTART)

DESCRIPTION: This procedure loads the system from the system disc. This is the standard way to restart the system after a routine shutdown.

A COOLSTART deletes all spooled jobs and all input and output spool files. These can be preserved by doing a WARMSTART. The SPOOK5 utility may be used to store large spool files for subsequent processing. After spool files have been stored, the =SHUTDOWN command should be given, and a COOLSTART initiated.

STEP	PROCEDURE
1	Turn keyswitch to 2.
2	If Automatic WARMSTART is enabled, enter <u>N</u> when the prompt appears on the Console: WARMSTART? (Y/N) <u>N</u>
3	When the Control B Mode prompt appears, enter <u>COOLSTART</u> H for help-> <u>COOL</u> HP32033G.01.00 WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u> ANY CHANGES? <u>n</u> **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION MON, DEC 17, 1984, 10:48 AM? (Y/N) LOG FILE NUMBER 185 ON 10:48/2/LDEV #3 NOT READY *WELCOME*
4	Another option for Step 3 is to enter <u>COO</u> when the Control B Mode appears. HP320.01.00 **PERFORMING A COOLSTART** The dialogue then continues with the warning message as listed in Step 3.

COLDSTART - SERIES 37

OPERATOR FUNCTION: SYSTEM STARTUP (COLDSTART)

DESCRIPTION: This procedure cold loads the system from a magnetic or cartridge tape, or from serial disc. In each case, the procedure allows you to modify the system configuration while retaining users' information. COLDSTART is commonly used when an installation maintains several backup versions, each with a different configuration.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive, and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a COLDSTART from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev</i> 1. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (The Initiator dynamically allocates this drive to the nonsystem domain, making it available for private volume use once the startup is complete.)</p>
2	When the Control B Mode prompt (H for Help->) appears, enter <u>COLDSTART</u> .
3	HP32033G.01.00 WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u>

STEP	PROCEDURE
4	<p>The dialogue then continues:</p> <p>ANY CHANGES? <u>n</u></p> <p>**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS</p> <p>DIRECTORY MAINTENANCE COMPLETED LOADING OF SYSTEM FILES IN PROGRESS LOADING OF SYSTEM FILES COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION BANK 0 DEPENDENT MEMORY USED - 14103 WED, SEP 19, 1984, 7:22 PM? (Y/N) <u>Y</u> LOG FILE NUMBER 793 ON *WELCOME* :HELLO OPERATOR.SYS;HIPRI 19:23/#S1/LOGON FOR: OPERATOR. SYS,PUB ON LDEV #20 :</p>

UPDATE - SERIES 37

OPERATOR FUNCTION: SYSTEM STARTUP (UPDATE)

DESCRIPTION: This procedure cold loads the system from magnetic or cartridge tape, or from a serial disc. This is the standard procedure used when starting the system with an updated MPE operating system from Hewlett-Packard or an MPE backup copy prepared on a different HP 3000 system.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;"> <p>NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing an UPDATE from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain making it available for private volume use once the startup is complete.)</p>
2	<p>When the Control B Mode prompt (H for help->) appears enter <u>UPDATE</u>.</p>

STEP	PROCEDURE
3	<pre> HP32033G.01.00 ** PERFORMING AN UPDATE ** **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS. DIRECTORY MAINTENANCE COMPLETED LOADING OF SYSTEM FILES IN PROGRESS LOADING OF SYSTEM FILES COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION BANK 0 DEPENDENT MEMORY USED - 14103 WED, SEP 19, 1984, 7:22 PM? (Y/N) <u>Y</u> LOG FILE NUMBER 793 ON *WELCOME* :HELLO OPERATOR.SYS;HIPRI 19:23/#S1/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #20 : </pre>
4	<p>Another option for when the Control B Mode prompt appears is to enter <u>UPD</u></p> <pre> HP32033G.01.00 ** PERFORMING AN UPDATE ** The dialogue then continues with the warning message as listed in Step 3. </pre>

RELOAD - SERIES 37

OPERATOR FUNCTION: SYSTEM STARTUP (RELOAD)

DESCRIPTION: This procedure cold loads the entire system, including all system files and configuration information. The system is reloaded from a backup copy which was produced by a :SYSDUMP to magnetic or cartridge tape, or serial disc.

CAUTION

A RELOAD DESTROYS ANY FILES WHICH MAY BE
ON ANY OF THE SYSTEM DISC VOLUMES.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 tape drive and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <p style="text-align: center;">NOTE</p> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a RELOAD from serial disc.</p> <p>Mount the backup serial disc pack on any drive that does not share the controller on <i>tdev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain making it available for private volume use once the startup is complete.)</p>
2	<p>When the Control B Mode prompt (H for help->) appears, enter <u>RELOAD</u>.</p>

STEP	PROCEDURE
3	<pre> HP32033G.01.00 WHICH OPTION <COLDSTART/RELOAD/UPDATE>? RELOAD WHICH OPTION <SPREAD, COMPACT, RESTORE, ACCOUNTS, NULL>? **WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS. DIRECTORY MAINTENANCE COMPLETED INITIALIZATION OF DISC FREE SPACE MAPS COMPLETED RELOAD OF USER FILES IN PROGRESS RELOAD OF USER FILES COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION WED, SEP 19, 1984, 7:22 PM? (Y/N) Y LOG FILE NUMBER 791 ON *WELCOME* :HELLO OPERATOR.SYS;HIPRI 19:23/#S1/15/LOGON FOR: OPERATOR.SYS,PUB. ON LDEV #20 </pre>
4	<p>After entering <u>RELOAD</u>, the dialogue might also show:</p> <pre> HP 32033G.01.00 ** PERFORMING A RELOAD ** </pre> <p>The dialogue then continues as in Step 3.</p>

ADDING I/O DEVICES - SERIES 37

OPERATOR FUNCTION: ADDING STANDARD I/O DEVICES

DESCRIPTION: This procedure describes one method for adding input/output devices to the system. You may only add a system domain disc drive during a RELOAD. The description is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII of this manual.

STEP	PROCEDURE
1	<p>Turn keyswitch to position 2.</p>
2	<p>Enter <u>START</u>.</p>
3	<p>The MPE Initiator begins execution and prints:</p> <pre> HP32033G.01.00 (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press <u>RETURN</u>.) Respond to the Initiator prompts: WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u> ANY CHANGES? <u>YES</u> LOAD MAP? <u>RETURN</u> MEMORY SIZE=<u>xxx</u>? (MIN=256, MAX=4096)? <u>RETURN</u> I/O CONFIGURATION CHANGES? <u>yes</u> I/O MAP? <u>y</u> (I/O data then supplied.) LIST I/O DEVICES? <u>YES</u> (I/O devices then listed.) LIST DEVICE DEFAULTS? <u>YES</u> (Device defaults then listed.) HIGHEST DRT?<u>nn</u> (MIN=8, MAX=511)? <u>RETURN</u> or higher number LOGICAL DEVICE #? <u>nnn</u> MAX # OF OPEN SPOOLFILES = 30 (MIN=0, MAX=1010)? LIST I/O DEVICES? TERMINAL TYPE CHANGES? CLASS CHANGES? LIST I/O DEVICES? I/O CONFIGURATION CHANGES? </pre>

STEP	PROCEDURE
<p>3 (cont.)</p>	<p>**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS.</p> <p>DISC VOLUME CHANGES? VIRTUAL MEMORY CHANGES? DISABLE LOGGING? SYSTEM TABLE CHANGES? MAX # OF SPOOLFILE KILOSECTORS = 256 (MIN=0, MAX=777777)? # OF SECTORS PER SPOOLFILE EXTENT = 1024 (MIN=128, MAX 32767)? RECOVER LOST DISC SPACE? DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION BANK 0 DEPENDENT MEMORY USED - 14103 MON, DEC 17, 1984, 11:29 AM? (Y/N) LOG FILE NUMBER 189 ON 11:30/1/LDEV #3 NOT READY *WELCOME*</p>

DELETING I/O DEVICES – SERIES 37

OPERATOR FUNCTION: DELETING I/O DEVICES

DESCRIPTION: This procedure describes one method for deleting input/output devices from the system. You may only delete a system domain disc during a RELOAD. The description below is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII of this manual.

STEP	PROCEDURE
1	Turn keyswitch to position 2.
2	Enter <u>LOAD</u> .
3	<p>The MPE Initiator begins execution and prints:</p> <p>HP32033G.01.00</p> <p>(If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press <u>RETURN</u>.) Respond to the Initiator prompts:</p> <p>WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u> ANY CHANGES? <u>YES</u> LOAD MAP? <u>RETURN</u> MEMORY SIZE = 512 (MIN=256, MAX=4096)? I/O CONFIGURATION CHANGES/ <u>YES</u> I/O MAP? <u>y</u> (I/O Map data then given.) LIST I/O DEVICES? <u>y</u> (I/O Devices then listed.) LIST DEVICE DEFAULTS? <u>y</u> (Device defaults then given.) HIGHEST DRT = 103 (MIN=8, MAX=511)? LOGICAL DEVICE #? MAX # OF OPEN SPOOLFILES = 30 (MIN=0, MAX=1010)? LIST I/O DEVICES? TERMINAL TYPE CHANGES? CLASS CHANGES? LIST I/O DEVICES? I/O CONFIGURATION CHANGES?</p> <p>**WARNING** AFTER THIS POINT DO NOT INTERRUPT THE STARTUP PROCESS UNTIL AFTER THE MESSAGE " *WELCOME* " APPEARS</p>

Quick Reference Guide

STEP	PROCEDURE
3 (cont.)	<p>SYSTEM TABLE CHANGES? MAX # OF SPOOLFILE KILOSECTORS = 256 (MIN=0, MAX=777777)? # OF SECTORS PER SPOOLFILE EXTENT = 1024 (MIN=128, MAX=32767)? RECOVER LOST DISC SPACE? DIRECTORY MAINTENANCE COMPLETED PART 1 OF 6 COMPLETED - MEMORY RESIDENT TABLES SET UP PART 2 OF 6 COMPLETED - SL BINDING PART 3 OF 6 COMPLETED - SYSTEM I/O PROCESS CREATION PART 4 OF 6 COMPLETED - DRIVER LOADING PART 5 OF 6 COMPLETED - DISC RESIDENT TABLES SET UP PART 6 OF 6 COMPLETED - SYSTEM PROCESS CREATION BANK 0 DEPENDENT MEMORY USED - 14103 MON, DEC 17, 1984, 11:29 AM? (Y/N) LOG FILE NUMBER 189 ON 11:30/2/LDEV #3 NOT READY *WELCOME*</p>

RESTORING FILES

OPERATOR FUNCTION: RESTORING FILES FROM A BACKUP COPY

DESCRIPTION: This procedure retrieves users' files from :SYSDUMP and :STORE volumes. The volumes may be either magnetic tapes or a serial disc. The procedure allows you to restore specific files of a particular group or account, or to restore all the files from the backup copy.

STEP	PROCEDURE
1	Log on to the system: <u>:HELLO MANAGER.SYS</u>
2	Define the tape or disc drive where the backup copy is mounted: <u>:FILE <i>restorefile</i>;DEV=<i>devclass</i></u>
3	Define the standard :RESTORE list file as the desired list output device: <u>:FILE SYSLIST;DEV=<i>devclass</i></u>
4	Restore the files and print a listing: <u>:RESTORE *<i>restorefile</i> [;<i>filename.group.acct</i>] [;SHOW] [;KEEP]</u>
5	Respond to the System Console message which requests device allocation: <u>=REPLY <i>pin,ldev</i></u> The system restores users' files, requesting that you mount additional volumes, as required.

COMMENTS

For MPE V/P, a file will be restored to the system domain only if the account name, group name, and file creator exist in the system directory. In addition, a file will be restored to a private volume only if the home volume, for the group in which the file resides, is physically mounted.

Files currently opened, loaded into memory, or being stored or restored, cannot be acted upon by a :RESTORE command.

Users with System Manager (SM) or System Supervisor (OP) capability can restore any file into any group and account. Users without SM and OP capability can only restore files to which they have WRITE access, if the file exists. They can only restore files into groups to which they have SAVE access, if the file does not exist. In addition, these users must have Privileged Mode capability (PM) in order to restore files with negative file codes (i.e., IMAGE data bases).

ENABLING/DISABLING LOGGING

OPERATOR FUNCTION: TURNING LOGGING ON AND OFF

DESCRIPTION: This procedure initiates a SYSDUMP and, during the ensuing dialogue, turns logging on or off.

STEP	PROCEDURE
1	Log on to the System Manager's account: : <u>HELLO MANAGER.SYS</u>
2	Define the output file(s) where the system is to be copied: : <u>FILE <i>dumpfile</i>;DEV=<i>devclass</i></u> : <u>FILE <i>auxfile</i>;DEV=<i>devclass</i></u>
3	Initiate the SYSDUMP and respond to prompts: : <u>SYSDUMP *<i>dumpfile</i> [, *<i>auxfile</i>]</u> ANY CHANGES? YES SYSTEM ID = <u>HP32033G.01.00?</u> (RETURN) MEMORY SIZE = 512 (MIN=256, MAX=4096)? (RETURN) I/O CONFIGURATION CHANGES? (RETURN) SYSTEM TABLE CHANGES? (RETURN) MISC CONFIGURATION CHANGES? (RETURN) LOGGING CHANGES? YES LIST LOGGING STATUS <u>NO</u> STATUS CHANGES? YES ENTER TYPE, ON/OFF? <u>1, ON</u> or <u>1, OFF</u> (Turns logging on or off.) ENTER TYPE, ON/OFF? (RETURN) LIST LOGGING STATUS? <u>NO</u> LOG FILE RECORD SIZE (SECTORS) = 2 (MIN=1, MAX=8)? (RETURN) LOG FILE SIZE (RECORDS) = 1023 (MIN=16, MAX=32767)? (RETURN) DISC ALLOCATION CHANGES? (RETURN) SCHEDULING CHANGES? (RETURN) SEGMENT LIMIT CHANGES? (RETURN) SYSTEM PROGRAM CHANGES? (RETURN) SYSTEM SL CHANGES? (RETURN) ENTER DUMP DATE? (RETURN) (Dumps only MPE and the I/O configuration. When this copy is used for system startup, all files and the accounting structure remain unchanged.)
4	You are now requested to allocate the output device. After your reply, the system is copied to the backup medium.
5	END OF SUBSYSTEM

COMMENTS

The tape produced by this SYSDUMP procedure can be used later to COLDSTART the system. You may specify 1,OFF for all logging events, except type 11, to be disabled or disable logging during the Initiator/User dialogue with the "DISABLE LOGGING?" prompt. Refer to Sections V and VII of this manual for additional information on logging.

SERIALIZING A DISC PACK

OPERATOR FUNCTION: SERIALIZING A DISC PACK

DESCRIPTION: This procedure allows you to serialize a disc pack by accessing the VINIT subsystem.

STEP	PROCEDURE
1	Remove the disc you want serialized from normal system use (off line): <u>:DOWN ldev</u>
2	Log onto an account with System Manager (SM) or System Supervisor (OP) capability: <u>:HELLO MANAGER.SYS</u>
3	Invoke the VINIT subsystem: <u>:VINIT</u>
4	Change the volume label to indicate that the disc is a serial disc: <u>>SERIAL ldev</u>
5	Exit from the VINIT subsystem: <u>>EXIT</u>
6	Allow the disc you serialized to function again: <u>:UP ldev</u>

RESTART USER LOGGING

OPERATOR FUNCTION: RESTARTS THE USER LOGGING PROCESS

DESCRIPTION: This procedure responds to a user's request to restart a logging process.

STEP	PROCEDURE
1	<p>11:06/#58/14/FRDM/LC.SMITHCO/;START LOG PROCESS WITH LOGID SMITHCO.</p> <p>The message is a request from LC.SMITHCO to start the log process with logging identifier SMITHCO.</p>
2	<p>List the current logging identifiers on the system to determine the log filename for logging identifier SMITHCO:</p> <p><u>:LISTLOG</u></p>
3	<p>List the file to determine if the log file LGFILE01 is a new or existing file:</p> <p><u>:LISTF LGFILE01.PUB.SMITHCO,1</u></p> <p>The current end-of-file location is displayed. It shows that the file already contains data.</p>
4	<p>RESTART the logging process for logid SMITHCO. (If the file had been empty, the START option should have been selected.)</p> <p><u>:LOG SMITHCO;RESTART</u></p> <p>The following message will be printed on the System Console:</p> <p>USERLOG SMITHCO RESTARTED (ULOGMSG 15)</p>
5	<p>Inform LC.SMITHCO that user logging is running:</p> <p><u>:TELL LC.SMITHCO;LOG PROCESS SMITHCO STARTED.</u></p>
6	<p>To stop the logging process, enter:</p> <p><u>:LOG SMITHCO;STOP</u></p> <p>The following message will be displayed on the System Console:</p> <p>USER LOGGING PROCESS SMITHCO IS TERMINATED (ULOGMSG 11)</p>

SYSTEM SHUTDOWN

OPERATOR FUNCTION: SYSTEM SHUTDOWN

DESCRIPTION: This procedure shuts down the operating system in an orderly manner. Before using this procedure, it is your responsibility to warn all logged-on users and shut all communications lines.

STEP	PROCEDURE
1	Store any spool files you wish to preserve, using the SPOOK 5 utility program.
2	Inhibit new users from logging on: <u>:LIMIT 0,0</u>
3	Check for logged on users. If none exist, go to Step 7. <u>:SHOWJOB</u>
4	Warn sessions of impending shutdown: <u>:WARN@;message</u>
5	After a reasonable length of time, abort any remaining sessions: <u>:ABORTJOB#Sunn</u>
6	Clear all outstanding allocation messages: <u>:RECALL</u> <u>:REPLY pin,0</u> or <u>=REPLY pin,0</u>
7	Shut any communication lines on the system: <u>:MPLINE ldev;SHUT</u> <u>:DSCONTROL ldev;SHUT</u>
8	Close down the operating system: <u>=SHUTDOWN</u> The system should print a shutdown message and then halt. Occasionally, a pending I/O operation prevents the orderly halt, making it necessary for you to manually halt the computer. If the system continues to run for more than two minutes after the :SHUTDOWN command, press the RUN/HALT switch, which is located on the System Control Panel, or enter HALT at the CMP prompt (->) on the Series 39/40/42/44/48, or the DCU prompt (M>) on the Series 64/68.

POWER UP - SERIES 37/39/40/42, 44/48, & 64/68

OPERATOR FUNCTION: SYSTEM POWER-UP

DESCRIPTION: This procedure describes how to turn on the system power.

STEP	PROCEDURE
1	<p>Series 37: Turn keyswitch to position 2.</p> <p>Series 39/40/42: Turn on the POWER switch, located on the front of the system cabinet.</p> <p>Series 44/48: Turn on the MAIN POWER switch, located at the lower-left rear of the computer. (Figure 11-3.) Turn on the PROCESSOR ON/OFF switch, located on the front of the system cabinet.</p> <p>Series 64/68: Turn on the MAIN POWER switch, located in the Power Control Module at the lower rear of the computer.</p>
2	<p>For all Systems: Turn on the peripheral devices, and place them on line. Note that moving head discs performs a head load cycle each time the AC power to the drive is removed and then re-stored. This will also occur whenever the RUN/STOP front panel switch on the drive is cycled (e.g., RUN-STOP-RUN). This takes about one minute.</p>
3	<p>Start up the MPE Operating System, using one of the system startup procedures described in this appendix.</p>
4	<p>Run the MEMLOGAN utility program by entering:</p> <p style="text-align: center;"><u>:RUN MEMLOGAN.PUB.SYS;PARAM=1.</u></p> <p>This utility clears all previously recorded memory errors.</p>

POWER DOWN -

I SERIES 37/39/40/42, 44/48, & 64/68

OPERATOR FUNCTION: SYSTEM POWER-DOWN

DESCRIPTION: This procedure describes how to power-down the entire system.

STEP	PROCEDURE
1	Shut down the MPE operating system, as described previously in "SYSTEM SHUTDOWN".
2	Set all disc drive RUN/STOP switches to STOP or power off (HP 7945). Allow time for discs to stop rotating. Turn off all peripheral devices.
3	<p>Series 37: Turn keyswitch to 0.</p> <p>Series 39/40/42: Turn off the POWER switch, located on the front of the system cabinet (see Figure 11-1). Printed circuit boards may now be removed without damage.</p> <p>Series 44/48: Turn off the processor ON/OFF switch (see Figure 11-3). Turn off the MAIN POWER switch, located at the lower left rear of the computer. Printed circuit boards may now be removed without damage.</p> <p>Series 64/68: Turn off the MAIN POWER switch located in the Power Control Module at the lower left rear of the computer. Printed circuit boards can now be removed without damage.</p>

NOTE

Hewlett-Packard recommends maintaining your system in a POWER ON operating state at all times, due to the potential impact to system reliability that may be experienced in frequent power down and power up situations. Component failures have been shown to be directly proportional to the amount of stress caused by power cycling. For example, the energy savings realized by powering off your system on nights and weekends, can be offset by reduced system reliability.

If your operation requires frequent power shutdowns, it is essential that the power down and power up procedures documented in this manual be followed exactly.

WARMSTART - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: SYSTEM STARTUP (WARMSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure loads the system from the system disc. It is the only restart procedure which results in recovery of incompletely processed spooled jobs and spooled device files.

WARMSTART should only be used to recover spool files and IMAGE transaction logging magnetic tape buffers.

STEP	PROCEDURE
1	On the System Control Panel, set the START thumbwheel switch to the channel address and device address of your system disc. The system disc is always configured as logical device number one (<i>ldev 1</i>).
2	For startup from the System Control Panel, press the START key. For startup from the CMP, if the system is already running, simultaneously press the <u>CONTROL</u> key and B (B^C). If the system is not running, press <u>RETURN</u> . When you see the CMP prompt character (->), enter START on the System Console.
3	<p>The MPE Initiator begins execution and prints:</p> <p><i>HP32033v.uu.ff</i></p> <p>In the message, <i>v</i> is the current version of MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press <u>RETURN</u>.)</p>
4	<p>WHICH OPTION <WARMSTART/CDDLSTART>? <u>WARMSTART</u></p> <p>At this point, there is a one or two minute delay, while the Initiator confirms that the configured memory size can be supported on the available physical memory, and tests to make sure the DRT's have been handled correctly.</p>
5	DATE (M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
6	<p>TIME (H:M)? Enter the time (24-hour clock) as <i>hh:mm</i>.</p> <p>The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date/time message is correct, press <u>RETURN</u> to continue the WARMSTART.</p> <p>You now receive the *WELCOME* message. The system automatically logs on as OPERATOR.SYS.</p> <p>The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.</p>

Quick Reference Guide

STEP	PROCEDURE
7	<p>The system will now print one or more of the following, depending upon the system configuration:</p> <pre>time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Snnn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn</pre>

COMMENTS

After a WARMSTART the following conditions exist: STREAMS=OFF, JOBFENCE=14, OUTFENCE=14, JLIMIT=0, and SLIMIT=0.

If User Logging was taking place prior to the WARMSTART, the system will print the following message:

```
time/pin/RECOVERING USER LOGGING PROCESS logid
```

If the process associated with "*logid*" is a tape file, the next request will be to mount the tape associated with the process. This will be a standard mount request.

After the User Logging files have been recovered, the following message will be printed:

```
time/pin/USER LOGGING FILE
logfile RECOVERED INCLUDING xxxx
OPENS AND xxxx CLOSES
```

If there was an error during recovery, an error message will be printed.

When prompted with "DATE(M/D/Y)?", if RETURN is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to assure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

COOLSTART - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: SYSTEM STARTUP (COOLSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure loads the system from the system disc. This is the standard way to restart the system after a routine shutdown.

A COOLSTART deletes all spooled jobs and all input and output spool files. These can be preserved by doing a WARMSTART. The SPOOK5 utility may be used to store large spool files for subsequent processing. After spool files have been stored, the #SHUTDOWN command should be given, and a COOLSTART initiated.

STEP	PROCEDURE
1	On the System Control Panel, set the START or LOAD thumbwheel switch to the channel address and device address of your system disc. The system disc is always configured as logical device number one (<i>ldev 1</i>).
2	For startup from the System Control Panel, press the START or LOAD key. For startup from the CMP, if the system is already running, simultaneously press the CONTROL key and B (B^C). If the system is not running, press RETURN . When you see the CMP prompt character (->), enter <u>START</u> on the System Console.
3	The MPE Initiator begins execution and prints: <i>HP32033v.uu.ff</i> In the message, <i>v</i> is the current version MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN .)
4	WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u>
5	ANY CHANGES? RETURN (Return implies <u>NO</u> .)
	At this point, there is a one or two minute delay (see WARMSTART for explanation).
6	DATE (M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
7	TIME (H:M)? Enter the time (24-hour clock) as <i>hh:mm</i> .
	The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date/time message is correct, press RETURN to continue the COOLSTART.
	You now receive the *WELCOME* message. The system automatically logs on OPERATOR.SYS.
	The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.

STEP	PROCEDURE
8	<p>The system will now print one or more of the following, depending upon the system configuration:</p> <pre> time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/Sn#nn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn </pre>

COMMENTS

After a COOLSTART the following conditions exist: STREAMS=OFF, JOBFENCE=0, and DUTFENCE=1; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can make changes to the system configuration during a COOLSTART. Respond YES to the "ANY CHANGES?" prompt in Step 5, and the Initiator/User dialogue described in Section VII of this manual begins.

When prompted for "DATE(M/D/Y)?", if a RETURN is entered, instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time at system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

COLDSTART - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: SYSTEM STARTUP (COLDSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the system from a magnetic or cartridge tape, or from serial disc. In each case, the procedure allows you to modify the system configuration while retaining users' information. COLDSTART is commonly used when an installation maintains several backup versions, each with a different configuration.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive, and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;"> <p>NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a COLDSTART from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (The Initiator dynamically allocates this drive to the nonsystem domain, making it available for private volume use once the startup is complete.)</p> <p>2 On the System control panel, set the START or LOAD thumbwheel switch to the channel address and device address of the cold load device.</p> <p>3 For startup from the System Control Panel, press the START or LOAD key. For startup from the CMP, if the system is already running, simultaneously press the CONTROL key and B (B^C). If the system is not running, press RETURN. When you see the CMP prompt character (->), enter <u>LOAD</u> on the System Console.</p> <p>4 The MPE Initiator begins execution and prints:</p> <pre>HP32033v.uu.ff</pre> <p>In the message, <i>v</i> is the current version MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP26XX-type terminal, press RETURN.)</p>

STEP	PROCEDURE
5	WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u> ANY CHANGES? <u>RETURN</u> (Return implies <u>NO</u> .)
6	If this is a startup from tape, the tape is read and rewound.
7	The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i> ", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.
8	DATE (M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
9	TIME (H:M)? Enter the time (24-hour clock) as <i>hh:mm</i> . The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date and time are correct, press <u>RETURN</u> to continue the dialogue.
10	You now receive the *WELCOME* message. The system automatically logs on OPERATOR.SYS. The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon. The system may now print one or more of the following, depending on your system's configuration: <i>time/pin/MEMORY ERROR LOGGING INITIATED</i> <i>time/pin/SP# n/SPOOLED IN</i> <i>time/pin/SP# n/SPOOLED OUT</i> <i>time/#Snmn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV# m</i>

COMMENTS

After a COLDSTART, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=0; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during a COLDSTART. Respond YES to the "ANY CHANGES?" prompt, and the Initiator will begin the Initiator/User Dialogue described in Section VII of this Manual.

When prompted for "DATE (M/D/Y)?", if a RETURN is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to assure proper operation of functions (i.e., :SYSDUMP) related to the system clock.

UPDATE - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: SYSTEM STARTUP (UPDATE) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the system from magnetic or cartridge tape, or from a serial disc. This is the standard procedure used when starting the system with an updated MPE operating system from Hewlett-Packard or an MPE backup copy prepared on a different HP 3000 system.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing an UPDATE from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain making it available for private volume use once the startup is complete.)</p>
2	<p>On the System Control Panel, set the START or LOAD thumbwheel switch to the channel address and device address of the cold load device.</p>
3	<p>For startup from the System Control Panel, press the START or LOAD key. For startup from the CMP, if the system is already running, simultaneously press the (CONTROL) key and B (B^C). If the system is not running, enter (RETURN). When you see the CMP prompt character (->), enter LOAD on the System Console.</p>
4	<p>The MPE Initiator begins execution and prints:</p> <pre>HP32033v.uu.ff</pre> <p>In the message, <i>v</i> is the current version MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press (RETURN)).</p>

STEP	PROCEDURE
5	WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>UPDATE</u>
6	SYSTEM DISC DRT= <i>nn</i> ? (RETURN) or input the correct number.
7	ANY CHANGES? (RETURN) (Return implies <u>NO</u>).
	If this is a startup from tape, the tape is read and rewound.
	The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i> ", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.
8	DATE (M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
9	TIME (H:M)? Enter the time (24-hour clock) as <i>hh:mm</i> .
	The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date and time are correct, press (RETURN) to continue the dialogue.
	You now receive the *WELCOME* message. The system automatically logs on OPERATOR.SYS.
	The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.
10	<p>The system will now print one or more of the following, depending upon the system configuration:</p> <pre> time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP#n/SPOOLED IN time/pin/SP#nSPOOLED OUT time/S#nnn/pin/LOGON FOR: OPERATOR SYS,PUB ON LDEV #nn </pre>

COMMENTS

After an UPDATE, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=1; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during an UPDATE. Respond YES to the "ANY CHANGES?" prompt and the Initiator begins the Initiator/User Dialogue described in Section VII of this Manual.

When prompted for "DATE (M/D/Y)?", if a (RETURN) is entered instead of an actual date, the system will assume the default date/ time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

RELOAD -

SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: SYSTEM STARTUP (RELOAD) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the entire system, including all system files and configuration information. The system is reloaded from a backup copy which was produced by a :SYSDUMP to magnetic or cartridge tape, or serial disc.

CAUTION

A RELOAD DESTROYS ANY FILES WHICH MAY BE ON ANY OF THE SYSTEM DISC VOLUMES.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC OR CARTRIDGE TAPE: Mount the MPE backup tape on the Unit 0 tape drive and place the device on line, or insert the cartridge tape into the drive.</p> <p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="text-align: center;"> <p>NOTE</p> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a RELOAD from serial disc.</p> </div> <p>Mount the backup serial disc pack on any drive that does not share the controller on <i>ldev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain making it available for private volume use once the startup is complete.)</p>
2	<p>On the System Control Panel, set the START or LOAD thumbwheel switch to the channel address and device address of the cold load device.</p>
3	<p>For startup from the System Control Panel, press the START or LOAD key. For startup from the CMP, if the system is already running, simultaneously press the CONTROL key and B (B^C). If the system is not running, depress RETURN. When you see the CMP prompt character (->), enter <u>START</u> or <u>LOAD</u> on the System Console.</p>

STEP	PROCEDURE
4	<p>The MPE Initiator begins execution and prints:</p> <pre>HP32033v.uu.ff</pre> <p>In the message, <i>v</i> is the current version MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press <u>RETURN</u>.)</p>
5	<p>WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>RELOAD</u></p>
6	<p>WHICH OPTION <SPREAD/COMPACT/RESTORE/ACCOUNTS/NULL?></p> <p>Press <u>RETURN</u> to select SPREAD (default). The reload options are described following this table.</p>
7	<p>ANY CHANGES? <u>RETURN</u> (Return implies <u>NO</u>.)</p> <p>If this is a RELOAD from tape, the tape is read and rewound. Additional volumes of tape reels may be requested.</p> <p>The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i>", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.</p>
8	<p>DATE (M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i>.</p>
9	<p>TIME (H:M)? Enter the time (24-hour) clock as <i>hh:mm</i>.</p> <p>The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date and time are correct, press <u>RETURN</u> to continue the dialogue.</p> <p>You now receive the *WELCOME* message. The system automatically logs on OPERATOR.SYS.</p> <p>The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.</p>
10	<p>The system may now print one or more of the following, depending on your system's configuration:</p> <pre>time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Srun/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn</pre>

COMMENTS

After a RELOAD, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=1; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during a RELOAD. Respond YES to the "ANY CHANGES?" prompt, and the Initiator will begin the Initiator/User Dialogue described in Section VII of this Manual.

When prompted for "DATE (M/D/Y)?", if RETURN is entered instead of the true date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

RELOAD OPTIONS

Your response in Step 6 selects the algorithm the system will use to reload the discs. The algorithm determines on which system disc a file is stored, and whether the *user.group.account* structure is placed in the appropriate directory area. RELOAD options are:

SPREAD

MPE attempts to place the file back on a disc of the device class as it was originally created. If this fails, MPE attempts to replace the file on a disc of the same type and sub-type as the disc on which it was previously located (for example, on a cartridge disc). If this fails, MPE attempts to place it on a disc of the same type (for example, a moving-head disc). If this fails, MPE attempts to place the file on any disc in device class DISC. If this fails, a message is printed and the file is not reloaded. In each of these attempts, the files are spread among similar discs, if possible. For instance, suppose that when the system was dumped, there was one cartridge disc that was full, and when it is reloaded there are two cartridge discs. In this case, each disc will be approximately half full. The advantages of the SPREAD option are reduced disc seeking (since files are spread out), and reduced fragmentation (since the disc is repacked). The disadvantage is that if the discs are nearly full, it may not be possible to restore all files that were previously stored on the discs. This situation very rarely occurs. In this case, one of the other options may be used.

COMPACT

MPE attempts to place the file back on the same volume from which it came. If this fails, the SPREAD option is used. The major advantage of COMPACT is that if there are no new deleted tracks, and the same discs are used, reloading of the system is guaranteed, no matter how full the discs are. In addition, each disc is compacted within the area between deleted tracks. If there are n deleted tracks, there will be at most $(n+1)$ fragments.

RESTORE

MPE attempts to place the files back on the same volume at the same locations from which they came. If this fails, MPE attempts to place the files anywhere on the volume from which they came. If this fails, the SPREAD option is used. The advantages to RESTORE are that it offers the same guarantee made in COMPACT for reloading the system, and that the same files that were previously using alternate tracks are still using them. The disadvantage is that no compacting of the discs is done so that the same fragmentation still exists.

ACCOUNTS

This option loads the system, creates a directory from the backup copy, and loads the system files which reside in the PUB group of the SYS account. No user files are loaded onto the system.

The directory which is created will consist of all accounts, groups, and user structures which were current at the time the backup copy was written (by the :SYSDUMP Configurator program).

This option is useful in that files saved by the :SYSDUMP program are compatible with files stored using the :STORE command. In this way you could, for example:

1. Create a new directory structure if the previous directory was destroyed.
2. Conserve vital disc space by selectively loading files into certain accounts with the :RESTORE command (after the system is operational).

■ NULL

MPE creates a null directory with MANAGER, SYS, PUB as the only user and no user files are copied to the disc.

NOTE

Hewlett-Packard recommends using the ACCOUNTS option to reload the accounting structure, then complete the RELOAD operation. After the system is operational use the :RESTORE command to restore user files into the accounts.

ADDING I/O DEVICES - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: ADDING STANDARD I/O DEVICES, E/F.00.00, G.00.00

DESCRIPTION: This procedure describes one method for adding input/output devices to the system. You may only add a system domain disc drive during a RELOAD. The description is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII of this manual.

STEP	PROCEDURE
1	On the System control panel, set the START thumbwheel switch to the channel address and device address of the system disc.
2	For startup from the System Control Panel, press the START key. For startup from the CMP, if the system is already running, simultaneously press the CONTROL key and B(B ^C). If the system is not running, press RETURN . When you see the CMP prompt character (->), enter <u>START</u> on the System Console.
3	<p>The MPE Initiator begins execution and prints:</p> <pre>HP32033v.uu.ff</pre> <p>(If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN.) Respond to the Initiator prompts:</p> <pre>WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u> ANY CHANGES? <u>YES</u> LOAD MAP? RETURN MEMORY SIZE=<u>xxxx</u>? RETURN I/O CONFIGURATION CHANGES? <u>YES</u> LIST I/O DEVICES? <u>YES</u> LIST CS DEVICES? <u>YES</u> HIGHEST DRT=?<u>nn</u>? RETURN or higher number LOGICAL DEVICE #? <u>nnn</u> DRT #? <u>nnn</u> UNIT #? <u>nnn</u> SOFTWARE CHANNEL #? <u>n</u> TYPE? RETURN SUB TYPE? RETURN RECORD WIDTH? RETURN OUTPUT DEVICE? RETURN ACCEPT JOBS/SESSIONS? <u>YES</u> or <u>NO</u> ACCEPT DATA? <u>YES</u> or <u>NO</u> INTERACTIVE? <u>YES</u> or <u>NO</u> DUPLICATIVE? <u>YES</u> or <u>NO</u> INITIALLY SPOOLED? <u>YES</u> or <u>NO</u> INPUT OR OUTPUT? <u>IN</u> or <u>OUT</u> (Spooled devices only.)</pre>

STEP	PROCEDURE
<p>3 (cont.)</p>	<p>DRIVER NAME? (Refer to Section VII of this manual) DEVICE CLASSES? <i>devclass</i> IS <i>devclass</i> A SERIAL DISC CLASS? YES or NO IS <i>devclass</i> A FOREIGN DISC CLASS? YES or NO LOGICAL DEVICE #? (RETURN) MAX # OF OPEN SPOOLFILES=<i>xxxx</i>? (RETURN) LIST I/O DEVICES? (RETURN) LIST OS DEVICES? (RETURN) CLASS CHANGES? (RETURN) LIST I/O DEVICES? (RETURN) ADDITIONAL DRIVER CHANGES? (RETURN) I/O CONFIGURATION CHANGES? (RETURN) DISC VOLUME CHANGES? (RETURN) VIRTUAL MEMORY CHANGES? (RETURN) DISABLE LOGGING (RETURN) MAX # OF SPOOLFILES KILOSECTORS=<i>xxxxxxxx</i>? (RETURN) # OF SECTORS PER SPOOLFILE EXTENT=<i>nnn</i>? (RETURN) RECOVER LOST DISC SPACE? (RETURN) DATE (M/D/Y)? <i>mm/dd/yy</i> TIME (H:M)? <i>hh:mm</i> (24-hour clock)</p>

DELETING I/O DEVICES - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: DELETING I/O DEVICES, E/F.00.00, G.00.00

DESCRIPTION: This procedure describes one method for deleting input/output devices from the system. You may only delete a system domain disc during a RELOAD. The description below is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII of this manual.

STEP	PROCEDURE
1	On the System control panel, set the START thumbwheel switch to the channel address and device address of the cold load device.
2	For startup from the System Control Panel, press the START key. For startup from the CMP, if the system is already running, simultaneously press the CONTROL key and B(B ⁰). If the system is not running, press RETURN . When you see the CMP prompt character (->), enter <u>START</u> on the System Console.
3	<p>The MPE Initiator begins execution and prints:</p> <pre>HP32033v.uu.ff</pre> <p>(If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN.) Respond to the Initiator prompts:</p> <pre>WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u> ANY CHANGES? <u>YES</u> LOAD MAP? RETURN MEMORY SIZE=<u>nnn</u>? RETURN I/O CONFIGURATION CHANGES? <u>YES</u> LIST I/O DEVICES? <u>YES</u> LIST CS DEVICES? <u>YES</u> HIGHEST DRT=?<u>nn</u>? RETURN LOGICAL DEVICE #? <u>nnn</u> (dev# of device being deleted) DRT #? <u>0</u> LOGICAL DEVICE #? RETURN MAXIMUM # OF OPEN SPOOLFILES=<u>nn</u>? RETURN LIST I/O DEVICES? RETURN LIST CS DEVICES? <u>YES</u> CLASS CHANGES? RETURN LIST I/O DEVICES? <u>YES</u> ADDITIONAL DRIVER CHANGES? RETURN I/O CONFIGURATION CHANGES? RETURN DISC VOLUME CHANGES? RETURN VIRTUAL MEMORY CHANGES? RETURN DISABLE LOGGING? RETURN MAX # OF SPOOLFILE KILOSECTORS=<u>nnnnnnnn</u>? RETURN # OF SECTORS PER SPOOLFILE EXTENT=<u>nnn</u>? RETURN</pre>

Quick Reference Guide

STEP	PROCEDURE
3 (cont.)	RECOVER LOST DISC SPACE? <u>RETURN</u> DATE (M/D/Y)? <u>mm/dd/yy</u> TIME (H:M)? <u>hh/mm</u> (24-hour clock)

SOFTWARE DUMP - SERIES 39/40/42,& 44/48

OPERATOR FUNCTION: DUMPING MAIN MEMORY

DESCRIPTION: The Software Dump Facility (SDF) operates in a standalone environment and stores all of main memory to a serial storage medium. Perform a software dump after a system failure or system halt.

It is a wise precaution to have one or more backup copies of the SDF on a serialized storage medium. Remember that a backup SDF cannot be created after a software dump has failed; you must have one already on hand. A backup SDF should be created when the system is initially configured, and you should create a new backup SDF each time you receive a software update. This will ensure that you have the correct version of the SDF on your backup copy at all times. Refer to the discussion of Backup Software Dump procedures in Section X.

NOTE

For Base System configuration consisting of a single HP 7906A disc drive operating in split mode (i.e., the system on the fixed disc, and the cartridge as a private volume/serial disc), the Backup Software Dump is the only method of obtaining a main memory dump.

STEP	PROCEDURE
1	Mount a serial storage medium on a logical device specified by the device class DDUMP, then place the drive on line.
2	On the System Control Panel, set the DUMP thumbwheel switches to the channel and device address of the system disc.
3	On the System Control Panel, press the DUMP key. To dump via the CMP, simultaneously press the <u>CONTROL</u> key and B (B ^C). When you see the CMP prompt character (->), enter <u>DUMP</u> on the System Console.
4	At this point, the SDF is loaded and begins a serial execution of the SDFCOM file (SDFCOM), which contains ASCII commands, and is located on the system disc.
4a	<p>If the Software Dump Facility is loaded correctly, the following message will appear on the System Console:</p> <pre>SOFTWARE DUMP FACILITY (VER xxx.xxx/xxx)</pre> <p>The system will then execute the first instruction in the SDFCOM file. Check to see that the serialized storage medium is on line and ready, then press the <u>RETURN</u> key on the System Control Panel, or enter <u>RUN</u> in response to the CMP prompt. Main memory is stored to the serialized storage medium and the system automatically executes a WARMSTART (unless you have altered SDFCOM.)</p>

STEP	PROCEDURE
4b	<p>If the system halts while loading the SDF, the following error message will appear on the System Console:</p> <pre>***DUMP FAILED</pre>
4c	<p>This message indicates that an error has been detected, and the SDF is unable to execute. A backup software dump must be performed. Refer to "CREATING A BACKUP SDF" in Section X for step-by-step procedures.</p> <p>If the SDF command file does not exist or has been corrupted, the program automatically goes into interactive mode. The SDF prompts you for a command by printing (SOFTDUMP COMMAND>), at which point you enter the desired SDF command (refer to Table 10-1).</p>
4d	<p>If your serial storage medium is flawed, the following message may appear on the System Console:</p> <pre>SERIAL DEVICE I/O ERROR - You are now in SOFTDUMP INTERACTIVE MODE. Please mount new media, then type "DUMP" in response to the prompt "(SOFTDUMP COMMAND>)".</pre>

NOTES

Entering a Y^C from the System Console at any time while the SDF file is executing may cause SDF to abort the current command and place the user in interactive mode.

If you wish to alter your SDF command file, refer to "CHANGING THE SDF COMMAND FILE" in Section X.

If you want to print the dump to a line printer, run the DPAN4/DPAN5 utility program immediately after restarting the system. DPAN4/DPAN5 is described in the MPE V Utilities Reference Manual (32033-90008).

FORMATTING SYSTEM PACKS - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: FORMATTING SYSTEM DISC PACKS

DESCRIPTION: This procedure describes how to use the Sleuth Simulator (SLEUTHSM), which is part of the Diagnostic Utility System (DUS), to format system disc packs. The DUS is on a standalone serial medium and is loaded onto a shutdown system.

STEP	PROCEDURE
1	Load the Diagnostic/Utility System as described in "LOADING THE DUS", in this appendix. (Note that all entries must be in upper case.)
2	Type <u>AID</u> on the System Console and press <u>(RETURN)</u> . The following message will be displayed: AID xxx.xxx >10
3	Type <u>LOAD SLEUTHSM</u> and press <u>(RETURN)</u> . The Sleuth Simulator is then loaded into memory. The System Console displays the next line number in the program, and you are ready to enter the dialogue necessary to format a disc pack.
4	Enter the following statements to format any disc. >5000 <u>DEV 0,channel,device,20,unit</u> >5010 <u>FMT 0</u> >5020 <u>RUN</u>
5	After the disc is formatted, SLEUTHSM again prompts for input (>). For flagging defective tracks, enter the program which corresponds to the type of disc pack you wish to flag: 7906,7920 Disc Pack >EP >5000 <u>DEV 0,channel,device,10,0</u> >5010 <u>DB AA,6144,0</u> >5020 <u>RC 0</u> >5030 <u>PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?"</u> >5040 <u>INPUT A</u> >5050 <u>PRINT "HEAD#?"</u> >5060 <u>INPUT B</u> >5070 <u>SEEK 0,A,B,0</u> >5080 <u>IDI 0,AA(0),3,D</u> >5090 <u>PRINT "CONTINUE? (YES/NO)"</u> >5100 <u>INPUT &BB</u> >5110 <u>IF &BB="YES" THEN 5020</u> >5120 <u>RUN</u>

STEP	PROCEDURE
5 (cont.)	<p>7925 Disc Pack</p> <pre> >EP >5000 DEV 0,<i>channel</i>,<i>device</i>,10,0 >5010 DB AA,8192,0 >5020 RC 0 >5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?" >5040 INPUT A >5050 PRINT HEAD#?" >5060 INPUT B >5070 SEEK 0,A,B,0 >5080 IDI 0,AA(0),3,D >5090 PRINT CONTINUE? (YES/NO)" >5100 INPUT &BB >5110 IF &BB="YES" THEN 5020 >5120 RUN </pre> <p>In line 5000 of the above programs, you must supply the channel number and the device number of the drive on which the disc pack is mounted.</p> <p>The programs ask three questions for each defective track. In response to the first, enter the cylinder number of the defective track; in response to the second, enter the head number of the defective track. The cylinder and head numbers of defective tracks are listed on the "List of Defective Tracks" supplied with each new disc.</p> <p>To the third question, "CONTINUE? (YES/NO)", enter <u>NO</u> until you have entered all defective tracks, then enter <u>YES</u>.</p>
6	<p>After the defective tracks have been flagged, SLEUTHSM again prompts for input (>). Enter another program or halt the system.</p>

LOADING THE DUS - SERIES 39/40/42, & 44/48

OPERATOR FUNCTION: COLD LOADING THE DIAGNOSTIC UTILITY SYSTEM (DUS)

DESCRIPTION: The Diagnostic/Utility System (DUS) is memory resident and allows you to run diagnostic and utility programs. The DUS is on a standalone serial medium and is loaded onto a shut down system.

STEP	PROCEDURE
1	Mount the medium containing the Diagnostic Utility System on the appropriate drive and place the drive on line, if applicable.
2	On the System Control Panel, set the LOAD thumbwheel switch to the channel address and device address of the drive containing the DUS.
3	<p>From the System Control Panel: press the HALT key, then press the LOAD key.</p> <p>From the CMP: press <u>RETURN</u>. When the CMP prompt (->) appears on the system console, enter <u>HALT</u>. When another prompt is printed, enter <u>LOAD</u>.</p> <p>At this point the medium containing the DUS is loaded into memory, and the following message appears on the system console:</p> <pre>DIAGNOSTIC/UTILITY SYSTEM REVISION xxx.xxx ENTER YOUR PROGRAM NAME (Enter <u>HELP</u> for program information.) :</pre>

LOADING THE DUS - SERIES 37

OPERATOR FUNCTION: COLD LOADING THE DIAGNOSTIC UTILITY SYSTEM (DUS)

DESCRIPTION: The Diagnostic Utility System (DUS) is memory resident and allows you to run diagnostic and utility programs. The DUS is on a standalone magnetic tape and is loaded onto a shut down system.

STEP	PROCEDURE
1	Mount the medium containing the Diagnostic Utility System (DUS) on the appropriate drive and place the drive on line.
2	On the Console, press the CNTL and B keys simultaneously to enter the CONTROL-B mode of operation.
3	When the H for help-> prompt is displayed, enter the LOAD command and specify the channel and device on which the medium is mounted. The DUS is now loaded into memory and the following message is displayed on the Console: DIAGNOSTIC/UTILITY SYSTEM REVISION XX.XX ENTER YOUR PROGRAM NAME :



WARMSTART - SERIES 64/68

OPERATOR FUNCTION: SYSTEM STARTUP (WARMSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure loads the system from the system disc. It is the only restart procedure which results in recovery of incompletely processed spooled jobs and spooled device files.

WARMSTART should only be used to recover spool files and IMAGE transaction logging magnetic tape buffers.

STEP	PROCEDURE
1	If the system is already running, simultaneously depress the CONTROL key and B (B^C) . If the system is not running, press RETURN . When you see the DCU prompt (M>), enter <u>START</u> on the System Console.
2	The MPE Initiator begins execution and prints the following message: HP 32033v.uu.ff In the message, v is the current version of MPE, uu is the present update-level number, and ff is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN .)
3	WHICH OPTION <WARMSTART/COOLSTART>? <u>WARMSTART</u> At this point, there is a one or two minute delay, while the Initiator confirms that configured memory size can be supported on the available physical memory, and tests to make sure the DRTs have been handled correctly.
4	DATE (M/D/Y)? Enter the current date in the form mm/dd/yy.
5	TIME (H:M)? Enter the time (24-hour clock) as hh:mm. The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date/time message is correct, press RETURN to continue the WARMSTART. You now receive the *WELCOME* message. The system automatically logs on as OPERATOR.SYS. The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.

STEP	PROCEDURE
6	<p>The system may now print one or more of the following, depending upon the system configuration:</p> <pre> time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Snnn/pin/LOGON FOR OPERATOR.SYS,PUB ON LDEV #nn </pre>

COMMENTS

After a WARMSTART, the following conditions exist: STREAMS=OFF, JOBFENCE=14, DUTFENCE=14, JLIMIT=0, and SLIMIT=0.

If User Logging was taking place prior to the WARMSTART, the system will print the following message:

```
time/pin/RECOVERING USER LOGGING PROCESS logid
```

If the process associated with *logid* is a tape file, the next request will be to mount the tape associated with the process. This will be a standard mount request.

After the User Logging files have been recovered, the following message will be printed:

```
time/pin/USER LOGGING FILE logfile RECOVERED INCLUDING
xxx OPENS AND xxx CLOSES
```

If there was an error during recovery, an error message will be printed.

When prompted for "DATE (M/D/Y)?", if **RETURN** is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

COOLSTART - SERIES 64/68

OPERATOR FUNCTION: SYSTEM STARTUP (COOLSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure loads the system from the system disc. It is the standard way to restart the system after a routine shutdown.

A COOLSTART deletes all Spooled Jobs and all Input and Output Spool files. These can be preserved by doing a WARMSTART. The SPOOK.5 utility may be used to store large spool files for subsequent processing. After all spool files have been stored, the =SHUTDOWN command should be given, and a COOLSTART initiated.

STEP	PROCEDURE
1	If the system is already running, simultaneously press the CONTROL key and B (B^C) . If the system is not running, press RETURN . When you see the DCU prompt (M>), enter <u>START</u> on the System Console.
2	The MPE Initiator begins execution and prints the following message: HP 32033v.uu.ff In the message, v is the current version of MPE, uu is the present update-level number, and ff is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN .)
3	WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u>
4	ANY CHANGES? RETURN (Return implies <u>NO</u>) At this point, there is a one or two minute delay (refer to "WARMSTART" for an explanation).
5	DATE (M/D/Y)? Enter the current date in the form mm/dd/yy.
6	TIME (H:M)? Enter the time (24-hour clock) as hh:mm. The system prints the day, date, and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date/time message is correct, press RETURN to continue the COOLSTART. You now receive the *WELCOME* message. The system automatically logs on as OPERATOR.SYS. The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.

STEP	PROCEDURE
7	<p>The system may now print one or more of the following, depending upon the system configuration:</p> <pre> time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Snnn/pin/LOGON FOR OPERATOR.SYS,PUB ON LDEV #nn </pre>

COMMENTS

After a COOLSTART the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=1; JLIMIT and LIMIT are set to the values specified during system configuration.

You can make changes to the system configuration during a COOLSTART. Respond YES to the "ANY CHANGES?" prompt, and the Initiator will begin the Initiator/User dialogue described in Section VII of this manual.

When prompted for "DATE (M/D/Y)?", if (RETURN) is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

COLDSTART - SERIES 64/68

OPERATOR FUNCTION: SYSTEM STARTUP (COLDSTART) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the system from magnetic tape or from serial disc. In each case, the procedure allows you to modify the system configuration while retaining users' information. COLDSTART is commonly used when an installation maintains several backup versions, each with a different configuration.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive and place the device on line.</p>
2	<p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a COLDSTART from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev</i> 1. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain, making it available for private volume use once the startup is complete.)</p>
3	<p>If the system is already running, simultaneously press the CONTROL key and B (B^C). If the system is not running, press RETURN.</p> <p>When you see the DCU prompt (M), enter LOAD on the System Console. If you wish to cold load from a device other than the preset default device, enter the IMB number, channel number and device number, separated by commas, after LOAD, e.g.:</p> <p><u>LOAD imb,channel,device</u></p> <p>Note however, that once you have overridden the default cold load device in this way, the new values become the default until power is cycled on the system. In this case the default values initially set by the factory take effect.</p>

STEP	PROCEDURE
4	<p>When the system finishes accessing the cold load medium, the MPE Initiator begins execution and prints:</p> <pre>HP 32033v.uu.ff</pre> <p>In this message, <i>v</i> is the current version of MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press <u>RETURN</u>.)</p>
5	<p>WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u></p>
6	<p>ANY CHANGES? <u>RETURN</u> (Return implies <u>NO</u>.)</p> <p>If this is a startup from tape, the tape is read and rewound. The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i>", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.</p>
7	<p>DATE(M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i>.</p>
8	<p>TIME(H:M)? Enter the time (24-hour clock) as <i>hh.mm</i>.</p> <p>The system prints the day, date and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date and time are correct, press <u>RETURN</u> to continue the dialogue.</p> <p>You now will now receive the *WELCOME* message. The system automatically logs on OPERATOR.SYS.</p> <p>The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.</p> <p>The system may now print one or more of the following, depending upon the system configuration:</p>
9	<pre>time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Snnn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn</pre>

COMMENTS

After a COLDSTART, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=0; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during a COLDSTART. Respond YES to the "ANY CHANGES?" prompt and the Initiator begins the Initiator/User dialogue described in Section VII of this manual.

When prompted for "DATE(M/D/Y)?", if RETURN is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

UPDATE - SERIES 64/68

OPERATOR FUNCTION: SYSTEM STARTUP (UPDATE) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the system from magnetic tape or from serial disc. This is the standard procedure used when starting the system with an updated MPE operating system from Hewlett-Packard, or an MPE backup copy prepared on a different HP 3000 system.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC TAPE: Mount the MPE backup tape on the Unit 0 magnetic tape drive. Place the device on line.</p>
2	<p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a UPDATE from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev 1</i>. Set the drive to Unit 0, being sure no other drives on the same controller are also set to unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain, making it available for private volume use once the startup is complete.)</p> <p>3 If the system is already running, simultaneously press the CONTROL key and B (B^C). If the system is not running, press RETURN. When you see the DCU prompt (M>), enter LOAD on the System Console. If you wish to cold load from a device other than the preset default device, enter the IMB number, channel number and device number, separated by commas, after LOAD, e.g.:</p> <p><i>LOAD imb,channel,device</i></p> <p>It is important to note that once you have overridden the default cold load device in this way, the new values become the default until power is cycled on the system. In this case the default values initially set by the factory take effect.</p> <p>When the system finishes accessing the cold load medium, the MPE Initiator begins execution and prints:</p> <p><i>HP 32033v.uu.ff</i></p> <p>In this message, <i>v</i> is the current version of MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN.)</p>

STEP	PROCEDURE
4	WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>UPDATE</u>
5	SYSTEM DISC DRT= <i>nnn</i> ? <u>RETURN</u> (or input correct DRT#).
6	ANY CHANGES? <u>RETURN</u> (Return implies <u>NO</u> .)
7	<p>If this is a startup from tape, the tape is read and rewound.</p> <p>The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i>", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.</p>
8	DATE(M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
9	<p>TIME(H:M)? Enter the time (24-hour clock) as <i>hh:mm</i>.</p> <p>The system prints the day, date and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the DATE and TIME prompts. If the date and time are correct, press <u>RETURN</u> to continue the dialogue.</p> <p>You will now receive the *WELCOME* message. The system automatically logs on as OPERATOR.SYS.</p> <p>The user OPERATOR must exist in the SYS account (with OP or SM capability) prior to system startup in order to accomplish the automatic logon.</p>
10	<p>The system may now print one or more of the following, depending upon the system configuration:</p> <pre> time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP# n/SPOOLED IN time/pin/SP# n/SPOOLED OUT time/#Snnn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn </pre>

COMMENTS

After an UPDATE, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=1; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during an UPDATE. Respond YES to the "ANY CHANGES?" prompt, and the Initiator will begin Initiator/User dialogue described in Section VII of this manual.

When prompted for "DATE(M/D/Y)?", if a RETURN is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

RELOAD - SERIES 64/68

OPERATOR FUNCTION: SYSTEM STARTUP (RELOAD) E/F.00.00, G.00.00

DESCRIPTION: This procedure cold loads the entire system including all system files and configuration information. The system is reloaded from a backup copy which was produced by a ;SYSDUMP to magnetic tape or serial disc.

A RELOAD DESTROYS ANY FILE WHICH MAY BE ON ANY OF THE SYSTEM DISC VOLUMES.

STEP	PROCEDURE
1	<p>FOR STARTUP FROM MAGNETIC TAPE: Mount the MPE backup tape on the Unit-0 magnetic tape drive. Place the device on line.</p>
2	<p>FOR STARTUP FROM A SERIAL DISC:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; margin: 0;">NOTE</p> </div> <p>The instructions given here apply to computers with more than one disc controller. If your system has a serial disc and system disc configured on one controller, read "GENERAL INSTRUCTIONS" in this appendix before doing a RELOAD from serial disc.</p> <p>Mount the MPE backup serial disc pack on any drive that does not share the controller on <i>ldev</i> 1. Set the drive to Unit 0, being sure no other drives on the same controller are also set to Unit 0. (During startup, the Initiator dynamically allocates this drive to the nonsystem domain, making it available for private volumes use once the startup is complete.)</p>
3	<p>If the system is already running, simultaneously press the <u>CONTROL</u> key and B (B^C). If the system is not running, press <u>RETURN</u>. When you see the DCU prompt (M>), enter <u>LOAD</u> on the System Console.</p> <p>If you wish to cold load from a device other than the preset default device, enter the IMB number, channel number, and device number, separated by commas, after <u>LOAD</u>, e.g.:</p> <p><u>LOAD imb,channel,device</u></p> <p>However, it is important to note that once you have overridden the default cold load device in this way, the new values become the default until power is cycled on the system. In this case the default values initially set by the factory take effect.</p>

STEP	PROCEDURE
	<p>When the system finishes accessing the cold load medium, the MPE Initiator begins execution and prints:</p> <pre>HP 32033v.uu.ff</pre> <p>In this message, <i>v</i> is the current version of MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number. (If the message does not appear after one minute, or if the Console is not an HP 26XX-type terminal, press RETURN.)</p>
4	WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>RELOAD</u>
5	WHICH OPTION <SPREAD/COMPACT/RESTORE/ACCOUNTS/NULL>?
	<p>The reload options are described following this table. Press RETURN to select SPREAD (default).</p>
6	ANY CHANGES? RETURN (Return implies <u>NO</u> .)
	<p>If this is a startup from tape, the tape is read and rewound. Additional volumes or tape reels may be requested.</p>
	<p>The system prints the message "BANK 0 DEPENDENT MEMORY USED - <i>nnnnn</i>", where <i>nnnnn</i> is the number of words (in decimal) used by INITIAL in constructing the operating system.</p>
7	DATE(M/D/Y)? Enter the current date in the form <i>mm/dd/yy</i> .
8	TIME(H:M)? Enter the time (24-hour clock) as <i>hh:mm</i> .
	<p>The system prints the day, date and time. If the date or time is incorrect, type <u>NO</u> and the system will repeat the date and time prompts. If the date and time are correct, press RETURN to continue the dialogue.</p>
	<p>You will now receive the *WELCOME* message. The system automatically logs on as OPERATOR.SYS.</p>
	<p>The user OPERATOR must exist in the SYS account (with OP capability) prior to system startup in order to accomplish the automatic logon.</p>
9	<p>The system may now print one or more of the following, depending on your system's configuration:</p> <pre>time/pin/MEMORY ERROR LOGGING INITIATED time/pin/SP #n/SPOOLED IN time/pin/SP #n/SPOOLED OUT time/#Smmn/pin/LOGON FOR: OPERATOR.SYS,PUB ON LDEV #nn</pre>

COMMENTS

After a RELOAD, the following conditions exist: STREAMS=OFF, JOBFENCE=0, and OUTFENCE=1; JLIMIT and SLIMIT are set to the values specified during system configuration.

You can change the system configuration during a RELOAD. Respond YES to the "ANY CHANGES?" prompt, and the Initiator will begin the Initiator/User dialogue described in Section VII of this manual.

When prompted for "DATE(M/D/Y)?", if RETURN is entered instead of an actual date, the system will assume the default date/time of WED NOV 1, 1972 12:00 AM. Always be sure to enter the correct date and time on system startup to ensure proper execution of functions (i.e., :SYSDUMP) related to the system clock.

RELOAD OPTIONS

Your response in Step 5 selects the algorithm the system uses to RELOAD the disc. The algorithm determines on which system disc a file is stored and whether the *user.group.account* structure is placed in the appropriate directory area. RELOAD options are:

SPREAD MPE attempts to place the file back on a disc of the device class as it was originally created. If this fails, MPE attempts to replace the file on a disc of the same type and sub-type as the disc on which it was previously located (for instance, on a cartridge disc). If this fails, MPE attempts to place it on a disc of the same type (for example, a moving-head disc). If this fails, MPE attempts to place the file on any disc in device class DISC. If this fails, a message is printed and the file is not reloaded. In each of these attempts, the files are spread among similar discs, if possible. For example, suppose that when the system was dumped, there was one cartridge disc that was full, and when it is reloaded there are two cartridge discs. In this case, each disc will be approximately half full. The advantages of the SPREAD option are reduced disc seeking (since files are spread out), and reduced fragmentation (since the disc is repacked). The disadvantage is that if the discs are nearly full, it may not be possible to restore all files that were previously stored on the discs. This situation rarely occurs. In this case, one of the other options may be used.

COMPACT MPE attempts to place the file back on the same volume from which it came. If this fails, the SPREAD option is used. The major advantage of COMPACT is that if there are no new deleted tracks and the same discs are used, reloading of the system is guaranteed, no matter how full the discs are. In addition, each disc is compacted within the area between deleted tracks. If there are n deleted tracks, there will be at most $(n+1)$ fragments.

RESTORE MPE attempts to place the files back on the same volume at the same locations from which they came. If this fails, MPE attempts to place the files anywhere on the volume from which they came. If this fails, the SPREAD option is used. The advantages to the RESTORE option are that it offers the same guarantee made as COMPACT for reloading the system, and that the same files that were previously using alternate tracks are still using them. The disadvantage is that no compacting of the discs is done, so that the same fragmentation still exists.

ACCOUNTS

This option loads the system, creates a directory from the backup copy, and loads the system files which reside in the PUB group of the SYS account. No user files are loaded onto the system.

The directory which is created will consist of all accounts, groups, and user structures which were current at the time the backup copy was written (by the :SYSDUMP Configurator program).

This option is useful in that files saved by the :SYSDUMP program are compatible with files stored using the :STORE command. In this way you could, for example:

1. Create a new directory structure if the previous directory was destroyed.
2. Conserve disc space by selectively loading files into certain accounts with the :RESTORE command (after the system is operational).

NULL

MPE creates a null directory with MANAGER.SYS,PUB as the only user, and no user files are copied to disc.

NOTE

Hewlett-Packard recommends using the ACCOUNTS option to reload the accounting structure, then complete the RELOAD operation. When the system is operational use the :RESTORE command to restore user files into the accounts.

ADDING I/O DEVICES - SERIES 64/68

OPERATOR FUNCTION: ADDING STANDARD I/O DEVICES E/F.00.00, G.00.00

DESCRIPTION: This procedure describes one method for adding input/output devices to the system. You may only add a system domain disc drive during a **RELOAD**. The description is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII in this manual.

STEP	PROCEDURE
1	If the system is already running, simultaneously press the CONTROL key and B (B ^C). If the system is not running, press RETURN . When you see the DCU prompt (M>), enter START on the System Console.
2	<p>The MPE Initiator begins execution and prints:</p> <pre>HP 32033v.uu.ff</pre> <p>(If the message does not appear after one minute, or if the console is not an HP 26XX-type terminal, press RETURN.)</p> <pre>WHICH OPTION <WARMSTART/COOLSTART>? <u>COOLSTART</u> ANY CHANGES? <u>YES</u> LOAD MAP? <u>RETURN</u> MEMORY SIZE=nnn? <u>RETURN</u> I/O CONFIGURATION CHANGES? <u>YES</u> LIST I/O DEVICES? <u>YES</u> LIST CS DEVICES? <u>YES</u> HIGHEST DRT?=nnn? <u>RETURN</u> or higher number. LOGICAL DEVICE #? <u>nnn</u> DRT #? <u>nnn</u> UNIT #? <u>nnn</u> SOFTWARE CHANNEL #? <u>n</u> TYPE? <u>RETURN</u> SUB TYPE? <u>RETURN</u> RECORD WIDTH? <u>RETURN</u> OUTPUT DEVICE? <u>RETURN</u> ACCEPT JOBS/SESSIONS? <u>YES</u> or <u>NO</u> ACCEPT DATA? <u>YES</u> or <u>NO</u> INTERACTIVE? <u>YES</u> or <u>NO</u> DUPLICATIVE? <u>YES</u> or <u>NO</u> INITIALLY SPOOLED? <u>YES</u> or <u>NO</u> INPUT OR OUTPUT? <u>IN</u> or <u>OUT</u> (Spooled devices only) DRIVER NAME? <u>driver</u> (Refer to Section VII of this manual.) DEVICE CLASS? <u>devclass</u> IS <u>devclass</u> A SERIAL DISC CLASS? <u>YES</u> or <u>NO</u> IS <u>devclass</u> A FOREIGN DISC CLASS? <u>YES</u> or <u>NO</u></pre>

STEP	PROCEDURE
2 (cont.)	LOGICAL DEVICE #? <u>RETURN</u> MAX # OF OPEN SPOOLFILES= <i>nn</i> ? <u>RETURN</u> LIST I/O DEVICES? <u>RETURN</u> LIST CS DEVICES? <u>RETURN</u> CLASS CHANGES? <u>RETURN</u> LIST I/O DEVICES? YES ADDITIONAL DRIVER CHANGES? <u>RETURN</u> I/O CONFIGURATION CHANGES? <u>RETURN</u> DISC VOLUME CHANGES? <u>RETURN</u> VIRTUAL MEMORY CHANGES? <u>RETURN</u> DISABLE LOGGING <u>RETURN</u> MAX # OF SPOOLFILE KILOSECTORS= <i>nnn</i> ? <u>RETURN</u> # OF SECTORS PER SPOOLFILE EXTENT= <i>nnn</i> ? <u>RETURN</u> RECOVER LOST DISC SPACE? <u>RETURN</u> DATE(M/D/Y)? <i>mm/dd/yy</i> TIME(H:M)? <i>hh:mm</i> (24-hour clock)

DELETING I/O DEVICES - SERIES 64/68

OPERATOR FUNCTION: DELETING I/O DEVICES E/F.00.00, G.00.00

DESCRIPTION: This procedure describes one method for deleting input/output devices from the system. You may only delete a system domain disc drive during a RELOAD. The description below is a summary intended to illustrate a general technique. Complete instructions and guidelines must be obtained from Section VII of this manual.

STEP	PROCEDURE
1	If the system is already running, simultaneously press the <u>CONTROL</u> key and B (<u>B^C</u>). If the system is not running, press <u>RETURN</u> . When you see the DCU prompt (M), enter <u>LOAD</u> on the System Console.
2	<p>The MPE Initiator begins execution and prints:</p> <pre>HP 32033v.uu.ff</pre> <p>In this message, <i>v</i> is the current version of MPE, <i>uu</i> is the present update-level number, and <i>ff</i> is the fix-level number.</p> <pre>WHICH OPTION <COLDSTART/RELOAD/UPDATE>? <u>COLDSTART</u> ANY CHANGES? <u>YES</u> LOADMAP? <u>RETURN</u> MEMORY SIZE=nnn? <u>RETURN</u> I/O CONFIGURATION CHANGES? <u>YES</u> LIST I/O DEVICES? <u>YES</u> LIST CS DEVICES? <u>YES</u> HIGHEST DRT?=nnn? <u>RETURN</u> (or input correct DRT#) LOGICAL DEVICE #? <u>nnn</u> DRT#? <u>0</u> LOGICAL DEVICE #? <u>RETURN</u> MAX # OF OPEN SPOOLFILES=<u>nn</u>? <u>RETURN</u> LIST I/O DEVICES? <u>RETURN</u> LIST CS DEVICES? <u>RETURN</u> CLASS CHANGES? <u>RETURN</u> LIST I/O DEVICES? <u>RETURN</u> ADDITIONAL DRIVER CHANGES? <u>RETURN</u> I/O CONFIGURATION CHANGES? <u>RETURN</u> DISC VOLUME CHANGES? <u>RETURN</u> VIRTUAL MEMORY CHANGES? <u>RETURN</u> DISABLE LOGGING? <u>RETURN</u> MAX # OF SPOOLFILE KILOSECTORS=<u>nnn</u>? <u>RETURN</u> # OF SECTORS PER SPOOLFILE EXTENT=<u>nnn</u>? <u>RETURN</u> RECOVER LOST DISC SPACE? <u>RETURN</u> DATE(M/D/Y)? <u>mm/dd/yy</u> TIME(H:M)? <u>hh:mm</u> (24-hour clock)</pre>

SOFTWARE DUMP – SERIES 64/68

OPERATOR FUNCTION: DUMPING MAIN MEMORY

DESCRIPTION: The Software Dump Facility (SDF) operates in a standalone environment and stores all of main memory to a serial storage medium. Perform a software dump after a system failure or system halt.

It is a wise precaution to have one or more backup copies of the SDF on a serialized medium. Remember that a backup SDF cannot be created after a software dump has failed; you must have one already on hand. A backup SDF should be created when the system is initially configured, and you should create a new backup SDF each time you receive a software update. This will ensure that you have the correct version of the SDF on your backup copy at all times. Refer to the discussion of Backup Software Dump procedures in Section X.

STEP	PROCEDURE
1	Mount a serial storage medium on a logical device specified by the device class DDUMP, then place the drive on line.
2	If the DCU prompt is not already present on the System Console, simultaneously press the <u>CONTROL</u> key and B (B^C). When you see the DCU prompt (M>), enter <u>DUMP</u> or <u>DU</u> .
3	At this point, the SDF is loaded from the specified device and begins a serial execution of the SDF command file (SDFCOM), which contains ASCII commands and is located on the system disc.
3a	<p>If the Software Dump Facility is loaded correctly, the following message will appear on the System Console:</p> <p>SOFTWARE DUMP FACILITY (VER xxx.xxx/xxx)</p> <p>The system will then execute the next instruction in the SDFCOM file, usually a HALT.</p> <p>Check to see that the serial storage medium is on line and ready, then press the <u>RETURN</u> key to continue execution of SDF. Main memory is stored to the serial storage medium and the system automatically executes a WARMSTART (unless you have altered SDFCOM).</p>
3b	<p>If the system halts while loading SDF, the following error message will appear on the System Console:</p> <p>***DUMP FAILED</p> <p>This message indicates that an error has been detected, and the SDF is unable to execute. A backup software dump must be performed. Refer to Section X for step-by-step procedures.</p>

STEP	PROCEDURE
3c	If the SDF command file does not exist or has been corrupted, the program automatically goes into interactive mode. SDF prompts you for a command by printing a SOFTDUMP COMMAND>, at which point you enter the desired SDF command (refer to Table 10-1).
3d	<p>If your serial storage medium is flawed, the following message may appear on the System Console:</p> <pre>SERIAL DEVICE I/O ERROR - you are now in SOFTDUMP INTERACTIVE MODE. Please mount new media, then type DUMP in response to the prompt "SOFTDUMP COMMAND>".</pre>

COMMENTS

Entering a Y^C from the System Console at any time while the SDF file is executing may cause SDF to abort the current command and place the user in interactive mode.

If you wish to alter your SDF command file, refer to Section X.

If you want to print the dump to a line printer, run the DPAN4/DPAN5 Utility program immediately after restarting the system. DPAN4/DPAN5 is described in the MPE V System Utilities Reference Manual (32033-90005).

FORMATTING SYSTEM PACKS - SERIES 64/68

OPERATOR FUNCTION: FORMATTING SYSTEM DISC PACKS

DESCRIPTION: This procedure describes how to use the Sleuth Simulator (SLEUTHSM), which is part of the Diagnostic Utility System (DUS), to format system disc packs. The DUS is on a standalone serial medium and is loaded onto a shut down system.

STEP	PROCEDURE
1	Load the Diagnostic/Utility System as described in "LOADING THE DUS" in this appendix. Note that all entries must be in uppercase.
2	Type <u>AID</u> on the System Console and press <u>RETURN</u> . The following message will be displayed: AID xxx.xxx >10
3	Type <u>LOAD SLEUTHSM</u> on the console and press <u>RETURN</u> . The Sleuth Simulator is loaded into memory; the System Console will display the next line number in the program. You are now ready to initiate the dialogue necessary to format a disc pack.
4	Enter the following data to format any disc on the HP 3000 Series 64/68: >5000 <u>DEV 0,channel,device,20,unit,imb</u> >5010 <u>FMT 0</u> >5020 <u>RUN</u>
5	After the disc is formatted, SLEUTHSM again prompts for input (>). To flag defective tracks, enter the program which corresponds to the type of disc pack you wish to flag. 7920 Disc Pack >EP >5000 <u>DEV 0,channel,device,10,0,imb</u> >5010 <u>DB AA,6144,0</u> >5020 <u>RC 0</u> >5030 <u>PRINT CYLINDER # TO BE FLAGGED DEFECTIVE?</u> >5040 <u>INPUT A</u> >5050 <u>PRINT HEAD#?</u> >5060 <u>INPUT B</u> >5070 <u>SEEK 0,A,B,0</u> >5080 <u>IDI 0,AA(0),3,D</u> >5090 <u>PRINT CONTINUE?(YES/NO)</u> >5100 <u>INPUT &BB</u> >5110 <u>IF &BB=YES THEN 5020</u> >5120 <u>RUN</u>

STEP	PROCEDURE
6	<p>7925 Disc Pack</p> <pre> >EP >5000 DEV 0,channel,device,10,0 >5010 DB AA,8192,0 >5020 RC 0 >5030 PRINT "CYLINDER # TO BE FLAGGED DEFECTIVE?" >5060 INPUT B >5070 SEEK 0,A,B,0 >5080 IDI 0,AA(0),3,D >5090 PRINT CONTINUE? (YES/NO)" >5100 INPUT &BB >5110 IF &BB="YES" THEN 5020 >5120 RUN </pre> <p>In line 5000 of the above programs, you must supply the channel number and device number of the drive on which the disc pack is mounted.</p> <p>The programs ask three questions for each defective track. In response to the first, enter the cylinder number of the defective track; in response to the second, enter the head number of the defective track. The cylinder and head numbers of defective tracks are listed on the "List of Defective Tracks" supplied with each new disc.</p> <p>To the third question, "CONTINUE? (YES/NO)", enter <u>NO</u> until you have entered all defective tracks, then enter <u>YES</u>.</p> <p>After the defective tracks have been flagged, SLEUTHSM again prompts for input (>). Enter another program or halt the system.</p>

NOTE

The HP 7911, 7912, 7933 and 7935 disc drives have an internal mechanism for flagging defective tracks. SLEUTHSM can be used to format discs, but not to flag defective tracks.

LOADING THE DUS - SERIES 64/68

OPERATOR FUNCTION: COLD LOADING THE DIAGNOSTIC UTILITY SYSTEM

DESCRIPTION: The Diagnostic Utility System (DUS) is memory resident and allows you to run diagnostic and utility programs. The DUS is on a standalone magnetic tape and is loaded onto a shut down system.

STEP	PROCEDURE
1	Mount the tape containing the Diagnostic Utility System on the tape drive and place the drive on line.
2	<p>If the DCU prompt (M>) is not already present on the system console, press <u>RETURN</u>. When you see the prompt, enter <u>HALT</u>. When another prompt appears, enter <u>LOAD</u>.</p> <p>If you wish to cold load from a device other than the preset default device, enter the IMB number, channel number, and the device number, separated by commas, after LOAD, e.g.:</p> <p><u>>LOAD imb,channel,device</u></p> <p>Note, however, that once you have overridden the default coldload device in this way, the new values become the default until power is cycled on the system. In this case, the default values initially set by the factory take effect.</p>
3	<p>At this point the tape containing the DUS is loaded into memory, and the following message appears on the System Console:</p> <pre>DIAGNOSTIC/UTILITY SYSTEM REVISION xxx.xxx ENTER YOUR PROGRAM NAME (Type HELP for program information.) :</pre>

SHIFT STRING DUMP - SERIES 64/68

OPERATOR FUNCTION: PRE-SYSTEM STARTUP (AFTER SYSTEM FAILURE)

DESCRIPTION: This procedure is used to obtain a shift string dump whenever a system failure occurs which results in a system halt (DCU maintenance prompt comes up on System Console). Through DCU maintenance mode commands, the contents of specific CPU registers are stored on the Floppy Disc Unit of the HP 3000 Series 64/68 Console, which is directly controlled by the HP 2647F terminal. The procedure consists of two parts: formatting and labeling the diskette and obtaining the shift string dump itself.

STEP	PROCEDURE																									
1	Insert a diskette in the floppy disc drive. Ensure that the HP label is up and in the front right corner.																									
2	Set REMOTE key to up position.																									
3	Press RETURN key; then press CLEAR DISPLAY key.																									
4	<p>Display volume information by typing SHOW VOLUMES, followed by CONTROL COMMAND (hold the CONTROL key down and simultaneously press the COMMAND key). A message similar to the following will then be displayed:</p> <table border="1"> <thead> <tr> <th>VOLUME</th> <th>NAME</th> <th>Start of</th> <th>HP-IB ADDRESS</th> <th>Write</th> </tr> <tr> <th>Local</th> <th>Disc</th> <th>Free Space</th> <th>Space</th> <th>Protect</th> </tr> <tr> <th>Volume</th> <th>Type#Unit</th> <th>Left</th> <th>Left</th> <th>Protect</th> </tr> <tr> <th>-----</th> <th>-----</th> <th>-----</th> <th>-----</th> <th>-----</th> </tr> </thead> <tbody> <tr> <td>DUMP01</td> <td>nFD#1</td> <td>32</td> <td>1024</td> <td>ND</td> </tr> </tbody> </table>	VOLUME	NAME	Start of	HP-IB ADDRESS	Write	Local	Disc	Free Space	Space	Protect	Volume	Type#Unit	Left	Left	Protect	-----	-----	-----	-----	-----	DUMP01	nFD#1	32	1024	ND
VOLUME	NAME	Start of	HP-IB ADDRESS	Write																						
Local	Disc	Free Space	Space	Protect																						
Volume	Type#Unit	Left	Left	Protect																						
-----	-----	-----	-----	-----																						
DUMP01	nFD#1	32	1024	ND																						
5	If the write protect tab is on (YES in the write protect column), remove the diskette from the drive, remove the tab covering the notch on the left front of its cover, and reinsert the diskette. Otherwise, continue to Step 6.																									
6	If the volume name is in lowercase letters, such as "nonfmt" or "nonsif", it has not been labeled. Skip Steps 7-8 and create the volume as described in Step 9. Otherwise, continue to Step 7.																									
7	If the volume name is in uppercase letters and the start of free space is at 32, the label is okay and the diskette may be used as is. If a different volume label is wanted or free space is not at 32, perform Steps 8-10. Otherwise, skip to Step 11.																									
8	<p>To purge an old volume label, type PURGE VOLUME <filename>, followed by CONTROL COMMAND (hold the CONTROL key down and simultaneously press the COMMAND key). This operation takes approximately two seconds (the light on the floppy disc unit will flash momentarily; no message is displayed on the Console). Example: PURGE VOLUME DUMP01</p>																									

STEP	PROCEDURE																																												
9	<p>To label the diskette with a new volume name, type CREATE VOLUME <filename> ON DISC#1, followed by CONTROL COMMAND (hold the CONTROL key down and simultaneously press the COMMAND key). Use any name up to eight characters long, with the first character alphabetic, for filename. This operation takes approximately 8-10 seconds. The red light on the floppy disc unit comes on; when it goes out the operation is complete. No message is displayed on the Console. Example: CREATE VOLUME DUMP02 ON DISC#1.</p>																																												
10	<p>To verify the new volume name, type SHOW VOLUMES, followed by CONTROL COMMAND (hold the CONTROL key down and simultaneously press the COMMAND key). The volume name should be in uppercase letters and the start of free space at 32.</p> <table border="1"> <thead> <tr> <th>VOLUME</th> <th>NAME</th> <th colspan="3">HP-IB ADDRESS</th> </tr> <tr> <th>Local</th> <th>Disc</th> <th>Start of</th> <th>Space</th> <th>Write</th> </tr> <tr> <th>Volume</th> <th>Type#Unit</th> <th>Free Space</th> <th>Left</th> <th>Protect</th> </tr> <tr> <th>-----</th> <th>-----</th> <th>-----</th> <th>-----</th> <th>-----</th> </tr> </thead> <tbody> <tr> <td>DUMP02</td> <td>nFD#1</td> <td>32</td> <td>1024</td> <td>NO</td> </tr> </tbody> </table>	VOLUME	NAME	HP-IB ADDRESS			Local	Disc	Start of	Space	Write	Volume	Type#Unit	Free Space	Left	Protect	-----	-----	-----	-----	-----	DUMP02	nFD#1	32	1024	NO																			
VOLUME	NAME	HP-IB ADDRESS																																											
Local	Disc	Start of	Space	Write																																									
Volume	Type#Unit	Free Space	Left	Protect																																									
-----	-----	-----	-----	-----																																									
DUMP02	nFD#1	32	1024	NO																																									
11	Set REMOTE key to down position.																																												
12	<p>Get the Maintenance Prompt (M>) on the HP 2647F System Console by pressing RETURN. If neither "C>" nor "M>" is returned, hold the CONTROL key down and type "B". If "C>" prompt comes up, turn the CONTROL/MAINT/REMOTE keyswitch to MAINT or REMOTE position.</p>																																												
13	<p>In response to "M>" prompt, type the following:</p> <pre>M> BA=OCT RETURN M> DS;LG;WS;RFLAG=0;XA;XB;RFLAG=1;XA;XB RETURN</pre>																																												
14	<p>The system will respond with the following header and series of questions. Enter appropriate responses for each line, followed by RETURN. Be as accurate as possible in supplying this information, as it will assist the Customer Engineer (CE) or Technical Support Engineer (TSE) in locating the cause of the system failure.</p> <p style="text-align: center;">GEMINI BOARD STRING & REGISTER DUMP</p> <table border="1"> <thead> <tr> <th>FILE</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>DESC</td> <td>FIRM</td> <td>SOFT</td> <td>CTLA</td> <td>CTLB</td> <td>SKSP</td> <td>RAL0</td> <td>RAL1</td> <td>RAL2</td> <td></td> </tr> <tr> <td>10</td> <td>RAL3</td> <td>VBUS</td> <td>CIR</td> <td>CAC</td> <td>MCS</td> <td>MMC</td> <td>CBI1</td> <td>CBI2</td> <td>CBI3</td> <td>CBI5</td> </tr> <tr> <td>20</td> <td>CBI7</td> <td>IOB1</td> <td>IOB2</td> <td>IOB3</td> <td>WCS0</td> <td>WCS1</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	FILE	0	1	2	3	4	5	6	7	8	9	0	DESC	FIRM	SOFT	CTLA	CTLB	SKSP	RAL0	RAL1	RAL2		10	RAL3	VBUS	CIR	CAC	MCS	MMC	CBI1	CBI2	CBI3	CBI5	20	CBI7	IOB1	IOB2	IOB3	WCS0	WCS1				
FILE	0	1	2	3	4	5	6	7	8	9																																			
0	DESC	FIRM	SOFT	CTLA	CTLB	SKSP	RAL0	RAL1	RAL2																																				
10	RAL3	VBUS	CIR	CAC	MCS	MMC	CBI1	CBI2	CBI3	CBI5																																			
20	CBI7	IOB1	IOB2	IOB3	WCS0	WCS1																																							

STEP	PROCEDURE
	<p>DATE: TIME: OPERATOR: SYSTEM: MEMORY SIZE: HOW LONG WAS SYSTEM RUNNING? WHAT WAS RUNNING? DESCRIBE WHAT HAPPENED. <CNTRL-G OR TO TERMINATE></p> <p>The DCU will automatically load the contents of the shift string registers for each PCA into the floppy disc unit. This operation takes approximately 2-3 minutes.</p>
15	<p>When "M>" prompt returns, perform the following steps to write the remainder of data on the screen to the diskette:</p> <ol style="list-style-type: none"> a. Ensure MEMORY LOCK key is up (MEMORY LOCK is off). b. Set REMOTE key to up position. c. Press RECORD key (located between "READ" and "SOFTKEYS" keys) to write screen to diskette. d. When screen activity stops, press DELETE LINE key. Type "M F H L" (be sure letters are separated by spaces), followed by <u>CONTROL</u> COMMAND (hold down the <u>CONTROL</u> key and simultaneously press the COMMAND key). This operation takes approximately 1-2 seconds. The light on the floppy disc unit flashes momentarily; no message is displayed on the Console. e. Set REMOTE key to down position. f. Press <u>RETURN</u> to get "M>" prompt.
16	Remove diskette and save for CE or TSE.
17	Proceed with Memory Dump and/or System Startup procedures.

GLOSSARY

A ^c	<p>Control A. A character entered by simultaneously pressing the CONTROL key and an A key on the Console keyboard. Generates an equals sign ("=") prompt, used to perform selected Console commands. A^c has no meaning on non-console keyboards.</p> <p>To terminate a current process or operation. This is accomplished via the :ABORT command, which is only available in session or in break.</p>
Access	<p>The process of obtaining data from files or acquiring the use of a device. "Access" implies an input/output (I/O) operation, and is used as a synonym for I/O.</p>
Account	<p>MPE's method of organizing users and files and allocating the use of system resources such as central processor time, online connect time, and file space. Accounts are also the principal billing entity for the use of these resources. Every user must specify an account to gain access to the system.</p>
Account Level Security	<p>The types of file access assigned by the System Manager to the account when it is created. The types of access are: Read, Lock, Append, Write, and Execute, abbreviated R, L, A, W, and X, respectively. They may be assigned to any user ("ANY") or members of the specified account only ("AC"). The file access permitted the account are the first level of security since the Account Manager may further restrict groups and users by assigning them a more limited set of file access modes.</p>
Account Librarian	<p>A user who is granted special file access modes to maintain files within the account. The Account Manager may assign Account Librarian (AL) capability to more than one user.</p>
Account Manager	<p>The person responsible for managing an account by defining groups and users and specifying capabilities (i.e., IA, BA, ND, SF), file access modes (i.e., Read, Lock, Write), and resource-use limits (i.e., CPU processing time or disc space) for each. The System Manager assigns Account Manager (AM) capability to a single user name within the account when it is first created.</p>
Account Member	<p>Any person who has been granted access to the system through the use of a valid user name within an account. Account members are created by the Account Manager, who defines the user name and assigns the user appropriate capabilities and security restrictions.</p>
ACTIVE State	<p>The condition of an input or output spool file, defined differently for each. During input spooling, an ACTIVE file is a spool file being created, indicating that the input spooler is still collecting data from the input device (which is usually a terminal or tape drive). An ACTIVE output spool file is the only file being output to a device. When the standard output device is the system printer, for example, the file being printed is ACTIVE.</p>
Actual File Designator	<p>The file name resulting from a resolution of the formal file designator with file equations and other file system functionality. This name resolution occurs only when the file is opened or created.</p>

ADCC	Asynchronous Data Communications Controller. A terminal controller, functionally similar to a GIC, that serves as the hardware interface between the CPU and terminals connected to the system (either directly or via modem). Each Main ADCC supports four terminals and an Extender ADCC; the Extender adds an additional four ports, for a combined maximum of eight terminals supported per ADCC.
Address	A number which identifies a exact location in memory to which a process may send data or from which a process may retrieve data.
AIB	Asynchronous Interface Board. A controller board used to manage data transfer to and from terminals. Refer to SIB, ATP.
AL Capability	Account Librarian. A capability assigned to a user name within the account. The person who logs onto the system as Account Librarian is allowed special file access modes to maintain specified files within the account. More than one person may be assigned AL Capability.
Allocate	Locating and reserving disc space for a particular file. Also, loading a program into memory with the :ALLOCATE command. Such programs remain in memory until unloaded with the :DEALLOCATE command, or until the system is halted.
Alphanumeric Character	May be either a letter of the alphabet (A-Z) or the digits 0 through 9.
ALU	Arithmetic Logic Unit. Component which performs arithmetic and logic operations as part of the Central Processing Unit. The CPU may contain one or more Arithmetic Logic Units.
AM Capability	Account Manager. A capability assigned by the System Manager to a user within an account. The person assigned AM capability is responsible for establishing users and groups, assigning resource use limits and capabilities to each, and maintaining account security.
Analog	Data which varies continuously rather than in discrete steps. When used in reference to circuits, those circuits that produce an output varying as a continuous function of the input. The opposite of digital.
Arithmetic Logic Unit	Refer to ALU.
ASCII	American Standard Code for Information Interchange. When used to describe a file or format, it refers to the standard method of representing binary data (7 bits plus a parity bit) agreed upon by the United States Standards Intitute. Also called USASCII.
Associated Device	A device class that has been assigned to a user with the :ASSOCIATE command. Thereafter, the user has Operator control of the designated device until the user logs off, or gives up control of the device, or the Operator regains control with the :DISASSOCIATE command.
Asynchronous Interface Board	Refer to AIB.
ATP	Advanced Terminal Processor. An intelligent hardware interface between the terminals and the CPU. The ATP supports up to 96 terminals, handles character processing, eliminates CPU interrupts, supports full-duplex asynchronous modems, and direct memory access of user data.

BA Capability	Batch Access. Default capability assigned to accounts and user names that permits users to submit batch jobs.
Backplane	Wiring blocks or units which provide most of the interconnecting circuits of a system. Individual printed-circuit boards plug into the backplane. Every card cage used with the HP 3000 uses one or more backplanes.
Back-Reference	The technique of using an asterisk before a formal file designator to indicate that it has been previously defined during the current session or job with the :FILE command.
Backup	The process of storing computer data onto an off line media, such as magnetic tape or serial disc. Also used to describe the data, such as "backup files", or media, such as "backup tape".
Batch Access	A processing mode that allows users to submit data and program files to the computer as a single entity, called a job. Jobs also contain MPE, subsystem, or utility commands which control the execution of the job. The principle difference between batch and interactive access is that a batch job does not require continuous input or supervision. Once entered, MPE processes a job independently of the user who submitted it.
Baud Rate	In data transmission, baud is a unit of signaling speed equal to the number of discrete conditions or signal events per second. Baud is the same as "bits per second" only if each signal event represents exactly one bit. The most familiar reference to Baud Rate is terminal speed settings. Most terminals have a baud rate switch on the keyboard; in addition, the baud rate is either "sensed" by the system and/or set with the :SPEED command.
BCD	Binary Coded Decimal. A decimal notation in which individual decimal digits are each represented by a group of four binary digits.
Binary	The base 2 numbering system which uses only two digits, 0 and 1, to express numeric quantities. Binary is the basic method of representing numbers, alphabetic characters, and symbols in digital computers.
Binary Coded Decimal	Refer to BCD.
Bit	A contraction of BInary digiT. A two-state signal, expressed in binary notation as the characters 0 or 1, which represent an ON or OFF signal respectively. All alphanumeric characters and symbols used by digital computers are unique combinations of bits.
Bit Bucket	A slang expression which refers to a non-existent computer storage area, used when the system-defined "\$NULL" file appears in a command line. Data sent to the bit bucket is thrown away, allowing users to examine system parameters without actually changing or storing any information. For example, when the System Supervisor wants to check current SYSDUMP parameters, he or she can enter "SYSDUMP \$NULL" at the colon prompt, respond to the :SYSDUMP dialogue as though an actual SYSDUMP were being taken, but make no changes to the system.
Bits Per Inch	Refer to BPI.
Block	A group of one or more logical records transmitted to or from a file in a single input/output operation. Programs executed during a session, using a terminal as the I/O device, use different block sizes to facilitate data entry and update.

Block Mode	A processing mode that transmits groups of characters instead of sending data one bit at a time.
Blocking Factor	The number of logical records transmitted as a single physical block of data. A large blocking factor (several logical records treated as a unit) will require fewer I/O operations to transfer a given amount of data. Although this reduces the load on the disc and usually improves system response time, large data blocks require more main memory.
BPI	Bits Per Inch. Used for measuring density of data on a recording medium.
Board	Refer to Card.
Booting	To bring the system on line, or "boot" the system. Booting is a slang expression, derived from the phrase "pulling yourself up by your bootstraps".
Break	An operation that both interrupts (suspends or aborts) an executing process and allows the user to initiate some other operation. Executed by pressing the BREAK key on the terminal or calling the CAUSEBREAK intrinsic. If a process is only suspended, the user may resume it with the :RESUME command.
Break Mode	A processing mode in which you interact with the Command Interpreter after pressing the <u>BREAK</u> key to suspend the currently executing program. Commands that are "breakable" will be listed as such in the USE matrix included in each command specification in Section III.
Buffer	Temporary storage area that is used to compensate for different data transmission or processing speeds between two devices. Also used to compensate for asynchronous occurrences of an event between two devices which must communicate synchronously.
Bus	One or more conductors used as a path to transmit information (data address and control signals) between the CPU, memory, and I/O card cages of the computer.
Byte	A combination of 8 bits treated as a unit. One-half of an HP 3000 word.
Cache, Disc	Refer to Disc Caching.
Capabilities	Assigned to accounts, groups, and users to control access to MPE. Capabilities determine which commands account members may execute, whether they can initiate sessions or jobs, save files, use extra data segments, etc. The System Manager assigns each account a capability list when the account is created. These capabilities, or a subset of them, are assigned to each group and user within the account by the Account Manager.
Capability Class	The combination of capabilities that determine the user's role, such as Account Manager (AM capability) or Group Librarian (GL capability), the user's ability to execute commands, and their degree of influence over system operation. Also referred to as capability set.
Card	A printed-circuit board onto which components (such as microprocessors, memory, and other integrated circuits) are mounted. One or more cards are used to control hardware, store data, and allow communication between the various computer devices. "Card" may also refer to a punched card containing input or output data from a keypunch machine.

Card Cage	The structure used to hold cards in their proper place inside the computer. Card cage and "I/O Bay" are sometimes used interchangeably, although the latter usually refers to the entire cabinet containing one or more card cages used to store the cards which control I/O devices.
Card Image	The representation of data stored on a punched card, usually in binary or ASCII. A fixed-length record of 80 characters.
CBI	Common Bus Interface. Unit which serves as the interface between the Central System Bus (CSB) and an Intermodule Bus (IMB).
CCTL	Carriage Control. A parameter of the :BUILD and :FILE commands that tells MPE that the program will provide carriage control information.
CE	Customer Engineer. Your Hewlett-Packard representative responsible for the installation, troubleshooting, and maintenance of your computer hardware.
Central Processing Unit	CPU. The arithmetic-logic unit, stack registers, and control logic of the computer. The CPU is responsible for executing program instructions, making calculations, and initiating I/O.
Central System Bus	Refer to CSB.
Channel Number	The number assigned to the device controller board in the I/O card cage. Used to calculate the logical address of the device, or DRT number.
Characters Per Inch	Refer to CPI.
Circular Subqueue	The CS, DS, or ES subqueues, referred to as circular since processes executing in these subqueues share the CPU in a round-robin schedule for a specified fraction of time. Since CPU time is allocated among several processes, more than one time period is usually required to complete a process.
Class Name	A label that is either unique to or associated with one or more devices in the system's I/O configuration, used to reference a particular device or class of devices. Device class names may be up to eight alphanumeric characters long, beginning with a letter. A single logical device may have multiple device class names. The HP 2680 Laser Printer, for example, is usually referred to as EPOC (Electrophotographic Output for Computers), PP (Page Printer), or FLP (Fast Line Printer), yet directing output to any of these class names will send the output to a Laser Printer.
Closing A File	Terminating access to a file after completing all input/output operations to it. Accomplished by calling the FCLOSE intrinsic or terminating process execution.
CMP	Control and Maintenance Processor. A diagnostic tool that allows users to duplicate the functions of the switches located on the System Control Panel of the computer. Specifically, the CMP provides control functions to perform system startup, halt, memory dump, and aids in system maintenance. It is available only on Series 39/40/42/44/48 systems.
Code	A language that can be understood and used by computers. A set of precise rules specifying how data may be represented. In data communications, a system of rules and conventions in which the signals representing data can be transmitted, received, and processed.

Code Segments	Instructions to the CPU contained in a single logical module; one or more code segments comprise a complete program or subprogram. Code segments remain unchanged during program execution, and may be overwritten with a new code segment once the current segment has executed completely. In this way, programs larger than the maximum code segment size will execute without user intervention or a large amount of memory.
Code Segment Table	CST. A table that contains a list of permanently allocated MPE and subsystem code segments and code segments that come from any Segmented Library (SL). Each four-word entry in the CST contains, among other information, the address and length of a single code segment, whether it can run in Privileged Mode, and whether it has been accessed. The size of the Code Segment Table can be modified during the SYSDUMP dialogue. If the CST is too small, programs will not run when the system is heavily loaded. If it is too large, main memory space is wasted.
Cold Dump	The process of storing the contents of memory on magnetic tape after a system failure or a system halt. Sometimes called Memory Dump, or simply Dump.
Cold Load	The process of loading MPE from system disc or magnetic tape into memory, following a system failure or planned shut down. The five types of cold loads are: WARMSTART, COOLSTART, COLDSTART, UPDATE, and RELOAD.
COLDSTART	To cold load the entire operating system and I/O configuration from magnetic tape or serial disc. A COLDSTART is commonly used when changing the system configuration, when a COOLSTART has failed, when starting a new system, or when the integrity of MPE (and the system disc) is in doubt.
Collating Sequence	The sequence into which characters are sorted or ordered.
Command	A key word that directs MPE, a subsystem, or a utility program to perform a specific operation.
Command Interpreter	C.I. The part of MPE which analyzes and processes commands entered during a session or submitted as part of a job.
Common Bus Interface	Refer to CBI.
Compiler	A program which translates source code written by a programmer into machine-readable format.
Configuration	The layout of the computer system, including MPE table, memory, and buffer sizes, which peripheral devices are connected to the computer, and how they may be accessed. The system is configured by the System Supervisor, who works in tandem with a Hewlett-Packard Systems Engineer (SE).
Connect Time	The duration, in minutes, of a session or job.
Console	The terminal used by the Operator to execute specific commands for the purpose of managing sessions, jobs, and system resources. The Console can be moved from LDEV 20, where it normally resides, to another terminal with the ;CONSOLE command.

Console Command	A command which can only be executed from the Console at the "=" prompt (generated by pressing CONTROL and the A key on the Console keyboard). Console commands, unlike other commands executed by the Operator, cannot be distributed to MPE users since A ^C has no meaning on a standard terminal's keyboard.
Console Logging	One of the system logging events that causes console commands to be recorded in the system log file.
Console Messages	A message sent to the System Console by the system or a user.
Console Operator	Refer to System Operator.
Control A	Refer to A ^C .
Control and Maintenance Processor	Refer to CMP.
Control Key	A key on the terminal, usually labeled "CNTL" or "CTRL", which is used in combination with other keys to send a special ASCII character to the CPU. Simultaneously pressing the Control Key and an "S" (expressed "S ^C ") for example, will freeze the terminal display. "Q ^C " will restart the terminal's scrolling.
Control Y	A character entered by simultaneously pressing the CONTROL key and a Y on a terminal's keyboard. Appears as Y ^C in reference text. It is typically a subsystem break and will not affect MPE commands.
COOLSTART	A type of cold load in which MPE programs, configuration data, accounting information, the file directory, volume table, and users files are loaded from the system disc rather than from tape. A COOLSTART is generally used following a routine system shutdown. In the case of system failure, a COOLSTART is recommended after any spool files are recovered with a WARMSTART, and if the integrity of the system disc is not suspect.
CPI	Characters Per Inch. Used for measuring data density on magnetic tapes. Also referred to as BPI.
CPU	Refer to Central Processing Unit.
CPU Time	The amount of time, in milliseconds, that a user, group, or account has used the Central Processing Unit, or CPU.
Crash	Also called a head crash or disc crash. This occurs when the read/write heads on a disc drive (which normally ride on a thin cushion of air above the disc) make physical contact with the disc surface, destroying data and the disc track. The extent of damage to the system depends on which disc crashed and how much of the disc was corrupted. A crash of the system disc is very serious, since it contains the directory of user files as well as MPE programs, the I/O configuration, and accounting structure. Crash is also used to refer to a system failure.
Creator, File	User who creates a file with the :BUILD command, the FOPEN intrinsic, EDIT/3000, or another subsystem.
CRT	Cathode Ray Tube. Generally used as an abbreviation for a video computer terminal.

CSB	Central System Bus. A high-speed bus used on the HP 3000 Model 68 which provides communication pathway between the CPU module, the Main Memory Module, and one or more Intermodule Buses (which transmit information to and from I/O device controllers).
CS Capability	A capability assigned to accounts and users which permits access to MPE's communications subsystems.
CST	Refer to Code Segment Table.
Cursor	A position indicator on a video terminal, used to identify a single character or space where text or data may be entered, changed, or deleted.
Customer Engineer	Refer to CE.
CV Capability	Create Volume Capability. The ability to define and access private volumes (non-system domain discs) with the :NEWVSET command. UV capability is automatically given to users and accounts assigned CV capability.
Cylinder	A portion of a disc pack that consists of vertically aligned tracks on each disc platter within the pack. The first track on the first platter is directly above the first track on the second platter, which is aligned with the first track on the third platter, etc. These tracks, taken together, are considered a cylinder. Therefore, cylinder 1 refers to track 1 on each of the disc's platters.
Data Segment	A contiguous portion of memory allocated to a program, session, job, or MPE itself, to store text or data. Also referred to as the "Stack" or "Data Stack" if it is the first segment allocated to the program. Extra Data Segments are permitted a user who has DS capability.
Data Segment Table	DST. A main-memory resident table that contains a list of data segments currently in use by the operating system and user processes. Each segment is identified by a four-word entry recording its length, location, whether it currently resides in memory or has been swapped to disk, and other characteristics.
DCU	Diagnostic Control Unit, which provides control functions to perform system startup, halt, memory dump, control the status display, display the DCU log, control Console speed, and display all control mode commands. Supplied with the Series 64/68 HP 3000 computers in place of the System Control Panel used on other models of the HP 3000. It is accessed solely through the device configured as the System Console.
Defaults	Values for parameters or various system characteristics that take effect automatically unless the user specifies another value.
Delimiter	A character that marks the end of a string of characters. Common delimiters are , ; = and <u>RETURN</u> .
Device Class Name	Refer to Class Name.
Device Controller	A board, either installed in the I/O card cage or part of the master peripheral device, that controls the device. "Intelligent" controllers handle many of the functions normally performed by the CPU, such as data blocking and de-blocking, interrupt handling, and direct memory access.

Device File	Used as a synonym for spool file. When the commands :SHOWIN or :SHOWOUT are executed, input and output spool files are identified by an number listed in the column labelled "DFID" (Device File IDentification). A device file may also refer to any non-disc device, such as \$STDIN and \$STDLIST, the default input and output device files for a terminal.
Device-Independent	A characteristic of the operating system which allows users to selectively re-direct input to and output from a program, session, or job. Input and output devices are defined with the FILE command; file equations created with this command take effect for the duration of the job or session in which they were defined.
Device Reference Table	Refer to DRT.
Device Subtype	A number ranging from 0 to 15, defining a specific device and its associated software driver. There can be several device subtypes within one basic type. For example, a graphics terminal and one without graphics capabilities would share the same device type, but would be assigned different subtype numbers.
Device Type	Device types are defined by number. For example, 0 represents a moving-head disc, 16 is the class type number assigned to line printers, etc.
DI Capability	DIagnosticician. A capability usually assigned only to the Hewlett-Packard Customer Engineer (CE) which permits him or her to conduct certain CPU and diagnostic tests.
Diagnostic Control Unit	Refer to DCU.
Diagnostic Utility System	DUS. A set of utilities used to diagnose a system failure. The DUS is loaded from stand-alone serial storage media into main memory of the shutdown system.
Digital	A method of representing all information stored, processed, or transferred in discrete values or symbols. The opposite of analog.
Direct Access	Reading from or writing to a random access device (usually a disc) by addressing a specific logical record. Direct record access is not possible on serial storage media (such as magnetic tapes) since data can only be read sequentially, from the first record (or byte) to the <i>n</i> th record (or byte).
Direct Memory Access	Refer to DMA.
Directory	An area on the system disc reserved for account, group, user, private volume, and file information. MPE uses two directories to manage file access: The Job Temporary File Directory, which contains entries for all temporary files, and the System File Directory, which monitors system and permanent user files.
Disc	A circular plate of magnetically coated material used to store computer data. MPE differentiates between system domain discs, which by definition contain shareable files, and non-system domain discs, including Private Volumes, foreign discs, and Serial Discs, which are allocated to a single user at a time and therefore contain non-shareable files.

Disc Caching	An MPE facility which allows a portion of main memory to be used as a high-speed disc buffer. Disc caching can significantly improve system performance by storing frequently used programs and files in main memory, where they can be accessed by users much more quickly than if stored on disc. Note that the benefits of disc caching depend upon two conditions: first, whether the system is I/O bound (slowed down by frequent disc access); and second, if there is enough main memory to allocate part of it to a disc cache.
Disc Drive	A peripheral device which reads information from a disc volume and writes information to the disc.
Disc Files	Files stored on disc.
Disc Pack	Two or more disc platters plus a top and bottom cover mounted on a spindle. Hard disc drives for the HP 3000 use disc packs with three platters. Files are stored on five surfaces (read/write heads 0 through 4); the sixth surface (usually the top side of platter 2) contains directory information. One disc pack is mounted on a single drive which is referenced by a logical device number; it may be permanent or removable media.
Disc Platter	Refer to Platter.
Disc Swapping	Refer to Swapping.
Distributed Systems Network	A system of hardware and software data communication products that enables users to access the HP 3000 without direct (hard-wired) connection between the computer and their terminal. HP's distributed system network also allows communication between two HP 3000 computers.
DMA	Direct Memory Access. Hardware contained in the General Interface Channel (GIC) which allows large records of data to be transferred at the maximum speed on the HP-IB. DMA hardware directly places data into memory without assistance from the CPU.
DPAN	A memory Dump ANalysis program that produces a formatted listing of the contents of main memory saved with the Software Dump Facility after a system failure or shutdown. The formatted listing is used to determine the cause of any failure.
DRT	Device Reference Table. A table containing the logical address of disc, tape, and other peripheral devices.
DRT Number	Device Reference Table Number. The physical I/O address of a device controller, displayed in the second column of the I/O Configuration Table listed during the ;SYSDUMP dialogue. An index into the DRT.
DS Capability	Extra Data Segment Capability. A capability assigned to users and accounts which allows an executing process to use extra data segments. DS capability is normally restricted to few users, since allowing many processes to use extra data segments can easily overload the system, requiring large amounts of main memory, a large virtual storage area on the system disc, frequent disc swapping, or all three.
DS Line	Distributed Systems communications line between a remote terminal and an HP 3000, controlled by the Distributed Systems Network.

DST	Refer to Data Segment Table.
DTE	Data Terminal Equipment. Any device equipped with the proper interface necessary to enter data into, or output data from, a communications system.
Dump Analyzer	Refer to DPAN.
DUS	Refer to Diagnostic Utility System.
EBCDIC	Extended Binary Coded Decimal Interchange Code. An 8-bit code which is an extension of Binary-Coded Decimal (BCD) notation. May represent up to 256 characters.
EDIT/3000	An HP 3000 text editor used to create and manipulate ASCII files.
Editor	A common operating system utility program used in the preparation and modification of text and program files. EDIT/3000 is one of the text editors used with the HP 3000.
Error Messages	Messages describing errors which occur either during an interactive session or a batch job. The messages are reported to the standard list device, which is usually a terminal (for a session) or a line printer (when a job executes).
Escape Key	A special terminal key, labelled "ESC", which is used in combination with other characters to modify a session or terminal. For example, when <u>ESCAPE</u> is followed by a semi-colon, the MPE Echo Facility is disabled. This suppresses the display of any characters entered on the terminal. <u>ESCAPE</u> followed by a colon enables echoing.
ESD	ElectroStatic Discharge.
Exclusive Access	Restricts file access to one user at a time. Exclusive access is particularly important during file updates, when two or more people modifying the same record within a file could destroy critical information.
Executing State	The state of a job/session, displayed when the :SHOWJOB command is executed. Possible states are: INTRO, WAIT, INIT, EXEC*, EXEC, and SUSP.
Extent	A portion of a file consisting of physically contiguous sectors on the disc. One file may have as many as 32 extents. The file's creator may, however, set the maximum number of extents to fewer than 32. Default is 8.
FCOPY/3000	A subsystem supplied with the HP 3000's Fundamental Operating Software which provides the user with a selection of commands to copy, append, translate, verify, and compare files. Executed with the MPE command :FCOPY.
FID	Refer to File Information Display.
File	A group of related records that comprise a named collection of data. Files, which are created by users, are organized into groups. The complete file specification includes the name of the file's group and account in addition to the 8-character file name.

File Code	A four-digit integer that identifies the special function of a file. Users may assign a file code between 0 and 1023 to a file they create to classify it according to its purpose.
File Directory	A catalog maintained by the system which records a file's name, who created the file, its location, and other defining characteristics.
File Equation	The result of using the MPE :FILE command to equate a file name to a device. Generally used to direct the input to or output from a program, job, or session to a particular device by referencing the device class, such as "TAPE " or "LP ".
File Information Display	FID. A display of file characteristics, an error message, an error number, and current FOPEN intrinsic parameters that is provided when certain file input/output errors occur.
File Labels	The first sector of a disc file containing the following file information: file name, file code, record size, file format, current end-of-file mark, maximum number of records, blocking factor, number of disc sectors in use, number of extents currently allocated, and maximum number of extents. This information may be displayed with the :LISTF,2 command.
File Level Security	The file access modes and types of users to whom they are available. These are set to default values when the file is created but may be changed by the file creator using the :ALTSEC command.
File Mark	A uniquely formatted area on a magnetic tape that is used to separate files; equivalent to the Tape Mark.
File Name	A label by which a file may be uniquely identified. Must be alphanumeric, beginning with a letter, and contain one to eight characters.
File Pointer	Logical record pointer kept by MPE to indicate the next sequential record to be accessed in a file. Pointer is set to the first record when the file is opened.
File State	The condition of a spooled file, which may be either OPEN, READY, ACTIVE, or LOCKED. An OPEN file, for example, is one currently being accessed by a user or program.
File System	The part of the MPE operating system that organizes data and programs. Automatically handles user access to input/output devices, data blocking, buffering, data transfers, and deblocking.
Firmware	Microcode instructions used to control a device or process which cannot be altered. Instructions stored in read-only-memory (ROM) or Writeable Control Store (WCS) are considered firmware. Part of the CPU.
Fixed-Length Record	A record that always contains the same number of characters or words. Fixed-length records within a single file are always the same length.
Flexible Disc	A random storage device also called a diskette or floppy disc. Data may be written to or read from one or both sides with a special disc drive intended only for diskettes.
FLEXIBLE DISCCOPY/3000	An HP 3000 utility program that transfers IBM 3741-formatted flexible disc data sets into MPE standard formatted ASCII or binary disc files.

Foreign Disc	A non-system domain disc that MPE does not recognize as a Private Volume or Serial Disc. Foreign discs are non-shareable devices, and may be formatted either sequentially or for direct record access. Foreign discs, like Private Volumes and Serial Discs, do not have entries into the System Volume Table.
Formal File Designator	The name, supplied by a user or a program, used to open or create a file.
Formatting	Preparing a disc or tape volume so that files may be written to it. Also called "initializing".
FOS	Fundamental Operating Software. The collection of MPE programs, utilities, and subsystems bundled together for one price, and supplied on a Master Installation Tape.
Fully-Qualified File Name	A complete file description, including the file name, group to which the file belongs, and the account name. For example, the fully-qualified file name of the LETTER file in the PUB group of the SYS account would be expressed as LETTER.PUB.SYS.
Fundamental Operating Software	Refer to FOS.
General Interface Channel	GIC. Hardware I/O channel boards which fit into the I/O card cage and connect with the Intermodule Bus (IMB). Two high-speed "master" devices, listed as Unit 0 in the System Configuration Table, may be plugged directly into one GIC. Additional devices may be "slaved" off the master device, so that a single GIC can control two high-speed master devices and multiple slave devices. Also called General I/O Channel.
GIC	Refer to General Interface Channel.
GL Capability	A user attribute, assigned by the Account Manager, that grants a user special file-access modes for the maintenance of certain files within the user's home group.
Group	Used by MPE to partition an account and organize the account's files. Groups are the smallest entity for which filespace, CPU seconds, and connect minutes are reported, and, optionally, limited by the Account Manager. A PUB group is created for each account when the account is defined. Others are created as needed by the Account Manager.
Group Level Security	The file access modes and types of users to whom they are available as specified by the Account Manager when the group is created. Any file access modes not permitted the account may not be assigned to a group.
Group Librarian	The person whose user name has been assigned GL capability by the Account Manager. There may be more than one Group Librarian per account.
Handshaking	A term used to describe a communications protocol between devices, or between a device and the CPU.
Hardware	A general term describing all the physical components and devices connected to the computer, including the CPU cabinet, tape drives, disc drives, terminals, etc.

Hard-Wired Terminal	A terminal directly connected to the computer system by a length of cable.
Head	The mechanism on a disc or tape drive which reads data from, and writes data to, the disc or tape volume. The head on a disc drive does not normally make physical contact with the surface of the media, whereas the tape head will.
Header	The first page printed when output is directed to a line printer. Specifically, it is an identification page that prints, in four groups of three identical lines, the session name (if any), session number, logon identification, day of the week, date, and time. It may be suppressed by the :HEADOFF command.
Hexadecimal	A method of representing a single alphanumeric character with any combination of four binary digits (0 and 1). Hexadecimal also describes the base 16 numbering system, in which the first 10 digits are 0 through 9, and the last 6 are A through F.
Home Group	The group assigned to a user by the account manager when the user name is defined. This group is the user's default logon group if a group name is not specified with the :HELLO or :JOB command.
HPDraw	A software program available for the HP 3000 used to produce graphic designs and illustrations.
HP-IB	Hewlett-Packard Interface Bus. A high-speed (1 Megabyte/second) interface bus used in HP computer systems. The HP-IB is controlled by a single GIC, with up to fifteen devices interconnected on one HP-IB.
IA Capability	Interactive Access. A capability assigned to accounts and users which allows users to initiate sessions with the :HELLO command.
IMAGE/3000	A data base management system available on the HP 3000 consisting of a set of programs and procedures that can be used to define, create, access and maintain a data base.
IMB	InterModule Bus. Part of the internal circuitry of the HP 3000 and indirectly connected to the high-speed Central System Bus, or CSB. The IMB provides an interface between the CSB, terminals (via the Serial Interface Bus, or SIB) and non-terminal devices (via the GIC).
IMF/IML	Interactive Mainframe Facility/Interactive Mainframe Link. An MPE communications subsystem that permits users to access a mainframe computer in interactive mode using HP's Distributed Systems Network (DSN).
INP	Intelligent Network Processor. A communications input/output board used with HP data communications products.
INITIAL	Also called MPE Initiator, or the Initiator Dialogue. A stand-alone program, executed during a cold load, that loads the MPE operating system, recovers spool files, handles disc errors, and reconfigures input/output devices and system parameters.
Initialization State	The state of a job/session when it begins to execute on its own stack. Indicated by "EXEC*" when the :SHOWJOB command is issued.
Initiator, MPE	Refer to INITIAL.

Input	Refers to data to be processed, or the process of transferring data from external storage to the computer. Also defined as current, power, voltage, or other driving force applied to a device
Input/Output	Refers to the process of, or equipment used in, transmitting information to or from the computer.
Intelligent Network Processor	Refer to INP.
Interactive	The exchange of information and control between the user and a computer in real time. The opposite of batch mode processing.
Interactive Access	I.A. A processing mode, known as a session, that allows users at remote or local terminals to communicate directly with the computer and receive an immediate response.
Interactive Mainframe Facility/Link	Refer to IMF/IML
Interface	A general term describing the hardware, software, or firmware used to permit communication between devices, or between modules within a complex program.
Interleave	A method of writing data to a disc device for the purpose of improving data access speed.
Intermodule Bus	Refer to IMB.
Interprocess Communication	IPC. A facility of the MPE file system that permits processes to communicate with one another, without user intervention. In this way, one task may initiate or "spawn" another task, or several tasks.
Intrinsic	Procedure in MPE that may be used in user programs to perform common tasks such as file access, message formatting, data conversion, etc.
Intrinsic Call	Invocation of an MPE intrinsic from within a program.
Introduced State	The state of a batch job when it is first input to a spooled device. Displayed as "INTRO" when the :SHOWJOB command is executed.
I/O	Abbreviation for Input/Output.
I/O Bay	The cabinet which contains card cages and device controller boards for all peripherals connected to the HP 3000.
IPC	Refer to Interprocess Communication.
JCW	Job Control Word. A 16-bit logical word which resides in an MPE-managed table, used to pass information between processes. In addition to system-defined JCWs, users may define their own JCWs, both of which may be used by their job/session.
Job	A single file, submitted by the user, containing operating system and utility commands and references to the files they will manipulate. Once submitted, a job executes independently of the user or session that initiated it. Jobs are commonly used to compile source programs, modify files, or

perform other functions that do not require user interaction. Submitting a job is also called "streaming" (from the :STREAM command) or batch processing.

Job Control Word	Refer to JCW.
:JOBFENCE	An Operator command that defines acceptable input priorities for jobs and sessions. The :JOBFENCE command is followed by a numerical parameter, <i>priorityfence</i> , that must be between 0 (the least limiting parameter) and 14 (the most limiting parameter). Jobs which have an input priority less than or equal to the current job fence will be deferred until their priority is raised or the fence is lowered. Sessions with a priority less than or equal to the current fence will be refused with the message "CAN'T INITIATE NEW SESSIONS NOW".
Job State	A generic term for the preliminary stages, excluding initial validation, that a new job or session must pass during its lifespan.
Junction Panel	Part of the I/O bay, junction panels provide a framework onto which peripheral and terminal connectors are mounted. A single junction panel is divided into sections; each section is used to mount one or more connectors of a single type. For example, one junction panel section will contain all modem ports. The five types of connectors which can be mounted on a junction panel are: direct connect, modem, printer, INP common, and HP-IB connectors.
K	A symbol representing the number 1024, or 2^{10} . Frequently used as a synonym for "thousand".
Keyed Files	Files whose records can be read in logical sequence or directly accessed by a key associated with each record.
Keyed Sequential Access Method	Refer to KSAM.
Keyword	A word that has been assigned a specific meaning by MPE, a subsystem, or utility.
Keyword Parameters	Words that have special meaning to the Command Interpreter and are used to modify the intent or effect of an MPE command. Keyword parameters, unlike positional parameters, may appear in any order after a command has been entered on the command line. An entire keyword parameter group, such as "PASS= <i>password</i> ", must be separated from other keyword parameters by a ";".
KSAM	Keyed Sequential Access Method. A file access method supported on the HP 3000 (and included with the Fundamental Operating Software) in which records may be accessed either sequentially or randomly by primary or alternate record key.
LAN	Refer to Local Area Network
Laser Printing System	Refers to the production of documents using the model HP 2680A or 2687 Laser Printers with the HP 3000.

Linear Subqueue	Synonym for the AS and BS subqueues, which allocates CPU time to a process until it is complete, or gives up the queue. The AS subqueue is reserved for MPE programs, subsystems, and utilities, and is never available to user processes. Users who initiate jobs and/or sessions with the HIPRI parameter of the :JOB or :HELLO command will be placed in the BS subqueue.
Loading	To prepare a program for execution by allocating entries in the Code Segment Table (CST) or Extended Code Segment Table (XCST). The CST and XCST contain information about the code segment, including its address, current location (on disc or in memory) and other information which facilitates program execution. "Loading" a program does not mean that the code segment itself is currently stored in main memory.
Local Area Network	Abbreviated LAN. A computer network confined to a single location. For example, connecting two or more computer systems within a single office together is considered a Local Area Network.
Locked State	The status of an output spool file when it is being accessed by the SPOOK utility, and therefore unavailable for printing.
Lockword	A word, assigned to a file when it is created or renamed, that must be supplied to regain access the file in any way. The word may be from one to eight alphanumeric characters long and must begin with an alphabetic character.
Log File	A disc file that maintains a running record of system events. Each event is recorded in a separate log record, and is correlated with the job or session that causes the event.
Logging Shutdown	A shutdown marking the end of the logging cycle. In most cases it is performed just prior to either system or database backup.
Logical Device Number	A unique number between 1 to 1024 that the System Manager assigns to each I/O device when the system is configured. Users, jobs, and programs may reference the physical device by its logical device number or by device class. Frequently abbreviated <i>ldev</i> .
Logical Record	A collection of fields or related data, treated as a unit, residing in a file.
Log Off	The termination of a session, accomplished by typing the command BYE and pressing <u>RETURN</u> . Log Off also refers to the termination of a job with the :EOJ command.
Log On	The process of initiating a session on the HP 3000 by using the :HELLO command. Logging on also refers to the initiation of a job with the :JOB command.
Logon UDC	A User-Defined Command, or UDC, that is automatically executed at logon. Specified with an OPTION LOGON statement within the UDC.
Log Records	Data sets that are written to the log file by MPE. A total of 21 types of log records may be accessed, manipulated, and displayed with the MPE utility LISTLOG5.

Machine Instruction	The smallest resolvable piece of a code segment. Machine instructions are used by the CPU to accomplish a single task, such as moving an item of data to the CPU, moving it from the CPU to memory, or performing a single calculation using data in the CPU.
Main Memory	Fast, random access storage that contains all currently executing code and data segments, including portions of MPE and any utilities in use. Main memory is volatile; if the system halts for any reason, any files not saved on disc or tape will be lost.
Master Device	A peripheral device, identified as Unit 0 in the "CHANNEL" column of the I/O configuration table. Master devices usually contain the device controller board used to control it and other "slave" devices.
Master Installation Tape	Refer to MIT.
Master Volume	Defined for Private Volumes, this is the volume that contains both the accounting directory and disc directory for the complete volume set. The Master Volume must be mounted in order to access any volume in a set (which can consist of up to 8 discs) and must have the same name as the Volume Set.
Memory Error Logging	A facility which records all memory errors, beginning automatically when the system is initialized.
MIT	Master Installation Tape. A tape that contains the MPE operating system, utilities, and subsystems for the HP 3000. It may either be a new version of the software, a backup of the user's system, or the original Installation Tape for a new site. MIT may also refer to a particular release of MPE.
Modem	MODulator/DEModulator. A device that allows communication between computer systems without relying on direct (hard-wired) connection. At the site where the communication link is initiated, the modem converts digital signals generated by the computer into a form which can be transmitted via telephone (modulation). At the receiving facility, the telephone signal is re-converted into a digital signal (demodulation) and input to the computer.
Motherboard	A printed circuit assembly into which circuit boards are plugged. The motherboard provides an organized means to transmit data, control information, and power between the components and devices controlled by the circuit boards. Refer to Backplane.
MPE	Multi-Programming Executive. The operating system of the HP 3000 computer system. MPE monitors and controls program input, compilation, run preparation, loading, execution, and output.
MR Capability	A capability assigned to accounts and users which allows one user multiple RINs (Resource Identification Numbers) so that they may lock more than one resource or device at a time. Usually assigned to few people, since simultaneous resource locking can lock (or "hang") the entire system.
MRJE	Multileaving Remote Job Entry. A Distributed Systems Network (DSN) product that provides a link between an HP 3000 and a mainframe computer using Remote Job Entry communications protocol.
MTS	Multipoint Terminal Software. An HP product that allows you to connect several terminals to a single line.

Multileaving Remote Job Entry	Refer to MRJE.
Multipoint Terminal Software	Refer to MTS.
Multi-Programming Executive	Refer to MPE.
ND Capability	Non-shareable Device capability. A capability assigned to accounts and users which permits account members to own a non-sharable device, which includes unspooled tape drives and line printers, serial discs, private volumes, and foreign discs.
\$NEWPASS	A system-defined file, only one of which may exist during a single job or session. \$NEWPASS is the file name assigned to any file referenced by the name \$QLDPASS.
NM Capability	Node Manager. A capability assigned to users allowing them to control communications subsystems at their node.
Node	One end of a communications link. For example, if two HP 3000 computers are connected together via a DS line, each is system is considered a node.
Non-system domain	One of the two configurations for disc drives. Disc information for non-system domain discs is not entered in the System Volume Table. They can be mounted and unmounted while the system is running without adversely affecting normal operation. Private Volumes, serial discs, and foreign discs are non-system domain disc drives.
\$NULL	A system-defined file that can be opened for input or output, but is always treated as a nonexistent file. The \$NULL file is typically opened as an output file by various MPE programs which do not need any output saved. For example, when used with the :SYSDUMP command, it allows the operator to step through the configuration dialogue and alter system parameters without actually changing the system. Slang expression for the \$NULL file is "Bit Bucket".
Octal	The base eight numbering system, in which alphanumeric characters are represented by a combination of three binary digits.
Offline State	The condition of a device when it is not available to the system, i.e. not under the direct control of the CPU.
\$QLDPASS	A system-defined temporary file. The file recently closed with the name \$NEWPASS is renamed \$QLDPASS.
OP Capability	System Supervisor capability. A capability assigned to the System Supervisor's user name and account. He or she is responsible for performing backups, altering the system configuration, and in general, tuning the computer so that it continues to perform well and meet the needs of users.
OPEN State	The state of a spool file when it is being accessed by a user program or MPE. An OPEN input spool file occurs when data is being collected from the input device (usually a terminal or tape drive). An OPEN output spool file is the disc file being created by the output spooler.

Operator Command	MPE commands executed at the System Console by the Operator. Operator commands may be distributed to specific users at the Operator's discretion with the :ALLOW, :ASSOCIATE, and :JOBSECURITY commands.
OPERATOR.SYS	The user and account that MPE automatically logs onto at the Console when the system is started. OPERATOR.SYS may or may not be assigned special capabilities. Unlike the System Supervisor, who is assigned OP capability, or the System Manager, assigned SM capability, there is no mnemonic which entitles the Operator to execute a special subset of commands. The Operator's power and responsibilities derive solely from control of the System Console, and any capabilities assigned to it by the Account Manager of the SYS account.
OPT/3000	Online Performance Tool, a subsystem used to evaluate and improve system performance.
Optional Parameter	Parameter that is not required when entering a command or calling an intrinsic. In reference manuals, optional parameters are surrounded by brackets, [].
Output	Data transferred from internal to secondary (external) storage in a computer. Also, the process of transferring information from the computer to a peripheral device. Output is also current, voltage, power, or driving force delivered by a circuit or device.
Output Priority	A number in the range of 1 (lowest priority) to 13 (highest priority) assigned to an output spool file either by the system (a default value) or by a user. It is used by MPE to prioritize the order in which files will be printed.
Parameter	A variable assigned a constant value for a particular purpose or process. It is used in commands and procedure calls to request a specific action.
Password	A word assigned to an account, group, or user that must be supplied to log onto the account and group (if not the home group), to initiate a job/session as the specified user. Passwords may be up to eight alphanumeric characters, but must begin with a letter. Since they are not echoed to the screen when entered, and are known only to authorized individuals, passwords enhance system security.
PCB	Process Control Block. A main-memory resident table that contains status information for each process running on the system. Entries in the table are 21 words, and monitor memory management, dispatching, the stack number, what extra segments a process is using and their location, whether the process is waiting for a resource or waiting for a response from another process, and other information.
PDN	Refer to Public Data Network.
Peripherals	Refers to devices attached to a computer, such as terminals, tape and disc drives, and printers. Also called peripheral devices.
Permanent File	A file stored on disc with an entry into the system directory. To erase the file, it must be deliberately purged from the system with the :PURGE command or certain invocations of the FCLOSE intrinsic.

PH Capability	Process Handling. A capability optionally assigned to accounts, groups, and users that allows a currently executing process to create other processes. PH capability also permits process suspension, interprocess communication, and process deletion. Since the proliferation of processes results in heavy system resource usage, PH capability is typically assigned to few users.
Physical Record	One or more logical records, treated as a unit when transmitted to and from devices. The number of logical records contained in a single block is determined by the blocking factor, specified when the file is first created with the :BUILD command or the FOPEN intrinsic.
PIN	Process Identification Number. A number assigned to a process by MPE when the process is created. It is used internally by MPE (in the PCB table) and during requests for system resources at the Console (when the Operator responds to requests by referencing the PIN in the :REPLY command).
Platter	A single disc coated with magnetic material. One or more platters are mounted on a central spindle, and together they form a complete disc pack. Information may be recorded on one or both sides of each platter within the pack.
PM Capability	Privileged Mode. A capability assigned to accounts, groups, or users which allows unrestricted memory access, access to privileged CPU instructions, and the ability to call privileged procedures.
Positional Parameters	One or more terms appearing in a specific order on the command line which modify the intent or effect of the command. If a positional parameter is omitted, the user must supply a comma in its place.
Power Down	The procedure for turning off the system power.
Power Up	The procedure for turning on the system power.
Priority Request	The use of the optional parameter ;HIPRI in the :HELLO and :JOB commands. This capability, granted to System Supervisors and System Managers, will cause a job to be dispatched or a session to be initiated, overriding the current job fence or execution limit.
Private Volumes	Removable disc volumes that are not included in the System I/O Configuration table, and therefore must be brought online with an explicit :LMOUNT command. To access a private volume, a user's logon group and account must be assigned to a specific volume set with the VS parameter of the :ALTGROUP and :ALTACCT commands. Since private volumes are non-system domain devices (and do not have entries in the System Volume Table), they may be logically mounted and unmounted during normal system operation without disrupting the system.
Privileged Mode	Refer to PM.
Process	The unique execution of a program or procedure. If several users execute the same program, each is a separate process. Similarly, if the same user runs several programs, each execution is also considered a distinct process.
Process Control Block	Refer to PCB.
Process Handling	Refer to PH.

Process Identification Number	Refer to PIN.
Prompts	The specific characters used by MPE, subsystems, and utilities to indicate a request for the user to enter a command. Common prompts include :, /, and ?.
PUB Group	A special group, created when the account is created, whose files are usually accessible to all users within the account.
Purging	Deleting a permanent file from the system with the :PURGE command. Also used to delete an accounting entry like a user name, group name, or an entire account.
QUERY	A software utility that allows users to access data in an IMAGE data base.
Quiet Mode	A session mode in which messages sent from other jobs or sessions to a terminal are not displayed. Users enable Quiet Mode with the ":SETMSG OFF" command. To determine who is running "quietly", the Operator may execute the :SHOWJOB command: Those sessions not receiving messages are noted by the word "QUIET" in the third column of the listing. Since a :WARN message from the System Console will override Quiet Mode, it should be used for all critical communication, such as informing the user of a pending system shutdown.
Random Access	Direct access to data stored in a device. For example, if a user or program requires the 17th record in a file stored on random access media, that record may be selected for the read/write operation without scanning the preceding 16 records. Typical random access storage devices include main memory and disc drives.
READY State	The condition of an input spool file when it is available for access by the spooler program or user. READY output spool files are complete files waiting to be printed. They may also be manipulated with the SPOOK utility.
Record	A collection of fields or related data treated as a unit, residing in a file.
Record Width	The amount of data which is transmitted to and from a device at one time, which is a decimal value specified in words. For example, the standard record width for terminals is 40 words. The record width for disc devices is 128 words.
Register	A temporary storage device capable of containing one or more computer bits or words.
Relative I/O	RIO. A direct file access method that permits individual records to be deactivated. These inactive records remain on disc, but are ignored in a logical read operation.
Relative Record Number	A number that represents the position of a logical record in relation to the first record in the file. The first record is numbered either 0 or 1, depending on the subsystem or utility being used.
RELOAD	To cold load the entire system, including all MPE files, the accounting structure, I/O configuration tables, and user files from the backup medium. This option is normally used when no other cold load option has succeeded.

Remote Job Entry	RJE. An HP program, executed with the :RJE command, that provides an interface between the HP 3000 and other computers using the IBM 2780/3780 communications protocol. RJE makes the HP 3000 appear to be either an IBM 2780 or 3780 Data Transmission Terminal to the host system, and provides a complete multiprogramming environment.
Remote Terminal	A terminal that is indirectly connected to the computer, using a modem and telephone hook up.
Report	A display of information about accounts, groups, and users generated with the :REPORT command. The information, listed in columns, contains both the current value and maximum limit for the following: filespace (in sectors), CPU time (in seconds), and connect time (in minutes). System Managers may :REPORT on all groups in all accounts; Account Managers may :REPORT on all groups in their own account; standard users may only display information for their logon group.
Resource Identification Number	RIN. A number which identifies a user-defined resource. Users are normally assigned only a single RIN, which means they may have exclusive access to one resource, such as an I/O device, a file, or a program, at a time. Allowing an account, group, or user multiple RINs (by specifying MR capability with the :ALTACCT, :ALTGROUP, or :ALTUSER commands) allows users to lock more than one resource at a time, which can hang an application.
Restore	The process of retrieving user files from a :SYSDUMP and :STORE tapes or serial disc and writing them to disc. Executed with the :RESTORE command.
Resume	To begin execution of a procedure or program after it has been suspended. Also an MPE command (:RESUME).
RIN	Refer to Resource Identification Number.
RIO	Refer to Relative I/O.
RJE	Refer to Remote Job Entry.
Run	Begin the execution of a program.
Run-Time	The environment in which a process is running or executing.
SDF	Software Dump Facility. A facility that gives the System Operator the capability of storing all main memory to a serial storage medium. It operates in a stand-alone environment, and is used following a system failure or a system halt.
Sector	A portion of a track on a disc, and the smallest addressable piece of the disc. MPE-formatted discs use 128-word sectors (256 bytes).
Security	The provisions included in MPE to protect the system from unauthorized use. MPE offers several means to create a secure environment. At the most basic level this includes the organization of files into groups, and users into accounts, either of which may be assigned a password. Security also refers to the ability to read, write, append, lock, and execute files, optionally assigned to accounts by the System Manager, and to groups and users by the Account Manager.

Segmented Library	SL. Contains code segments which are shareable, general-use MPE, utility, and subsystem procedures that are not unique to a particular process. The three levels of SLs are: the Group Library SL, available to any user who can access the group, the Public Library SL, accessible to account users, and the System Library SL, used by all system users.
Segmenter	A subsystem of the MPE operating system that performs all intermediate functions between source code compilation and program execution. Its primary function is to gather and link into segments most of the resources needed to form an executable program file.
Sequential	Used to describe the manner in which information may be read from or written to a device. Sequentially accessed files are stored in such a way that the logical order of the file's records is identical to their physical layout on disc or tape.
Serial Disc	A sequentially-accessed disc that is treated like a magnetic tape. Flexible diskettes, disc packs, and cartridge tape may all be used as serial discs. They are designed to store system data (backups), load pertinent subsystems, and to perform stand-alone CPU and non-CPU diagnostics.
Serial Interface Board	SIB. A board which serves as an interface between the Intermodule Bus and one or more terminal controller boards.
Session	Using the HP 3000 interactively by entering commands and data through a terminal's keyboard and receiving immediate responses to input. A session is initiated with the :HELLO command and ends with a :BYE command, or another :HELLO command, which logs the user on again.
SF Capability	Save Files capability. The capability which permits users to save the files they create. Assigned by default to accounts and users.
HPSlate	An HP 3000 screen editor used to create and manipulate ASCII files.
Slave Device	A peripheral device not directly connected to the HP 3000 via a General Interface Channel (GIC). A slave device also does not have its own device controller, but instead is controlled through a master device. Slave devices are listed in I/O Configuration Table (listed during the :SYSDUMP dialogue) as non-zero units in the third ("UNIT ") column.
SM Capability	A capability assigned to the user name and account to which the person designated as System Manager logs on. The System Manager is responsible for the structure, security, and overall operation of the system by establishing accounts and assigning capabilities and resource-use limits to each.
Software Dump Facility	Refer to SDF.
SORT/MERGE/3000	A utility program which orders records in a file and merges the sorted files.
Source Code	The language programmers use to write a program, which must be translated, or compiled, into a machine-readable format before it can be executed by the computer.
SPL	Systems Programming Language. The only programming language available for the HP 3000 which allows users to control every machine instruction in a code segment. It is used for many applications, including MPE itself.

Spooler	A two-stage program that manages input and output to non-sharable devices so that they appear to be shared among several users. The input spooler collects data from an input device, which is usually a terminal or tape drive. The output spooler builds an output spool file on disc, and oversees the orderly selection and printing of READY spool files.
Spool File	A file on a mass storage device (usually a disc drive) that is either spooled from an input device or spooled to an output device. Spool files may be either OPEN, ACTIVE, READY, or LOCKED. These states describe different stages of the spooling process depending upon whether the file is an input or output spool file.
Spooling, Input	The first stage of the spooling process, in which data is collected from :JOB and/or :DATA accepting devices (such as terminals or tape drives). Once all of the data has been collected and the spool file is complete (the READY state), it may be opened by the spooler program (the OPEN state) to create an output spool file.
Spooling, Output	The second stage of the spooling process, in which an output spool file is created on the spooling disc. Once complete (the READY state), the file is placed in the queue to await printing. The currently printing output spool file is ACTIVE; only one such spool file may be ACTIVE at a time. Output spool files may also be accessed by the SPOOK utility, at which point they are LOCKED.
Status bits	Bits (or word, if status words are used) which indicate the condition of a device. The status bits or word can be checked by a program or microcode, and based upon the value, a specific sequence of instructions executed.
\$STDIN	A system-defined file name that refers to the Standard Input device used to initiate a session or job; usually a terminal keyboard, card reader, or tape drive.
\$STDINX	A system-defined file name that refers to the standard input device used to initiate a session or job. Unlike \$STDIN, \$STDINX treats the : prompt appearing in the first column as part of the data file, rather than an end-of-file indicator.
\$STDLIST	A system-defined file name that refers to the standard session or job listing device. This is the terminal on which a session is initiated or the system line printer, tape drive, or card punch for a job.
Storage Device	A device (such as a disc pack, a disc cartridge, a flexible disc, magnetic tape, or cartridge tape) onto which data can be stored and subsequently retrieved.
Store	An operation in which data is saved in a known location. The unit of information may be as small as a single byte, such as the result of an assembler instruction, or the contents of several discs, which might be several hundred megabytes of data.
Stream	An MPE command (:STREAM) that allows users to spool batch jobs or data from a session or a job. Once a job is streamed, it will execute as a separate process without requiring input or supervision from the user who streamed it.

Subqueue Priority	The subqueue (BS, CS, DS, or ES) assigned to a process when it is initiated which determines how it will compete with other processes for CPU time. The highest subqueue that a job or session may be assigned is BS, specified with the ;HIPRI parameter of the :HELLO or :JOB command. The default subqueue is CS, although users may request a lower queue if they do not need output immediately. The ES subqueue, for example, is sometimes used to compile programs, since compilations are CPU-intensive, and can usually be deferred. To display the queue status of all executing processes, enter the SHOWQ command: those processes running in the AS subqueue (reserved for MPE processes) or BS subqueue are identified by an "L" in the left-hand column, since these queues are referred to as "linear" subqueues. When a C, D, or E appears in the left-hand column, the process is executing in the CS, DS, or ES subqueues, also called "circular" subqueues.
Subsystem	A software program that performs a specific function, such as compiling programs, copying files, or editing text. Subsystems are executed by entering a single command at the colon prompt. At that point a different prompt is displayed, and a set of commands specific to the subsystem are available to the user. In addition, the user must explicitly exit the subsystem, usually by typing "e" or "exit".
SYS account	A special account, included with the system when it is first installed, that contains all MPE files (stored in the Segmented Library) and supported subsystems, utility programs, and compilers.
:SYSDUMP	An MPE program that copies the operating system, the current I/O configuration, the file directory, accounting information, and users' files onto magnetic tape or serial disc. Full SYSDUMPS should be done regularly to minimize the loss of data after a system failure. Partial SYSDUMPS, which typically copy only files that have been added or modified since the last full Sysdump are an equally important part of a regular backup schedule. SYSDUMPS are also used to change the system's I/O configuration, system tables, system logging, and other parameters.
System Buffers	An auxiliary data storage area that streamlines throughput for system messages displayed with the :HELLO, :BYE, :WARN, and :TELL commands, and also used by multipoint (MTS) lines. Each buffer is 128 words long. Since they reside in main memory, allocating too many buffers will waste memory; too few buffers, however, may degrade system response time.
System Catalog	A list of User-Defined Commands (UDCs) that are created by the System Manager for use by any user on the system.
System Configuration	Tailoring the operating system to accommodate the current physical layout and workload of a particular installation. The configuration is typically modified when new terminals, another line printer or a disc drive are added. The system also may be reconfigured to assign new class names to existing devices, change the size of system tables or virtual memory, modify system logging, or alter any other configuration parameter.
System Console	The terminal, usually logical device 20, that the System Operator uses to monitor system activity, respond to resource requests, and send messages to user's terminals. The Console (and its associated privileges and responsibilities) may be transferred to another logical device with the :CONSOLE command.

System Control Panel	A panel composed of control switches and status indicator lights found on the Series 39, 40, 42, 44, and 48 computers.
System-Defined Files	Files defined by MPE and made available to all users to indicate standard input or output devices, special temporary files, and files opened for output which do not perform an actual write operation.
System Disc	The disc volume, mounted as logical device 1, which contains MPE, I/O configuration information, the accounting structure and file directory, and utilities and subsystems. It also contains an area reserved for virtual memory and may be used to store user files.
System Domain	One of the two configurations for disc drives. System domain discs contain only sharable files, and remain online until the system is shut down. Because information about all system domain discs is entered into the System Volume Table, a system domain disc may only be taken offline by altering the I/O configuration during the :SYSDUMP dialogue and cold loading the new configuration.
System Failure	An internally detected error from which recovery is not possible. Rather than continue to operate, risking data integrity, MPE halts.
System File Directory	A directory maintained by MPE that records the name, group, and account of each permanent file on the system. The directory also "knows" the size of each file, its location on the disc, who may access the file, and other information.
System Halt	The condition of MPE following a system shutdown or system failure, indicated by no response at the System Console or any user terminals. In addition, the system's HALT light will be on.
System Logging	A facility to record the occurrence of specific events and system resource usage by accounts, groups, and users on a job/session basis. The System Manager enables logging and selects which events will be recorded during the Sysdump dialogue. The type of events which may be logged include: Job initiation and termination, file closing (and therefore opening), system shutdown, I/O errors, volume mounts, spooling, etc. The minimum logging events which should be "ON" are type 1 (LOGGING ENABLED), type 7 (POWER FAIL), and type 11 (I/O ERROR), which help your CE diagnose any system problems.
System Manager	The person who manages the computer installation, responsible for creating accounts and defining resource-use limits and capabilities for each. "System Manager" is also a capability (SM) assigned to the user name and account that the System Manager logs onto.
System Messages	Reports from the system that reflect its state at any given time. System messages address a variety of topics, including the status of jobs and sessions, peripherals, device files, and queues.
System Operator	The person who monitors the System Console and manages the computer on a daily basis. This includes establishing job and session limits, setting the output fence, responding to users' resource requests, cold loading the system after a shutdown or failure, and informing users of the system's status. Also called Console Operator, or just Operator.
Systems Programming Language	Refer to SPL.

System Prompt	The colon (:) which appears on the left side of the terminal display to inform the user that MPE is waiting for a command.
System Shutdown	Logging off all jobs and sessions and unloading the MPE operating system in an orderly manner.
System Startup	Loading the MPE operating system from either disc or tape by bringing a subset of the MPE Initiator program into memory.
System Status and Display Panel	A panel on the Series 64/68 that contains sets of light-emitting diodes, which indicate the status of the Current Instruction Register, AC power, RUN and HALT modes, battery, and internal temperature.
System Supervisor	The person assigned OP capability, and who is responsible for tuning the computer system so that it runs efficiently. The System Supervisor works with the System Manager and the Hewlett-Packard Systems Engineer (SE) to configure the system and determine resource-use needs of all accounts and users on the system.
System Volume Table	Refer to Volume Table.
Swapping	Also known as disc swapping, this is the method MPE uses to manage the transfer of programs and data files into and out of main memory. Processes which are waiting for a system resource to be available will be swapped out to an area on disc called "virtual memory". Another process, which does have the resources it needs to execute will be swapped from virtual memory into main memory, where it will begin processing. Disc swapping is handled entirely by MPE, and is transparent to users.
Tape Mark	A uniquely formatted area on a magnetic tape that is used to separate files; it also may be used to delimit the end of the tape (two file or tape marks). Also called File Mark.
TDP/3000	Text and Document Processor. An HP 3000 line editor (with a screen editor option) used to create and manipulate ASCII text files.
Temporary File	A file that exists only for the duration of a session or job. Also, a file opened by a program for access while the program is executing. For example, a work file is a temporary file created by the Editor. It will not become permanent until the user saves it to disc.
Terminal Buffer	An auxiliary data-storage area used to buffer all terminal I/O and improve data throughput to and from the display screen. The number of buffers allocated per terminal is a function of the type of terminal controller used by the system, the size of the data segment, the number of terminals supported, and their baud rate. With too few terminal buffers, the system's response time will be slow, and the display erratic.
Terminal Type	Hewlett-Packard's classification of the various terminal models. There are 19 groups with one or more models in each group.
Text and Document Processor	Refer to TDP/3000.
Thumbwheel	One or more dials on the 39/40/42/44/48 models of the HP 3000 used to set the hardware channel number and device address. These two settings can be used to determine the logical address of the device, or DRT number.

Track	A data area on disc that forms a concentric circle, divided into sectors. One full track passes under the disc head during each rotation of the disc.
Trailer	The last page printed every time output is directed to a line printer. The trailer is an identification page that prints, in four groups of three identical lines, the session number, session name, logon identification, day of the week, date, and time.
UDC	User-Defined Command. A command that is defined by a user to fit a specific need. A UDC typically executes one or more MPE commands in a format convenient for the user. For example, a long command name, such as :DELETESPOOLFILE may be abbreviated to :DSPF by defining the abbreviation in a UDC. Several UDCs are generally included in a single text file, with each UDC separated by a line of asterisks (*). Once defined, the UDCs must be enabled with the :SETCATALOG command.
Undefined-Length Records	Records whose length (in bytes or words) can vary and are only defined by a maximum allowable file size. Files with undefined length records must have a blocking factor of one, and are written without buffering.
UPDATE	A cold load option which loads MPE and all files in the PUB group of the SYS account from the backup media. I/O configuration data, the directory, and user files are loaded from the system disc. UPDATE is typically used to install a new version of system software, or to load MPE from another computer.
USASCII	United States of America Standard Code for Information Interchange. Refer to ASCII.
User	Anyone logged onto a session, using a local or remote terminal to interact with the computer. Each user is identified by a user and account name, and can access files owned by their logon group. The user's session is identified by a unique number, displayed with the :SHOWJOB command.
User-Defined Command	Refer to UDC.
User Logging	A facility that enables users and subsystems to record additions and modifications to files. If necessary, user logging also provides the means whereby recorded entries can be used to recover the files themselves.
User Name	The name by which the system identifies both a user and the capabilities and file access modes assigned the user. Also referred to as an account member.
User Level Security	The file access modes permitted the user, which must duplicate, or be a subset of, the file access permitted the user's account and group.
Use Volume Capability	Refer to UV Capability.
Utility Programs	MPE programs that perform specific functions such as file copying, sorting and merging, memory dump analysis, and monitoring available disc space.
UV Capability	Use Volume Capability. A capability assigned at the account and user level that enables users to access private disc volumes.
Variable-Length Records	Records that vary in size with respect to each other.

VINIT	A Volume INITIALization subsystem (accessed with the :VINIT command) that contains several commands for online initialization and formatting of private volumes, serial discs, and foreign discs.
Virtual Memory	A term describing the allocation of disc space to save a segment of main memory temporarily. Virtual memory is an extension of main memory: When there is insufficient space for a user's stack in main memory, or if the stack is not being modified, MPE will swap out the stack (save it to the system disc in the area reserved as virtual memory) and load another stack, or reload the same stack, when space becomes available. In this way, many users can share main memory more efficiently than would be possible without virtual memory.
Volume	A single disc pack, referenced by a unique logical device number.
Volume Class	A subgroup of a volume set, and the smallest volume unit that can be referenced by a user. To access a volume class, all volumes within the class (the complete volume set) must be mounted in the non-system domain.
Volume Name	The name given to a volume set or volume class with the :NEWVSET command. The name may only be assigned by a user with CV (Create Volume) capability, usually the System or Account Manager. The volume name, like file, account, and group names, is an ASCII character string of up to eight alphanumeric characters, beginning with a letter.
Volume Set	No more than eight removable disc volumes that share a common file directory. Accounts and groups may be assigned to a volume set with the ;VS parameter of the :NEWACCT and :NEWGROUP commands. When users access volumes in a set, all the volumes need not be mounted for the I/O request to succeed.
Volume Table	A table that lists the disc volume names and corresponding logical device numbers of all system domain disc drives. Discs with entries in the Volume Table are available to all users. By contrast, those volumes on non-system domain drives (such as private disc volumes) do not have entries into the Volume Table, and may only be accessed after an explicit or implicit :MOUNT of the volume has been executed.
VPLUS	A comprehensive software system that implements and controls source data entry, and provides an interface between the terminal and any transaction processing program.
WARMSTART	To cold load the system from the system disc. This procedure is used if incompletely processed spooled jobs and spooled files must be recovered, since other startup options do not permit the recovery of spool files.
Word	Sixteen bits or 2 bytes of information in the HP 3000 system.
Work File	A temporary file created when the Editor is invoked. Once text is entered, the file must be saved with the KEEP Editor subcommand to become a permanent disc file. A work file is also defined as a copy (in memory) of a permanent disc file. Any changes to the work file will be lost unless the user saves the updated version of the file.
Write Ring	A plastic ring which must be placed on the inside of a magnetic tape reel before users or programs are allowed to write to it.

Write-Protect Protecting data stored on a disc or tape so that it can not be overwritten, and the original information destroyed.

XCST Extended Code Segment Table. Contains entries for all code segments which come from users' program files and all those segments that are assigned when the commands ;RUN and ;ALLOCATE are executed. Each entry in the Extended Code Segment Table, which resides in main memory, is 4 words long.

Y^c Control Y. A character entered by simultaneously pressing the CONTROL key and Y on a terminal. Y^c interrupts the current program, and returns control to the calling program only if the program enables the trap.

1

2

3

4

A

- Aborting a Program, 2-11
- :ABORTIO Command, 3-9
- :ABORTJOB Command, 3-11, 4-15
- :ACCEPT Command, 3-13, 4-11
- Access (Default) Modes, Printer, 8-3
- Access Modes
 - Account Files, 6-7
 - FEATURE, 8-3
 - Files, 6-7
 - Group Files, 6-9
 - TRANSPARENT, 8-3
- AC LINE LOW Light (44/48), 11-11
- Account
 - Altering, 6-30
 - Assignment, 10-14
 - Attributes, 6-18, 6-34
 - Billable Unit, 6-11
 - Commercial Service Bureau, 6-13
 - Creation, 6-1
 - Description, 6-11, 6-26
 - Discussion, 6-30
 - In-house Service Bureau, 6-13
 - Librarian (AL), 6-33
 - Limits, 6-12
 - Multi-div. Corporation, 6-13
 - Password/Name, 6-12
 - Priority, 6-12
 - Public Group, 6-12
 - Resources, 6-12
 - Sci. Research Ctr., 6-14
 - SUPPORT, 6-15
 - SYS, 6-15, 6-16
 - SYS Attributes, 6-16
 - Users, 6-12
- Account Manager (AM), 6-2
 - Capabilities, 6-26
 - Functions, 6-27
- Account SMITH
 - Description, 6-28
 - Diagrammed, 6-30
 - Discussed, 6-30
 - Lockwords, 6-31
 - Passwords, 6-31
 - Privacy, 6-32
- Account Structure, 6-26
 - Defining Groups, 6-29
 - Defining Users, 6-30
 - Group, 6-26
 - User, 6-27
- Account-Level Security, 6-7
- Accounting Structure, 6-14
- Accounting System, 6-13, 6-14
- Accounts
 - ACCOUNTS (Reload), 7-42
 - Billing, 6-34
 - Displaying, 6-20, 6-34
 - Listing, 6-18
 - New, 6-18
 - Offline Storage, 7-36
 - Purging, 6-23
 - Reports, 6-34
 - Setting Up, 6-12, 6-18
 - Spanning, Two Directories, 10-13
 - Spanning, Diagram, 10-15
 - Typical, 6-12
- ACTIVITY Light
 - (39/40/42), 11-4
 - (44/48), 11-11
- ADCC Configuring, 7-78
- :ALLOCATE Command, 3-15, 5-29
- :ALLOW Command, 3-17, 4-43
- :ALTACCT Command, 3-19
- :ALTGROUP, Command, 3-24
- :ALTJOB Command, 3-28
- :ALTLOG Command, 5-43
- :ALTPOOLFILE Command, 3-30
- :ALTUSER Command, 3-32
- :ALTVSET Command, 3-35
- ASOCTABL5 Utility, 4-42
- Association Table, Creating, 6-25
- ATP Configuring, 7-79
- Attribute
 - Account Librarian (AL), 6-3, 6-33
 - Account Manager (AM), 6-2, 6-26
 - Batch Access (BA), 6-5
 - Comm. Software (CS), 6-4
 - Diagnostician (DI), 6-3
 - Extra Data Segments (DS), 6-5
 - Group Librarian (GL), 6-3, 6-33
 - Interactive Access (IA), 6-5
 - Multiple RIN (MR), 6-5
 - Non-sharable Devices (ND), 6-4
 - Private Disc Volumes (UV), 6-4
 - Privileged Mode (PM), 6-5
 - Process Handling (PH), 6-5
 - System Manager (SM), 6-1
 - System Supervisor (OP), 6-2
 - User Logging (LG), 6-4
 - Volume Sets (CV), 6-4

INDEX

Attributes

- Account, Altering, 6-30
- Capability-Class, 6-4
- File Access, 6-3
- List, 6-34
- Local, 6-6
- Program, 6-4
- Standard User, 6-3
- SYS Account, 6-15, 6-16
- User, 6-1

B

Backing Up The System

- Methods Available, 5-4
- MPE Installation Tape, 5-3
- OP Responsibilities, 5-3
- Scheduling, 5-4
- SYSDUMP, Carriage Return, 5-8
- SYSDUMP, Cold Load, 5-6
- SYSDUMP, Full, 5-7
- SYSDUMP, Future Date, 5-8
- SYSDUMP, Partial, 5-7
- Using :STORE Command, 5-5
- Using :SYSDUMP Command, 5-5

Backspacing, 2-2

Backup Files, 1-3

- (See Saving Files, :STORE)
- Backup, Disc Files, 6-34
- How Frequently Made, 4-35
- Methods, :SYSDUMP/:STORE, 4-35

Batch Processing, 2-5

Battery Light

- Series 37, 11-1c
- (39/40/42), 11-4
- (64/68), 11-15

:BREAKJOB Command, 3-37

Breakpoint Table, 5-23

Buffer Configuration

- Primary Message Table, 5-24
- Secondary Message Table, 5-24
- Special Request Table, 5-24
- System Buffers, 5-23
- Terminal Buffers, 5-24

C

:CACHECONTROL Command, 3-38, 5-29

Capabilities, 6-1

- Account Manager, 6-26
- Operator, Distributing, 4-42
- System Manager, 6-15

Capability Sets, 6-1

Card Reader, Configuring, 7-87

Cartridge Tape

- Media Life, 8-14
- On line Formatting, 10-30

CATALOG.PUB.SYS, 5-24, 9-55

CATALOG.PUB.SYS Messages, 9-56

CATALOG.PUB.SYS Modification, 5-24

Catalogs

- Catalog Manager (MAKECAT), 9-56
- HELP Subsystem (CICAT), 9-58
- Messages (CATALOG.PUB.SYS), 9-55

Channel Address, 11-5

Checkpoint Recovery, 8-2

Circuits, 4-47

Code Segment Table (CST), 5-21, 7-18

Cold Load Error Messages, 9-40

Cold Load Startup, 4-4

COLDSTART, 7-38, 7-40

- Quick Reference, A4i, A-17, A-38

Colon Prompt, 2-6

Command Definitions, VINIT, 10-31, 10-32

Command Elements, 2-6

Command Errors, 2-9

Command Files, User Defined (UDCs), 6-23

Command Interpreter, 2-1

Command Name, 2-6

Command Sets

- Account Manager, 6-28
- CMP Commands, 11-12
- CMP Maintenance, 11-29
- Console Commands, 1-2, 2-5, 4-2
- Console Interrupt (A^C), 2-2
- Console/Operator, 4-2
- DCU Control Commands, 11-19
- DCU Maintenance, 11-18
- Differences, 4-2
- Distributing Operator Capabilities, 4-42
- Listing, 6-18, 6-20
- Log File, 5-39
- Managing Private Volumes, 10-8

- Monitoring Jobs/Sessions, 4-10
- Operator, 2-5, 4-2
- Operator Commands, 1-2, 2-5, 3-2
- Peripheral Devices, 4-15
- Private Volumes, Operator, 10-21
- Requiring Capabilities, 3-3
- Software Dump Commands, 10-46
- System Manager, 1-2, 2-5, 6-17
- System Operator, 4-2
- System Supervisor (OP), 1-2, 2-5, 5-2
- User Mounts/Dismounts, 10-22
- User Private Volumes, 10-1
- VINIT, 10-25
- Commands
 - :ABORTIO, 3-9
 - :ABORTJOB, 3-11, 4-15
 - :ACCEPT, 3-13, 4-11
 - :ALLOCATE, 3-15, 5-29
 - :ALLOW, 3-17, 4-43
 - :ALTACCT, 3-19, 6-7, 6-14, 6-17, 6-19, 10-13, 10-14
 - :ALTGROUP, 3-24, 6-7, 6-15, 10-13, 10-14
 - :ALTJOB, 3-28
 - :ALTPOOLFILE, 3-30, 4-34
 - :ALTUSER, 3-32, 6-6, 6-30
 - :ALTVSET, 2-1, 3-35, 10-13
 - :BREAKJOB, 3-37
 - :CACHECONTROL, 3-38, 5-29
 - :CONSOLE, 3-40, 4-44, 6-25
 - :DEALLOCATE, 3-42, 5-29
 - :DEBUG, 3-43
 - :DELETESPOOLFILE, 3-44, 4-30
 - :DISALLOW, 3-46
 - :DOWN, 3-49, 4-20, 10-8
 - :DOWNLOAD, 3-51, 4-27, 8-4, 8-5
 - :FOREIGN, 3-53, 4-23
 - :FULLBACKUP, 3-54a
 - :GIVE, 3-55, 4-20
 - :HEADOFF, 3-57, 4-28
 - :HEADON, 3-58, 4-28
 - :JOBFENCE, 3-59, 4-12
 - :JOBPRI, 3-61
 - :JOBSECURITY, 3-62, 4-43
 - :LDISMOUNT, 3-63, 4-22, 10-8
 - :LIMIT, 3-64, 4-12, 5-27
 - :LISTACCT, 2-10, 3-66, 6-17, 6-20, 6-34
 - :LISTGROUP, 2-10, 3-69, 6-20, 6-34
 - :LISTUSER, 2-10, 3-72, 6-20, 6-34
 - :LMOUNT, 3-75, 4-22, 10-8, 10-22
 - :LOG, 3-77, 5-43
 - :LOGOFF, 3-78, 5-23
 - :LOGON, 3-79, 5-22
 - :NEWACCT, 3-80, 6-7, 6-17, 10-13
 - :NEWGROUP, 3-84, 6-7, 6-14, 6-29, 10-13, 10-14
 - :NEWUSER, 2-1, 3-87, 6-6, 6-30, 10-14
 - :NEWVSET, 2-1, 3-90, 10-8
 - :OPENQ, 3-92
 - :OUTFENCE, 3-93, 4-34
 - :PARTBACKUP, 3-94a
 - :PURGEACCT, 3-95, 6-17, 6-23
 - :PURGEGROUP, 3-97, 6-32, 10-8
 - :PURGEUSER, 2-1, 3-99, 6-32
 - :PURGEVSET, 2-1, 3-100, 10-8, 10-13
 - :RECALL, 2-10, 3-101
 - :REFUSE, 3-102, 4-11
 - :REPLY, 2-10, 3-103, 4-19
 - :REPORT, 2-1, 2-10, 3-105, 6-17, 6-20, 6-34
 - :RESETACCT, 3-108, 6-17, 6-22
 - :RESTORE, 2-10, 3-109, 4-36, 5-5, 6-34, 10-8
 - :RESUMEJOB, 3-116
 - :RESUMELOG, 3-117, 5-39
 - :RESUMESPOOL, 3-118, 4-33, 8-1, 8-13
 - :SETCATALOG, 3-120, 6-24, 6-35
 - :SHOWALLOW, 3-122
 - :SHOWCACHE, 3-124, 5-30
 - :SHOWCATALOG, 3-126, 6-24a, 6-35
 - :SHOWCOM, 3-127
 - :SHOWLOG, 3-129, 5-39
 - :SHOWQ, 3-130
 - :SHUTDOWN, 3-132
 - :SHUTQ, 3-134
 - :STARTCACHE, 3-135, 5-29
 - :STARTSESS, 3-135a
 - :STARTSPOOL, 3-136, 4-10, 4-30
 - :STOPCACHE, 3-138, 5-29
 - :STOPSPPOOL, 3-139, 4-30
 - :STORE, 2-10, 3-141, 4-36, 6-34, 10-8
 - :STREAMS, 3-147, 4-10, 5-19
 - :SUSPENDSPOOL, 3-149, 4-33, 8-13
 - :SWITCHLOG, 3-151, 5-40
 - :SYSDUMP, 2-1, 3-153, 4-35, 5-5
 - :TAKE, 3-155, 4-20a
 - :TUNE, 2-1, 3-156, 5-28
 - :UP, 3-159, 4-20a, 10-8
 - :VINIT, 3-160, 10-24, 10-43
 - :VMOUNT, 3-163, 4-9, 4-22, 10-21

INDEX

- :WARN, 3-165, 4-15, 4-41, 5-23
- :WELCOME, 3-167, 4-41
- Commands, CMP
 - DCTEST, 11-31
 - DISPLAY, 11-31
 - IOMAP, 11-32
 - SELFTEST, 11-29c
 - SHUTTEST, 11-31
- Commands, Console Operator
 - =ABORTIO, 3-9
 - =ABORTJOB, 3-11, 4-15
 - =LOGOFF, 3-78, 4-15
 - =LOGON, 3-79
 - =RECALL, 3-101
 - =REPLY, 3-103, 4-19
 - =SHUTDOWN, 3-132, 4-15, 4-41, 8-14
- Commands, DCU
 - C>AR, 11-20
 - C>Display, 11-20
 - C>DUmp, 11-20
 - C>EXit, 11-21
 - C>HALt, 11-21
 - C>HE[LP], 11-19
 - C>LD, 11-21
 - C>LG, 11-21
 - C>LOad, 11-22
 - C>PArT, 11-22
 - C>RUn, 11-22
 - C>STart, 11-22
 - C>SW<n>[;], 11-22a
 - C>SW, 11-22
 - M>BY[E], 11-35
 - M>HE[LP], 11-35
 - M>RM, 11-35
 - M>RX, 11-35
 - M>SP[EED], 11-35
- Commands Description, 2-5
- Commands Sets Operator, 2-5
- Commands, Help
 - COMMENT, 10-46
 - CONSOLE, 10-46
 - DEBUG, 10-46
 - DUMP, 10-46
 - DUMPDEV, 10-46
 - HALT, 10-46
 - HELP, 10-46
 - INTERACTIVE, 10-46
 - VINIT, 10-31
 - WARMSTART, 10-46
- Commands, User
 - :ABORT, 2-10
 - :ALTLOG, 5-43
 - :ALTSEC, 6-24
 - :ASSOCIATE, 4-42
 - :BUILD, 2-10, 6-3, 10-11, 10-23
 - :BYE, 2-10
 - :CONTINUE, 2-9
 - :DATA, 2-10, 4-11
 - :DISASSOCIATE, 4-42
 - :DISMOUNT, 10-11, 10-20, 10-23
 - :DSCONTROL, 4-41
 - :DSTAT, 4-23, 10-9, 10-21
 - :EDITOR, 10-11, 10-23, 2-10
 - :FILE, 6-22, 8-1, 8-4
 - :FORTRAN, 2-10
 - :GETLOG, 5-43
 - :HELLO, 4-11, 6-23
 - :HELP, 2-9
 - :JOB, 4-11, 6-26
 - :LISTF, 2-10, 6-23
 - :LISTLOG, 5-43
 - :LISTVS, 2-10, 10-9, 10-20
 - =LOGOFF, 4-15
 - :MOUNT, 6-32, 10-11, 10-19, 10-22a
 - :NEWVSET, 10-11
 - :PREP, 2-8, 6-6
 - :REDO, 2-9
 - :RELEASE, 6-11
 - :RELLOG, 5-43
 - :RENAME, 6-31
 - :REPORT, 10-9
 - :RESTORE, 6-3, 6-22, 10-11
 - :RESUME, 2-10
 - :RUN, 2-10, 6-17, 10-23
 - :SAVE, 6-3
 - :SHOWDEV, 4-43
 - :SHOWIN, 4-16, 4-18
 - :SHOWJOB, 4-13, 4-41
 - :SHOWLOGSTATUS, 5-43
 - :SHOWOUT, 4-16, 4-20, 4-32
 - :STORE, 5-5, 6-22, 6-33, 10-8, 10-11
 - :STREAM, 5-19
 - :TELL, 4-41, 5-23
 - :VSUSER, 10-21
- Commands, User, VINIT SUBSYSTEM
 - >COPY, 10-27
 - >DSTAT, 10-29
 - >DTRACK, 10-30
 - >EXIT, 10-30
 - >FOREIGN, 10-30

- >FORMAT, 10-30
- >HELP, 10-31, 10-32
- >INIT, 10-32, 10-33
- >PDEFN, 10-33, 10-34
- >PDTRACK, 10-34
- >PFSPACE, 10-34, 10-35
- >PLABEL, 10-35, 10-36
- >SCRATCH, 10-36
- >SERIAL, 10-36
- >VERIFY, 10-36, 10-37
- COMMENT, SDF Command, 10-45
- Communications
 - Systems Devices, Changing, 7-2a
 - Transmission Mode, 7-9
- Communications, Data
 - Clustered Network, 4-45
 - Distributed Data Processing, 4-44
 - Documentation, 4-44
 - Local Area Network, 4-45
 - Networks, 4-44
 - Overview, 4-44
 - Telecommunications, 4-45
- COMPACT (Reload), 7-41
- Condense/Recover Sequence, VINIT, 10-26
- Condensing Disc Free Space, VINIT, 10-26
- Conditioning, Disc Volume, 5-31
- Conditioning, System Volume, 10-6
- Configuration
 - Device Default Config. Table, 5-18a
 - I/O, 5-10
 - MPE Streaming, 5-19
 - Tables & Queues, 5-20
- Configuring Buffers, 5-23
- Configuring Non-I/O Values
 - Allocating RINs, 5-25
 - CPU Processing Limits, 5-27
 - Data Segment Limit Changes, 5-27
 - Disc Caching Subsystem, 5-29
 - Discussion, 5-24
 - Jobs/Sessions Limitations, 5-27
 - Logon Recognition Time, 5-27
 - Permanent Segment Allocations, 5-29
 - Scheduling Queues Alterations, 5-28
 - Segmented Library Changes, 5-28
- Configuring Peripherals
 - Device Defaults, 7-77a
 - Discussion, 7-77
 - Drivers, ADCC, 7-78
 - Drivers, ATP, 7-79
 - Drivers, Card Reader, 7-87
 - Drivers, Cartridge Tape, 7-89
 - Drivers, Disc, 7-91
 - Drivers, Disc, Flexible, 7-90
 - Drivers, Laser Printer, 7-86
 - Drivers, Line Printer, 7-84, 7-85
 - Drivers, Magnetic Tape Unit, 7-88
 - Drivers, Serial Appl'n Printers, 7-82
 - Drivers, Serial Spooled Printer, 7-83
 - Line Speeds (ATP/ADCC), 7-81
 - MPE V/E Terminal Types, 7-80
 - MPE V/P Terminal Types, 7-80
 - Port Speeds (ATP/ADCC), 7-81
 - Printers, 7-82a, 7-83a, 7-83b
 - Series 37, 7-77b
 - Tape Unit, 7-89a
 - Terminal Subtypes (Type 16), 7-81
- Configuring The System (OP), 5-10
- Console Capabilities, Expanded, 6-25
- :CONSOLE Command, 3-40, 4-44
- Console Commands, 2-2
- Console Lock Up, 4-44
- Console Messages, 9-26
- Console Operator, 4-1
 - (See System Operator)
 - Operator Control, 4-44
 - SDF Command, 10-45
- Console Operator Commands
 - (See Commands, Console Operator)
- Console Prompt (=), 4-2
- Console, Shift To Another Device, 4-44
- Continuation Characters, 2-8
- Control B Mode, 4-5c, 11-1c, 11-29
- CONTROL FUNCTIONS Switch, 11-10
- Control Maintenance Processor (CMP)
 - Accessing, 11-12
 - Commands, 11-12
 - Diagnostic Commands, 11-29a
 - Diagnostics, 11-29
 - Discussion, 11-29
 - Log Action Display, 11-13
 - Log, Example Event, 11-14
 - Maintenance Commands, 11-12
 - Selftest Results Listing, 11-30
- Control Panel, System
 - Controls, Hardware (39/40/42), 11-2
 - Controls, Hardware (44/48), 11-9
 - Controls, Security (39/40/42), 11-3
 - Controls, Security (44/48), 11-10
 - Controls, Software (39/40/42), 11-3
 - Controls, Software (44/48), 11-9
 - Discussion, 11-1
 - Information Decals, 11-4
 - Physical Panel, Series 37, 11-1

INDEX

- Physical Panel (39/40/42)
 - 11-1e, 11-2, 11-5
- Physical Panel (Series 37), 11-1
- Physical Panel (44/48), 11-9
- Physical Panel (64/68), 11-16
- Power Supply Failure List, 11-16
- Status Lights (Series 37), 11-1c
- Status Lights (39/40/42), 11-4
- Status Lights (44/48), 11-11
- Status Lights (64/68), 11-15
- Thumbwheel Switches (39/40/42), 11-4
- Thumbwheel Switches (44/48), 11-11

COOLSTART, 7-37, 7-37a

- Quick Reference, A-4h, A-15, A36

Copying System

- Quick Reference, A-3

Copying, Volume To Volume, VINIT, 10-27

CMP (Control Maintenance Processor), 11-12

CPU Time, 6-14

CST (Code Segment Table), 5-21, 7-18

CST Block Table, 7-28

D

- :DATA Command, 4-11
- Data Communications, Overview, 4-44
- Data Privacy, 6-32
- Data Segment Table (DST), 5-22, 7-19
- :DEALLOCATE Command, 3-42
- DCTEST, CMP Command, 11-31
- DCAT (Device Classes), 7-55
- DCU (Diagnostics Control Unit), 11-17
 - DCU, Control Mode, 11-19
 - DCU, Default Parameters, 11-23
 - DCU, Diagnostics, 11-34
 - DCU, Discussion, 11-17
 - DCU, DRT Calculation, 11-23
 - DCU, Functions, 11-17
 - DCU, Maintenance Commands, 11-34
 - DCU, Maintenance Mode, 11-34
 - DCU, Operating Modes, 11-18
- :DEBUG Command, 3-43
- DEBUG, SDF Command, 10-46
- Defective Sectors Table (DSCT), 10-34
- Defective Track List, 10-34
- Defective Tracks Table (DTT), 7-59, 10-33
- :DELETESPOOLFILE Command, 3-44, 4-31
- Deleting a Character, 2-2, 2-9
- Deleting a Line, 2-3

- Delimiters, 2-6, 2-7
- Device Addresses, 11-5
- Device Classes (DCAT), 7-55
- Device Management (:ALLOW), 4-43
- Device Management, System Operator, 4-15
- Device Ref. Table (DRT), 7-5, 11-1e
- Device Type List, 7-6
- Device, User Control, 4-43
- Device User Association Table, 6-25
- Devices, Peripheral
 - Active Device Files, 4-16
 - Controlling Availability, 4-20
 - Data Device Files, 4-17
 - Device Classes, 4-16
 - Files Discussion, 4-15
 - I/O List, 7-43
 - Job/Session Input Files, 4-17
 - Listing Input Device Files, 4-20
 - Listing Output Device Files, 4-20
 - Magnetic Tapes, 4-25
 - Management, 4-15
 - Operator-Assigned Output Files, 4-19
 - Operator-Assigned, 4-18
 - Output Device File, 4-18
 - Printers, 4-26
 - Redirecting Output, 4-19
 - :SHOWIN User Command, 4-19
 - Using Disc Volumes, 4-21
- DFSM (Disc Free Space Map), 10-26
- DFSM Listing, VINIT, 10-34
- Diagnostic Control Unit (DCU), 11-17
- Diagnostic Control Unit, Commands
 - C>AR, 11-20
 - C>Display], 11-20
 - C>DUmp, 11-20
 - C>EXit, 11-21
 - C>HALt, 11-21
 - C>HElp, 11-19
 - C>LD, 11-21
 - C>LG, 11-21
 - C>LOad, 11-22
 - C>PART, 11-22
 - C>RUUn, 11-22
 - C>STart, 11-22
 - C>SW<n>[;], 11-22a
 - C>SW[;], 11-22
- Diagnostic Utilities; DUS
 - Quick Reference, A-33, A-34, A-53
- Diagnostic Utility System (DUS), 10-47
- DUS, Cold Loading
 - Quick Reference A-33, A-33a, A-53

- Diagnostics
 - (See CMP & Tele-Support)
 - (30/40/42/44/48), 11-29
 - (64/68), 11-35
 - Remote, 11-24
- Disabling/Enabling Logging
 - Quick Reference, A-6
- :DISALLOW Command, 3-46
- :DISASSOCIATE Command, 4-42
- Disc Conditioning
 - On line, VINIT, 10-7
 - Private Volumes, 4-21
 - Requirements, 4-21
 - System Volumes, 4-21
- Disc Domains, 10-2
- Disc
 - Condensing Free Space, (VINIT), 10-26
 - Create A Foreign, VINIT, 10-30
 - Delete Tracks, 7-60
 - Description, 8-13
 - Drive, Configuring, 7-91
 - Drive, Status, 10-21
 - Drive, Status Display, VINIT, 10-29
 - Drives, Allocating, 10-3
 - Files, Serial Disc Backup, 6-34
 - Flexible, Care Of, 4-24
 - Flexible, Configuring, 7-90
 - Foreign, Creating A, 4-22
 - Foreign, Facility, 4-22
 - Format, 5-30
 - Formatting, 10-48
 - Free Space Map (DFSM), 10-26
 - Free Space Map Listing, 10-34
 - HP 7933 & 7935, 8-13
 - Labeling, 5-31
 - Nonsystem Domain Devices, 10-3
 - On line Formatting, VINIT, 10-30, 10-31
 - Pack, Care Of, 4-23
 - Pack Handling, 4-23
 - Pack Storage, 4-23
 - Private Volumes Applications, 10-1
 - Private Volumes Control, 4-22
 - Private Volumes, Overview, 10-1
 - Request Table, 5-23
 - Structure, 5-30
 - System Domain Devices, 10-3
 - System, Adding A, 10-4
 - System, The, 5-30
 - Tape Backup, 6-34
 - Volume Conditioning, 10-6
 - Volumes, Using, 4-21
- Disc Packs, Defective Tracks
 - Quick Reference, A-31, A-51
- Disc Packs, Formatting
 - Quick Reference, A-31, A-51
- Discs
 - As Serial Devices, 10-38
 - List Contents, VINIT, 10-35
 - Nonsystem Unloading, 8-14
 - Process Defective Tracks, VINIT, 10-30
 - System, Unloading, 8-14
- Disc Serializing
 - Quick Reference, A-8
- DISC VOL Switch (39/40/42), 11-3
- Disc Volume Changes
 - Add, 7-26
 - Delete, 7-26
 - List, 7-25
 - Relist, 7-26
- :DISCRPS Command, 3-48
- Diskette, On line Formatting, VINIT, 10-30
- Dismount, Logical, 10-8
- :DISMOUNT, Command, 10-20, 10-23
- Dismount/Mount, Physical, 10-7
- Display Accounting Information, 6-34
- Display, CMP Command, 11-14, 11-31
- Displaying Accounts, 6-20
- Domain Devices, Nonsystem, 10-3
- Domain Devices, System, 10-3
- Domain Reassignment At Startup, 10-4a
- Domain, Nonsystem, Serial Discs, 10-38
- Domains, Disc, 10-2
- :DOWN Command, 3-49
- :DOWNLOAD Command, 3-51
- DOWN/SCRATCH, 10-33
- DRT (Device Ref. Table), 7-5, 11-1e
- DRT Numbers, Conversion Formula, 11-6
- DRT Numbers, Conversion Table, 11-7
- DRT Numbers, 11-6
- DRT, Series 37, 11-1e
- DST (Data Segment Table), 5-22, 7-19
- Dump
 - Main Mem. After System Failure, 10-40
 - Shift String (64/68), 11-35
 - Software, 10-40
 - To Disc/Tape, 10-40
- DUMP, SDF Command, 10-45
- DUMP Switch (39/40/42), 11-3
- DUMP Switch (44/48), 11-10
- DUMP, CMP Command, 11-12
- DUMPDEV, SDF Command, 10-46
- Dumping Main Memory

INDEX

Quick Reference, A-29, A-49, A-4c
Duplex Mode, Terminal, 2-3
DUS (Diagnostic Utility System) 10-47

E

Echoing, Terminal, 2-3
EDIT/3000, File, 6-35, 8-5
Editor Files
 MARGIN, 8-5
 MODE=FEATURE, 8-5
 MODE=TRANSPARENT, 8-5
 Parameters Discussion, 8-5
 Printer, 8-6
 Special VFCs, 8-6a
 VFC, 8-5
 VFC Examples, 8-6
Enabling/Disabling Logging
 Quick Reference, A-6
Error Code (See Error Messages)
Error Messages
 Cold Load, 9-40
 Cold Load, Configuration, 9-44/9-47
 Cold Load, Defective Tracks, 9-48, 9-49
 Cold Load, Directory, 9-49
 Cold Load, Disc Spc Mangmt, 9-51
 Cold Load, File System, 9-53
 Cold Load, I/O, 9-41, 9-42, 9-44
 Cold Load, I/O Table Initialization, 9-49
 Cold Load, Internal Traps, 9-53
 Cold Load, Restore, 9-52
 Cold Load, Table, 9-50
 Cold Load, Unnumbered, 9-54
 Cold Load, Volume Table, 9-48
 Console, 9-26
 CS-80 Sparing, 9-53
 DCU Error Code, 11-38
 DCU Hardware Halts, 11-43
 Discussion, 9-1
 DRT Use, 7-56
 I/O Devices, 7-55, 7-56
 Load, ROM Code, 11-39, 11-41
 Memory Management, 9-52
 Modification, 5-24
 System Failure List, 9-3
 System Halt Conditions, 11-45
 System Stop (SYSSTOP), 11-43
 Volumes Missing, 7-56

Exiting The VINIT Subsystem, 10-30
Extended Code Segment Table, 5-21
Extra Data Segments Capability (DS), 6-19

F

Failure System What To Do, 9-1
Failures System Different Kinds Of, 9-1
Files
 Access Attributes, 6-3
 Designator Subsystem Formal, 7-81
 Foreign Disc Facility, 4-22
 Foreign Disc, Creating A, 4-22
 Level Of Security, 6-10
 Listing, 6-23
 Loading Messages, 7-71, 7-72, 7-73
 Saving, 6-15
 Security, 5-40, 6-6
 Space, 6-14
 Storage, Offline, 6-22
 System/User, Backup, 4-35
Files, Backup with :STORE, 4-36
 Disc/Directory Errors, 4-39
 Discussion, 4-36
 Errors Cause Abort, 4-39
 File Eligibility, 4-36
 File Eligibility Chart, 4-38
 Showing :STORE Results, 4-36
 :STORE Tapes, 4-36
 Tape Error Recovery, 4-39
Files, Restoring
 Quick Reference, A-5
Flexible Disc Drive Configuring, 7-90
:FOREIGN Command, 3-53, 4-22
Formatting Disc Packs
 Quick Reference, A-31, A-51
Formatting, System Disc, 5-31
FORMS, Message, 8-4
FOS, Fundamental Operating Software, 1-1
Four Wire, 4-47
FSETMODE Intrinsic, 5-30
:FULLBACKUP Command, 3-54
Full Duplex, 4-46

INDEX

G

:GETLOG Command, 5-43
Getting Started
 Quick Reference, A-1
:GIVE Command, 3-55, 4-20
Group, 6-12
Group Assignment, 10-14
Group Librarian (GL), 6-33
Group Reports, 6-34
Group, Home, 6-12
Group-Level Security, 6-9
Groups, Defining, 6-29

H

Half Duplex, 4-46
HALT Light (39/40/42), 11-4
HALT Light (44/48), 11-11
HALT Light (64/68), 11-16
HALT Switch (39/40/42), 11-2
HALT Switch (44/48), 11-9
HALT, CMP Command, 11-12
HALT, SDF Command, 10-46
Halting Execution, 2-10
Halting Nonprogram Commands, 2-10
:HEADOFF Command, 3-57, 4-28
:HEADON Command, 3-58, 4-28
Heat Shutdown, 11-35
 (See Overheating)
:HELLO Command, 4-11
HELP (Typical Entry), 9-58
HELP With VINIT Commands, 10-31
HELP, MPE Command Catalog, 9-58
HELP, SDF Command, 10-46
High Temperature, 11-35
 (See Overheating)
HIPRI Parameter, 4-13
Home Group, 6-12
HP 2680A Auto Recovery, 8-1
HP 2680A Format Control, 8-1
HP 2680A Job Recovery, 8-1
HP 2680A Job-To-Job Integrity, 8-2
HP 2608A/S & 2563A Printer, 8-3
HP 2608A & 2688A Printer, 8-3
HP 2619 Printer, 8-13
HP 2688A Auto Recovery, 8-1

HP 2688A Format Control, 8-1
HP 2688A Job Recover, 8-1
HP 7933 & 7935 Disc Drives, 8-13

I

ICS, 5-23
ICS (Interrupt Control Stack), 7-21
Information Privacy, 6-31
INITIAL Error Recovery, 5-33
INITIAL, Starting Program, 4-5a
Initiator/User Dialogue, 7-38
INP, 4-46
Input/Output Queue, 7-19
IOMAP, CMP Command, 11-32
I/O (See Configuring Peripherals), 7-77
I/O Configuration
 Access Type For Device, 5-16
 Access Type, Definition, 5-17
 Access Type, Device Class, 5-17
 Access Type, Examples, 5-16
 Corresponding Output Device, 5-13
 Data Accepting Devices, 5-14
 Device Class List, 5-15
 Device Class Names, Repeated, 5-16
 Device Controller's Driver, 5-15
 Device Ref. Table (DRT), 5-12
 Duplicative (Echo) Option, 5-14
 Interactive Device Option, 5-14
 Job/Session Devices, 5-14
 Logical Device Number (ldev), 5-11
 Modes (Device Options), 5-13
 Record Width, 5-13
 Software Channel Number, 5-12
 Spooling Option, 5-14
 Table, 5-10
 Terminal Type/Speed, 5-13
 Type/Subtype, 5-12
 Unit Numbers, 5-12
I/O Devices (See Peripheral Device), 4-15
I/O Devices Setup (See Reconfiguring), 7-11
I/O Devices, Adding
 Quick Reference, A-25, A-40
I/O Devices, Changing, 7-2
I/O Devices, Deleting
 Quick Reference, A-27, A-4q
I/O Devices, Config./List, 7-43
I/O Queue, 5-22, 7-19, 7-68
Inserting a Character, 2-9

INDEX

Installation Tape, MPE, 5-3
Intelligent Network Processor (INP), 4-46
Interactive Processing, 2-3
INTERACTIVE, SDF Command, 10-46
Interrupt Control Stack, 5-23
Interrupt Control Stack (ICS), 7-21
Interrupting Execution, 2-10
Interrupting Nonprogram Commands, 2-10

J

Job Control By Users, 4-43
Job
 Device Control, 4-12
 Introducing A, 4-11
 Limiting Execution, 4-12
 Monitoring A, 4-13
 Priority, 6-23
 States, 4-13
 Totals, 6-14
:JOB Command, 4-11
:JOBFENCE Command, 3-59, 4-13
:JOBPRI Command, 3-61
Jobs, Aborting, 4-15
:JOBSECURITY Command, 3-62, 4-43
Jobs, Limiting Number Of, 4-12
Jobs, Status of (STATE), 4-13
 DEFERRED, 4-14
 EXEC, 4-14
 INTRO, 4-14
 SUSP, 4-14
 WAIT, 4-14
Jobs/Sessions, System Operator, 4-11

K

Keyword Parameters, 2-8
Keyswitch, Series 37, 11-1a

L

Label A Volume, 10-35
Label Change, To SERIAL, 10-36
Laser Printer
 Configuring, 7-86
 HP 2680A, 8-1
 HP 2688A, 8-1
:LDISMOUNT Command, 3-63, 4-22
Librarian
 Account (AL), 6-33
 Group (GL), 6-33
:LIMIT Command, 3-64, 4-12, 5-27
LINE Light (64/68), 11-15
Line Printer
 Editor File, 8-5
 HP 2608A, 8-3,
 HP 2608A/S & 2563A, 8-3
 HP 2619, 8-13
:LISTACCT Command, 3-66
:LISTGROUP Command, 3-69
Listing Files, 6-23
:LISTLOG Command, 5-43
List Output Spool Files, 4-22
:LISTUSER Command, 3-72
:LMOUNT Command, 3-75, 4-22
Load Map, 7-43
LOAD Switch (39/40/42), 11-3
LOAD Switch (44/48), 11-10
LOAD, CMP Command, 11-13
LOAD/UNLOAD Button, 8-14
Local Attributes, 6-6
Lockwords, 6-10, 6-12, 6-17, 6-24
LOG, CMP Command, 11-13
:LOG Command, 3-77, 5-43
Logging
 Changing Characteristics, 7-24
 Event List, Logging, 7-24
 Event Type List, 7-24
 File Record Size, 7-25
 List Status, 7-24, 7-25
 Log File Size, 7-25
 Status Changes, 7-24
 Status Update, 7-25
Logging, Enabling/Disabling
 Quick Reference, A-6
Log Files, 1-4
Logging Off, 2-5

- Logging On, 2-3
 - Logging System
 - File Size, 5-40
 - Log Record, 5-39
 - Logging, General System, 5-37
 - Creating/Naming Files, 5-39
 - Error Handling, 5-41
 - Error Messages, 5-41
 - Error Messages (Table), 5-42
 - File Security, 5-40
 - File Size, 5-40
 - File Status Messages, 5-41
 - Log File Commands, 5-39
 - Log File Record, 5-38
 - What System Logging Is, 5-38
 - Logging, User
 - Processes, 5-43
 - Processes Per System, 5-43
 - Recording Changes, 5-43
 - Logging, User, Restart
 - Quick Reference, A-9
 - Logical Dismount, 10-8
 - Logical Mount, 10-7
 - :LOGOFF Command, 3-78, 5-23
 - :LOGON Command, 3-79, 5-23
- M**
- Magnetic Tapes
 - Care And Handling, 4-25
 - Cartridge Tape Care, 4-26
 - Operator Tasks, 4-25
 - MAINT MODE Switch (44/48), 11-10
 - MAKECAT
 - Catalog Manager, 9-57
 - Examples, 9-57
 - Procedure, 9-57
 - Memory, Main Changing CST
 - (Code Segment Table), 7-67
 - Memory, Main, Changing, 7-18
 - (See Reconfiguring, Main Memory)
 - CST (Code Segment Table), 7-18
 - DST (Data Segment Table), 7-19
 - I/O Queue, 7-19
 - PCB (Process Control Block), 7-19
 - System Tables, 7-18
 - Memory, Virtual, Changes, 7-67
 - Messages, 2-2
 - CATALOG.PUB.SYS, 9-56
 - Console, 9-26
 - Error, 9-1
 - Error, Cold Load, 9-40
 - System Failure List, 9-3
 - Message Catalog, 9-55
 - Message Catalog Format, 9-55
 - Message Programs
 - Catalog Manager (MAKECAT), 9-56
 - HELP With Commands (CICAT), 9-58
 - Messages (CATALOG.PUB.SYS), 9-55
 - Modem Setup, 7-8
 - MOTION CHECK Condition, 8-14
 - Mount
 - Logical, 10-7
 - Parameters, 10-19
 - User Command, 10-22
 - Mount/Dismount, Physical, 10-7
 - MPE
 - Codes, Series 37, 11-16
 - Installation Tape, 5-3
 - Logging, 5-37
 - Multi-Programming Executive, 1-1
 - Operational Supervision, 5-1
 - Streaming, Configuration, 5-19
 - MPE, Copying
 - Quick Reference, A-3
 - MPE File Security, 6-6
 - Overriding, 6-12
 - MPE System Shutdown
 - Quick Reference, A-10
 - MTS/3000, 4-46
- N**
- :NEWACCT Command, 3-80
 - :NEWGROUP Command, 3-84
 - :NEWUSER Command, 3-87
 - :NEWVSET Command, 3-90
 - Non-echoing, Terminal, 2-3
 - NULL (Reload), 7-42

INDEX

O

- :OPENQ Command, 3-92
- Operational Supervision, MPE, 5-1
- Operator Commands, 4-2
- Operator Commands, Private Volumes, 10-21
- Operator, System, 4-1
 - (See System Operator)
- OPERATOR.SYS, 6-25
- :OUTFENCE Command, 3-93
- OVERTEMP Light (64/68), 11-16
- OVERTEMP SHUTDOWN Light (44/48), 11-11
- Overheating
 - Shutdown Facility (Series 37), 11-35
 - Shutdown Facility (39/40/42), 11-35a
 - Shutdown Facility (44/48), 11-36
 - Shutdown Facility (64/68), 11-36
- Overtemperature Shutdown, 11-35

P

- Paper Jam Recovery, 8-1
- Parameter List, 2-6
- Parameters
 - Editor File, Discussion, 8-5
 - Editor File, Format, 8-5
 - HIPRI, 4-13, 6-23
 - Keyword, 2-8
 - Positional, 2-7
- Parameters, Suggested
 - Buffers, 7-93
 - CPU Time Limits, 7-95
 - CST/XCST/Tables, 7-92
 - Discussion, 7-92
 - For A 16-User System (List), 7-99
 - ICS, 7-94
 - Memory, 7-95, 7-96
 - On Logging, 7-94, 7-95
 - On RINs, 7-94, 7-95
 - On Running, 7-95
 - On Spoolfiles, 7-92, 7-96
 - Parameter Min./Max. List, 7-97, 7-98
 - Queues, 7-93, 7-94
 - Tables, 7-93
 - Tables Buffers, 7-94

- Tables PCB, 7-93
- Troubleshooting, 7-94
- :PARTBACKUP Command, 3-94u
- Password, 6-19
- PCB (Process Control Block), 5-22, 7-19
- Peripheral Configuration, 7-77
- Peripheral Devices
 - Active Device Files, 4-16
 - Controlling Availability, 4-20
 - Data Files, 4-17
 - Device Classes, 4-16
 - Files Discussion, 4-15
 - Job/Session Input Files, 4-18
 - Listing Input Files, 4-18
 - Listing Output Files, 4-20
 - Magnetic Tapes, 4-25
 - Management, 4-15
 - Operator-Assigned Input Files, 4-18
 - Operator-Assigned Output Files, 4-19
 - Printers, 4-26
 - Redirecting Output, 4-19
 - :SHOWIN User Command, 4-18
 - :SHOWOUT, User Command, 4-20
 - Using Disc Volumes, 4-21
- Physical Mount/Dismount, 10-7
- Positional Parameters, 2-7
- Power Down
 - Quick Reference, A-12
- Power Failure Recovery, 8-2
- POWER Light (39/40/42), 11-4
- POWER Light (44/48), 11-11
- POWER SUPPLY Light (64/68), 11-16
- Power Up
 - Quick Reference, A-11
- Primary Character Set, 8-2
- Primary Message Table Configuring, 5-24
- Printer Format
 - Eight Line Per Inch, 8-10
 - Six Line Per Inch, 8-10
- Printer Software, CIPER/3000, 8-1
- Printer, Configuring, 7-85
 - HP 2608S/2563A, 7-85
 - HP 2680A/2631/261X, 7-84
- Printer
 - Carriage Control Codes, 8-11
 - Defaults At Job Ends, 8-4
 - Editor File, 8-5
 - Environment File, 8-4
 - HP 2608A/2688A, 8-1
 - HP 2608A/S, 2563A, 8-3
 - HP 2619, 8-13
 - Laser, Configuring, 7-86

Preventing Data Loss, 8-13
 Serial Application, Configuring, 7-82
 Serial Spooled, Configuring, 7-83

Printers

Control Panel (Drawing), 4-28
 Discussion, 4-26
 Forms Message, 4-27
 Header/Trailer Output, 4-28

Private Volumes

Adding A Disc, 10-3
 Alteration, 10-13
 Applications, 10-1
 Assignment, 10-14, 10-17
 Categories, 10-11
 Classes, 10-10
 Conditioning, Procedure, 10-39
 Conditions, 10-18
 Conversion To System Disc, 10-4a
 Creating/Accessing, 10-17
 Creation (Definition), 10-11
 Deletion (Purge), Sets, 10-13
 Enable/Disable, 10-21
 From System Disc, 10-4
 Group Assignment, 10-14
 Home Set, 10-11
 Information Listing, 10-9
 List Contents, 10-35
 Logical Mount, 10-22
 Managing, 10-8
 Multiuse, 10-1
 Operator Commands, 10-21
 Overview, 10-1
 Private Volume Conditioning, 10-32
 Procedure, 10-17
 Purge Accounts, 10-16
 Purge Groups, 10-16
 Sets, 10-10
 User List, 10-21
 User Mounts/Dismounts, 10-22
 VINIT, 10-7, 10-33

Private Volume Set

Definition List, 10-20
 Dismounting, 10-20
 Mounting, 10-19
 User List, 10-21

Process Control Block (PCB), 5-22, 7-19

Programmatic Sessions, 6-4

PROMPT, SDF Command, 10-46

Prompts, 2-2

:PURGEACCT Command, 3-95

:PURGEGROUP Command, 3-97

:PURGEUSER Command, 3-99

:PURGEVSET Commland, 3-100

Purging

Accounts, 6-23
 Groups, 6-32
 Users, 6-32

Q

Queues/Tables, Changing, 5-20

R

:RECALL Command, 3-101

Reconfiguration

Buffers, 5-23
 I/O, 5-10
 Non-I/O Values, 5-24
 Tables/Queues, 5-20

Reconfiguring The System (OP), 5-10

Acceptance Values, 7-10
 Adding/Deleting Devices, 7-4a
 Automatic Answer, 7-8
 Batch Job Headings, 7-28
 Buffers, System, 7-20
 Buffers, Terminal, 7-19
 Catalog File Name, 7-23a
 Class Changes, 7-15
 Class List, 7-15
 Class, Access Type, 7-16
 Class, Delete/Add, 7-15
 Class, Foreign Disc, 7-17
 Class, Serial Disc, 7-17
 Code Segment Qty, 7-28
 Code Segment Size, 7-28
 Communications Buffer, 7-10
 Communications Devices, 7-3
 Concurrent Programs, 7-28
 Concurrent Values, 7-23a
 Configurator/User Dialogue, 7-1
 Copy The Modified MPE, 7-31
 Data Segments, Size, 7-28
 Default Phone Number, 7-12
 Device Classes, 7-12a
 Device Concurrency, 7-16
 Device, I or O, 7-11
 Device Spool Status, 7-11

INDEX

- Device Type, Subtype, 7-6
- Dial And Answer, 7-8
- Directory Size, 7-25
- Disc Allocation, 7-25a
- Disc Class, 7-13
- Disc Volume Changes, 7-26
- Driver Add/Delete, 7-18
- Driver Changes, 7-17
- Driver List, 7-17
- Driver Name, 7-11, 7-18
- DRT Entry Numbers, 7-4
- Dump Files, 7-32
- Duplicate Status, 7-11
- Foreign Disc, 7-17
- ID, Local & Remote, 7-12
- Interactive Status, 7-11
- I/O Devices, 7-2a, 7-14
- Job CPU Time Limit, 7-23a
- Jobs/Sessions, 7-10
- Ldev Numbers, 7-16
- Line/Modem Speeds, 7-9
- List Classes, 7-17
- List I/O Devices, 7-17
- Log On Time Change, 7-23
- Logging, 7-24
- Main Memory Size, 7-2a
- Main Memory, Changing, 7-18
- Message Catalog, 7-23
- Misc. Configuration Changes, 7-22
- Output Device, Type, 7-10
- Parameters, Min./Max. List, 7-97, 7-98
- Parameters, Recommended, 7-92
- Parameters, Suggested List, 7-97
- Physical Unit Number, 7-5
- Record Width, 7-10
- RINs, Global, 7-22
- Segment Limits, 7-28
- Segmented Library, Add, 7-31
- Segmented Library, Change, 7-29
- Segmented Library, Delete, 7-29
- Segmented Library, Listing, 7-29
- Segmented Library, Replace, 7-30
- Segmented Library, Updated List, 7-31
- Softdump, 7-23a
- Software Channel, 7-6
- Spoolfile Sectors, 7-27
- Spoolfiles, Maximum, 7-13
- Stack Size, 7-29
 - :SYSDUMP/Configurator Dialogue, 7-1
- System Program, Change, 7-29a
- System Tables, 7-18
- Terminal Speed, 7-7
- Terminal Type, 7-6a
- Terminal Type Files (MPE V/E), 7-14
- Timeout Values, 7-7, 7-8
- Transmission Mode, 7-9
- User Stack Size, 7-28
- Virtual Memory Allocation, 7-27
- Virtual Memory Size, 7-27
- Record Format, Report, 6-21
- Recover Lost Disc Space, VINIT, 10-26
- RECOVER Option, 10-26
- Recovery, 1-3
 - Checkpoint, 8-2
 - Paper Jam, 8-1
 - Power Failure, 8-1
- :REFUSE Command, 3-102, 4-12
- Readout, 16-BIT LED (64/68), 11-16
- RELOAD, 7-38, 7-41
- Reload From Backup
 - Quick Reference, A-4m, A-21, A-42
- Reload Options, A-23
 - ACCOUNTS, 7-42, A-24
 - COMPACT, 7-41, A-23
 - NULL, 7-42, A-24
 - RESTORE, 7-41, A-23
 - SPREAD, 7-41, A-23
- Reload System
 - Quick Reference, A-4m, A-21, A-42
- :RELOG Command, 5-43
- Remote Console, 11-24
 - (See Tele-Support)
- REMOTE CONSOLE Light (44/48), 11-11
- REMOTE Light (39/40/42), 11-4
- REMOTE Light (64/68), 11-15
- Replacing a Character, 2-9
- :REPLY Command, 3-103, 4-19
- :REPORT Command, 3-105
- :RESETACCT Command, 3-108
- Resetting Accounts, 6-22
- Resource Accounting, 1-2
- Resource Identification Number (RIN)
 - Allocation, 5-25
- Restart After Shutdown
 - Quick Reference, A-4h, A-15, A-36
- Restart User Logging
 - Quick Reference, A-9
- Restart, New System
 - Quick Reference, A-4i, A-17, A-38
- Restart, Warmstart
 - Quick Reference, A-4f, A-13, A-34
- :RESTORE Command, 3-109, 4-36, 4-40, 5-5

RESTORE (Reload), 7-41
 Restoring Files
 Quick Reference, A-5
 :RESUME Command, 3-116
 :RESUMEJOB Command, 3-116
 :RESUMELOG Command, 3-117, 5-39
 :RESUMESPOOL Command, 3-118, 4-34
 Retrieving Stored Files, 4-39
 :RESTORE, 4-40
 RIN Allocating (OP), 5-25
 RINs (Resource Identification Numbers), 7-22
 RINs, Global
 Change Number Of, 7-23
 Delete, 7-22
 List, 7-22
 Updated, 7-23
 RUN Light (39/40/42), 11-4
 RUN Light (44/48), 11-11
 RUN Light (64/68), 11-15
 RUN Switch (39/40/42), 11-2
 RUN Switch (44/48), 11-9
 RUN, CMP Command, 11-12

S

SADUTIL, 10-47
 Save User Files (SF), 6-3
 Saving Files With :SYSDUMP Discussion, 4-40
 Scheduling Backups, 5-4
 Scratch, Set To, VINIT, 10-36
 Secondary Character Set, 8-2
 Secondary Message Table Configuring, 5-24
 Security
 Account-Level, 6-7, 6-31
 Default, 6-10, 6-11
 File, 6-6
 File-Level, 6-10
 Group-Level, 6-9
 System Log File, 5-40
 SECURITY Switch (39/40/42), 11-3
 SECURITY Switch (44/48), 11-10
 Segmented Library, 7-29a
 SELFTEST, CMP Command, 11-13
 Selftest
 Control-B Mode, 11-1d, 11-29
 Series 37, 11-29
 Serial Disc Configuring, 10-38

Serial Discs
 Conditioning, VINIT, 10-39
 Create Foreign Disc, 10-39
 Description, 10-38
 Display Foreign Status, 10-40
 Foreign Discs, 10-39
 Initializing, 10-39
 Nonsystem Domain, 10-38, 10-39
 Serializing A Disc
 Quick Reference, A-8
 Series 37
 Keyswitch Positions, 11-1a
 SPU Front Panel, 11-1
 Session
 Aborting, 4-14a
 Device Control, 4-12
 EXEC, 4-14
 INTRO, 4-14
 Introducing A, 4-11
 Limiting Execution, 4-11
 Limiting Number Of, 4-13
 Monitoring A, 4-13
 Priority, 6-23
 Programmatic, 6-4
 Status Of (STATE), 4-14
 Totals, 6-15
 :SETCATALOG Command, 3-120
 Setting Up Account, 6-18
 Shift-out/Shift-in, Character Sets, 8-2
 Shift String Dump
 (64/68), 11-35
 Quick Reference, A-54
 :SHOWALLOW Command, 3-122
 :SHOWCACHE Command, 3-124, 5-30
 :SHOWCATALOG Command, 3-126
 :SHOWCOM Command, 3-128
 :SHOWDEV Command, 4-43
 :SHOWIN Command, 4-16
 :SHOWJOB Command, 4-13
 :SHOWLOG Command, 3-129, 5-39
 :SHOWLOGSTATUS Command, 5-43
 :SHOWOUT Command, 4-16, 4-32
 :SHOWQ Command, 3-130
 :SHUTDOWN Command, 3-132
 Shutdown, System Operator, 4-41
 :SHUTQ Command, 3-134
 Shutting Down The System
 Quick Reference, A-10
 Shutting System Down, 4-41
 Simplex, 4-46
 Sleuth Simulator, of DUS

INDEX

- Quick Reference, A-31, A-51
- SLEUTHSM, 10-47
 - Program, 10-32
 - System Formatter, 10-6
- SLEUTHSM, of DUS
 - Quick Reference, A-31, A-51
- Software Dump
 - Quick Reference, A-4c, A-29, A-49
- Software Dump Facility (SDF)
 - Backup Dump Procedure, 10-43
 - Backup Software Dump, 10-43
 - Can't Make A Copy, 10-42
 - Changing SDF Command File, 10-45
 - Creating An SDF Copy, 10-42
 - SDF Commands, 10-46
 - SDF Copy Procedure, 10-41
 - Store Main Memory, 10-40
 - Store To Disc On Tape, 10-40
 - To Run SDF, 10-41
- Spanning
 - Account Diagram, 10-15
 - Accounts (Two Directories), 10-13
 - Capabilities, 10-13
- Special Request Table Configuring, 5-24
- SPEED, CMP Command, 11-14
- Spinning Down A Disc, 8-13
- Spool File Recovery
 - Quick Reference, A-4f, A-13, A-34
- Spool File Size Changes, 5-37
- Spooling, Operator Control, 4-30
- Spooling (RESTART), 4-10
- Spooling, Input
 - ACTIVE, 4-29
 - Description, 4-29
 - Devices, 4-29
 - Maintaining Job Sequence, 4-31
 - OPEN, 4-29
 - Operator Control, 4-30
 - READY, 4-29
 - Spool File Status, 4-32
 - Stopped Abnormally, 4-31
- Spooling, Output
 - ACTIVE, 4-32
 - Altering One File, 4-34
 - Controlling Devices & Class, 4-33
 - Controlling Queues, 4-34
 - Description, 4-31
 - Going Back nnn Pages, 4-33
 - Listing Files, 4-32
 - OPEN, 4-32
 - READY, 4-32
 - Resuming The Spooler, 4-33
 - Setting The Fence, 4-34
 - Spool File States, 4-32
 - Suspending The Spooler, 4-33
- SPREAD (Reload), 7-41
- :STARTCACHE Command, 3-135, 5-29
- Start Dialogue WARMSTART, 7-39
- START Switch (39/40/42), 11-3
- START Switch (44/48), 11-10
- START, CMP Command, 11-13
- Starting The System (OP), 7-37
 - Cold Load (COLDSTART), 4-8
 - Cold Load (COOLSTART), 4-6
 - Cold Load Procedure, 4-6
 - Cold Load (RELOAD), 4-9
 - Cold Load (UPDATE), 4-7
 - Cold Load (WARMSTART), 4-6
 - Comparing The Cold Loads, 4-8
 - Discussion, 4-4, 5-8
 - Enabling Private Volumes, 4-10 (RESTART)
 - Enabling STREAMS Device, 4-10
 - Initiator Program INITIAL, 5-8
 - MPE Component Sources, 4-9
 - Quick Reference, A-2
 - Restart Procedure COLDSTART, 5-9
 - Restart Procedure COOLSTART, 5-9
 - Restart Procedure RELOAD, 5-10
 - Restart Procedure UPDATE, 5-9
 - Restart Procedure WARMSTART, 5-9
 - Series 37, 4-5a
 - Series 39/40/42/44/48, 4-5
 - Series 64/68, 4-6
 - System Operator, 4-4
 - Using INITIAL Program, 4-5, 4-5a, 4-6
- :STARTSESS Command, 3-135a
- :STARTSPOOL Command, 3-136, 4-31
- Startup Dialogue
 - CMP/DCU START Commands, 7-38
 - COOLSTART Option, 7-39
 - Date And Time Verification, 7-74
 - Disc Verification, 7-61
 - Disc Verification/Errors, 7-61
 - Disc, Defective Tracks Table, 7-59
 - Disc, Delete Tracks, 7-60
 - Disc, Directory Size, 7-70
 - Disc, Recover Lost Space, 7-70
 - Disc, Track Defect Status, 7-66
 - Error Messages, Disc, 7-73
 - Error Messages, DRT Use, 7-56
 - Error Messages, I/O Devices, 7-56
 - Error Messages, Volumes Missing, 7-57
 - Files Loaded, 7-72

- Files, Loading Messages, 7-72, 7-73
- Files, Lost Data 7-71
- Files Purged, 7-71
- Files Purged List, 7-71
- Files Saved, 7-71
- I/O Configuration Change, 7-43
- I/O Devices, List, 7-43
- List Classes & I/O Devices, 7-55
- Load Map, 7-75
- Load Map Request, 7-43
- Main Memory, Changing, 7-67
- Memory Size Values, 7-43
- Memory, Bank 0 Used, 7-74
- Reconfiguration Request, 7-42
- RELOAD Options, 7-41
- RELOAD Options, ACCOUNTS, 7-42
- RELOAD Options, COMPACT, 7-41
- RELOAD Options, NULL, 7-42
- RELOAD Options, RESTORE, 7-41
- RELOAD Options, SPREAD, 7-41
- Spoolfile Sector Data, 7-68
- Track, Defect Status, 7-66
- Tracks Verification, 7-61
- Tracks Verification/Errors, 7-61, 7-62
- Tracks, Defect Status, 7-66
- Tracks, Delete, 7-60
- Virtual Memory Changes, 7-67
- Volume, Delete, 7-58
- Volumes Listing, 7-57
- Volumes Verification/Errors, 7-61
- Volumes, Add, 7-58
- Volumes, Defect Status, 7-66
- Volumes, Defective Tracks Table, 7-59
- Volumes, Delete Tracks, 7-60, 7-61
- Volumes, Mount, 7-58
- Volumes, Verification, 7-62
- Volumes, Verification/Errors, 7-63
- WARMSTART Option, 7-39
- Startup, Modification, 1-3
- Startup State Configurator, A-4a
- Status, Disc Drives, 10-21
- :STOPCACHE Command, 3-138, 5-29
- :STOPSPPOOL Command, 3-139, 4-31
- :STORE Command, 3-141, 4-40, 5-5
- Storage of Files, Offline, 6-22
- Storage, Private Volumes Overview, 10-1
- Streaming, 5-19
- :STREAMS Command, 3-147, 4-10, 5-19
- Subsystems
 - COBOL, 6-15
 - FORTAN, 6-15
- Supervisor, System (OP), 5-1
- :SUSPENDSPOOL Command, 3-149, 4-33
- Swap Table, 5-23
- :SWITCHLOG Command, 3-151, 5-39
- :SYSDUMP Backup
 - Define Dumped Files, 7-35
 - File Listing, 7-35
 - File Subsets, 7-35
 - List Dumped Files, 7-35
 - Save All Files, 7-34
 - Save Some Files, 7-35
 - System Only, 7-33
- :SYSDUMP Command, 3-153, 4-36
- 4-40, 5-4
- System
 - Backup, 5-3
 - Backup, System Only, 7-33
 - Buffer Configuring, 5-23
 - Configurator, 7-1
 - Directory Listing, VINIT, 10-33
 - Parameters Recommended, 7-92
 - User Files, Backup, 4-36
 - With Files, 7-34
- System Backup, :SYSDUMP
 - Quick Reference, A-3
- System COLDSTART
 - Quick Reference, A-4i, A-17, A-38
- System Control Panel, 11-1
- (See Control Panel)
- System Controls, 11-1
- System COOLSTART
 - Quick Reference, A-4h, A-15, A-36
- System Disc
 - Adding A, 10-3
 - An Overview, 5-30
 - Error Handling Considerations, 5-34
 - Formatting, 5-31
 - INITIAL Error Recovery, 5-33
 - Initialization, 5-31
 - Labeling Volumes, 5-31
 - Memory Layout, 5-35
 - Physical Arrangement, 5-30
 - Physical Arrangement (Illus.), 5-32
 - Platter Format, 5-30
 - Platter Format (Illus.), 5-32
 - Private Conversion, 10-4
 - Track Reassignment, 5-31
 - Track Verification, 5-31
 - Volume Conditioning, 5-31
 - Volume Names, 5-31
 - Volume Table Check, 5-33

INDEX

- System Disc Domain, During Startup, 10-4a
- System, Disc Domain, 10-2
- System Disc From Private Volume, 10-4a
- System Disc Layout Changes, 5-35
 - Directory, Size Changes, 5-36
 - Memory Layout (Illus.), 5-36
 - Spool File Size Changes, 5-37
 - Virtual Memory, Allocation, 5-35
 - Virtual Memory, Enlargement, 5-35
 - Virtual Memory, Size Changes, 5-35
- SYSTEM DISC Switch (44/48), 11-10
- System Domain Devices, 10-2
- System Error Messages, 9-40
- System Failure, What To Do, 9-1
- System Failure List, 9-3
- System Failures Different Kinds Of, 9-1
- System Files
 - INITIAL, 6-15
 - PROGEN, 6-15
 - SL.PUB.SYS, 6-15
 - SYSDUMP, 6-15
- System Formatting, SLEUTHSM, 10-6
- System Halt
 - Shift String Dump, A-54
- System Halt Conditions, 11-45
- System Manager (SM), 6-1
 - Capabilities, 6-15
 - Commands, 6-17
 - Expanded Console, 6-25
 - Functions, 6-15
 - Log On, 6-16
- System Operating, Copying
 - List Files Dumped, 7-32
 - System Only, 7-31
 - System Plus Files, 7-31a
- System Operator
 - Capabilities, Distribution, 4-42
 - Commands, 4-2
 - Console Management, 6-25
 - Device Availability, 4-20
 - Starting the System, 4-4
 - Tasks, 4-1
 - Using INITIAL Program, 4-4
- System Pack Formatting, 10-47
- System Peripheral Configuration, 7-77
- System, Private Volumes Overview, 10-1
- System Power Down
 - Quick Reference, A-12
- System Power Up
 - Quick Reference, A-11
- System Processor Unit, 11-1
 - Series 37, 11-1
 - (39/40/42), 11-1e
 - (44/48), 11-8
- System Recovery
 - Pre-system Startup, A-54
- System Reload From Backup
 - Quick Reference, A-4m, A-21, A-42
- System Resources Accounting, 6-14
- System Segmented Library, 7-29a
- System Shutdown, 4-41
 - Quick Reference, A-10
- System Startup
 - (See Startup Dialogue), 4-4
 - COLDSTART, 7-38, 7-40
 - COOLSTART, 7-37, 7-39
 - Quick Reference, A-4h, A-15, A-36
 - RELOAD, 7-38, 7-40, 7-41
 - UPDATE, 7-37a
 - UPDATE Option, 7-40
 - WARMSTART, 7-37, 7-39
 - With INITIAL, 4-5
- System Startup And Modification, 7-37
 - (See Startup Dialogue)
- System Startup State Configurator, 6-24a
- System Supervisor (OP), 6-2
 - A Role Description, 5-1
 - Backing Up The System, 5-3
 - Changing Non-I/O Values, 5-24
 - Command Set, 5-2
 - Configuring The System, 5-10
 - I/O Configuration Table, 5-10
 - Logging Facilities, MPE, 5-37
 - Reconfiguring The System, 5-10
 - Starting The System, 5-8
 - System Disc Responsibilities, 5-30
- System Volume Conditioning, 10-6
- System Updated, Startup
 - Quick Reference, A-4k, A-40
- System/User Files, Backup, 4-35
 - (See Backup Files)
- System WARMSTART
 - Quick Reference, A-4f, A-13, A-34
- System, Adding I/O
 - Quick Reference, A-4o, A-25, A-46
- System, Deleting I/O Devices
 - Quick Reference, A-4q, A-27, A-48
- System, Diagnostics, DUS
 - Quick Reference, A-33a, A-33, A-53
- System, Formatting Packs
 - Quick Reference, A-31, A-51

System, Updated, Startup
 Quick Reference, A-4k, A-19

T

Tables Configuration

Extended (XCST), 5-21
 Queue, User Process (UCOP), 5-22
 Table, (PCB), 5-21

Tables, Changing System

Breakpoint, 7-21
 Disc Request, 7-68
 Loader Segment, 7-21
 Primary Message, 7-20
 Secondary Message, 7-20
 Special Request, 7-20
 Swap, 7-20
 Timer Request List, 7-21
 UCOP Request Queue, 7-21
 User Logging, 7-21

Tables/Queues Configuration

Configurator Dialogue, 5-20
 Queue, Controller Process, 5-22
 Queue, Input/Output (IOQ), 5-22
 Stack, Interrupt Control (ICS), 5-23
 Table, Breakpoint, 5-23
 Table, Code Segment (CST), 5-21
 Table, Code Segment, Extended, 5-21
 Table, Data Segment (DST), 5-22
 Table, Disc Request, 5-23
 Table, Process Control Block (PCB), 5-22
 Table, Swap, 5-23

:TAKE Command, 3-155

Tape Cartridge Unit, 8-14

Tape Drive, Cartridge, Configuring, 7-89

Tape Drive, Magnetic, Configuring, 7-88

Tape Storage, Files, 6-22

Tape, Cartridge, On line Formatting, 10-30

Telecommunications

Circuits, 4-47
 Communication Links, 4-46
 Four Wire, 4-47
 Full Duplex, 4-46
 Half Duplex, 4-46
 INP, 4-46
 Leased Line, 4-47
 Lines/Channels, 4-46
 Modems, 4-46
 Multipoint :MTS/3000, 4-46

Multipoint Networks, 4-46

Network Components, 4-45

Simplex, 4-46

Sub Voice Band, 4-47

Switched Network, 4-46

Terminals As I/O Devices, 4-46

Terminals, Local, 4-46

Terminals, Remote, 4-46

Transmission Modes, 4-46

Transmission Speed, 4-47

Two Wire, 4-47

Voice Band, 4-47

Wideband, 4-47

Tele-Support, Hardware Needs

Series 37, 11-24a
 (39/40/42/44/48), 11-25
 (64/68), 11-28
 General, 11-24

Tele-Support, Operation

(39/40/42/44/48), 11-25
 (64/68), 11-28

Tele-Support, Series 37, 11-24a

Tele-Support, Software Needs, 11-24

Tele-Support, Terminal-To-Terminal

(39/40/42/44/48), 11-25
 (64/68), 11-29

:TELL Command, 5-23

Temperature, High, 11-36

(See Overheating)

Terminal Buffers, 5-24

Terminal Subtypes, Configuring, 7-81

Terminal Type

List, 7-6

Supported By MPE V/P/E, 7-80

Thumbwheel Switches

(39/40/42), 11-4

(44/48), 11-11

Description, 11-4

Time of Century Clock, 4-5

Timer Request List (TRL), 5-23

Tracks

Defect Status, 7-66

Defective List, 10-34

Defective, Table, 7-59

Delete, 7-60

Verification, 7-61

Verification/Errors, 7-62

Transmission Modes, 4-46

:TUNE Command, 3-156, 5-28

Two Wire, 4-47

INDEX

U

UCOP, 5-22
UDC (User Defined Commands), 6-23, 6-24
 Access, 6-24
 Catalog, 6-24, 6-35
 Definitions, 6-23
 Listing, 6-24a, 6-35
 Making A Catalog, 6-35
 Modifying, 6-24
 Priority Levels, 6-23
 Purging, 6-24
 Structure, 6-23
Undoing Edit (:REDO), 2-9
:UP Command, 3-159, 4-20a
UPDATE, 7-37a, 7-40
Updated System, Startup
 Quick Reference, A-4k, A-40
Use Types, Group, 6-9
User Attributes, 6-1
User Controller Process Queue, 5-22
User Defined Commands
 (See UDCs)
User Files (SF), 6-3
User Job Control, 4-43
User Types, Accounts, 6-7
User Types, Definitions, 6-9
User/Initiator Dialogue, 7-38
Users, Defining, 6-30
Utilities :ASOCTABL5.PUB.SYS, 6-25
Utility, LISTDIR5.PUB.SYS, 6-34

V

Verify Readability
 Discs/Cartridge Tape, 10-36

Vertical Format Control (VFC)
 Automatic, 8-3
 HP 2608A/2563A, 8-4
:VINIT Command, 3-160
VINIT Subsystem
 Capabilities Needed, 10-24
 Example, 10-38
 Its Use, 10-37
 Overview, 10-24
Virtual Memory Changes, 7-67
:VMOUNT Command, 3-163, 4-22
Volume Conditioning, 10-6
Volume Conditioning, Disc, 5-31
Volume Set Definition, 10-33
Volumes Verification, 7-62
Volumes Verification/Errors, 7-61
Volumes, Change
 (See Reconfiguring The), 7-25
 Copying, 10-28
Volumes, Defect Status, 7-66
Volumes, Disc, Changes
 Add, 7-26
 Delete, 7-26
 List, 7-26
 Relist, 7-26
Volumes
 Foreign Disc, Access/Alter, 4-23
 Private, Applications, 10-1
 Private, Overview, 10-1
 Using Discs, 4-21
 Volumes, Private, Control, 4-22

W

Warmstart, 7-37, 7-39
 Quick Reference, A-4f, A-13, A-34
WARMSTART, Series 37, 4-5c
WARMSTART, SDF Command, 7-37, 10-46
:WARN Command, 3-165, 4-15, 5-23
:WELCOME Command, 3-167

Part No. (32033-90005)
Printed in U.S.A. 7/84
Update #1 (U0185) Incorporated JAN 1985

