HEWLETT hp PACKARD

computer systems COMMUNICATOR

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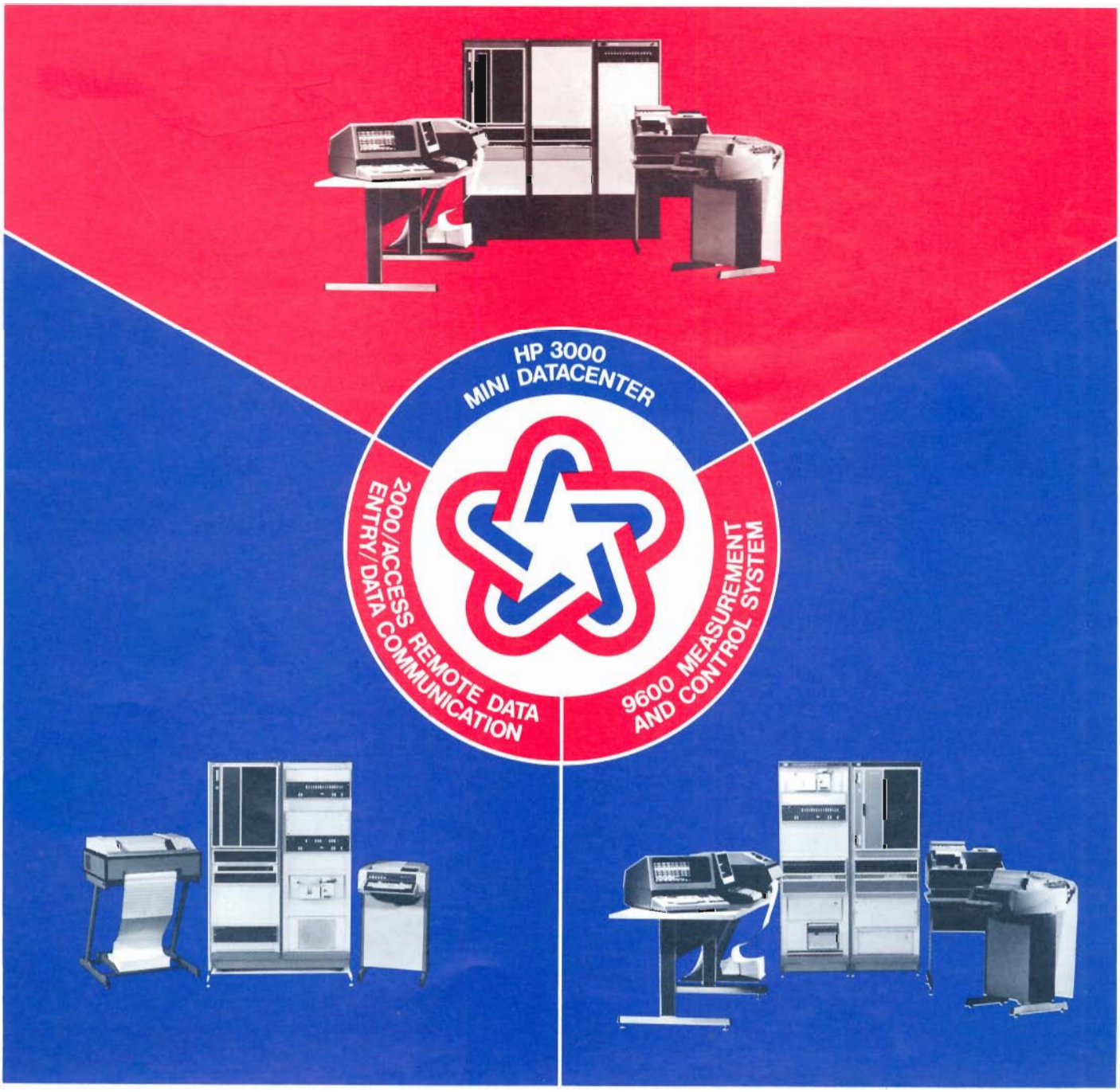
JULY 1, 1976



subscription information

Annual subscriptions consisting of 6 issues are available as outlined below.

I. CUSTOMERS WITH SOFTWARE MAINTENANCE AGREEMENTS OR SOFTWARE SUBSCRIPTION SERVICE AGREEMENTS (SOFTWARE SERVICE CONTRACT SUBSCRIPTIONS)

All Hewlett-Packard customers with Software Service Contracts are entitled to one BASE SUBSCRIPTION (1 copy per issue) at no additional charge. These customers may also buy ADDITIONAL SUBSCRIPTIONS whose purchase price is to be prorated against the remaining life of their Software Service Contract. A proration table appears on the ORDER FORM which is bound into this issue.

To receive a BASE SUBSCRIPTION at no charge as well as to purchase ADDITIONAL SUBSCRIPTIONS under the provisions of the Software Service Contract Program, complete the ORDER FORM and forward it to your local HP Sales and Service Office. Your local Customer Engineer will validate your order and mail it to the appropriate HP department.

Rates:	U.S.A.	NON-U.S.A.
BASE SUBSCRIPTION	NAC*	NAC*
ADDITIONAL SUBSCRIPTIONS (ea.)	$12/yr.	**

1) ADDITIONAL SUBSCRIPTIONS must go to the same name and address as the BASE SUBSCRIPTION to qualify for the reduced rates.

2) ADDITIONAL SUBSCRIPTIONS ordered at a later date than the BASE SUBSCRIPTION must include, with the order form, a copy of the address label for proper identification.

3) Charges for ADDITIONAL SUBSCRIPTIONS will be prorated to expire with your Software Service Contract.

4) Orders for ADDITIONAL SUBSCRIPTIONS from a customer with a Software Service Contract will be verified by the Customer Engineer who will complete the "FOR HP USE ONLY" portion of the subscription form and direct the order to the appropriate HP department. The customer will be billed by his local HP Customer Engineering Department.

*No Additional Charge (NAC)

**Contact your local HP Customer Engineer for the price in the currency of your country.

II. CUSTOMERS WITHOUT SOFTWARE MAINTENANCE AGREEMENTS OR SOFTWARE SUBSCRIPTION SERVICE AGREEMENTS (MAIL ORDER SUBSCRIPTIONS)

Rates:	U.S.A.	NON-U.S.A.
BASE SUBSCRIPTION	$48/yr.	***
ADDITIONAL SUBSCRIPTIONS (ea.)	$12/yr.	***

1) ADDITIONAL SUBSCRIPTIONS must be ordered at the same time as the BASE SUBSCRIPTION and go to the same name and address as the BASE SUBSCRIPTION to qualify for the reduced rate.

2) The customer is to include payment (check, bank draft, money order, etc.) with the order. This is a Direct Mail Order procedure; please do not send a purchase order to HP.

3) Complete the ORDER FORM as directed and mail together with your payment to:

Hewlett-Packard Co.
Mail Order Dept.
P.O. Drawer No. 20
Mountain View, California 94043
U.S.A..

SUBSCRIPTION CORRESPONDENCE

Address all correspondence relating to **COMMUNICATOR** subscriptions to:

Subscription Service Manager
Hewlett-Packard Company
Mail Order Dept.
P.O. Drawer No. 20
Mountain View, California 94043
U.S.A.

***The international customer is encouraged to also use HP's Direct Mail Order System by remitting a bank draft in U.S. dollars according to the order procedure outlines above. If the currency regulations in the customer's country disallow the purchase of bank drafts in American dollars, or if the customer does not have ready access to the required banking services, the customer may order subscriptions from the local HP Sales and Service Office through his Customer Engineer. The customer should contact his HP Office for the price of the subscription in the currency of his country then complete the ORDER FORM and forward it together with payment to his local HP Office.

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

HEWLETT-PACKARD
COMPUTER SYSTEMS COMMUNICATOR ORDER FORM

Please Print:

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip Code _____

Country _____

☐ MAIL ORDER SUBSCRIPTIONS

BASE SUBSCRIPTION $ _____

_____ ADDITIONAL SUBSCRIPTION(S) $ _____
No.

TOTAL AMOUNT ENCLOSED $ _____

☐ SOFTWARE SERVICE CONTRACT SUBSCRIPTIONS

BASE SUBSCRIPTION (NO ADDITIONAL CHARGE) NAC

_____ ADDITIONAL SUBSCRIPTION(S) $ _____
No.

TOTAL AMOUNT YOU WILL BE BILLED $ _____

FOR HP USE ONLY

SUPPORT OFFICE NUMBER _____ ORDER DATE _____

APPROVED BY _____ C.E. NUMBER _____

SERVICE CONTRACT NUMBER _____ EXPIRATION DATE _____

AUTHORIZED TOTAL NUMBER OF SUBSCRIPTIONS _____

CUSTOMER'S HP OPERATING SYSTEM _____

Printed 4/76

TABLE OF PRORATED $ AMOUNT DUE PER ADDITIONAL SUBSCRIPTION

(Use only for ordering ADDITIONAL SUBSCRIPTION(S) against an existing Software Service Contract)

	Months Remaining in Service Contract											
	1	2	3	4	5	6	7	8	9	10	11	12
Cost of Each ADDITIONAL SUBSCRIPTION	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00

INSTRUCTIONS FOR ORDERING COMMUNICATOR

All Hewlett-Packard customers with Software Service Contracts are entitled to one BASE SUBSCRIPTION (1 copy per issue) at no additional charge. These customers may also buy ADDITIONAL SUBSCRIPTIONS whose purchase price is to be prorated against the remaining life of their Software Service Contract.

Customers who do not have Software Service Contracts may purchase Mail-Order Subscriptions through HP's Direct Mail Order System.

A. MAIL-ORDER SUBSCRIPTION(S)

1. Complete name and address portion of ORDER FORM.
2. Compute amount due:
   a) Annual Base Subscription (6 issues) $ 48.00
   b) ____ Additional Subscriptions* @ $12.00 ea. $ ____
   c) Total Order Amount (a + b) $ ____
   d) Transfer number of ADDITIONAL SUBSCRIPTIONS and all dollar amounts to ORDER FORM.
3. Mail check or bank draft with ORDER FORM to:

   HEWLETT-PACKARD CO.
   MAIL ORDER DEPARTMENT
   P.O. DRAWER #20
   MOUNTAIN VIEW, CA. 94043
   U.S.A.

B. SOFTWARE SERVICE CONTRACT SUBSCRIPTION(S)

1. Complete name and address portion of ORDER FORM.
2. Compute amount due: (BASE SUBSCRIPTION is at no additional charge.)
   a) Annual Base Subscription (6 issues) $ 0.00
   b) ____ Additional Subscriptions* $ ____
   Prorate the dollar amount to make the ADDITIONAL SUBSCRIPTIONS EXPIRE WITH YOUR Software Service Contract. (SEE TABLE)
   c) Total Order Amount (a + b) $ ____
   d) Transfer number of ADDITIONAL SUBSCRIPTIONS and all dollar amounts to ORDER FORM.
3. Forward ORDER FORM to your local HP Customer Engineering Representative. Your order will be approved and forwarded to the appropriate department. You will be billed for any ADDITIONAL SUBSCRIPTIONS by your local HP office.

C. SPECIAL INSTRUCTIONS FOR INTERNATIONAL CUSTOMERS

1. International customers who do not have Software Service Contracts are encouraged to use HP's Direct Mail Order System by remitting a bank draft in U.S. dollars according to the ordering procedures outlined in Instruction A above. Optionally, international customers may purchase the **Communicator** through their local HP Sales and Service Office. The customer should contact his HP Office for the subscription prices in the currency of his country, then complete the Order Form and forward it together with payment to his local HP Customer Engineering Department.

1. International customers with Software Service Contracts should follow the ordering procedure outlined in Instruction B above. If the customer wishes to purchase ADDITIONAL SUBSCRIPTIONS, he should contact the local HP Office for the subscription price in the currency of his country, then submit the ORDER FORM. The customer will be billed for ADDITIONAL SUBSCRIPTIONS by his local HP Office.

*All ADDITIONAL SUBSCRIPTIONS will be sent to the same name and address as the BASE SUBSCRIPTION.

47-5952-5570
Rev. 4/76

HEWLETT-PACKARD
COMPUTER SYSTEMS COMMUNICATOR ORDER FORM

Please Print:

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip Code _____

Country _____

☐ MAIL ORDER SUBSCRIPTIONS		☐ SOFTWARE SERVICE CONTRACT SUBSCRIPTIONS	
BASE SUBSCRIPTION	$ _____	BASE SUBSCRIPTION (NO ADDITIONAL CHARGE)	NAC
_____ No. ADDITIONAL SUBSCRIPTION(S)	$ _____	_____ No. ADDITIONAL SUBSCRIPTION(S)	$ _____
TOTAL AMOUNT ENCLOSED	$ _____	TOTAL AMOUNT YOU WILL BE BILLED	$ _____

FOR HP USE ONLY

SUPPORT OFFICE NUMBER _____ ORDER DATE _____

APPROVED BY _____ C.E. NUMBER _____

SERVICE CONTRACT NUMBER _____ EXPIRATION DATE _____

AUTHORIZED TOTAL NUMBER OF SUBSCRIPTIONS _____

CUSTOMER'S HP OPERATING SYSTEM _____

Printed 4/76

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   d) Transfer number of ADDITIONAL SUBSCRIPTIONS and all dollar amounts to ORDER FORM.
3. Mail check or bank draft with ORDER FORM to:

   HEWLETT-PACKARD CO.
   MAIL ORDER DEPARTMENT
   P.O. DRAWER #20
   MOUNTAIN VIEW, CA. 94043
   U.S.A.

B. SOFTWARE SERVICE CONTRACT SUBSCRIPTION(S)

1. Complete name and address portion of ORDER FORM.
2. Compute amount due: (BASE SUBSCRIPTION is at no additional charge.)
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   b) _____ Additional Subscriptions* $ _____
   Prorate the dollar amount to make the ADDITIONAL SUBSCRIPTIONS EXPIRE WITH YOUR Software Service Contract. (SEE TABLE)
   c) Total Order Amount (a + b) $ _____
   d) Transfer number of ADDITIONAL SUBSCRIPTIONS and all dollar amounts to ORDER FORM.
3. Forward ORDER FORM to your local HP Customer Engineering Representative. Your order will be approved and forwarded to the appropriate department. You will be billed for any ADDITIONAL SUBSCRIPTIONS by your local HP office.

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1. International customers with Software Service Contracts should follow the ordering procedure outlined in Instruction B above. If the customer wishes to purchase ADDITIONAL SUBSCRIPTIONS, he should contact the local HP Office for the subscription price in the currency of his country, then submit the ORDER FORM. The customer will be billed for ADDITIONAL SUBSCRIPTIONS by his local HP Office.

*All ADDITIONAL SUBSCRIPTIONS will be sent to the same name and address as the BASE SUBSCRIPTION.

47-5952-5570
Rev. 4/76

editor's note

Ever wish there was a simple way of purchasing a set of manuals for your computer system? The feature article will help you accomplish that. Extra copies of the HP 3000 Series II software documentation can be ordered by simply specifying one product number. By doing so, you will receive the standard set of manuals needed to utilize the Series II Computer System.

We welcome comments on our new set of HP software documentation — your comments and suggestions help us improve our documentation.

Those of you with software service contracts will have received a copy of the new pre-series II QUERY manual (part no. 30000-90042). This was rewritten to make it easier to use and to include the enhancements announced in the April **Communicator.** We would be interested to hear your comments on the new manual. The IMAGE enhancements announced in the April **Communicator** were also documented and distributed at the same time.

The Distribution Department assures us that you will soon be receiving the new edition of the FORTRAN manual (part no. 30000-90040) which incorporates the enhancements documented in the May issue of the **Communicator.** There is still a time lag between the time the enhancements are announced and the time that you receive formal documentation — we are working at reducing this, but meanwhile we hope the **Communicator** is filling the gap.

* * * * *

The 2000 Section is rather small this issue, but the 2000 technical editors have promised us that the next issue of the **Communicator** will contain software and documentation information worth waiting for.

Please continue to send any ideas on topics you would like to see discussed in future issues of the **Communicator.**

Address your correspondence to:

Editor
Computer System **Communicator**
HP General Systems Division
5303 Stevens Creek Blvd.
Santa Clara, California 95050

contents

bulletins

2000/F TO 2000 ACCESS EDUCATIONAL APPLICATIONS UPGRADES

Nancy Saylor
HP General Systems

This new manual explains the procedures for moving 2000/F educational applications to a 2000 Access system. It describes adapting the following applications for use on the Access System:

- Instructional Management Facility
- Instructional Dialogue Facility
- Course Writing Facility
- College Information System
- HP MATH

The manual, part number 19665-90002, is available from the Corporate Part Center for the price of $1.00.

HP 2000 ACCESS OPERATOR'S POCKET GUIDE

Nancy Saylor
HP General Systems

This pocket guide is written for a 2000 Access System Operator. It summarizes operator commands and frequently used operating procedures.

The HP part number for this manual is 22687-90007 and the price is $1.00.

documentation

The following tables list currently available customer manuals for HP 2000 Systems products. This list supersedes the list in the last issue of the **Communicator.**

The most recent changes to the tables are indicated for easy reference. Prices are subject to change without notice.

Copies of manuals and updates can be obtained from your local Sales and Service office. The address and telephone number of the office nearest to you are listed in the back of all customer manuals.

Update packages are free of charge. If you require an update package only, send your request to:

Software/Publications Distribution
5303 Stevens Creek Blvd.
Santa Clara, Ca 95050

Customers in the U.S. may also order directly by mail. Simply list the name and part number of the manual(s) you need on the Corporate Parts Center form supplied at the back of the **Communicator.**

A few words about documentation terms:

New — A new manual refers only to the first printing of a manual. When first printed, a manual is assigned a part number.

Revised — A revised manual is a printing of an existing manual which incorporates new and/or changed information in its contents. For example, a manual is revised when an update package is incorporated into the manual: the manual gets a new print date and the update package disappears. Note that a revision to a manual effectively obsoletes the previous version of the manual.

Update — An update package is a supplement to an existing manual which contains new and/or changed information. Updates are issued when information must get to customers, yet it is inappropriate to issue a revised manual. An update has no part number; it is automatically included when you order the manual with which it is associated.

PART NUMBER	2000 E	2000 F	ACCESS	MANUAL TITLE	PRICE†	PUBLICATION DATE	CURRENT UPDATE
02000-90055		X		2000C/2000F IDF Author's Manual	$ 8.50	1/73	8/74
02000-90080		X		2000E to 2000F Conversion Guide	1.00	4/76	
19665-90001			X	2000/F to 2000/Access System Upgrade Kit and Conversion Program Manual	2.00	5/76 *R	
19665-90002			X	2000/F to 2000 Access System Educational Application Upgrades	1.00	2/76 *N	
22687-90001			X	Access BASIC Reference Manual, HP 2000	10.00	9/75	
22687-90005			X	Access Operator's Manual, HP 2000	10.00	9/75	10/75
22687-90007			X	Access System Operator's Pocket Guide	1.00	1/76 *N	
02000-90048	X			BASIC/2000 Level E Reference Manual, Timeshared	10.00	9/75	
02000-90049	X			BASIC/2000 Level E System Operator's Manual, Timeshared	5.00	9/74	8/75
5952-4490	X			BASIC/2000 Level E Pocket Guide, Timeshared	0.15	10/74	
02000-90073		X		BASIC/2000 Level F Reference Manual, Timeshared	7.50	12/75	
02000-90074		X		BASIC/2000 Level F System Operator's Manual, Timeshared	10.00	6/75	10/75
5952-4491		X		BASIC/2000 Level F Pocket Guide, Timeshared	0.15	8/75	
24387-90001		X		Basic Analysis and Mapping Program Manual	18.00	6/74	5/75
24387-90002		X		Basic Analysis and Mapping Program Pocket Guide	1.00	6/74	
24384-90001		X	X	College Information System – System Overview	5.00	6/74	
24384-90003		X	X	College Information System Reference Manual	19.00	9/75	
24384-90005		X	X	College Information System – Technical Manual	95.00	5/75	
24383-90001		X		Course Writing Facility Reference Manual	15.00	5/74	
22692-90001			X	Course Writing Facility Reference Manual	16.50	12/75	
5951-1381		X		DOS-M/2000C Timeshared BASIC File Handler	1.00	5/71	
20352-90001		X		Educational Budget and Accounting System – System Overview	5.00	6/74	
20352-90002		X		Educational Budget and Accounting System – Reference Manual	10.00	3/75	4/76
20352-90003		X		Educational Budget and Accounting System – Technical Manual	75.00	3/75	
20353-90001		X		Educational Payroll System – System Overview	3.50	10/74	
22700-90001			X	FCOPY/2000 Reference Manual	4.50	1/76	
22693-90003			X	HP MATH for HP 2000 Access Curriculum Guide	17.50	7/75	
22693-90002			X	HP MATH for HP 2000 Access Proctor's Manual	6.50	7/75	
22693-90001			X	HP MATH for HP 2000 Access Teacher's Handbook	5.50	7/75	
20310-90007		X		HP MATH Curriculum Guide	20.00	7/74	
20310-90005		X		HP MATH Proctor's Manual	5.00	9/74	
20310-90001		X		HP MATH Teacher's Handbook	5.00	9/74	
22691-90003			X	Instructional Dialogue Facility for HP 2000 Access Author's Manual	13.00	9/75	
22691-90004			X	Instructional Dialogue Facility for HP 2000 Access Author's Pocket Guide	3.00	9/75	
22691-90002			X	Instructional Dialogue Facility for HP 2000 Access Course Developer's	5.00	9/75	
22691-90001			X	Instructional Dialogue Facility for HP 2000 Access Proctor's Manual	6.00	9/75	
20309-90005		X		Instructional Dialogue Facility Author's Pocket Guide	3.50	10/74	
20309-90003		X		Instructional Dialogue Facility Course Developer's Manual	6.00	8/74	
20309-90001		X		Instructional Dialogue Facility Proctor's Manual	10.00	9/74	
22690-90001			X	Instructional Management Facility for HP 2000 Access Proctor's Manual	6.50	9/75	
22690-90002			X	Instructional Management Facility for HP 2000 Access System Manager's Reference Manual	4.50	9/75	
20308-90001		X		Instructional Management Facility Proctor's Manual	7.00	9/74	

PART NUMBER	2000 E	2000 F	ACCESS	MANUAL TITLE	PRICE†	PUBLICATION DATE	CURRENT UPDATE
20308-90003		X		Instructional Management Facility System Manager's Manual	5.00	10/74	
22687-90009			X	Learning Timeshare BASIC	3.50	5/76	
20240-90001			X	Telecommunications Supervisory Package/2000 Manager's Manual	5.00	1/76	
20240-90002			X	Telecommunications Supervisory Package/2000 User's Manual	3.50	1/76	
20311-90001		X		Timeshared Graphics for Tektronix Terminals	7.00	8/74	
20311-90003		X		Timeshared Graphics Plotting Package	5.00	8/74	

*N = New Manual (Refer to the Bulletin section.)
*R = Revised Manual
† Prices listed are subject to change without notice.

training schedule

The schedule for customer training courses on General Systems Division Products is outlined below and in the HP 3000 section of this publication. Included here are 2000 Access courses for the 6 month period, July through December 1976.

GENERAL SYSTEMS DIVISION COURSE SCHEDULE July-December 1976					
				Course Dates and Training Center Location	
COURSE NUMBER	COURSE TITLE	LENGTH	PRICE	GENERAL SYSTEMS SANTA CLARA	EASTERN TRAINING CENTER – ROCKVILLE
22973A	2000 Access, Data Entry, File Management and RJE	5 days	$500	8/23/76 10/25/76	9/13/76

Registration

Requests for enrollment in any of the above courses should be made through your local HP Sales Office. Your Sales Representative will supply the Training Registrar at the appropriate location with the course number, dates, and requested motel reservations. Enrollments are acknowledged by a written confirmation indicating the training course, time of class, location and accommodations reserved.

Accommodations

Students provide their own transportation, meals, and lodging. The Training Registrar will be pleased to assist in securing motel reservations at the time your Sales Office requests a registration.

Cancellations

In the event you are unable to attend a class for which you are registered, please notify the Training Center Registrar immediately in order that we may offer your seat to another student. To avoid paying for a reservation which you do not use, we must receive notification of your cancellation no later than two weeks before the class begins.

EASTERN TRAINING CENTER	GENERAL SYSTEMS DIV. TRAINING CENTER
Hewlett-Packard 4 Choke Cherry Road Rockville, Maryland 20850 (301) 948-6370	Hewlett-Packard 5303 Stevens Creek Blvd. Santa Clara, Calif. 95050 (408) 249-7020

software tips

COBOL CALLS TO SORT FOR FILES GREATER THAN 10,000 RECORDS

John Pavone
HP General Systems

COBOL and SORT assumes a default of 10,000 records when no file-size value is established or passed to SORT as a parameter.

The COBOL SORT statement format does not include any parameter to pass the filesize; therefore, if an input file for SORT is not a disc file and the number of records is not provided, a filesize default of 10,000 records is assumed. Attempts to pass files greater than 10,000 records results in an error condition and abort of the SORT program.

When calling SORT via the SORT statement:

A. If an input procedure is used to pass the records to sort

OR

If the USING filename clause is used and filename is not a disc file

AND

a filesize value is not established, the default value of 10,000 records is used.

B. If the USING filename is a disc file, no filesize parameter is necessary as SORT programmatically gets the filesize value from the File Information Table.

To specify filesize for non-disc file conditions, the following alternatives can be used:

1. Use the SELECT filename ASSIGN to "System-file-name" format where the ***filesize*** parameter is part of the "System-file-name" format.

2. Use a file equation at RUN time to specify or override the filesize

:FILE *name*;DISC=***filesize***

where:

name = the name assigned within the "System-file-name" format in SELECT/ASSIGN statement of the defined sort-file.

filesize = the maximum number of records which SORT will be expected to process. A filesize value less than the actual number passed will cause an error and abort of the SORT program.

CLIP AND INSERT

Gary Davis
HP MSR Farmington, Michigan

SORT

Invoking
:RUN SORT.PUB.SYS

Commands

INPUT { filename | * } [,number of records] [,record size]

OUTPUT { filename | * } [;NUM] [,KEY]

KEY { position } [,length] [,type] [,DESC]
[;position] . . .

type may be:
BYTE, INT, DOUBLE, REAL, LONG,
PACKED, DISPLAY or PACKED*

RESET

VERIFY

END

Make your HP/3000 Software Pocket Guide (03000-90126) complete with the commands for SORT/3000. The new page has been reproduced to fit in the back of your pocket guide.

MERGE

Invoking
:RUN MERGE.PUB.SYS

Commands

INPUT {filename} [,filename] . . .

OUTPUT {filename} [,number of records] [,KEY]

KEY {position} [,lenght] [,type] [,DESC]
[;position] . . .

type may be
BYTE, INT, DOUBLE, REAL, LONG,
PACKED, DISPLAY or PACKED*

RESET

VERIFY

END

Cut inside red border and insert in back of your pocket guide.

MPE FILE SYSTEM NOW WORKS WITH SYSTEM/3'S BOMP

Joe Dietzgen
HP General Systems

The IBM System/3 Bill of Material Processor (BOMP) uses a special file system trick that does not work with our MPE File System. Therefore a new feature has been added to RPG/3000. This feature is available in RPG 2.03 and documented in the May 15 **Communicator.**

The System/3 Bill of Material Processor accesses an Indexed File by Relative Record Number and by key value (i.e., part number). This requires two RPG files that point to the same Indexed File Data Set. The first is defined as a Random Indexed file with a byte key. The second file is a Random Indexed File with an Integer Relative Record Number Key. The files are accessed by RPG CHAIN statements.

CHAIN number one uses a byte key value (i.e., part number). CHAIN number two uses an Integer Relative Record Number. Both files use a System/3 file equation that points to the same INDEXED File Data Set. One file is referenced twice. The System/3 only opens the file once.

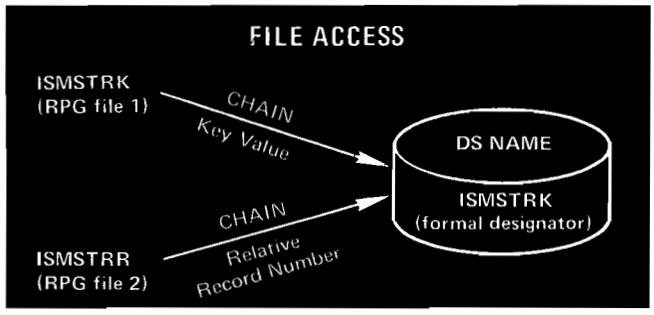
The HP 3000 can open one file more than once. An MPE :FILE command can cause two opens for the same file. The file is treated as logically independent files. Two opens provide duplicate access and buffers for the same file. This is an MPE File System benefit which is not possible on the System/3.

To execute like the System/3, another new RPG/3000 feature was added, allowing multiple RPG files to access the same Indexed File Data Set, and only open the Data Set once.

This means the RPG/3000 programmer can use either method: open multiple files or a single file. To open two independent files for the same Data Set, the user provides a :FILE command. To open two RPG files as a single file, he uses a DSNAMF file extension in RPG.

The DSNAME File Extension Specification points two or more RPG files to the same Indexed File Data Set. The Data Set is only opened once for multiple type file operations.

A sample program is shown in figure A.



```
0001          $CONTROL USLINIT,QUOTE=',MAP
0002     00010H          1



0003     10010FP3DATA   IPE          96
0004     10020FISMSTRK  IC  F       768R18AI     33 DISK
0005     10030FISMSTRR  UC  F       768R  II        DISK
0006     10035F                                              KDSNAMEISMSTRK
0007     10040FREPORT   O           120              PRINTER



0008     40010IP3DATA   AA  01    1 CI
0009     40020I         OR  02    1 CD
0010     40030I                                          2  19 KEY
0011     40040I                                          2   60DIRECT
0012     40050IISMSTRK  AA
0013     40060I                                         33  50 PNOIND
0014     40070IISMSTRR  AA
0015     40080I                                         33  50 PNODIR



0016     50010C    01       KEY        CHAINISMSTRK              03
0017     50020C    02       DIRECT     CHAINISMSTRR              03



0018     600100REPORT   D  2       01N03
0019     600200                              PNOIND     30
0020     600300                                         40 'INDEX'
0021     600400         D  2       02N03
0022     600500                              PNODIR     30
0023     600600                                         40 'DIRECT'
0024     600700ISMSTRR  D          02N03
0025     600800                                          7 'UPDATED'
```

Figure A. Opening Multiple Files or a Single File

bulletins

NEW COURSE OFFERINGS

General Systems Division is pleased to announce two new HP 3000 Series II courses, Advanced Usage and SPL (Systems Programming Language). The courses will be taught at our training centers in Santa Clara, California and Rockville, Maryland. Each course is 5 days in length.

The Advance Usage course will cover advanced text editing, introduction to SPL, Segmentation, file system details, advanced system capabilities (process handling, RINS, etc.) and DEBUG tools and techniques. The Advanced Usage course has a prerequisite of HP/3000 A Comprehensive Introduction or one of our previous introductory courses. *We also request that you have at least six months experience on the HP 3000 system.*

The SPL course will cover process environment, data declarations, instruction set, expressions, machine dependent features, procedures and subroutines, pointers, looping constraints, and bit operations. This course has a prerequisite of the Advanced Usage course.

See the Training Schedule in this section of the **Communicator** for places and dates.

software updates

Each issue of the **Communicator** provides you with information pertinent to the status of 3000 software products including the latest software changes and enhancements.

Software updates described in this issue relate to the following products:

PRODUCT	NUMBER	UPDATE AND FIX LEVEL	MIT TAPE DATE CODE
MPE	32000C	00.12	1623
BUILDINT/3000	32150A	03.01	1623
COBOL/3000	32213B	02.00	1623
Compiler Library/3000	32211C	04.01	1623
EDIT/3000	32201A	05.00	1623
FCOPY/3000	32212A	01.00	1623
Fortran/3000	32102B	00.02	1623
IMAGE/3000	32215A	04.01	1623
RPG/3000	32104A	02.05	1623
Sort/3000	32214B	01.00	1623
SPL/3000	32100A	06.02	1623

Where changes in documentation are indicated, updates to the appropriate manuals will be printed. This information is provided simply as a temporary measure.

MPE 32000C.00.12

This article describes MPE 32000C.00.12 as incorporated into the MIT tape, date coded 1623. The information in the article is organized as follows:

1. Modules modified for MPE C.00.12
2. Supported Utility Modules modified for MPE C.00.12
3. List of problems solved in MPE C.00.12
4. List of Supported Utility changes in MPE C.00.12
5. Known problems in MPE C.00.12
6. Documentation changes in MPE C.00.12

	MPE FIX LEVEL												
MODULE		1	2	3	4	5	6	7	8	9	10	11	12
INITIAL	0	X		X	X			X	X	X	X	X	X
SYSDUMP	1	X	X	X			X		X	X			X
SEGPROC	2	X	X				X			X	X		
SEGDVR	3												X
DISPATCH	4			X			X				X	X	X
LOAD	5		X										X
MAPP	6					X							
UCOP	7	X											
DEVREC	8												
PROGEN	9	X							X	X	X		X
ININ	10					X		X			X	X	
EXIN	11	X	X	X		X	X	X		X		X	
LOG	12	X											
IOPTRD0	13												
IOPTPN0	14						X		X				
IOPLOT0	15												
IOMDISK0	16			X				X	X	X			
IOFDISK0	17			X				X	X				
IOTAPE0	18				X				X				
IOLPRT0	19												X
IOCDRD0	20		X				X						
IOCLTTY0	21												
IOTERM0	22											X	
IOCDPN0	23												
IOPRPN0	24					N	X					X	X
IOREM0	25												
IOBSC0	26												
IOMDISK1	27	X		N				X	X	X	X		
PFAIL	30			X	X	X							
FILESYS	50	X	X	X	X	X	X	X	X	X	X	X	X
COMMINT	51	X		X			X					X	X
STORE/ RESTORE	52			X		X			X	X	X		X
DIRC	53									X			
ALLOCATE	54		X		X				X			X	X
DISKSPC	55	X										X	
MMCORE R	56						X		X			X	
MMDISKR	57												
ABORTRAP	58						X	X		X		X	
MESSAGE	59							X		X	X	X	
CROUTINE	60			X	X						X	X	
IOUTILITY	61	X		X	X			X	X	X			
TTYINT	62		X	X	X			X		X			
PCREATE	63	X									X		
MORGUE	64			X						X	X		
PROCMAIL	65												
PINT	66						X		X	X		X	
DATASEG	67	X								X			
IOPM	68		X			X						X	X
CHECKER	69												
UTILITY	70	X	X	X		X					X		
SEGUTIL	71	X		X				X		X			X

LOADER1	72		X	X				X		X		
RINS	73						X					X
JOBTABLE	74	X										
DEBUG	75	X										
NURSERY	76			X								
SYSDPLY	77						X					
FIRMWARESIM	78	X								X	X	X
SPOOLING	79			X	X			X	X	X	X	X
SPOOLCOMS	80	X					X		X		X	
MESSAGE CAT				X			X	X	X	X		X

2. MPE SUPPORTED UTILITY MODULE CHANGES

MODULE		1	2	3	4	5	6	7	8	9	10	11	12
DISKEDIT							N						
DPAN						N							X
FREE							N						
LISTDIR							N			X			
LISTEQ						N							X
LISTLOG						N							
PATCH							N						
RECOVER						N	X						
SAEDIT						N				X			
SAVIOUR						N				X			
SLPATCH							N						

N: New Source Release
X: Changes (Maintenance File)

3. PROBLEMS SOLVED IN MPE C.00.12

a. Previously, issuing a prompt after Control A on a loaded system could take a minute or longer. This was fixed by removing several procedures from PROGEN and placing them in ALLOCATE, MESSAGE and SPOOLCOMS. The segment is now less than half as large and can be swapped in easier.

b. In some circumstances changing the job limit upward did not result in waiting jobs logging on. The number of jobs executing would remain the same until some event in the system would start the waiting job(s) executing.

c. Deleting a READY input spoofle frequently would delete the wrong input spoofle (generally the first one in the list).

d. One cause of system failure numbers 202, 203 and 205 has been fixed. System failure 202 could result from a BREAK during an inopportune interval and system failures 203 and 205 resulted from losing carrier on a Bell type 103 modem.

e. The Dispatcher's memory contention recovery scheme has been made more efficient.

f. A split-stack addressing problem related to "breakable" commands has been corrected.

g. The Printing Reader/Punch driver (IOPRPN0) has been modified to:

1. Reduce its cpu requirements.
2. Increase card read speed.

h. The File System file label I/O procedure – FLABIO – has been moved from the segment FILESYS1 to FILESYS6. This has been done to improve its locality (decrease external references to FLABIO), and to decrease its memory requirements (now resides in a smaller segment).

i. INITIAL and SYSDUMP have been corrected so that a check for maximum number of virtual devices is properly performed. In addition, SYSDUMP has been changed so that a device's HEADOFF status is no longer carried across on a cold load tape. This would occur if a SYSDUMP was performed while some device had its HEADOFF status set.

j. The intrinsic EXPANDUSLF has been refined so that the resultant USL file will retain the identical domain characteristics (i.e. $NEWPASS,$OLDPASS,oldtemp file, or old permanent file) as that of its parent (original) USL file.

k. The restriction of printing a maximum of 132 columns has been removed. The line printer driver now accepts up to 2048 characters. All line printers truncate themselves, except for the HP 2607, which wraps around.

l. The DEBUG command in the SEGMENTER is now accessible only to users with privileged mode capability. Previously a non-privileged user could set a breakpoint in privileged code in the Segmenter and give himself privileged capability.

m. The LOADER would not allow the loading of a procedure in PUB.SYS if the calling account did not have a PUB group.

4. LIST OF SUPPORTED UTILITY CHANGES IN MPE C.00.12

a. DPAN now labels device types 22(SSLC) and 23(programmable controller). It also labels the stack overflow(STOV) process.

b. LISTEQ lists the OUTPRI and number of copies when specified in the file equation DEV parameter.

5. KNOWN PROBLEMS IN MPE C.00.12

a. Closing a tape file with NO REWIND is not implemented.

b. FSPACE spaces tape files by blocks rather than by records.

c. Chained SIOs on magnetic tape do not perform correctly, causing transfer of blocks larger than 4096 words to fail if the record format is variable or undefined.

d. The character ":" is treated as an EOF on $STDINX.

e. The commands: LISTACCT, LISTGROUP, and LISTUSER can lock the directory indefinitely if the output is written to magnetic tape and the tape is not ready.

f. Input arguments to the intrinsic BINARY of 65536, 65537, 65538, and 65539 fail to return overflow.

g. If the FORMSG parameter of FOPEN begins on an odd byte boundary, the preceding byte is also printed.

h. Lower case :eod is not recognized as an end-of-file on data accepting devices.

i. Issuing a :DEALLOCATE command for a non existent program file returns on ERR 217. The error should be ERR 217,52. The 52 is the file system error number returned from FCHECK.

j. DEBUG break points cannot be set in dynamically loaded procedures except by specifying the physical CST numbers.

k. When DPAN finds that the PCB table has been filled, it prints the erroneous messages "INVALID FIRST UNASSIGNED ENTRY" and "INVALID BACKWARD SUBQUEUE POINTER" even though there is no error in the PCB.

l. When the maximum number of open spoofles is not sufficient to handle all spooling requirements, spooled JOBs may cause endless numbers of null list files to be generated. This bug manifests itself as multiple $STDLIST files for a single JOB, each producing only a header and trailer. If the line printer is spooled, this results in many null spoofles, each using four sectors of disc space. If the line printer is not spooled, these null spoofles will begin printing immediately unless the printer is not ready. In this case, the system will crash due to an IOO overflow. If an open spoofle is closed during this resource allocation loop, the job may be launched normally. In this case, the last spoofle for $STDLIST will be the true job listing.

   This bug can be overcome by increasing the maximum number of open spoofles. The recommended value is 20, but a more exact figure can be found by examining the usage of your system. Each initial allocation (FOPEN) of a spooled device uses one open spoofle. When the file is closed (FCLOSE), the spoofle becomes unopened.

   For example:

   > A SESSION's single access to a spooled line printer requires one opened spoofle; a spooled JOB requires at least two, one for $STDIN and one for $STDLIST. Each additional access to a file of device class LP requires an additional open spoofle.

   One indication that the limit is being reached is allocation failures for spooled devices.

6. DOCUMENTATION CHANGES IN MPE C.00.12

a. MPE/3000 OPERATING SYSTEM REFERENCE MANUAL

1. pg. 8-73 Add the following sentence to the 1st paragraph (EXPANDUSLF intrinsic).

   The new USL file will retain the identical domain characteristics (i.e. $NEWPASS, $OLDPASS,oldtemp file, or old permanent file) as that of the old USL file.

BUILDINT/3000, 32150A.03.01

This article describes BUILDINT/3000, HP 32150A.03.01 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN BUILDINT/3000:

1. SETJCW is called with TRUE as parameter in case of an error.

2. If the output file is not the STDLIST file then any error message is also sent to the STDLIST file.

COBOL/3000, HP 32213B.02.00

This article describes COBOL/3000, HP 32213B.02.00 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN COBOL/3000:

1. Records containing variable length table were written at their maximum size instead of their current size.

2. COMPUTE statements with TALLY replacement variable caused BOUNDS VIOLATION.

3. Certain nestings of tables could result in erroneous error diagnostic, "NO OF INDICES DOES NOT MATCH NO OF DIMENSIONS".

4. Certain moves to and from TALLY failed.

5. Date was not included in the COBOL header line.

KNOWN PROBLEMS IN COBOL/3000

1. GO TO statement to the first paragraph in a subprogram may result in BOUNDS VIOLATION at object time. To get around it, add dummy first paragraph or section.

2. Runtime data stacks which are too large are not always properly diagnosed at compile time. In this case, the DATA AREA size listed at the end of the compilation is usually much smaller than expected.

COMPILER LIBRARY/3000, HP 32211C.04.01

This article describes Compiler Library/3000, HP 32211C.04.01 as incorporated in the MIT tape date coded 1623.

PROBLEMS SOLVED IN COMPILER LIBRARY/3000:

1. The prompt provided at the terminal when an ACCEPT was directed to that device was written in post-space mode instead of pre-space mode.

2. A boundary condition bug was found in DIVD, divide decimal, such that division of a number between 32768 and 65535 by a number between the number being divided and 999,999,999 would result in an unpredictable quotient and remainder.

3. The FORTRAN blank fill utility, a function in the COMPILER LIBRARY, aborted with an integer overflow when the source address of the byte string to be blank filled was %77777. This function now uses logical arithmetic to avoid this relatively rare problem.

EDIT/3000, HP 32201A.05.00

This article describes EDIT/3000, HP 32201A.05.00 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN EDIT/3000:

1. A problem with the use of the string created by the Z:: command has been cleared up.

2. The range list specification in the PROCEDURE command is now properly implemented. Previously, it had accommodated only one range.

ENHANCEMENTS TO EDIT/3000

1. The offline option for the LIST and XPLAIN commands has been altered as follows:

   It is now possible to designate an offline list file even though the EDITOR was entered without specifying such a file when the EDITOR is initially invoked in a session. To designate the offline list file under such circumstances do the following:

   a. Press the BREAK key, or its equivalent. The operating system will prompt with a colon character.

   b. Enter the following file command,
   :FILE EDTLIST;DEV=LP
   where LP is the device class name desired and configured

   c. Enter the RESUME command to return control to the EDITOR,
   :RESUME
   After which the operating system will emit the message READ PENDING

   d. Continue to use the EDITOR, with the offline options directed to the device class of your choosing.

   The symptom for not having specified an offline listfile upon entry continues to be the emission of output to $STDLIST even though the offline option was specified.

KNOWN PROBLEMS IN EDIT/3000

1. In the CHANGE command, when the from-string, the first of two, terminates with a blank character, and when this string occurs at the end of a line, a line-wrap takes place such that the subsequent line is investigated. Sometimes the subsequent line is deleted. Originally this was supposed to be a feature for pure text editing.

   To prevent such a phenomenon do the following immediately after entering into a file.

```
VERIFY RIGHT,LENGTH
SET LENGTH=<lengthvalue+1>,
   RIGHT=<lengthvalue+1>
CHANGEQ<lengthvalue+1>/
   <lengthvalue+1>,"*",ALL
SET RIGHT=<lengthvalue-1>,
   LENGTH=<lengthvalue-1>
```

   The effect of this CHANGE command is to force trailing blanks into all lines entered into the work file.

FCOPY/3000, HP 32212A.01.01

This article describes FCOPY/3000, HP 32212A.01.01 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN FCOPY/3000:

1. A correction was made to prevent overflows, which were caused when streamed input files are designated as physical tape devices.

FORTRAN/3000, HP 32102B.00.02

This article describes FORTRAN/3000, HP 32102B.00.02 as incorporated into MIT tape date coded 1623.

PROBLEMS SOLVED IN FORTRAN/3000:

1. A bad USL could result when a subroutine was compiled into an old USL which already contained a subroutine with that name. There was roughly one chance in 128 of this problem occurring for any given subroutine. The usual symptom was the segmenter going into an infinite loop when a PREP was attempted.

2. A lot of straight line code with a lot of constants caused the constant table to be filled. Under certain circumstances an internal pointer was re-initialized to a bad value, resulting in a constant going out of range. The usual symptom of this problem was a garbage constant being supplied to the program.

3. An integer overflow could occur when using secondary entry points. If one entry referenced an array as a parameter, and one entry was made by another entry which did not reference that array, the address protection mechanism inadvertently caused an integer overflow.

4. Program units with blocks of I/O statements with 12 or more action labels (ERR= or END=) could cause constant pools to go out of range.

5. Some operations involving references to strings with variable lengths generated LOAD P+n,I instead of LOAD Q+n, causing bounds violations in the general case. This was caused by a typographical error in the compiler.

6. Use of system intrinsics which are parameterless functions could cause the compiler to abort. If the compiler did not abort, the code generated should be correct.

7. Data statements which initialized double precision variables to negative values could result in erroneous initializations or in the compiler aborting with a bounds violation.

8. The $CONTROL INIT option did not work on arrays mentioned in a DATA statement. If one array element was not initialized by a DATA statement and the two elements on either side were initialized by a DATA statement, that middle element sometimes contained garbage. The actual condition appears to be that garbage was produced for up to five words of uninitialized array elements bounded by initialized array elements.

9. Initialization code for double precision arrays was generating slightly incorrect addressing calculation code.

IMAGE/3000, HP 32215A.04.01

This article describes IMAGE/3000, HP 32215A.04.01 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN IMAGE/3000:

1. Formerly, a multiple reel DBUNLOAD would abort on some systems with the message "UNSUCCESSFUL EOF WRITE." This was caused by the "end of tape" condition being returned to DBUNLOAD when it was writing an end of file mark on the tape as part of its normal end of reel processing. This was incorrectly interpreted by DBUNLOAD as an error, leading to the abort.

RPG/3000, HP 32104A.02.05

This article describes RPG/3000, HP 32104A.02.05, as incorporated in MIT tape date coded 1623.

PROBLEMS SOLVED IN RPG/3000:

1. Only one IMAGE ISAM simulation in a data base was processed.

2. Only 340 compile time array records were processed.

3. An IMAGE DATA BASE NOT ENABLED (by DBLOCK) error occurred on an ADD to an IMAGE UPdate file in open mode 1.

4. A MOVEA (move array) of a constant to a variably indexed array resulted in a bounds violation.

5. Processing an RSAM file between limits could have resulted in a bounds violation.

6. A terminal was treated as a fixed length device. It may now be used as variable length.

SORT/3000, HP 32214B.01.00

This article describes Sort/3000, HP 32214B.01.00, as incorporated in MIT tape date coded 1623.

PROBLEMS SOLVED IN SORT/3000:

1. If SORT/3000 aborted in a JOB the job would continue to run. The appropriate bit in the Job Control Word (JCW) is now set to prevent the JOB from continuing to execute.

SPL/3000, HP 32100A.06.02

This article describes SPL/3000, HP 32100A.06.02 as incorporated into the MIT tape, date coded 1623.

PROBLEMS SOLVED IN SPL/3000:

1. EXTERNAL variables were not linked properly if the

first reference to such a variable was the first instruction in a code module and there was only one reference to the variable in the module. This has been corrected.

2. An XCH instruction was missing for an assignment statement if the left side contained an expression for the index value and the right side contained a type transfer function with a type LONG argument.

3. Certain syntax errors would cause the compiler to generate a USL file which caused the SEGMENTER to loop. This has been corrected.

4. A SEGMENT command which appeared after the outer block code began could cause the outer block to be incorrectly linked to the segment entry. This has been corrected.

5. A comment appearing in a DEFINE between a DEFINE IDENTIFIER and the equal sign was treated by the compiler as an error condition. This has been corrected.

6. A compare of the absolute value of a LONG variable with a constant resulted in the wrong addresses being loaded for the compare instruction. This has been corrected.

Enhancements/Modifications to SPL/3000

1. The opcodes are emitted for DOUBLE INTEGER multiply and DOUBLE INTEGER divide instead of generating calls to library routines as in previous levels of SPL.

2. The field width for the total number of errors and warnings listed at the end of a compile was insufficient if there were more than 999 errors or warnings. This has been modified to accommodate 9999 errors or warnings.

3. The NEW file was closed with unused space returned in all cases. The compiler has been modified to return unused space for such files only if the file did not exist before the compile started.

4. The MAP output for DEFINES was limited to one line. The compiler has been modified to list the definition in its entirety.

documentation

The following tables list currently available customer manuals for HP 3000 products. This list supersedes the list in the last issue of the **Communicator.**

The most recent changes to the tables are indicated for easy reference. Prices are subject to change without notice.

Copies of manuals and updates can be obtained from your local Sales and Service office. The address and telephone number of the office nearest to you are listed in the back of all customer manuals.

Update packages are free of charge. If you require an update package only, send your request to:

Software/Publications Distribution
5303 Stevens Creek Blvd.
Santa Clara, Ca. 95050

Customers in the U.S. may also order directly by mail. Simply list the name and part number of the manual(s) you need on the Corporate Parts Center form supplied at the back of the **Communicator.**

A few words about documentation terms:

New — A new manual refers only to the first printing of a manual. When first printed, a manual is assigned a part number.

Revised — A revised manual is a printing of an existing manual which incorporates new and/or changed information in its contents. For example, a manual is revised when an update package is incorporated into the manual: the manual gets a new print date and the update package disappears. Note that a revision to a manual effectively obsoletes the previous version of the manual.

Update — An update package is a supplement to an existing manual which contains new and/or changed information. Updates are issued when information must get to customers, yet it is inappropriate to issue a revised manual. An update has no part number, it is automatically included when you order the manual with which it is associated.

MPE/3000 MANUALS

PART NUMBER	3000 CX	SERIES II	MANUAL TITLE	PRICE	PUBLICATION DATE	CURRENT UPDATE
30000-90013	X	X	Console Operator's Guide	$ 7.00	6/76 *N	
32000-90004	X		Console Operator's Guide, 32000C MPE/30000	7.00	1/75	10/75
30000-90015		X	Error Messages and Recovery Manual	17.00	6/76 *N	
30000-90008		X	General Information Manual, HP 3000 Series II	6.50	6/76 *N	
03000-90096	X		General Information Manual, Multiprogramming Executive	4.00	11/73	
30000-90046		X	HP 3000 CX to HP 3000 Series II Program Conversion Guide	4.00	6/76 *N	
30000-90045		X	Index to MPE Reference Documents	5.50	6/76 *N	
32000-90002	X		MPE/3000 Reference Manual, 32000C	19.50	1/75	3/76
30000-90009		X	MPE Commands Reference Manual	12.50	6/76 *N	
30000-90010		X	MPE Intrinsics Reference Manual	15.00	6/76 *N	
30000-90011		X	MPE Segmenter Reference Manual	4.00	6/76 *N	
30000-90012		X	MPE Debug/Stack Dump Reference Manual	7.50	6/76 *N	
30000-90044		X	MPE System Utilities Reference Manual	5.00	6/76 *N	
32000-90008	X		MPE/3000 Operating System, System Utilities Manual	3.00	10/75	
30000-90049		X	Software Pocket Guide	3.50	6/76 *N	
03000-90126	X		Software Pocket Guide, HP 3000	3.50	7/75	
30000-90014		X	System Manager/System Supervisor Manual	10.00	6/76 *N	
32000-90006	X		System Manager/System Supervisor Manual, 32000C MPE/3000	13.00	10/75	
03000-90121	X	X	Using the HP 3000: A Guide for the Terminal User	7.50	6/75	

*N = New Manual (Refer to the Feature Article.)

LANGUAGE MANUALS

PART NUMBER	3000 CX	SERIES II	MANUAL TITLE	PRICE	PUBLICATION DATE	CURRENT UPDATE
30000-90026		X	BASIC Interpreter Reference Manual	$11.50	6/76 *N	
03000-90008	X		BASIC/3000 Interpreter Reference Manual	10.00	7/75	
03000-90050	X		BASIC/3000 Interpreter Pocket Guide	2.50	9/74	
32103-90001	X	X	BASIC/3000 Compiler Reference Manual	3.50	11/74	6/76
03000-90025	X	X	BASIC for Beginners	5.50	11/72	
32213-90001	X	X	COBOL/3000 Reference Manual	12.50	7/75	10/75
03000-90047	X	X	Cross Assembler for 2100 Computers Reference and Application Manual	12.00	5/76 *R	
30000-90040		X	FORTRAN Reference Manual	9.50	6/76 †N	
32102-90001	X		FORTRAN/3000 Reference Manual	13.50	3/76	
32104-90001	X	X	RPG/3000 Compiler Reference and Application Manual	16.50	2/75	
32104-90003	X	X	RPG Listing Analyzer	0.50	4/75	
03000-90002	X		SPL/3000 Reference Manual	7.50	11/73	
03000-90003	X		SPL/3000 Textbook	13.00	11/73	3/75
30000-90024		X	System Programming Language Reference Manual	15.00	6/76 *N	
30000-90025		X	System Programming Language Textbook	11.00	6/76 *N	

*N = New Manual (Refer to the Feature Article)
*R = Revised Manual
†Note: This is a new manual documenting the use of FORTRAN on HP 3000 Series II Computer Systems. The only change in FORTRAN between 3000 CX and 3000 Series II is four-word floating point available with Series II.

ADDITIONAL MANUALS

PART NUMBER	3000 CX	SERIES II	MANUAL TITLE	PRICE	PUBLICATION DATE	CURRENT UPDATE
30000-90047		X	2780/3780 Emulator Reference Manual	$ 8.50	6/76 *N	
30130-90001	X		2780/3780 Emulator Subsystem Reference and Application Manual	10.00	12/74	2/76
30000-90028		X	Compiler Library Reference Manual	12.00	6/76 *N	
03000-90009	X		Compiler Library Reference Manual, HP 3000	10.00	2/76	
30000-90050		X	Data Entry Library Manual	6.50	6/76 *N	
03000-90012	X	X	EDIT/3000 Reference Manual	7.50	8/75	6/76
03000-90064	X	X	FCOPY Reference Manual	6.00	6/76 *R	
30119-90009	X	X	HP 2894A Card Reader Punch Operating and Programming Manual	7.00	6/76 *N	
03000-90107	X	X	HP 3000 Cross Loader for HP 2100 Computer	11.00	10/74	6/76
36995-90013	X		IBM 1130/1800 to HP 3000 FORTRAN Conversion Guide	6.00	2/75	5/75
32104-90004	X		IBM System/3 to HP 3000 Conversion Guide	7.50	12/75	
30000-90041		X	IMAGE Data Base Management System Reference Manual	4.50	6/76 *N	
32215-90001	X		IMAGE/3000 Reference Manual	7.00	3/76	
30000-90057		X	Instruction Decoding Pocket Guide	1.00	6/76 *N	
30209-90008		X	Line Printer Operating and Programming Reference Manual	6.00	6/76 *N	
30000-90022		X	Machine Instruction Set Reference Manual	7.00	6/76 *N	
30000-90066		X	Programmable Controller Reference and Application Manual	6.00	6/76 *N	
30300-90002	X		Programmable Controller Reference and Application Manual	12.00	2/75	4/76
30000-90042		X	QUERY Reference Manual	6.50	6/76 *N	
32216-90001	X		QUERY/3000 Reference Manual	7.00	3/76	
30000-90067		X	Real-Time Programmable Controller Reference and Application Manual	7.50	6/76 *N	
30301-90002			Real-Time Programmable Controller Reference and Application Manual	9.50	2/75	
30000-90027		X	Scientific Library Reference Manual	5.00	6/76 *N	
03000-90010	X		Scientific Library Reference Manual, HP 3000	7.00	7/75	
30000-90016		X	Site Preparation Manual	6.00	6/76 *N	
30000-90017		X	Site Planning Workbook, HP Computer System	10.00	6/76 *N	
32214-90001	X	X	Sort/3000 Reference Manual	6.50	4/75	6/76
03000-90011	X		STAR/3000 (Statistical Analysis Routines) Reference Manual	5.50	11/72 *O	
32901-90001	X	X	Student Assignment System Reference Manual	10.00	7/75	6/76
32901-90005	X	X	Student Assignment System -- Technical Manual	13.00	7/75	
32900-90001	X	X	Student Information System Reference Manual	18.00	9/74	6/76
32900-90002	X	X	Student Information System -- System Overview	7.00	9/74	
32900-90005	X	X	Student Information System -- Technical Manual	18.50	3/75	
30000-90020		X	Systems Reference Manual	9.50	6/76 *N	
03000-90019	X		Systems Reference Manual, HP 3000 Computer	14.00	9/73	
03000-90015	X	X	Trace/3000 Reference Manual	4.00	6/76 *R	

*N = New Manual (Refer to the Feature Article.)
*R = Revised Manual
*O = Obsolete Manual

training schedule

The schedule for customer training courses on General Systems Division products is outlined below, and in the 2000 Access section of this publication. Included here are HP 3000 software courses offered in the U.S. for the period July through December, 1976 and in Europe, for the period July through August, 1976. You can also obtain a copy of the schedule from your local HP sales office. A European course schedule is available through the sales offices in Europe; a U.S. schedule through U.S. sales offices.

The schedule for customer training courses on General Systems Division products is outlined below, and in the 2000 Access section of this publication. Included here are HP 3000 software courses offered in the U.S. and in Europe, for the period May through August, 1976. You can also obtain a copy of the schedule from your local HP sales office. A European course schedule is available through the sales offices in Europe; a U.S. schedule through U.S. sales office.

Registration

Requests for enrollment in any of the courses should be made through your local HP Sales Office. Your Sales Representative will supply the Training Registrar at the appropriate location with the course number, dates, and requested motel reservations. Enrollments are acknowledged by a written confirmation indicating the training course, time of class, location and accommodations reserved.

GENERAL SYSTEMS DIVISION COURSE SCHEDULE (U.S.)

July – December 1976 — Course Dates and Training Center Location

NUMBER	COURSE TITLE	LENGTH	PRICE	GENERAL SYSTEMS SANTA CLARA	EASTERN TRAINING CENTER – ROCKVILLE
22801A	3000 Series II, A Comprehensive Introduction (Replaces 22962A)	5 days	$500	7/19/76 8/2/76 8/30/76 9/27/76 11/1/76 11/29/76	7/12/76 8/2/76 8/16/76 9/20/76 11/1/76 12/13/76
22802A	3000 Series II, System Management and Operation (Replaces 22964A)	4 days	400	7/6/76 7/26/76 8/9/76 9/7/76 10/4/76 11/8/76 12/6/76	7/19/76 8/23/76 9/27/76 11/8/76 12/20/76
22803A	3000 Series II, Advanced Usage	5 days	500	10/18/76	10/18/76 11/29/76
22804A	3000 Series II, SPL (Systems Programming Language)	5 days	500	10/25/76	10/25/76 12/6/76
22956A	3000 IMAGE	5 days	500	7/12/76 8/16/76 10/11/76 11/15/76 12/13/76	7/26/76 10/4/76 11/15/76
22957A	3000 COBOL, Audio Self Study	30 hrs.	325	These courses can be ordered using the Direct Mail Order form in the back of the **Communicator**.	
22958A	3000 BASIC, Audio Self Study	30 hrs.	325		
22975A	System 3 Conversion Seminar	2 days	200	8/23/76 11/22/76	

Accommodations

Students provide their own transportation, meals, and lodging. The Training Registrar will be pleased to assist in securing motel reservations at the time your Sales Office requests a registration.

Cancellations

In the event you are unable to attend a class for which you are registered, please notify the Training Center Registrar immediately in order that we may offer your seat to another student. To avoid paying for a reservation which you do not use, we must receive notification of your cancellation no later than two weeks before the class begins.

GENERAL SYSTEMS DIVISION COURSE SCHEDULE (EUROPE)

July – August 1976

COURSE NUMBER	COURSE TITLE	LENGTH	BOBLINGEN (GERMAN)	WINNERSH (ENGLISH)	ORSAY (FRENCH)	MILAN (ITALIAN)	STOCKHOLM (ENGLISH)
22962A	3000 Commercial/ Business User	5 days	8/9				8/30
22963A	3000 Scientific/ Engineering User	5 days					
22964A	3000 System Management	3 days					

Training Center Addresses

Santa Clara
5303 Stevens Creek Blvd.
Santa Clara, California 95050
(408) 249-7020

Rockville
4 Choke Cherry Road
Rockville, Maryland 20850
(301) 948-6370

Winnersh
King Street Lane
Winnersh, Wokingham
Berks RG11 5 AR
Tel: Wokingham 784774
Cable: Hewpie London
Telex: 847178 9

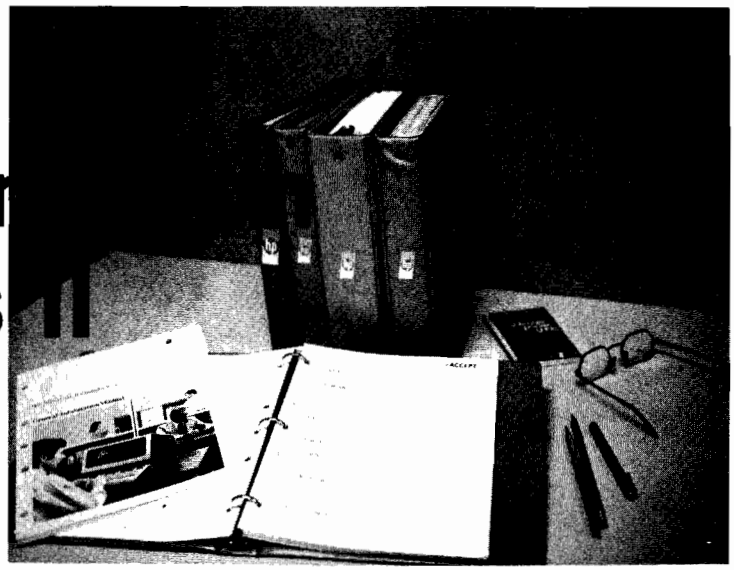
Orsay
Quartier de Courtaboeuf
Boite postale No. 6
F-91401-Orsay
France
Tel: (1) 907 78 25
Cable: HEWPACK Orsay
Telex: 60048

Boblingen
Kundenschulung
Herrenbergerstrasse 110
D-7030 Böblingen, Wurttemberg
Tel: (07031) 667-1
Telex: 07265739
Cable: HEPAG

Milan
Via Amerigo Vespucci, 2
1-20124 Milan
Tel: (2) 62 51
Cable: HEWPACKIT Milano
Telex: 32046

Stockholm
Enighetsvägen 1-3, Fack
S-161 20 Bromma 20
Tel: (08) 730 05 50
Cable: MEASUREMENTS
Stockholm Telex: 10721

featuring — new documer for the series II



Last month's introduction of the HP 3000 Series II Computer System brought with it an expanded and improved set of software documentation. In preparing for the release of the Series II we carefully reevaluated the entire set of software manuals from the standpoint of those who must use them. Some of the manuals (such as the EDIT and SORT manuals) survived this scrutiny well; others (such as the FCOPY manual) did not and consequently were rewritten entirely.

MPE-II DOCUMENTATION

The most significant result of this reevaluation is the approach used in describing the operating system. In the past we had attempted to describe all aspects of MPE in three manuals: a reference manual, a system manager/system supervisor manual, and a console operator's guide. As might be expected, the reference manual started off as a large document and with each new enhancement to MPE became more and more bulky and thus more difficult to use. The many new capabilities of MPE-II threatened to expand the size of the reference manual out of all practical proportions.

The MPE-II programming reference material has been divided among six manuals, as follows:

- HP 3000 Series II General Information Manual
- MPE Commands Reference Manual
- MPE Intrinsics Reference Manual
- MPE Segmenter Reference Manual
- MPE Debug/Stack Dump Reference Manual
- MPE System Utilities Manual

Each has its own index and a discussion of all pertinent error messages. In addition, however, there is also a separate manual which serves as a combined master index for all of the MPE-II manuals and another which presents all of the error messages (and their associated recovery actions) generated by MPE-II and its language and utility subsystems.

Besides the superficial reorganization of one manual into five, each MPE-II manual (including the ***System Manager/System Supervisor Manual*** and the ***Console Operator's Guide***) has been organized internally in an innovative fashion which makes it suitable for both quick reference and tutorial study. An early chapter of each manual summarizes all commands or intrinsics (arranged alphabetically). The remainder of the manual is arranged by functional operation. Each functional operation may include more than one command or intrinsic. The summary sheets contain a cross reference to the relevant functional descriptions later in the manual.

HOW TO ORDER MANUALS

The block diagram on the following page shows all of the available software manuals for the HP 3000 Series II. When a customer buys an HP 3000 Series II Computer System he receives one copy of each manual that applies to his particular system. Extra copies of individual manuals can be ordered by manual part number. To facilitate the ordering of sets of manuals, a standard manual package (product number 30381A) with three options (600, 601, and 602) has been devised. The content of this package and its options is as follows:

30381A

Using the HP 3000: A Guide for the Terminal User	03000-90121
HP 3000 Series II General Information Manual	30000-90008
MPE Commands Reference Manual	30000-90009
MPE Intrinsics Reference Manual	30000-90010
MPE Segmenter Reference Manual	30000-90011
MPE Debug/Stack Dump Reference Manual	30000-90012
MPE System Utilities Manual	30000-90044

Index to MPE Reference Documents	30000-90045
Error Messages and Recovery Manual	30000-90015
System Manager/System Supervisor Manual	30000-90014
Console Operator's Guide	30000-90013
HP 3000 Software Pocket Guide	30000-90049
System Reference Manual	30000-90020
Machine Instruction Set Reference Manual	30000-90022
Systems Programming Language Reference Manual	30000-90024
Systems Programming Language Textbook	30000-90025
HP 3000 Symbol Trace Reference Manual	03000-90015
Sort/3000 Reference Manual	32214-90001
FCOPY Reference Manual	03000-90064
EDIT/3000 Reference Manual	03000-90012
HP 3000 Compiler Library Reference Manual	30000-90028

30381A-600

BASIC Interpreter Reference Manual	30000-90026
BASIC/3000 Compiler Reference Manual	32103-90001
BASIC for Beginners	03000-90025

30381A-601

FORTRAN Reference Manual	30000-90040
HP 3000 Scientific Library Reference Manual	30000-90027

30381A-602

IMAGE Reference Manual	30000-90041
QUERY Reference Manual	30000-90042
COBOL/3000 Reference Manual	32213-90001
RPG/3000 Compiler Reference and Application Manual	32104-90001
RPG Listing Analyzer	32104-90003
Data Entry Library Reference Manual	30000-90050

HP 3000 SERIES II GENERAL INFORMATION MANUAL

Dave Eicher
HP General Systems

The HP 3000 Series II General Information Manual introduces you to the concepts and capabilities of the HP 3000 Series II computer system. Included in the manual are discussions of:

- The overall system features.
- The hardware features.
- The Multiprogramming Executive II (MPE-II) operating system features.
- The programming languages (COBOL, RPG, FORTRAN, BASIC, and SPL).
- The utility programs (EDIT, FCOPY, SORT, Compiler Library, Scientific Library, TRACE, and Data Entry Library).
- The data base management facilities (IMAGE and QUERY).
- The data communciations facilities (2780/3780 Emulator, Real-Time Programmable Controller, and Programmable Controller).

Appendices to the manual summarize the MPE-II commands and intrinsics, the entire set of HP 3000 Series II documentation, and the HP 3000 Series II machine instruction set.

Title: HP 3000 Series II General Information Manual
Part #: 30000-90008
Price: $6.50

MPE COMMANDS REFERENCE MANUAL

Dix McGuire
HP General Systems

The MPE Commands Reference Manual for the HP 3000 Series II Computer system explains how to issue MPE commands to control the processing of programs. Included are specific instructions for:

- initiating interactive sessions and batch jobs for processing programs.
- managing files used by the programs
- compiling, preparing and running the programs.
- determining the status of sessions, jobs, files, devices, and other elements.
- performing various utility functions.

As an aid in debugging, the manual also explains the command-related diagnostic messages that are issued by the operating system.

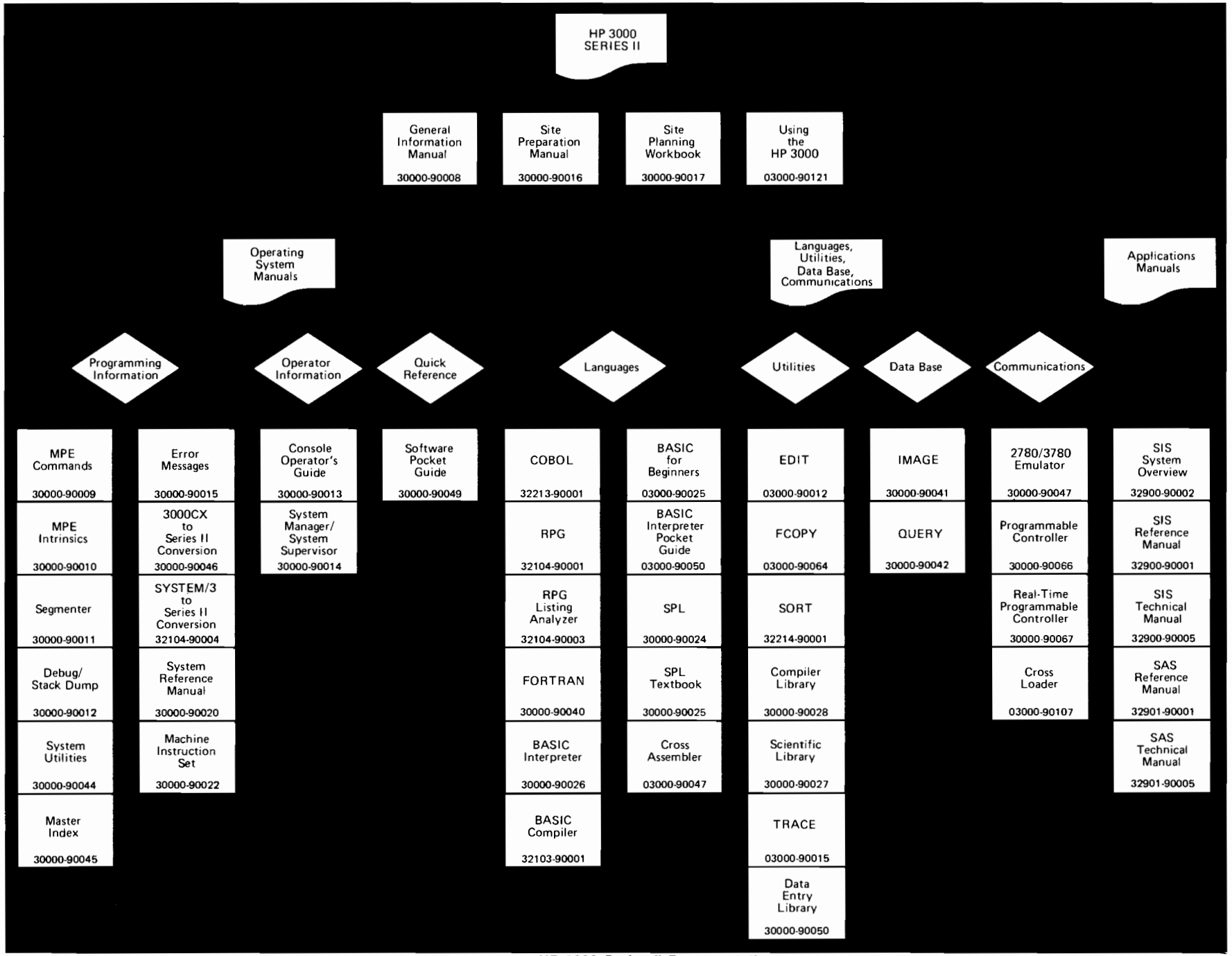
The manual employs two approaches in describing MPE commands and operations -- ***reference specifications*** and ***text discussion.***

The reference specifications cover the rules for entering each command, showing the command syntax and format, parameters, and examples illustrating proper command entries.

The text discussion explains the functions available through MPE and how to request them through sequences of commands.

The command reference specifications are arranged in alphabetical order and contain cross references to all associated material in the text discussion.

Title: MPE Commands Reference Manual
Part #: 30000-90009
Price: $12.50



HP 3000 Series II Documentation

MPE INTRINSICS REFERENCE MANUAL

Hal Goodwin
HP General Systems

MPE intrinsics, which were described in the MPE Reference Manual, now are covered in a separate manual.

Specifications for all intrinsics are grouped in Section II of the new manual, in alphabetical order. Descriptions covering the use of the intrinsics are arranged elsewhere in the manual in functional order. SPL programs are provided which demonstrate using the intrinsics in various applications.

The HP part number is 30000-90010 and the price is $15.00.

MPE SEGMENTER REFERENCE MANUAL

Hal Goodwin
HP General Systems

A more thorough discussion of the MPE Segmenter is available now in a manual covering this subsystem only. (Previously, the Segmenter was discussed in the MPE Reference Manual.)

The new manual is more user-oriented, and practical examples are provided which show specific applications of the Segmenter. The HP part number of the new manual is 30000-90011 and the price is $4.00.

DEBUG/STACK DUMP REFERENCE MANUAL

Joan Martin
HP General Systems

This manual describes the Debug/Stack Dump facilities provided as part of the Multi-Programming Executive (MPE) operating system. With the interactive program DEBUG, you can establish breakpoints, display and modify the data stack, and display code in any program running under MPE control. The stack/dump commands and intrinsics allow you to list the current contents of the data stack at any point in an executing program or when the program terminates abnormally. In both facilities, you can trace the stack markers to determine the location of the top of the stack, the Q register, the P register, and the logical code segment index.

The commands and intrinsics used by Debug/Stack Dump are described briefly in a reference format. These descriptions are followed by a detailed discussion of how to use the Debug facility to find errors in an executing program, and of how to use the Debug facility to find errors in an executing program, and of how to use the Stack Dump facility to list, trace, and analyze the data stack. Many examples are included in this discussion together with instruction in how to locate stack addresses from maps generated during program compilation and preparation.

Title: Debug/Stack Dump Reference Manual
Part #: 30000-90012
Price: $7.50

MPE SYSTEM UTILITIES REFERENCE MANUAL

Dix McGuire
HP General Systems

A new MPE System Utilities Reference Manual documents the ten MPE utility programs available on the HP 3000 Series II Computer system.

The utility programs are:

SADUTIL	Performs various disc operations, including copying disc files to tape for later retrieval.
RECOVER2.PUB.SYS	Recreates, on disc, files copied to tape by SADUTIL.
DPAN2.PUB.SYS	Prints analytical, formatted listing of main memory dump.
LISTLOG2.PUB.SYS	Prints listing of MPE Log File contents.
LISTEQ2.PUB.SYS	Lists :FILE commands and session/job temporary files used during current session/job.
DISKED2.PUB.SYS	Modifies and lists contents of disc files.
FREE2.PUB.SYS	Prints histograms of available space on each disc in system, and total number of entries in Free-Space Table for discs.
LISTDIR2.PUB.SYS	Lists attributes of accounts, groups, users, and files.
PATCH.PUB.SYS	Displays or modifies contents of program file.
SLPATCH.PUB.SYS	Displays or modifies contents of segmented library (SL) files.

Each program is fully documented, describing the syntax for each function, and including examples for each procedure.

Title: MPE System Utilities Reference Manual
Part #: 30000-90044
Price: $5.00

SYSTEM ERROR MESSAGES, AND RECOVERY REFERENCE MANUAL

Joan Martin
HP General Systems

All the error messages and/or error codes issued during operation of the HP 3000 system programs are collected together in this manual. It includes messages issued by MPE

and the utility programs offered with MPE such as EDIT/3000, FCOPY, the Segmenter, and the Compiler Library; messages from the HP 3000 languages: SPL, FORTRAN, COBOL, RPG, and BASIC; from the Data Base Management programs IMAGE and QUERY; from Data Communications programs; and the messages sent to the system console for the console operator and the system supervisor.

An attempt has been made to provide not only a description of the error causing each message, but also suggested action to take in order to correct the error. The manual concludes with a numeric index to all error codes issued by the system, and an alphabetic index to all messages.

This manual is a new concept in HP 3000 documentation. We will continue to improve and expand the manual as we obtain more recovery information. One of the best sources for such information is system users, so we are hoping to receive comments and suggestions from you about recovery procedures as well as any suggestions on ways to improve the manual in general.

The HP part number is 30000-90015 and the price is $17.00

INDEX TO MPE REFERENCE DOCUMENTS

Hal Goodwin
HP General Systems

An Index to MPE Documents is available.

Topics from the following MPE user manuals are arranged in alphabetical order in this master index:

MPE Commands Reference Manual
MPE Intrinsics Reference Manual
MPE Segmenter Reference Manual
MPE Debug/Stack Dump Reference Manual
HP 3000CX to Series II Program Conversion Guide
Console Operator's Guide
System Manager/System Supervisor Manual
MPE System Utilities Manual

The master index was entered on HP 2644 tape cassettes, which can be updated off-line, then read into a file and sorted using SORT/3000.

We welcome all comments you may have concerning the index so that your suggestions can help to make this a very useful document.

The HP part number is 30000-90045 and the price of the index is $5.50.

CONSOLE OPERATOR'S GUIDE

Barbara Lewis
HP General Systems

A new edition of the Console Operator's Guide for the HP 3000 Series II Computer System is now available. It contains step-by-step instructions on how to initialize and monitor operations of the MPE Operating System and how to request various operations through the MPE console.

The following features have been added to this new edition to make the job of the console operator easier:

- Operator commands presented alphabetically by command name with examples of each command in use.
- Step-by-step procedures needed to perform the functions of a Console Operator in the day-to-day operation of the system.
- Descriptions of the error and system failure messages with suggested recovery procedures for each.
- Step-by-step procedures on how to run the microprogrammed diagnostics to test the CPU registers, memory, and the I/O channels.

Title: Console Operator's Guide
Part #: 30000-90013
Price: $7.00

SYSTEM MANAGER/SYSTEM SUPERVISOR MANUAL

Barbara Lewis
HP General Systems

Here is a new edition of a manual for users assigned the System Manager, Account Manager, or System Supervisor capabilities.

This new edition includes the following features:

- An abbreviated introduction of how to enter commands and invoke commands programmatically.
- All MPE commands (which are available to System Managers, Account Managers, and System Supervisors) presented alphabetically by command name.
- Significant points that a user with System Manager, Account Manager, and System Supervisor capabilities may find useful.
- A detailed discussion of the functions that a Manager or Supervisor of an HP 3000 system may need to know, such as, creating, changing, or deleting accounts, configuring and initializing the system, managing the MPE scheduling queue and system logging facility, etc.

Title: System Manager/System Supervisor Manual
Part #: 30000-90014
Price: $10.00

SOFTWARE POCKET GUIDE

Mary Eicher
HP General Systems

The new HP 3000 Series II Software Pocket Guide contains instant references to commonly used system commands and intrinsics. Helpful parameter and format information for EDIT, DEBUG, Segmenter, 2780/3780 Emulator, FCOPY, and the file systems is also provided in the guide. SORT/MERGE data and a handy thumb index have been added to this latest issue which is spiral bound for additional convenience.

The manual Part Number is 30000-90049 and the price is $3.50.

HP 3000CX TO HP 3000 SERIES II PROGRAM CONVERSION GUIDE

Dix McGuire
HP General Systems

A conversion guide is available to help users who are converting programs and data files created on HP 3000 CX Computer systems for use on HP 3000 Series II Computer systems.

This manual defines the operational differences that exist in the following system components:

- Multiprogramming Executive (MPE) Operating System
- FORTRAN Compiler
- SPL Compiler
- BASIC Compiler and Interpreter
- IMAGE Data Base Management System

These components are the only ones that present significant conversion differences between the two systems. Except for the differences noted in the Conversion Guide, programs and data files produced on any HP 3000 CX Computer system should be generally usable without modification on any HP 3000 Series II Computer system (provided that all input/output devices required by the programs and data are connected on-line).

Title: HP 3000CX to HP 3000 Series II Program Conversion Guide
Part #: 30000-90046
Price: $4.00

SYSTEM PROGRAMMING LANGUAGE REFERENCE MANUAL

Greg Gloss
HP General Systems

A new SPL (Systems Programming Language) Reference Manual is now available for the HP 3000 Series II Computer System. In addition to describing the language in an easy-to-read format, the new manual covers input/output using the MPE intrinsics with several complete sample SPL programs. Additionally, all compiler diagnostics are fully explained.

Title: Systems Programming Language Reference Manual
Part #: 30000-90024
Price: $15.00

DATA ENTRY LIBRARY MANUAL

Dix McGuire
HP General Systems

A manual describing the new Data Entry Library for the HP 3000 Series II system is now available.

Data Entry Library (DEL/3000) is a set of programs and procedures that simplify forms design, data entry, and data editing using HP 2640A and HP 2644A terminals.

The manual shows you how to:

- create and store various forms such as purchase orders, billing forms, etc.
- display the forms on your terminal, and modify them as desired
- write programs that call DEL subroutines to display the forms on the terminal, accept data entered to the forms, and edit the data. Optionally, these programs can also store the edited data in data files on the system.

Your user-written programs can be written in COBOL, FORTRAN, BASIC, or Systems Programming Language (SPL).

The manual part number is HP 30000-90050 and the price is $6.50.

FCOPY REFERENCE MANUAL

Dave Eicher
HP General Systems

A completely new edition of the FCOPY Reference Manual is now available. This new edition, which applies to both the HP 3000CX and the HP 3000 Series II, includes the following features:

- Expanded descriptions of the FCOPY functions with many syntax examples.
- Thirteen fully annotated examples showing how to use FCOPY in jobs and sessions. All user input and resulting list output are shown. All of the examples were tested at the factory before being included in the manual.
- Expanded descriptions of the FCOPY error and warning messages with a suggested recovery action for each.
- An appendix describing how to use FCOPY in conjunction with the HP 2644A Mini Data Station peripherals (HP 3000 Series II only).
- An appendix specifying the default file characteristics that are used for each type of device if the characteristics have not been explicitly defined in MPE :FILE commands.

Title: FCOPY Reference Manual
Part #: 03000-90064
Price: $6.00

HP 3000 SERIES II SYSTEM REFERENCE MANUAL

Hal Goodwin
HP General Systems

A system reference manual for the HP 3000 Series II Computer System is available.

The system reference manual provides theory of operation information for the Series II system, as follows:

- System-level functional operation.
- Operation of the stack.
- Theory of operation for hardware elements.
- Interrupts.
- Input/output.

The HP part number is 30000-90020 and the price is $9.50.

MACHINE INSTRUCTION SET REFERENCE MANUAL

Gene Brittain
HP General Systems

The HP 3000 Series II Machine Instruction Set Reference Manual contains a description for each of the 209 unique firmware instructions which control the CPU and I/O processes of the HP 3000 Series II Computer Systems.

- Section I contains information on the traps and interrupts, condition codes, and instruction formats used in the descriptions.
- The instruction descriptions are grouped by their operational characteristics in Sections II and III.
- An index at the front of the manual is a group-by-group index, alphabetical within each group.
- The appendix contains an alphabetical index of all instructions.

Title: HP 3000 Series II Machine Instruction Set Reference Manual
Part #: 30000-90022
Price: $7.00

NEW SITE PREPARATION MANUAL AND HP COMPUTER SYSTEM SITE PLANNING WORKBOOK

Gerry Graham
HP General Systems

This manual provides the customer with the information and directions for selecting and preparing the site for installation of the HP 3000 Series II Computer System. In addition, the manual furnishes information that will enable the customer to plan for expansion of an existing system.

A planning summary is included that outlines the main steps of the site planning process. This summary, used in conjunction with accompanying data tables, also guides the site planning team through a step-by-step, "fill-in-the-blanks" procedure for calculating air conditioning and electrical power requirements.

The ***Site Preparation Manual*** is intended to be used together with the ***HP Computer System Site Planning Workbook.*** The workbook contains template sheets of scaled outlines of the computer system components that can be cut out and arranged on a mylar grid sheet to aid in planning the floor layout. There is also an Installation Planning Checklist to channel the planning efforts and a Site Completion Verification Form to help ascertain that the site is ready to receive the computer system at shipment time.

The ***HP 3000 Series II Computer System Site Preparation Manual*** part number is 30000-90016 and the price is $6.00. The ***HP Computer System Site Planning Workbook*** part number is 30000-90017 and the price is $10.00.

LINE PRINTER OPERATING AND PROGRAMMING REFERENCE MANUAL

Sandy Martensen
HP General Systems

Operating instructions and programming information for the four line printer subsystems available with the HP 3000 Series II computer system are provided in this new manual. The line printers are:

- HP 2607A
- HP 2613A
- HP 2617A
- HP 2618

The operating instructions for the 2607A and 2618A appear in separate sections but one section covers the 2613A and 2617A which are very similar. Programming information for all four line printers is provided in one section with examples of FORTRAN, COBOL, SPL, and BASIC programs. Special considerations for RPG programs are also discussed.

Information about supplies and maintenance, carriage control tapes, and configuration of the line printers in the MPE system is included. Tables in the appendix summarize the line printer specifications. An index is provided for each line printer and a thumb guide just inside the cover enables you to quickly locate the appropriate operating instructions.

Title: HP 3000 Series II Line Printer Operating and Programming Reference Manual
Part #: 30209-90008
Price: $6.00

software tips

ACCESSING SSGA FROM FORTRAN

Mark Solle
HP/Neely, Fullerton

A user has requested a solution for accessing SSGA from Fortran. I hope the following utility program will solve your requirement. It is not very elegant, but it does work.

```
0001                    ASMB,L
0002  00000                     NAM LABLD,30   UTILITY SSGA AREA  4 7 76  MGS
0003                            ENT LABLD
0004*
0005*
0006*       THIS UTILITY MUST BE INCORPORATED AT SYSGEN TIME
0007*       IT IS USED TO CREATE A SSGA AREA FOR USE AS OWNED
0008*       COMMON BY A FORTRAN PROGRAM OR SET OF FORTRAN
0009*       PROGRAMS
0010*       YOU MAY ADJUST THE SIZE AS REQUIRED
0011*
0012  00000 000000  LABLD BSS 64
0013                            END
**  NO ERRORS *TOTAL **RTE ASMB 750420**
```

```
0001                    ASMB,L
0002  00000                     NAM GTSSG,7       GET SSG VARIABLE   MGS  760408
0003                            ENT GTSSG
0004                            EXT LABLD,.ENTR
0005*
0006*       THIS ROUTINE CAN BE USED TO RETRIEVE INFOR FROM
0007*       A SSGA BLOCK FROM A FORTRAN CALLING PROGRAM
0008*
0009  00000 000000  VALUE NOP             VALUE
0010  00001 000000  ADDRS NOP             INDEX # OF SSGA WORD
0011  00002 000000  GTSSG NOP
0012  00003 016002X       JSB .ENTR
0013  00004 000000R       DEF VALUE
0014  00005 162001R       LDA ADDRS,I     GET INDEX #
0015  00006 042022R       ADA =B-1         RESET INDEX FOR 0 RELATIVE
0016  00007 066021R       LDB LABAD       GET INDIRECT DEF OF LABLD
0017  00010 006020        SSB             IS IT INDIRECT?
0018  00011 026016R       JMP NUTS        YES,GO FIX IT UP
0019  00012 040001  GO    ADA B           NO--PROCEED
0020  00013 164000        LDB A,I         GET IT
0021  00014 176000R       STB VALUE,I     PUT IT IN CALLERS BUFFER
0022  00015 126002R       JMP GTSSG,I
0023*
0024  00016 005423  NUTS  BLR,RBR         CLEAR THE INDIRECT BIT
0025  00017 164001        LDB B,I
0026  00020 026012R       JMP GO
0027*
0028  00021 000001X LABAD DEF LABLD       ADDRES OF LABELED SSGA
0029  00000         A     EQU 0
0030  00001         B     EQU 1
      00022 177777
0031                            END GTSSG
**  NO ERRORS *TOTAL **RTE ASMB 750420**
```

```
0001                    ASMB,L
0002  00000                   NAM PTSSG,7      PUT SSG VARIABLE   MGS  760408
0003                          ENT PTSSG
0004                          EXT LABLD,.ENTR
0005*
0006*     THIS ROUTINE CAN BE USED TO STORE    INFOR TO
0007*     A SSGA BLOCK   FROM A FORTRAN CALLING PROGRAM
0008*
0009*     CALLING SEQUENCE:  CALL PTSSG(VALUE,SSGA ARRAY INDEX #)
0010*
0011*     IE  CALL PTSSG(105,2)   PUTS INTEGER 105 IN WORD #2 OF SSGA
0012*
0013*
0014  00000 000000  VALUE NOP             VALUE OF DATA WORD
0015  00001 000000  ADDRS NOP             INDEX # OF SSGA WORD
0016  00002 000000  PTSSG NOP
0017  00003 016002X       JSB .ENTR
0018  00004 000000R       DEF VALUE
0019  00005 162001R       LDA ADDRS,I    GET INDEX #
0020  00006 042022R       ADA =B-1        RESET INDEX FOR 0 RELATIVE
0021  00007 066021R       LDB LABAD      GET DEF OF LABLD
0022  00010 006020        SSB            IS IT INDIRECT?
0023  00011 026016R       JMP NUTS       YES,GO FIX IT UP
0024  00012 040001  GO    ADA B          NO--PROCEED
0025  00013 166000R       LDB VALUE,I    GET IT
0026  00014 174000        STB A,I    PUT IT IN SSGA
0027  00015 126002R       JMP PTSSG,I
0028*
0029  00016 005423  NUTS  BLR,RBR         CLEAR THE INDIRECT BIT
0030  00017 164001        LDB B,I        GET REAL ADDRESS
0031  00020 026012R       JMP GO         PROCEED
0032*
0033  00021 000001X LABAD DEF LABLD      ADDRES OF LABELED SSGA
0034  00000           A     EQU 0
0035  00001           B     EQU 1
      00022 177777
0036                        END PTSSG
**  NO ERRORS *TOTAL **RTE ASMB 750420**
```

PROGRAMMING WITH FMGR MACROS

Jim Bridges
HP Data Systems

Several commands, which are processed by the RTE FMGR program (92002-12001), are elements of a high level programming language. For example, the CA command (CALCULATE) can perform arithmetic and logical operations on variables stored in a local array (GLOBAL parameters). The IF command permits a computed branch forward or backward in a file. The TR command provides a "subroutine call" with forward and backward parameter passing often. A user who might otherwise write a utility program in FORTRAN can perform the same functions by command files submitted to FMGR.

The following examples will illustrate some of the powers of FMGR macros, especially when they are incorporated into a job (submitted to the program "JOB") which takes advantage of spool files:

1. You have a magnetic tape with a large number of files (more than 100). Each file is the source code (assume HP Assembly language) for a library routine. The exact contents of the tape are unknown. You wish to store each routine into a file with *NAME* xxxxx, where xxxxx is the symbol taken from the NAM record in the source. (You could, of course, do this by storing a file under a temporary name, examining it with the EDITR and then renaming it. However, you would have to repeat this for each file.)

The entire task could be accomplished in one pass, but it is broken up to make it easier to follow. On the first pass, you would store each routine under a *NAME* of the form AAANNN, where AAA are any three alpha characters and NNN is a number beginning with 000 and is incremented by one for each routine stored. To do this, you would transfer control to the file named "STORE" as follows:

```
:TR,STORE,LIBRY
```

where LIBRY is the name we have chosen to name the

succession of files. Only the first three characters will be used and so the files will be named LIB000, LIB001, LIB002, etc. The file STORE is:

Note: The comments after the lines in the file (preceded by asterisks) are not part of the file itself.

```
:SV,1
:CA,9,@@@ZZZ,X.???ZZZ,A,1G                  * ELIMINATE PRINTOUT
:CA,7,0                                      * MASK OF TOP 3 CHARS, SET IN 9G
:TR,D100,7G                                  * SET COUNTER TO 0
:CA,8,ZZZ@ZZ,X,ZZZ?ZZ,A,1G,0,9G              * GET 100'S ASCII DIGIT
:TR,D10,7G                                   * MERGE WITH NAME, SET IN 8G
:CA,8,ZZZZ@Z,X,ZZZZ?Z,A,1G,0,8G              * GET 10'S ASCII DIGIT
:TR,D1,7G                                    * MERGE WITH NAME, REPLACE 8G
:CA,8,ZZZZZ@,X,ZZZZZ?A,1G,0,8G               * GET 1'S ASCII DIGIT
:ST,8,8G::::-1                               * MERGE WITH NAME, REPLACE 8G
:LI,8G,D                                     * STORE FROM MAG TAPE IN FILE
:CA,7,7G,+,1                                 * IF DOUBLE FILE MARK, STOP HERE
:IF,,EQ,,-10                                 * INCREMENT COUNTER
::          *WAIT FOR MAG TAPE ERROR TO INDICATE END OF ROUTINES *  * GO BACK TO LINE 4
  @ @
```

THE FILE D100 IS:

```
:CA, 1, 1G,/,100                             * GET 100'S DIGIT FROM COUNTER
:IF,1G,EQ,0,1                                * CAN'T SKIP < 1 SO WE CHECK FOR ZERO
:IF,,EQ,,1G                                  * DO TABLE LOOP-UP AND RETURN
::,000000X                                   * NOTE THAT "X" ON END MEANS ASCII
::,000100X                                   * IF IT WEREN'T THERE, IT WOULD BE
::,000200X                                   * NUMERIC. AFTER RETURN, WE WILL MASK
::,000300X                                   * OFF THE ASCII ZEROS WE DON'T WANT
::,000400X
::,000500X
::,000600X
::,000700X
::,000800X@@@@
::,000900X
::
```

THE FILE D10 IS SIMILAR

```
:CA,2,1G,/,100,*,100
:CA,1,1G,-,2G,/,10@@
:IF,1G,EQ,0,1
:IF,,EQ,,1G
::,000000X
::,000010X
::,000020X
::,000030X
::,000040X
::,000050X
::,000060X
::,000070X
::,000080X
::,000090X
::
```

THE FILE D1 IS ALSO SIMILAR TO D100

```
:CA,2,1G,/,100,*,100
:CA,3,1G,-,2G,/,10,*,10
:CA,1,1G,-,2G,-,3G
:IF,1G,EQ,0,1
:IF,,EQ,,1G
::,000000X
::,000001X
::,000002X
::,000003X
::,000004X
::,000005X
::,000006X
::,000007X@@
::,000008X
::,000009X
::
```

The parameters passed by the TR command are always placed in the GLOBALS 1G, 2G etc., according to how many there are. The ":," is an abbreviated form of the command TR,-1, which returns to the previous file (the CALLER).

2. You have 178 library routines on magnetic tape, then you get a parity error at the end. You can use this as a clue that there are no more routines on the tape, or perhaps you may find a double file mark (a null file).

When the FMGR encounters no input for a particular file (for example LIB178), it will not create any file on disc with that name. Therefore, it will cause an error break at the command :LI,8G,D.

In any event, knowing that you have 178 files (LIB000 to LIB177) you incorporate this number into the file RENAME shown below.


```
:JOB,LISTER
:SV,2                          * NEED SEVERITY CODE OF 2 TO PREVENT FMGR 015 ON MS
                                 COMMAND
:LU,8,COMS,ST                  * COMMAND FILE FOR EDITR
:LU,4,NAMES,BOST               * SCRATCH FILE TO HOLD COMMAND CREATED BY EDITR
:CA,1,LIB000                   * WE START WITH THIS FILE
:CA,9,@@@ZZZ,X,???ZZZ,A,1G     * KEEP TOP 3 CHARACTERS ONLY
:CA,7,0                        * SET COUNTER TO ZERO
:TR,D100,7G                    * COMPUTE ASCII 100'S DIGIT
:CA,8,ZZZ@ZZ,X,ZZZ?ZZ,A,1G,0,9G  * MERGE INTO NAME
:TR,D10,7G                     * DO SAME FOR 10'S DIGIT
:CA,8,ZZZZ@Z,X,ZZZZ?Z,A,1G,0,8G
:TR,D1,7G                      * AND UNITS DIGIT
:CA,8,ZZZZZ@,X,ZZZZZ?,A,1G,0,8G
:MS,8G                         * MOVE SOURCE TO LS AREA
:RU,EDITR,8                    * OPERATE ON IT WITH COMS FILE
:RT,EDITR                      * RELEASE LS TRACKS
:CS,4,RW                       * REWIND THE FILE USED BY COMS FILE
:CS,8,RW                       * REWIND COMS FILE ITSELF
:TR,4                          * USE THE FILE CREATED BY EDITR TO GET NEW NAME
:CS,4,RW                       * REWIND FOR USE ON NEXT PASS
:DP,NEW =,1G                     * TELL THE OPERATOR THE NEW NAME
:RN,8G,1G                        * RENAME LIBNNN TO NEW NAME
:CA,7,7G,+,1                     * INCREMENT THE COUNTER
:IF,7G,LT,178,-17                * GO BACK UNTIL 178 FILES PROCESSED
:SV,0                            * RETURN SEVERITY CODE TO "STANDARD"
:EOJ,LISTER
NOW LETS TAKE A LOOK AT THE COMMAND FILE WE PASSED TO EDITR

F     NAM
P//////::,&/////,                THIS IS JUNK TO MAKE SURE NO COMMAS
L0,4
EL
```

The first line in the command file is a blank line so that EDITR picks up source from the LS area. Then it finds the NAM record by looking for "NAM" in columns 1 through 10, i.e., it depends upon the standard tabs used in creating the source. The "junk" in line 3 is so that no commas remain in the edited NAM record which would indicate additional parameters to be passed back. A sample of the output created by EDITR to LU #4 is

```
::,&RLIB ,
```

The second comma is required to separate the NAM from the "junk".

A similar technique can be used to separate the modules in a file, which is a collection of relocatable, i.e. a library.

First do the following

```
:LG,10
:MR,%LIBRY
:PU,%LIBRY
:SA,%LIBRY
```

The process of saving any type 5 file from the LG area inserts zero length records (equivalent to file marks) after each end record found in the relocatable. You can then run the file RELO below as follows:

```
:TR,RELO,%LIBRY

:SV,1
:CA,5,1G
:CA,9,@@@AAA,X,???AAA,A,1G
:CA,7,0
:TR,D100,7G
:CA,8,AAA@AA,X,AAA?AA,A,1G,0,9G
:TR,D10,7G
:CA,8AAAA@A,X,AAAA?A,A,1G,0,8G
:TR,D1,7G
:CA,8,AAAAA@,X,AAAAA?,A,1G,0,8G
:DP,CNT=,7G,NAME=,8G
:CA,7,7G+,1
:ST,5G,8G::::-1,BR,7G,1 * IF BEYOND END, THEN NO
                          FILE WILL BE CREATED
:LI,8G,D * SO THIS LIST COMMAND WILL CAUSE
           FMGR ERR -6 AND STOP THE LOOP
:IF,,EQ,,-999
::
```

In this case the STORE command picks the library module out of the file %LIBRY which is indexed by the counter 7G. Now you can use the same job (LISTER) to rename the relocatable that was used in renaming the source. You must modify the COMS file, however, to look like the following:

```
P/////%/////,                    JUNK
L0,4
EL
```

Again, line 1 is a blank so that EDITR can receive the source (which is actually not source but relocatable) from the LS area. The search for the NAM record is not needed because the first line of every relocatable is the NAM record. Line 2 is based upon knowledge of the relocatable format: the NAM symbol begins in word 4. In this case the new file name will always begin with a percent sign.

KNOW YOUR RTE, PART 3

This is the third of a series of articles in the **Communicator** dealing with the inner works of HP's RTE systems. These articles go into some detail on how the system works; therefore, you should have already read and become familiar with the material in the RTE reference manual to your system.

When a key is hit on the system console, an interchange is started that involves most of the system. We are going to explore this interchange in this article and part of the next one. When we encounter a routine we will discuss its operation in detail once and from then on we will indicate that the routine is called. Right now we know all about the list processor (which was discussed in part one of this series and printed in the **Communicator** dated April 1, 1976) so we can just say "the list processor is called".

Figure 4 is an outline of the operator input sequence. Let's assume we want to enter a command, so we hit a key. The resulting interrupt takes the system to RTIOC at entry point $CIC. At this point, the system saves all the registers in the current programs ID segment, sets up the privileged I/O system (if one) and analyzes the interrupt.

In the case we are studying, the interrupt came from a device which has an EQT entry in the systems interrupt table so it sets up this EQT's addresses on the base page and enters the driver at its C. XX entry point. In this case, this driver must recognize that it is not expecting the interrupt and that the current EQT is the system consoles (i.e. EQT1 = SYSTY)*. When the driver recognizes this it sets the base page word "OPATN" not equal to zero and, depending on what else the driver is doing, either takes a continuation or completion exit. In the case we are analyzing, the driver takes a continuation exit (i.e. no completion I/O processing is required of RTIOC) and RTIOC – seeing "OPATN" set – transfers control to "$TYPE" which Figure 2 of the annotated system load map shows is in the SCHEDule module.

"$TYPE" first checks the "OPFLG" to make sure that any previous operator request has finished. This test is required so that the previous request is not messed with. If "OPSLG" is zero, it is set not equal to zero, and "$TYPE" calls "$XSIO" in RTIOC to output a carriage return, linefeed, *,← which puts the "*" prompt on a new line on the system console. "$XSIO" is the system I/O routine which controls all system generated I/O. "$XSIO" calls "$CVEQ" to translate the EQT number to an EQT address which "$ETEQ" uses to set up the EQT addresses on the base page. It then calls "LINK", an internal subroutine in RTIOC, to link the request on the EQT by priority and, if it is the first request, $XSIO calls the internal subroutine "DRIVR" to set up the EQT and calls the I/O driver for the system console. After "$XSIO" returns to "$TYPE", "$TYPE" calls it again, this time with an input request. "$XSIO" goes through the same sequence and returns.

```
OPERATOR INPUT SEQUENCE (CPU IDLE)

A)  ENTER RTIOC ($CIC) WITH KEY STROKE INTERRUPT FROM CONSOLE AND SAVE STATE.

B)  CALL TO $TYPE                       INITIATE PRINTING OF 'CR,LF,*←'
                $XSIO                   SYSTEM I/O CALL
                        $CVEQ           GET EQT ADDRESS
                        $ETEQ
                        LINK            LINK REQUEST ON EQT
                        DRIVER          INITIATE I/O
                $XSIO                   INITIATE MESSAGE INPUT
                                          (RETURN, DEVICE BUSY)
    RETURN TO $XEQ (DISPATCHER), AND TO IDLE LOOP

        $IRT                            RESTORE STATE AND RETURN TO POINT
                                        OF INTERRUPT

C)  PROCESS INPUT MESSAGE COMPLETION THROUGH 'IOCOM' (RTIOC) ROUTINE, RETURNS US
    BACK TO $TYPE ROUTINE AT 'TYP10' COMPLETION INTERRUPT TO $CIC:

        $CIC
            DRIVER                      DRIVER COMPLETES WRITE
            IOCOM
            DRIVER                      START READ
        $XEQ                            BACK TO IDLE

    NEXT COMPLETION:
        $CIC
            DRIVER                      DRIVER COMPLETES READ
            IOCOM
            DRIVER                      SEND NEXT REQUEST, IF ANY.
            TYP10                       JUMP TO SYSTEM COMPLETION ROUTINE

D)  EXECUTE A **    JSB $MESS **          TO INITIATE MESSAGE PROCESSORS:
                    $PARS                 PARSES INPUT COMMAND

E)  IF NO MESSAGE OUT __ GO TO $XEQ

F)  MOVE MESSAGE TO INPUT BUFFER AND SEND IT TO SYSTEM CONSOLE

            $XSIO
        $XEQ

G)  ON MESSAGE COMPLETION CLEAR OPFLG AND EXIT
        $XEQ
```

Figure 4. Operator Input Sequence

Since these two requests are made by the system (priority 0) with the interrupt system off there is a guarantee that there can be no intervening message out put on the console between the star and the input system message. Without locking the LU it is not possible to guarantee that an input will be made immediately after a prompt unless the system is making the request. When the input request is queued by $XSIO it returns to the $TYPE routine which goes to $XEQ in the dispatcher. Remember, in part 1 we said that whenever the system has nothing else to do, it goes to $XEQ. Now the system must wait for the operator to type his command, so the system goes to $XEQ to wait for this to happen. $XEQ performs any clean up required for terminating programs (remember the $ZZZZ list from part 1), checks the schedule list for work to do, and executes whatever program is available or goes to a jump self wait loop. (We will go into the dispatcher in detail in a latter issue.)

***See the BP map in Appendix A of your RTE manual.**

We are now left with the problem of knowing when the input command is complete, or rather, of communicating its completion to the $TYPE routine where it can be further processed. The system handles this by passing a special parameter to $XSIO. This parameter is called the completion address and is the location that control is transferred to when the request is complete. This means that ***$XSIO has two returns and takes both of them.*** This can only be done, of course, by taking one of the returns on the completion interrupt. Note, however, drivers which are to handle system requests must not be immediately complete when handling a system request (except the clear request).

Referring to Figure 4 at C, the first completion is the prompt, which causes RTIOC to start the read and return to $XEQ. The second completion is processed and control is transferred to $TYPE at the internal label, TYP10, whose address was passed to $XSIO when the request was made. $TYPE calls $MESS to process the message. If there is an answer (i.e. it is a status request of some sort), $TYPE will move it to the input buffer and call $XSIO to print the message. This last $XSIO call also specifies a return on the completion address at which point $TYPE clears the base page OPFLG, and exit to $XEQ. The base page flag OPFLG is set by $TYPE to protect its buffer, as indicated in Figure 5. This convention is why, for example, you can not get system attention while it is printing a EQT status message in response to the EQ command.

In the next issue we will explore $MESS to see how it processes the message we have just traced into the system. Your comments and questions are welcome. Send to: 9600 Technical Editor, Computer Systems **Communicator**, HP Data Systems Division, 11000 Wolfe Road, Cupertino, Ca. 95014.

THE INPUT BUFFER MANAGEMENT AND BASE PAGE COMMON FLAG <OPFLG> ARE CONTROLLED BY <$TYPE>, AS FOLLOWS:

INBUF	OPFLG	HAPPENINGS
INPUT	1	NOTHING, NOTHING AT ALL, WAITING FOR INPUT MESSAGE.
LINE INPUT	0	$MESS IS DOING ITS' THING, INBUF IS PASSED IN CALL.
OUTPUT MESSAGE	1	$MESS RETURNED A MESSAGE TO BE OUTPUT
---	0	LINE IS PRINTED, READY FOR NEXT ONE.

Figure 5. OPFLG Set by $TYPE

Software Sam

Dear Sam:

We have recently purchased a 9603 measurement system with disc-based RTE-II. Although our primary use is laboratory measurement, we find a large portion of our time spent in software development. Along with our increasing number of programs we have developed an increasing number of questions, a few of which I would like to pass along.

1. Is it possible to add programs to the disc-resident library on-line?

2. Our present method of compiling FORTRAN programs is through the use of a FMGR command file, as follows:

command file FORTCL {

```
:MS, PROG
:TR, FORTCL
:LG, 2
:RU, FTN4, 2, 1, 99
:MR, LIBR
:RU, LOADR, 99, 1, 28
:LS
:RT, EDITR
:LG, 0
:TR, -1
```

The problem with this method is that all of the subroutines in LIBR are loaded, not just the ones needed for external references. Is there a more efficient way we can do this?

3. Is there a way we can get a listing of the entry points in the disc-resident library to avoid duplication?

Our system has already been very useful to us and I hope that the answers to these questions will make it even more so. Thank you for your time.

Sincerely,

Robert E. Steele
University of California
Department of Physics
Santa Barbara, California

Dear Bob,

A number of RTE users have asked that the Disc resident library capability be expandable and I have passed your request to the lab. In answer to your three questions:

1. There is currently no supported way to add to the disc resident library short of patching the disc which SAM does not recommend!

2. Yes, there is a more efficient way. After the program is compiled, run the loader. Due to undefined externals the loader will pause. You may then move the library to the LG area and scan. The process would look like:

```
:MR,PROGA
:RU,LOADR,99,1,28
{ HERE THE LOADER WILL PAUSE PRINTING
      A LIST OF UNDEFINED EXTERNALS.
  YOU DO THE FOLLOWING:
*ON,FMGXX                a copy of FMGR
:MR,LIBRY
:EX

*GO,LOADR,2,0,1
```

The loader will then scan the user library on the LG TRACKS and finish loading. Picking up only those routines needed.

Since your application seems to require the same library, an easier way to do this would be to write a program to do the above for you. The program would only have two active lines.

a. DATA 1FMGR/(Put FMGXX here)./

b. DATA BUFFER/(Put GO,LOADR,2,0,1 here)./

c. CALL EXEC (9,1FMGR,2HL1,2HBR,2HY)

d. I = MESSS(BLHFR,JCOUN,LU)

Line **c** schedules FMGXX passing it a transfer file name, LIBRY, the **d** line is a call to the message processor to re-schedule the loader. (NOTE the three S's in MESSS)

3. Base Page words 1761 & 1762 give the disc address and the number of entry points in the disc resident library. Bits 0-6 of word 1761 are the sector, the upper bits are the track number.

If you read this area off the disc you will find that each entry requires 4 words. They are:

	UPPER 8 BITS	LOWER 8 BITS
1)	NAME	NAME
2)	NAME	NAME
3)	NAME	TYPE
4)	VALUE	

where: NAME = the 5 character name

TYPE = 1) Memory Resident

2) Disc Resident

3) Absolute

4) RP (for micro code)

VALUE = Track/sector (if type = 2; bits 0-6 Sector)

Memory Address (if type = 1)
Micro code address (if type = 4)
Absolute address (if type = 3)

With this information, you can easily write a program to list all entry points in the system.

Sam has also included a present at the end of this issue of the **Communicator**. The present is two programs that will allow the user to save and restore files from mag tape to disc & visa versa. In addition, it allows multiple discs on a mag tape and will scan to the appropriate spot on the mag tape for a restore operation. The two programs are fully compatible with our 7900 & 7905 disc. What is saved on one disc can be restored on another (provided there is enough room.) Purged files are not saved. This is an on-line back up for files only. Sam has used these programs and has found them to be a life saver at times. Note that HP does not and will not support these programs as a product.

Please do not write Sam to ask for sources as Sam has no software reproduction facilities. However, this program is being distributed to HP field system engineers.

```
0001  FTN4,B
0002  C
0003  C     VERSION    4 / 21 / 76    JRT
0004  C
0005          PROGRAM JSAVE,3,1
0006  C
0007          DIMENSION LU(5),IREG(2),MBUF(30),IPBUF(33)
0008          DIMENSION IBUF(14001B),JBUF(14000B)
0009          INTEGER FIRST,LAST,SFLAG
0010  C
0011          DIMENSION MESS1(12),MESS2(26),MESS3(13),MESS4(15)
0012          DIMENSION MESS5(13),MESS6(14),MESS7(10)
0013          DIMENSION MESS8(8),MESS9(12),MES10(13),MES11(9)
0014          DIMENSION IREV(11)
0015  C
0016          EQUIVALENCE (IA,IREG),(IB,IREG(2)),(X,IREG)
0017          EQUIVALENCE (IBUF,ITRAK),(JBUF,IBUF(2))
0018  C
0019          DATA SFLAG,JLNTH,MLNTH/0,14000B,26/
0020  C
0021          DATA MESS1/6412B,2H/J,2HSA,2HVE,2H: ,2HMA,2HG ,2HTA,2HPE,
0022         &            2H L,2HU:,2H ←/
0023          DATA MESS2/6412B,2H/J,2HSA,2HVE,2H: ,2HDI,2HSC,2H L,2HU:,2H
0024         &             2H[,,2HLA,2HST,2H T,2HRA,2HCK,2H] ,2H   ,
0025         &             2HLU,2H= ,2H0 ,2H=>,2H E,2HND,2H) ,2H ←/
0026          DATA MESS3/2H/J,2HSA,2HVE,2H: ,2HTH,2HAT,2H'S,2H N,2HOT,
0027         &           2H A,2H D,2HIS,2HC!/
0028          DATA MESS4/2H/J,2HSA,2HVE,2H: ,2HTH,2HAT,2H'S,
0029         &            2H N,2HOT,2H A,2H M,2HAG,2H T,
0030         &             2HAP,2HE!/
0031          DATA MESS5/2H/J,2HSA,2HVE,2H: ,2HCA,2HN',2HT ,
0032         &           2HDO,2H T,2HHA,2HT ,2HLU,2H! /
```

```
0033          DATA MESS6/2H/J,2HSA,2HVE,2H: ,2HMA,2HX ,2H= ,
0034         &           2H50,2H, ,2HMI,2HN ,2H= ,2H1!/
0035          DATA MESS7/6412B,2H/J,2HSA,2HVE,2H: ,2HHE,2HAD,2HER,2H: ,2H
0036          DATA MESS8/6412B,2H/J,2HSA,2HVE,2H: ,2HEN,2HD?,2H ←/
0037          DATA MESS9/6412B,2H/J,2HSA,2HVE,2H: ,2HDO,2HNE,2H! ,6412B/
0038          DATA MES10/6412B,2H/J,2HSA,2HVE,2H: ,2HMA,2HG ,
0039         &           2HTA,2HPE,2H F,2HIL,2HE:,2H ←/
0040          DATA MES11/2H/J,2HSA,2HVE,2H: ,2HEO,2HF ,2HFO,2HUN,2HD!/
0041          DATA IREV /6412B,2H/J,2HSA,2HVE,2H: ,2HRE,2HV ,2H5-,2H05,2H-
0042         &            2H6 /
0043    C
0044    C
0045          CALL RMPAR(LU)
0046          IF(LU.EQ.0)LU=1
0047          ILU=LU+400B
0048          CALL EXEC(2,ILU,IREV,11)
0049    C
0050    C     GET DISC AND MAG TAPE LU'S
0051    C
0052    10    CALL REIO(2,ILU,MESS1,12)
0053          X=REIO(1,ILU,MBUF,10)
0054          CALL PARSE(MBUF,IB*2,IPBUF)
0055          MTLU=IPBUF(2)
0056    C
0057          CALL EXEC(13,MTLU,ISTAT)
0058          IF(IAND(ISTAT,37400B)*2.EQ.23000B)GO TO 14
0059          IF(IAND(ISTAT,37400B)*2.EQ.24000B)GO TO 14
0060          CALL REIO(2,ILU,MESS4,15)
0061          GO TO 10
0062    C
0063    14    REWIND MTLU
0064    C
0065    15    IF(SFLAG.EQ.0)GO TO 151
0066          MESS2(10)=020137B
0067          MLNTH=10
0068    151   CALL REIO(2,ILU,MESS2,MLNTH)
0069          X=REIO(1,ILU,MBUF,10)
0070          CALL PARSE(MBUF,IB*2,IPBUF)
0071          IDISC=IPBUF(2)
0072          LASTTR=IPBUF(6)
0073          IF(IDISC.EQ.0)GO TO 90
0074          IF(IDISC.GT.6)GO TO 16
0075          CALL REIO(2,ILU,MESS5,13)
0076          GO TO 15
0077    C
0078    16    CALL EXEC(13,IDISC,ISTAT)
0079          ITYPE=IAND(ISTAT,37000B)/256
0080          IF((ITYPE.EQ.30B).OR.(ITYPE.EQ.32B))GO TO 20
0081          CALL REIO(2,ILU,MESS3,13)
0082          GO TO 15
0083    C
0084    C     GET MAG TAPE FILE NUMBER AND IDENT
0085    C
0086    20    IF(SFLAG.NE.0)GO TO 30
0087    21    CALL REIO(2,ILU,MES10,13)
0088          X=REIO(1,ILU,MBUF,10)
0089          CALL PARSE(MBUF,IB*2,IPBUF)
0090          NFILE=IPBUF(2)
0091          IF(NFILE.LE.0)GO TO 90
0092          IF(NFILE.LE.50)GO TO 22
0093          CALL REIO(2,ILU,MESS6,14)
0094          GO TO 21
```

```
0095  C
0096  C   POSITION THE TAPE
0097  C
0098  22    IF(NFILE.EQ.1)GO TO 30
0099  23    X=EXEC(1,MTLU,IBUF,JLNTH+1)
0100        IF(NFILE.EQ.1)GO TO 30
0101        IF(IB.GT.0)GO TO 211
0102        CALL EXEC(2,ILU,MES11,9)
0103        GO TO 30
0104  211   IF(IB.LE.100)GO TO 212
0105        CALL EXEC(2,ILU,MES11,19)
0106        GO TO 90
0107  212   CALL EXEC(2,ILU,IBUF,IB)
0108        CALL EXEC(3,MTLU+1300B)
0109        NFILE=NFILE-1
0110        GO TO 23
0111  C
0112  C   GET HEADER AND WRITE TO TAPE
0113  C
0114  30    DO 31 I=1,30
0115         MBUF(I)=2H
0116  31    CONTINUE
0117  C
0118  32    CALL EXEC(3,MTLU+1400B)
0119        CALL REIO(2,ILU,MESS7,10)
0120        CALL REIO(1,ILU,MBUF,30)
0121        CALL EXEC(2,MTLU,MBUF,30)
0122  C
0123  C
0124  C    HAVE ALL LU'S, NOW GO COPY THE DISC...
0125  C       COPY ALL DIRECTORY TRACKS FIRST, FOLLOWED BY
0126  C       ALL TRACKS USED BY FMP  (UN-USED TRACKS WON'T BE COPIED)
0127  C
0128        X=EXEC(1,IDISC,JBUF,128,10000,0)
0129        ITRAK=IB-1
0130        IF(LASTTR.NE.0)ITRAK=LASTTR
0131        CALL EXEC(1,IDISC,JBUF,JLNTH,ITRAK,0)
0132        FIRST=JBUF(5)
0133        LAST=JBUF(10)
0134        IF(LAST.EQ.LASTTR)LAST=LAST-1
0135        LOWDIR=JBUF(8)
0136        GO TO 41
0137  C
0138  40    CALL EXEC(1,IDISC,JBUF,JLNTH,ITRAK,0)
0139  41    CALL EXEC(2,MTLU,IBUF,JLNTH+1)
0140        IF(ITRAK.EQ.LOWDIR)GO TO 45
0141        ITRAK=ITRAK-1
0142        GO TO 40
0143  C
0144  45    DO 49 ITRAK=FIRST,LAST
0145         CALL EXEC(1,IDISC,JBUF,JLNTH,ITRAK,0)
0146         CALL EXEC(2,MTLU,IBUF,JLNTH+1)
0147  49    CONTINUE
0148  C
0149        ENDFILE MTLU
0150        ENDFILE MTLU
0151        SFLAG=1
0152        GO TO 15
0153  C
0154  C  END:   REWIND TAPE
0155  C
```

```
0156  90    REWIND MTLU
0157        CALL REIO(2,ILU,MESS9,12)
0158  C
0159        END
0160        END$
```


```
0001  FTN4,B
0002  C
0003  C     VERSION    4 - 24 - 76    JRT
0004  C
0005         PROGRAM JRSTR,3,1
0006  C
0007         DIMENSION LU(5),IREG(2),MBUF(30),IPBUF(33),IMBUF(33)
0008         DIMENSION IBUF(14001B),JBUF(14000B),IANS(2)
0009         INTEGER FIRST,LAST,FILE,DELTF,SFLAG
0010  C
0011         DIMENSION MESS1(1),MESS2(1),MESS3(1),MESS4(1),MESS5(1),MESS6
0012         DIMENSION MESS8(1),MESS9(1),MES10(1),MES11(1),MES12(1),MES19
0013         DIMENSION MES20(1),MES21(1),MES22(1),MES23(1),MES24(1),MES25
0014         DIMENSION MES26(1),MES27(1),MES28(1),MES29(1),MESS7(1)
0015         DIMENSION IREV(1)
0016  C
0017         EQUIVALENCE (IA,IREG),(IB,IREG(2)),(X,IREG)
0018         EQUIVALENCE (IBUF,ITRAK),(JBUF,IBUF(2))
0019         EQUIVALENCE (MBUF,IMBUF(2))
0020  C
0021         DATA JLNTH/14000B/,FILE/1/,MLNTH/26/,SFLAG/0/
0022         DATA IMBUF/6412B/,IMBUF(32)/2H ?/,IMBUF(33)/2H ←/
0023  C
0024  901    FORMAT("  /JRSTR: MAG TAPE LU: ←")
0025  902    FORMAT("  /JRSTR: DISC LU: ←")
0026  903    FORMAT("/JRSTR: THAT'S NOT A DISC!")
0027  904    FORMAT("/JRSTR: THAT'S NOT A MAG TAPE!")
0028  905    FORMAT("/JRSTR: CAN'T DO THAT LU!")
0029  906    FORMAT("/JRSTR: MAX = 50,  MIN = 11")
0030  908    FORMAT("  /JRSTR: END? ←")
0031  909    FORMAT("  /JRSTR: DONE!   ")
0032  910    FORMAT("  /JRSTR: MAG TAPE FILE:  (<0 = DIRECTORY, 0 = END)
0034  912    FORMAT("/JRSTR: EOF FOUND!")
0035  919    FORMAT("  /JRSTR: REV 4-24-76 ")
0036  920    FORMAT("/JRSTR: DIRECTORY INCONSISTENCY! # TRACKS = ??")
0037  921    FORMAT("  /JRSTR: LOADING CARTRIDGE  '      ' ")
0038  922    FORMAT("        PREVIOUS DIRECTORY AT TRACK:      ")
0039  923    FORMAT("           DISC ( LU    ) MAX TRACK:      ")
0040  924    FORMAT("        LOWEST AV. TRACK ON THIS CR:      ")
0041  925    FORMAT("  /JRSTR: MOVE DIRECTORY TO NEW HIGH TRACK? ")
0042  926    FORMAT("        (YES, NO, OR NEW TRACK NUMBER  [<=0 = ABORT]
0043  927    FORMAT("  /JRSTR: DIRECTORY NOW ON TRACK      ")
0044  928    FORMAT("  /JRSTR: CR '      ' DIRECTORY ON TRACK      ")
0045  929    FORMAT("/JRSTR: INPUT ERROR!")
0046  C
0047  C
0048  C
0049         CALL RMPAR(LU)
0050         IF(LU.EQ.0)LU=1
0051         ILU=LU+400B
0052  C
0053  C  SET UP MESSAGES
0054  C
0055         ASSIGN 901 TO ILABL
```

```
0056          MESS1(0)=ILABL
0057          MESS1(3)=6412B
0058          ASSIGN 902 TO ILABL
0059          MESS2(0)=ILABL
0060          MESS2(3)=6412B
0061          ASSIGN 903 TO ILABL
0062          MESS3(0)=ILABL
0063          ASSIGN 904 TO ILABL
0064          MESS4(0)=ILABL
0065          ASSIGN 905 TO ILABL
0066          MESS5(0)=ILABL
0067          ASSIGN 906 TO ILABL
0068          MESS6(0)=ILABL
0069          ASSIGN 908 TO ILABL
0070          MESS7(0)=ILABL
0071          MESS7(3)=6412B
0072          ASSIGN 909 TO ILABL
0073          MESS9(0)=ILABL
0074          MESS9(3)=6412B
0075          ASSIGN 910 TO ILABL
0076          MES10(0)=ILABL
0077          MES10(3)=6412B
0078          ASSIGN 911 TO ILABL
0079          MES11(0)=ILABL
0080          ASSIGN 912 TO ILABL
0081          MES12(0)=ILABL
0082          ASSIGN 919 TO ILABL
0083          IREV(0)=ILABL
0084          IREV(3)=6412B
0085          ASSIGN 920 TO ILABL
0086          MES20(0)=ILABL
0087          ASSIGN 921 TO ILABL
0088          MES21(0)=ILABL
0089          MES21(3)=6412B
0090          ASSIGN 922 TO ILABL
0091          MES22(0)=ILABL
0092          ASSIGN 923 TO ILABL
0093          MES23(0)=ILABL
0094          ASSIGN 924 TO ILABL
0095          MES24(0)=ILABL
0096          ASSIGN 925 TO ILABL
0097          MES25(0)=ILABL
0098          MES25(3)=6412B
0099          ASSIGN 926 TO ILABL
0100          MES26(0)=ILABL
0101          ASSIGN 927 TO ILABL
0102          MES27(0)=ILABL
0103          MES27(3)=6412B
0104          ASSIGN 928 TO ILABL
0105          MES28(0)=ILABL
0106          MES28(3)=6412B
0107          ASSIGN 929 TO ILABL
0108          MES29(0)=ILABL
0109    C
0110          CALL EXEC(2,ILU,IREV(3),11)
0111    C
0112    C     GET MAG TAPE LU
0113    C
0114    10    CALL REIO(2,ILU,MESS1(3),12)
0115          X=REIO(1,ILU,MBUF,10)
0116          CALL PARSE(MBUF,IB*2,IPBUF)
0117          MTLU=IPBUF(2)
```

```
0118  C
0119        CALL EXEC(13,MTLU,ISTAT)
0120        IF(IAND(ISTAT,37400B)*2.EQ.23000B)GO TO 14
0121        IF(IAND(ISTAT,37400B)*2.EQ.24000B)GO TO 14
0122        CALL REIO(2,ILU,MESS4(3),15)
0123        GO TO 10
0124  C
0125  14    REWIND MTLU
0126        FILE=1
0127  C
0128  C
0129  C  GET MAG TAPE FILE NUMBER  0 = END     <0 = PRINT DIRECTORY
0130  C
0131  20    IF(SFLAG.EQ.0)GO TO 201
0132        MLNTH=13
0133        MES10(15)=20137B
0134  201   CALL REIO(2,ILU,MES10(3),MLNTH)
0135        SFLAG=1
0136        X=REIO(1,ILU,MBUF,10)
0137        CALL PARSE(MBUF,IB*2,IPBUF)
0138        NFILE=IPBUF(2)
0139        IF(NFILE.LT.0)GO TO 50
0140        IF(NFILE.EQ.0)GO TO 90
0141        IF(NFILE.LE.50)GO TO 21
0142        CALL REIO(2,ILU,MESS6(3),14)
0143        GO TO 20
0144  C
0145  C   POSITION THE TAPE
0146  C
0147  21    IF(NFILE.NE.1)GO TO 22
0148        CALL EXEC(3,MTLU+0400B)
0149        GO TO 30
0150  22    DELTF=NFILE-FILE
0151        IF(DELTF.EQ.0)GO TO 30
0152  C
0153        ICON=MTLU+1300B
0154        IF(DELTF.GT.0)GO TO 23
0155        DELTF=-DELTF
0156        ICON=MTLU+1400B
0157  C
0158  23    DO 24 I=1,DELTF
0159         IF(ICON.GE.1400B)GO TO 231
0160         IF(IFBRK(0).LT.0)GO TO 14
0161         X=EXEC(1,MTLU,IBUF,JLNTH+1)
0162         IF(IB.EQ.0)GO TO 26
0163         IF(IB.GT.100)GO TO 56
0164         CALL EXEC(2,ILU,IBUF,IB)
0165  231    CALL EXEC(3,ICON)
0166  24    CONTINUE
0167  C
0168        IF(ICON.LT.1400B)GO TO 30
0169        CALL EXEC(3,MTLU+1400B)
0170        CALL EXEC(3,MTLU+1300B)
0171        GO TO 30
0172  C
0173  26    CALL EXEC(2,ILU,MES12(3),9)
0174        GO TO 14
0175  C
0176  C   GET HEADER AND CHECK IF THAT'S WHAT HE WANTS
0177  C
0178  30    FILE=NFILE
0179        X=EXEC(1,MTLU,IBUF,JLNTH+1)
```

```
0180          HEDLNT=IB
0181          IF(HEDLNT.EQ.0)GO TO 26
0182          IF(HEDLNT.GT.100)GO TO 40
0183    C
0184          IBUF(31)=37537B
0185          CALL EXEC(2,ILU,IBUF,31)
0186          CALL REIO(1,ILU,IANS,2)
0187          IF(IANS.EQ.2HYE)GO TO 40
0188    34    CALL EXEC(3,MTLU+0200B)
0189          GO TO 20
0190    C
0191    40    CALL REIO(2,ILU,MESS2(3),10)
0192          X=REIO(1,ILU,MBUF,10)
0193          MES23(12)=MBUF
0194          MES23(13)=MBUF(2)
0195          CALL PARSE(MBUF,IB*2,IPBUF)
0196          IDISC=IPBUF(2)
0197          IF(IDISC.GT.6)GO TO 42
0198          IF(IDISC.LE.0)GO TO 34
0199          CALL REIO(2,ILU,MESS5(3),13)
0200          GO TO 40
0201    C
0202    42    CALL EXEC(13,IDISC,ISTAT)
0203          ITYPE=IAND(ISTAT,37000B)/256
0204          IF((ITYPE.EQ.30B).OR.(ITYPE.EQ.32B))GO TO 44
0205          CALL REIO(2,ILU,MESS3(3),13)
0206          GO TO 40
0207    C
0208    C     GET DIRECTORY TRACKS - PERHAPS MODIFY DIRECTORY TO PUT IT IN
0209    C     A DIFFERENT TRACK THAN WHAT IT CAME FROM, AS FROM 7905 TO 7905
0210    C     WITH DIFFERENT # TRACKS PER CARTRIDGE.
0211    C
0212    C      MAG TAPE RECORD GIVES TRACK NUMBER THAT THE DIRECTORY CAME FR
0213    C      EXEC CALL GIVES LAST TRACK OF THE DISC WE'RE WRITING TO
0214    C       IF THEY'RE THE SAME, JUST PROCEED....
0215    C       IF DIFFERENT PRINT OUT CURRENT VALUES AND REQUEST OPERATOR
0216    C         FOR DESIRED LOCATION OF DIRECTORY.
0217    C
0218    C      NOW...  READ THE TAPE TO FIND SPECIFIED TRACK
0219    C              GET MAX TRACK ON THIS DISC
0220    C              REQUEST CHANGE (IF ANY)
0221    C              MODIFY DIRECTORY
0222    C              COPY ALL DIRECTORY TRACKS
0223    C              GO TO COPY DOWN REMAINING TRACKS
0224    C
0225    44    IF(HEDLNT.LE.100)CALL EXEC(1,MTLU,IBUF,JLNTH+1)
0226          LODIR=JBUF(8)
0227          NDIR=ITRAK-LODIR+1
0228          LOWEST=JBUF(10)
0229          MES21(18)=JBUF
0230          MES21(19)=JBUF(2)
0231          MES21(20)=JBUF(3)
0232          MES28(10)=JBUF
0233          MES28(11)=JBUF(2)
0234          MES28(12)=JBUF(3)
0235          IF(NDIR.EQ.-JBUF(9))GO TO 441
0236          CALL EXEC(2,ILU,MES20(3),10)
0237          GO TO 14
0238    C
0239    441   X=EXEC(1,IDISC,IDUM,1,32767,0)
0240          MAXTRK=IB-1
0241          IDELT=0
```

```
0242          IF(ITRAK.EQ.MAXTRK)GO TO 46
0243    C
0244          CALL CNUMD(ITRAK,MES22(21))
0245          CALL CNUMD(MAXTRK,MES23(21))
0246          CALL CNUMD(LOWEST,MES24(21))
0247          CALL EXEC(2,ILU,MES21(3),19)
0248          CALL EXEC(2,ILU,MES22(3),21)
0249          CALL EXEC(2,ILU,MES24(3),21)
0250          CALL EXEC(2,ILU,MES23(3),21)
0251          CALL EXEC(2,ILU,MES25(3),22)
0252          CALL EXEC(2,ILU,MES26(3),27)
0253          X=REIO(1,ILU,MBUF,10)
0254          CALL PARSE(MBUF,IB*2,IPBUF)
0255    C
0256          IF(IPBUF.LE.1)GO TO 45
0257          IF(IPBUF(2).EQ.2HNO)GO TO 46
0258          IF(IPBUF(2).NE.2HYE)GO TO 491
0259          IDELT=MAXTRK-ITRAK
0260          GO TO 46
0261    C
0262    45    IF(IPBUF(2).LT.LOWEST)GO TO 491
0263          IF(IPBUF(2).GT.MAXTRK)GO TO 491
0264          IDELT=IPBUF(2)-ITRAK
0265    C
0266    C     HAVE ALL LU'S, NOW GO COPY THE DISC...
0267    C
0268    46    CALL CNUMD(ITRAK+IDELT,MES28(23))
0269          CALL EXEC(2,ILU,MES28(3),23)
0270          JBUF(8)=JBUF(8)+IDELT
0271          GO TO 49
0272    C
0273    48    X=EXEC(1,MTLU,IBUF,JLNTH+1)
0274          CALL EXEC(13,MTLU,ISTAT)
0275          IF(IAND(ISTAT,200B).NE.0)GO TO 20
0276    49    KTRAK=ITRAK
0277          IF(ITRAK.GE.LODIR)KTRAK=ITRAK+IDELT
0278          CALL EXEC(2,IDISC,JBUF,JLNTH,KTRAK,0)
0279          GO TO 48
0280    C
0281    C   ERROR
0282    C
0283    491   CALL EXEC(2,ILU,MES29(3),10)
0284          GO TO 14
0285    C
0286    C   DIRECTORY OF MAG TAPE
0287    C
0288    50    X=EXEC(1,MTLU,IBUF,JLNTH+1)
0289          IF(IB.NE.0)GO TO 51
0290          CALL EXEC(3,MTLU+1400B)
0291          GO TO 20
0292    C
0293    51    IF(IFBRK(0).GE.0)GO TO 52
0294          CALL EXEC(3,MTLU+0200B)
0295          GO TO 20
0296    C
0297    52    IF(IB.GT.100)GO TO 56
0298          CALL EXEC(2,ILU,IBUF,IB)
0299          CALL EXEC(3,MTLU+1300B)
0300          FILE=FILE+1
0301          GO TO 50
0302    C
```

```
0303  C  IF NO HEADER RECORDS, IT'S 'DSAVE' - QUIT AND REWIND...
0304  C
0305  56    CALL REIO(2,ILU,MES11(3),19)
0306        GO TO 14
0307  C
0308  C
0309  C  END:   REWIND TAPE AND TERMINATE
0310  C
0311  90    REWIND MTLU
0312        CALL REIO(2,ILU,MESS9(3),8)
0313  C
0314        END
0315        END$
```

bulletins

NEW RELEASES FROM THE 2100/21MX CONTRIBUTED LIBRARY

Melanie Van Vliet
HP Data Systems

This listing plus the listing in the April issue constitutes all new library entries not included in the published 2100/21MX Contributed Library Program Catalog (22999-90040) April 1975.

The new contributed programs listed below are now available. Contact your local HP sales office to order contributed library material, or (if you are in the U.S.) you can use the Direct Mail Order form at the back of the **Communicator.**

Order No. — **Description and Price**

22681-18954 COPY EFMP FILES
Program COPY simplifies the task of making backup copies of EFMP (Extended File Management Program) files. EFMP files can be copied from one disc (the source disc) to another (the destination disc). To copy EFMP files the user inputs via system teletype the source and destination disc subchannel numbers and the EFMP files being copied. Optionally EFMP file names may be changed before storing them on the specified destination disc. If a duplicate file name exists on the destination disc, program COPY gives the option to destroy the duplicate file on the disc or change the name of the EFMP file that is being copied to the disc.

$30.00

22681-18956 EXOR RANDOM NUMBER GENERATION
This subroutine provides single-terminal Basic with a high-quality random number generator by combining Fibonacci and two different multiplicative random generators.

An 8K or 16K Education Basic system (single-terminal) is required. The routine uses EAU instructions.

$10.00

22681-18970 STAR – STARTREK – RTE
This is the classic game of Startrek. It is intended to simulate the popular television program having the same name. The operator is considered the captain of the Starship Enterprise. The mission is to rid the galaxy of invading Klingons. The program prompts the operator for the minimum and maximum number of Klingons and then designs a scenario – the number of Klingons you must destroy on a given number of stardates. The computer maintains a display of the klingons, their locations, and the star bases, and their locations. The program makes use of a random number generator to create a truce, storms, damage, and the locations of stars, Klingons, star bases, and the Starship Enterprise.

If any Klingons remain after the alotted number of stardates, or if the Enterprise runs out of fuel, you will have lost, and the computer will display an appropriate message. If you win (you have destroyed

the Klingons), the computer will give an unbiased score on your performance as captain of the Starship Enterprise.

Options available to the operator include:

(1) The ability to warp to a sector or quadrant
(2) Fire torpedoes to a sector location.
(3) Fire phasers within a quadrant
(4) Invoke an aiming aid
(5) Repair damage
(6) Miscellaneous Maintenance Functions

$50.00

22681-18980 RTE HP 2310C SPECIAL SUBSYSTEM DRIVER (DVR56)
Driver (56) is a special applications driver for the 2310 Miniverter, which operates under control of the I/O module of the Real Time Executive. This driver allows data to be sampled from a given miniverter channel (ICHAN) a specified number (n) of times. The random advance or sequential modes are not allowed with this driver. This driver operates only in the random start mode. The structuring of this driver in this manner saves a significant number (about 1/2) of the memory locations required of the 2310/2311 subsystem RTE driver. This driver doesn't convert the miniverter data. The MCONV call must be utilized for the conversion. I.56 and C.56 are the entry points of the initiator and continuator sections of D.56, respectively.

$20.00

22681-18991 IMPLEMENTING A USER WRITTEN IBL LOADER ON THE 21MX
This DOS-M program generates a mask tape from an object tape of a user-written IBL loader on the 21MX. The input object tape to the program is the assembler output of the user written IBL loader program. Hardware requirements are 16K memory, a paper tape reader, a paper tape punch, a line printer, and a teletype.

$20.00

22682-10906 ON-TOP DEMO
The contribution consists of two demonstration data bases, OE1TB and OE1DB, which when used with ON-TOP (24386A) provide a complete package of software and data to demonstrate on-line order processing. The ON-TOP application software is available on the December 1974 issue of the Cupertino Source Tape (for field sales requirements) or may be ordered by customers as product number 24386A.

The data base structures and the use of the ON-TOP software are completely described in the HP publication "ON-TOP Reference Manual", 24386-90001.

$80.00

22682-18907 RTEIF
This program passes operator inputs from the keyboard to the RTE-II message processor and prints system response for the operator. Thus all RTE operator requests are available from within the file manager, via this program. Furthermore, RTE commands can be stacked and executed from "BATCH" files, which can call other files to a nesting of 10 deep. Recursive calling is allowed.

The program will operate in a multi-terminal mode. All I/O is done via re-entrant routine on the logical unit provided as the first RMPAR parameter. It is small enough to operate in a foreground since the formatter is not used.

$10.00

22682-18908 PROM WRITER ASSEMBLER MASK TAPE
This routine accepts absolute assembler object code and produces a mask tape acceptable as input to the HP PROM Writer Control Program, (24287-60001, 60002). The routine runs under a DOS-III System.

$20.00

22682-18909 PERT PACKAGE FOR DOS-III
The PERT (Program Evaluation & Review Technique) package consists of a series of separate programs giving a complete statistical evaluation of the events under control. The essential parts are computation of data before the project starts (PERT0-PERT3) and computation of actualization during project execution (PERT4-PERT5). The entire package requires 24K of memory and a DOS-III system. The package can also be obtained in Spanish through the author.

$95.00

22682-18910 SCORE PACK
This source language assembler program generates the absolute binary subroutines required to support two CALL statements which are used in a BASIC test scoring program SCOPK (or "SCORE-PACK") for reading answers from HP 9320-2062 "Educational Test Scoring" cards and for reading 'process skill'

numbers from HP 9320-2051 – "Educational BASIC" cards.

Two options are provided in this source program:

(a) The "N" option locates the routines above MATrix in the HP Educational BASIC Interpreter #24160A, so that the functioning of BASIC is unaffected (except for a loss of 115 words of BASIC user space, or 1+% in a 16K memory).

(b) The "Z" option locates these subroutines in the space normally occupied by the MATrix subroutines in HP Educational BASIC; hence MATrix is disabled and BASIC user space is increased by 820 computer words, or 8+% in a 16K memory.

$40.00

22682-18911 RTE 2100 MICROPROGRAMMING SOFTWARE

This package contains the RTE versions of the HP Microassembler, the HP Micro Debug Editor, and the Writable Control Store Driver (33). These programs are direct modifications of the HP supported DOS/DOS-M versions. The DOS/DOS-M version of the HP writable Control Store Utility Routine can be used under RTE without modifications.

$60.00

22682-18913 RTE ASYNCHRONOUS DATA SET INTERFACE DRIVER

DVR72 is a RTE driver which controls an HP 12587 Asynchronous Data Set interface. The terminals expected by DVR72 are an HP 7260 Card Reader and/or a General Electric Terminet 1200 Printer. Each HP 12587 Interface has one Bell System type 103 or 202 Data Set (or equivalent) connected to it.

Using DVR72, the user program can issue command sequences to the 7260 Card Reader to return card data and/or status information.

The driver supports only printing capability for the GE 1200 and does an immediate completion if keyboard input is programmed.

$20.00

22682-18914 INTEL 8080 CROSS ASSEMBLER

Intel 8080 Microprocessor Cross-Assembler
Input: Source language in 8080 pneumonics.
Output: Depending on control statement.

1) LIST – Program list with chip address relative address, code, remarks.
2) TABLE – List of symbols used and their values (Location)
3) BINARY – Paper Tape (ASCII)
4) SORT – Same as table but alphanumeric

Form: Very close to HP Assembly.
System: Designed for DOS-M. But easily alterable to any system supporting ALGOL.

$20.00

software updates

Listed below are the software parts and manuals which are shipped with RTE-II and RTE-III systems. Revision levels (A, B, C, D, etc.) or date codes (1543, 1546, etc.) are included for your reference

SOFTWARE	RTE II	RTE III
Core Res Sys	92001-16012 1602	92060-12003 1604
Loader	92001-16002 1616	92060-16004 1616
Multi Term Monitor	92001-16003 B	Same
Sys Library	92001-16005 1545	Same
DVP43 (Power Fail)	92001-16004 1602	92060-16001 1602
Autor (Auto Restart)	92001-16014 B	Same
Autor Source	92001-18014 –	Same
Spool Monitor	92002-12001 B	Same
Spool Program	92002-12002 D Option	92060-12001 B
Batch Monitor Libr	92002-16006 D Y13	Same
EDITR	92002-16010 C	Same
EDITOR	20805-60001 C	Not included
DVR00	29029-60001 1543	Same
DVR31 (7900 Disc)	29013-60001 C	Same
DVR32 (7905 Disc)	92060-16031 A	Same
7900 System Generator	92001-16013 1602	92060-16029 1602
Fixed Head Generator	92001-16018 1602	Not Supported
7905 System Generator	92001-16026 1602	92060-16032 1602
WHZAT	Not Available	92060-16006 B
Assembler	92060-12004	Same
XREF	92060-16028	Same
$PVMP	Not applicable	92060-16035 A
FORTRAN II	20875-60001 E	Same
	20875-60002 E	Same
	20875-60003 E	Same
	20875-60004 E	Same
	20875-60005 E	Same
FORTRAN IV	24170-60001 C	Same
	24170-60002 C	
	24170-60003 C	Same
FORTRAN IV (10K Area)	24177-60001 1442	Same
	24177-60002 1442	
ALGOL	24129-60001 C	Same
	24129-60002 C	Same
RELO SUBR LIBR-EAU	24151-60001 D	Same
RELO SUBR LIBR-FP	24248-60001 C	Same
FFP SUBR LIBR	12977-16001 1451	Same
FTN4 SUBR LIBRARY	24152-60001 C	Same
FTN II FORMATTER	24153-60001 C	Same

SOFTWARE	RTE II	RTE III
16K SIO MAG TAPE 9 TR	13022-60001 B	Same
16K SIO MAG TAPE 7 TR	13030-60001 B	Same
16K SIO PAPER TAPE RDR	20319-60001 A	Same
16K SIO PAPER TAPE PUNCH	20320-60001 A	Same
16K SIO SYSTEM DUMP	20335-60001 B	Same
16K SIO TTY (LP COMPAT)	24127-60001 A	Same
16K SIO 2767 LP	24166-60001 B	Same
16K SIO 2762/2615	24329-60001 A	Same
16K SIO 2607 LP	24347-16001 1346	Same
PUNCH/VERIFY	20312-60001 A	Same
24K SIO TTY (LP COMPAT)	29100-60017 A	Same
24K SIO SYSTEM DUMP	29100-60018 A	Same
24K SIO PAPER TAPE RDR	29100-60019 A	Same
24K SIO PAPER TAPE PUNCH	29100-60020 A	Same
24K SIO 2767 LP	29100-60022 A	Same
24K SIO MAG TAPE 9 TR	29100-60023 A	Same
24K SIO MAG TAPE 7 TR	29100-60049 A	Same
24K SIO 2762/2615	29100-60050 A	Same
Manuals		
RTE REFERENCE	92001-93001 –	92060-90004
BATCH/SPOOL MONITOR	92002-93001 – Option Y13	Same
ASSEMBLER	92060-90005 –	Same
FORTRAN II	02116-9015 –	Same
FORTRAN IV	5951-1321 –	Same
ALGOL	02116-9072 –	Same
RELO SUBR	02116-91780 –	Same
SIO DVR 2762/2615	02762-90002 –	Same
SIO DVR 2767 LP	12653-90004 –	Same
SIO DVR 2607 LP	12987-90006 –	Same
SIO DVR 7970 B/E 9 TR	13022-90010 –	Same
SIO DVR 7970B 7 TR	13029-90010 –	Same
SIO INTRO	5951-1369 –	Same
SIO SYS CONFIG.	5951-1374 –	Same
SIO SUBSYS	5951-1390 –	Same
ERROR MESSAGES	5951-1377 –	Same
DVR00	29029-95001 –	Same

Following is a list of the drivers, (with part numbers, and revision levels) available for RTE systems.

RTE DRIVERS

DRIVER	PART #	REV LEVEL	DESCRIPTION
DVR00	29029-60001	1543	
DVR11	29030-60001	B	2892 Card Reader
DVR12	29028-60002	A	2767 Line Printer
DVR12	92001-16020	1534	26XX Line Printers
DVR31	29013-60001	C	7900 DISC
DVR32	92060-16031	A	7905 DISC
DVR15	09601-16021	A	7261A Card Reader
DVR23	92202-16001	A	9 Track MT
DVR30	20747-60001	C	Fixed Head DISC
DVR24	25117-60499	D	7 Track MT
DVR72	09611-16005	A	6940 A/B Local & Remote
DVR62	02313-16001	A	2313B DVR
	29009-60001	C	2313B DVR
	29011-60001	E	R2313

DOS-IIIB MODULES

The Index below indicates the modules available for DOS-IIIB systems, HP 24307B, date code 1523.

This Index relates the names of the relocatable modules to the part numbers of the equivalent paper tapes and indicates the purpose of the modules. Modules not specifically designated for the 2100A/S or for the 21MX computers are to be used on either.

NAME	PART NUMBER	REV	DESCRIPTION
DISCH	24307-16069	1523	DISC MONITOR
$EXMD	24307-16070	1523	EXEC MODULES
DVR00	20985-60001	1516	TTY-LIKE CONSOLE/ TERMINAL
DVR01	20987-60001	1419	PAPER TAPE READER
DVR02	20989-60001	1419	PAPER TAPE PUNCH
DVR05	24157-60001	1419	TTY-LIKE CONSOLE
DVR15	24307-16017	1446	7261A MARK SENSE CARD READER
D2892	24272-60001	1419	2892B CARD READER (DVR11)
D2767	24168-60001	1419	2767A LINE PRINTER (DVR12)
D26XX	24307-16011	1446	DVR12 FOR 2607, 2610, 2614, 2613, 2618
DVR23	13024-60001	1446	7970B/E MAG TAPE
DVR26	24307-16018	1507	2762A/B AND 2615A CONSOLE
DVR30	24307-16073	1523	DISC BATCH DRIVER
DVR31	24156-60001	1419	7900/7901 DISC
DVR67	24341-60001	1419	12889A HI SPD SERIAL IF
DVR70	24307-16009	1446	DVR70 FOR 12618A SYNC INTERFACE
DVR71	24307-16013	1515	12967A SYNCH MODEM IF
DVR72	24350-16001	1523	12587B ASYNC DATA SET IF
DVR73	24377-16001	1523	12920A/B MULTIPLEXOR
DVR74	24307-16014	1515	12966A/12968A ASYNCH IF
EFMP	24309-60002	1523	EXT FILE MGR EXEC MODULES
	24309-60003	1523	EXT FILE MGR UTILITIES
JOBPR	24307-16071	1523	JOB PROCESSOR
RLODR	24307-16072	1523	RELOCATING/LINKING LOADER
ASMB	24307-16006	1419	2100/21MX ASSEMBLER
.FTN4	24170-60001	C	FORTRAN IV COMPILER
	24170-60002	C	
	24170-60003	C	
FTN4	24177-60001	1442	FORTRAN IV COMPILER (10K AREA)
	-60002	1442	
ALGOL	24129-60001	C	ALGOL COMPILER
	24129-60002	C	
XREF	24223-60001	1523	2100/21MX CROSS REF TABLE GEN
F4D.N	24152-60001	C	RELO SUBRLIBR FTN4
F2E.N	24151-60001	D	RELO SUBR LIBR (EAU)
F2F.N	24248-60001	B	RELO SUBR LIBR (FP)
FFP.N	12907-16001	A	2100A/S FFP SUBR LIBRARY
$SETP	12907-16002	1350	2100A/S FFP SUBR $SETP
ATD01	24381-16001	1503	ASYNC TERMINAL DRIVER No. 1
ATD02	24307-16012	1442	ASYNC TERMINALL DRIVER No. 2
PMT01	24307-16008	1438	PAGE MODE TERMINAL DRIVER No. 1
PMT02	24307-16016	1503	PAGE MODE TERMINAL DRIVER No. 2
SLC	24307-16010	1438	SYNCHRONOUS LINE CONTROL DRIVER
DVR33	24278-60001	1419	2100/21MX WCS DRIVER
MASMB	24332-60001	1419	2100A/S WCS MICRO ASSEMBLER
WCSUT	24333-60001	A	2100/21MX MICRO UTILITIES
MDBUG	24334-60001	1419	2100A/S WCS MICRO DEBUG EDITR
XASMB	12978-16001	1437	21MX WCS MICRO ASSEMBLER
XDBUG	12978-16002	1437	21MX WCS MICRO DEBUG EDITOR
FFP.X	12977-16001	1451	21MX FFP SUBR LIBRARY
XSETP	12977-16002	1451	21MX FFP SUBR $SETP

documentation

The following tables list currently available customer manuals for Data Systems Division products. This list supersedes the list in the last issue of the **Communicator.**

The most recent changes to the tables are indicated for easy reference. Prices are subject to change without notice.

Copies of manuals and updates can be obtained from your local Sales and Service office. The address and telephone number of the office nearest to you are listed in the back of all customer manuals.

Update packages are free of charge. If you require an update package only, send your request to:

Software/Publications Distribution
11000 Wolfe Road
Cupertino, Ca. 95014

Customers in the U.S. may also order directly by mail. Simply list the name and part number of the manual(s) you need on the Corporate Parts Center form supplied at the back of the **Communicator**.

A few words about documentation terms:

New — A new manual refers only to the first printing of a manual. When first printed, a manual is assigned a part number.

Revised — A revised manual is a printing of an existing manual which incorporates new and/or changed information in its contents. For example, a manual is revised when an update package is incorporated into the manual: the manual gets a new print date and the update package disappears. Note that a revision to a manual effectively obsoletes the previous version of the manual.

Update — An update package is a supplement to an existing manual which contains new and/or changed information. Updates are issued when information must get to customers, yet it is inappropriate to issue a revised manual. An update has no part number; it is automatically included when you order the manual with which it is associated.

9600/9700 SYSTEM MANUALS

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
02005-90001	Real-Time Executive Software System	$12.00	10/71	6/73
02313-93002	RTE 2313B Analog-Digital Interface Subsystem Operating and Service Manual	12.50	2/74	8/75
02320-93002	RTE System Driver DVR76 for HP 2320A Low Speed Data Acquisition Subsystem Programming and Operating Manual	1.00	8/74	
02321-93001	RTE System Driver DVR74 for HP 2321A Low Speed Data Acquisition Subsystem Programming and Operating Manual	1.00	8/74	
09600-93010	RTE System DVR11 for HP 2892A Card Reader Programming and Operating Manual	1.00	8/74	
09600-93015	91200A TV Interface Kit; Programming and Operating Manual	4.50	7/75	1/76
09601-93007	RTE Device Subroutine for HP 5327A/B-H48 Counter	2.50	12/74	
09601-93009	RTE Device Subroutine for HP 5326A-H18 Counter	2.50	12/74	
09601-93014	RTE System Driver DVR15 Mark Sense Card Reader Programming and Operating Manual	1.00	2/76 *R	
09601-93015	RTE for 40-bit Output Register #12556B	1.00	10/74	
09603-93001	9603A/9604A Control System and Scientific Measurement Operating and Service Manual	7.50	6/75	12/75
09610-93003	ISA FORTRAN Extension Package Reference Manual	4.50	2/76 *R	
09611-90009	9611A Operating 406 Industrial Measurement and Control System	.25	4/75	
09611-90010	HP 6940A/B Multiprogrammer Verification Manual	4.50	8/75	
12604-93002	RTE DVR40 for 12604B Data Source Interface	1.00	8/74	
12665-93001	RTE System Driver DVR65 for HP 12771A Computer Serial Interface Kit	1.00	8/74	
12989-99001	RTE System Driver DVA15 for Card Reader Punch Subsystem 2894	1.00	1/75	
24998-90001	DOS/RTE Relocatable Library Reference Manual	10.00	3/76	
25117-93003	RTE System Driver DVR24 for HP 7970 Series Digital Magnetic Tape Unit	1.00	8/74	

9600/9700 SYSTEM MANUALS (Continued)

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
29003-93001	RTE System Driver DVR66 for HP 12772A Coupler Modem Interface Kit Programming and Operating Manual	1.00	8/74	
29003-93003	RTE System Driver DVR66 for HP 12770A Coupler Serial Interface Kit Programming and Operating Manual	1.00	8/74	
29009-93001	RTE System Driver DVR62 for HP 23138 Subsystem	2.50	8/74	
29013-90001	DVR31 RTE Moving Head Driver	10.00	2/73	
29014-90001	Moving Head Real-Time System Generator	20.00	4/72	
29015-90001	Fixed Head Real-Time System Generator	15.00	4/72	
29016-90002	RTE Scheduler	50.00	9/72	
29016-90003	Real-Time Input/Output Control	50.00	12/73	
29022-90001	Real-Time Relocating Loader	10.00	6/73	
29028-95001	RTE HP 2610A/2614A Line Printer Driver	1.50	8/73	
29029-91001	Real-Time Executive Multiple-Device System Control Device (DVR00) Program Listing	10.00	9/72	
29029-95001	Real-Time Executive System Driver DVR00 for Multiple Device System Control Small Programs Manual	1.50	11/75	
29033-98000	Real-Time Executive-File Manager System	10.00	3/73	
29100-93001	RTE System Driver DVR40 (29100-60041) for HP 12604B Data Source Interface Programming and Operating Manual	1.00	8/74	10/74
29100-93003	RTE System Driver DVR61 for HP 6940A, 6941A Bidirectional Multiprogrammer Programming and Operating Manual	3.00	3/76 *R	
29101-93001	RTE Core-Based Software System Users Manual	10.00	1/76	
29102-93001	RTE BASIC Software System Programming and Operating Manual	10.00	3/74	8/75
29103-93001	RTE System Cross Loader; Programming and Operating Manual	2.50	3/75	11/75
91060-93005	RTE Driver for X-Y Display Storage Subsystem (HP Model 1331C-016) Programming and Operating Manual	1.00	8/74	
91062-93003	Real-Time Executive System Driver for DVM/Scanner Subsystem	9.00	8/74	
92001-93001	RTE-II Software System Programming and Operating Manual	10.00	3/76	
92060-90004	RTE-III Software System Programming and Operating Manual	12.00	3/76	
92060-90005	RTE Assembler Reference Manual	7.00	1/76	
92060-90009	RTE-III General Information Manual	4.00	2/76	
92060-90010	RTE Batch/Spool Monitor and Operating System Pocket Guide	3.00	10/75	
92060-90012	RTE-III: A Guide for New Users	6.50	10/75	
92060-90013	Batch-Spool Monitor Reference Manual	9.50	12/75	3/76
92060-90014	RTE Interactive Editor Reference Manual	6.00	3/76	
92060-90016	Multi-User Real-Time BASIC Reference Manual	12.00	10/75	12/75
92200-93001	RTE System Driver DVR12 for HP 2607A Line Printer Programming and Operating Manual	1.00	3/74	
92200-93005	Real-Time Executive Operating System Drivers and Device Subroutine Manual	$ 5.00	3/76	
92202-93001	RTE System Driver DVR23 for HP 7970 Series Digital Mag Tape Units Programming and Operating Manual	1.00	8/74	
93005-93005	Thermal Line Printer Subsystem for Driver DVR00 (RTE)	2.50	12/74	
93513-90002	RTE System Driver DVA 76-DVR40 for 2801 Quartz Thermometer System	1.50	4/75	

SOFTWARE INPUT/OUTPUT SYSTEM MANUALS

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
02116-91760	Teleprinter Driver (LP Compatible) Manual	$ 1.00	8/73	
02762-90002	HP 2762A Terminal Printer Driver	1.00	5/73	
02892-90003	HP 2892A Card Reader Driver	1.50	6/72	
12602-90022	Mark Sense Card Reader Drivers	1.00	6/70	
12653-90004	HP 2767 Line Printer Driver	1.00	9/70	1/73
12845-90005	HP 2610A/2614A Line Printer Driver	1.00	2/74	
12987-90006	HP 2607 Line Printer Driver	5.00	11/73 *R	
13022-90010	HP 7970 Magnetic Tape Unit Driver	1.00	2/72	
13029-90010	Magnetic Tape Driver (7-Track)	1.00	2/72	
5950-9276	SIO Drum-Disc	1.00	2/70	
5951-1374	Software Input/Output System Configuration	1.00	7/74	
5951-1390	Subsystem Operation	2.00	2/76	

BASIC CONTROL SYSTEM MANUALS

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
02022-90014	Magnetic Tape Reformatting System Support Utilities	$ 1.50	1/74	
02100-90129	HP 2100 Microassembler Coding Form	5.00		
02100-90140	Decimal String Arithmetic Routines	6.50	10/73	
02108-90008	Microprogramming 21MX Computers Reference Manual	6.50	2/76 *R	
02116-9017	Basic Control System Manual	8.50	12/71	
02116-9072	ALGOL for HP 2000 Computers Reference Manual	10.00	2/76	*R
02116-91751	Prepare Tape System	2.50	8/74	
02116-91752	Magnetic Tape System	6.00	6/71	
02116-91780	2100 Series Relocatable Subroutines	11.00	12/74	
02762-90003	HP 2762A Terminal Printer Driver	1.00	5/73	
02892-90004	HP 2892A Card Reader Driver	1.50	6/72	
12602-90021	Mark Sense Drivers	1.00	6/70	
12653-90005	HP 2767 Line Printer Driver	1.00	10/70	
12845-90004	HP 2610A/2614A Line Printer Driver	1.00	6/72	
12987-90008	HP 2607 Line Printer Driver	5.00	12/73	
13023-90010	HP 7970 Magnetic Tape Unit Driver	1.00	5/74	
13026-90010	Magnetic Tape Driver (7-Track without DMA)	1.00	5/71	6/72
13027-90010	Magnetic Tape Driver (7-Track with DMA)	1.00	5/71	6/72
5951-1371	HP 2100 Front Panel Procedures	1.00	8/73	
5951-1376	Basic Binary Loader/Disc Loader, Basic Moving-Head Disc Loader	1.00	4/74	
5951-1391	Basic Control System	1.50	10/74	
5951-1392	Magnetic Tape System	1.00	7/71	

DISC OPERATING SYSTEM MANUALS

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
02767-90007	DOS/RTE 2767 Line Printer Driver	$ 1.00	12/70	
12560-90023	DOS RTE and BCS Calcomp Plotter Drivers	1.50	10/75	
12602-90023	DOS/RTE Mark Sense Drivers Kit 12602B	1.00	8/70	
12908-90004	HP 12908 Writable Control Store Driver	1.00	2/75	
24307-90006	DOS-III Reference Manual	20.00	1/76	3/76
24307-90012	DOS-III Data Communications Drivers	7.50	8/75	11/75
24307-90018	DOS-III Pocket Guide	3.50	12/75	
24307-90022	DOS-III Terminal Printer Driver	1.00	1/75	
24307-90073	DOS-III Standard Drivers	6.00	1/75	

*R = Revised Manual

DISC OPERATING SYSTEM MANUAL (Continued)

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
24376-90001	IMAGE/2000 Data Base Management System Reference Manual	11.00	8/75	
5951-1366	Cross Reference Table Generator	1.00	8/74	
5951-1381	DOS-M/2000C Timeshared BASIC File Handler	1.00	5/71	
5951-1394	2000C File Interface for DOS-M	1.00	6/71	

LANGUAGE MANUALS

PART NUMBER	MANUAL TITLE	PRICE	DATE	UPDATE
02116-9014	HP Assembler Manual	$ 6.50	8/75	
02116-9015	HP FORTRAN Manual	5.00	3/74	
02116-9016	Symbolic Editor	4.50	2/74	
02116-9072	ALGOL Reference Manual	10.00	2/76	
12907-90010	Implementing the HP 2100 Fast FORTRAN Processor	5.00	11/74	
24307-90014	DOS III Assembler Reference Manual	8.00	7/74	11/75
92060-90005	RTE Assembler Reference Manual	7.00	1/76 *R	
5951-1321	HP FORTRAN IV Reference Manual	6.00	12/75	

*R = Revised Manual

training schedule

The schedule for customer training courses on Data Systems Division products has been expanded to include courses offered at our European training centers. Listed below are courses offered in the U.S. during the period May through December 1976 and in Europe during the period May through August 1976.

You can also obtain a copy of the training schedule from your local HP sales office. A European course schedule is available through the sales offices in Europe; a U.S. schedule through U.S. sales offices.

*Prices quoted are for courses at the two U.S. training centers only. For prices of courses at European training centers please consult your local HP Sales Office.

Registration

Requests for enrollment in any of the above courses should be made through your local HP representative. He will supply the Training Registrar at the appropriate location with the course number, dates, and requested motel reservations. Enrollments are acknowledged by a written confirmation indicating the Training Course, time of class, location and accommodations reserved.

Accommodations

Students provide their own transportation, meals and lodging. The Training Registrar will be pleased to assist in securing motel reservations at the time of registration.

Cancellations

In the event you are unable to attend a class for which you are registered please notify the Training Center Registrar immediately in order that we may offer your seat to another student.

Training Center Addresses

Cupertino

11000 Wolfe Road
Cupertino, California 95014
(408) 257-7000

Rockville

4 Choke Cherry Road
Rockville, Maryland 20850
(301) 948-6370

Boise
P. O. Box 15
15 N. Phillippi Street
Boise, Idaho 83707
(208) 376-6000
TWX: 910-970-5784

Boblingen

Kundenschulung
Herrenbergerstrasse 110
D-7030 Böblingen, Wurttemberg
Tel: (07031) 667-1
Telex: 07265739
Cable: HEPAG

Winnersh

King Street Lane
GB-Winnersh, Wokingham
Berks RG11 5 AR.
Tel: Wokingham 784774
Cable: Hewpie London
Telex: 847178 9

Grenoble

5, avenue Raymond-Chanas
38320 Eybens
Tel: (76) 25-81-41
Telex: 980124

Milan

Via Amerigo Vespucci, 2
1-20124 Milan
Tel: (2) 62 51
Cable: HEWPACKIT Milano
Telex: 32046

Madrid

Jerez No 3
E-Madrid 16
Tel: (1) 458 26 00
Telex: 23515 hpe

Stockholm

Enighetsvägen 1-3, Fack
S-161 20 Bromma 20
Tel: (08) 730 05 50
Cable: MEASUREMENTS
Stockholm
Telex: 10721

TITLE			TRAINING COURSE RATES AND CENTER LOCATIONS									
COURSE NUMBER	LENGTH	PRICE	CUPERTINO	ROCKVILLE	BOISE	BOBLINGEN	WINNERSH	GRENOBLE	MILAN	MADRID	STOCKHOLM	AMSTERDAM/ BRU.
22940A	2100 MAINT.		8/2 10/11									
	10 days	$1000										
22941A	21MX MAINT.		7/12 8/16 9/27 12/6									
	5 days	$ 500										
22942A	7900 MAINT.		7/19 8/23 10/25 12/13					7/12 (English)				
	5 days	$ 500										
22943A	7970 B/E MAINT.				9/13			7/19 (English)				
	5 days	$ 500										
22945A	7905 MAINT.		8/16 10/4 11/1									
	5 days	$ 500										
22950A	2100 SER. ASSM.		7/19 8/16 9/13 10/11 11/15 12/6	7/26 8/16 9/13 10/4 11/1 11/29								
	5 days	$ 500										
22952A	DOS III B		7/12 11/1									
	5 days	$ 500										
22952B	DOS III B											
	5 days	$ 500				8/9		7/5				8/23
22953A	2100 IMAGE		7/21									
	3 days	$ 300										
22959A	ASSEMBLER/21MX					8/2	7/5					
	5 days	$ 500										
22960A	21MX MIC. PROG		7/26 10/18 12/13									
	5 days	$ 500										
22965B	RTE-II/III		7/12 7/26 8/9 8/16 9/13 9/27 10/11 10/25 11/8 11/29	7/12 8/2 8/23 9/20 10/11 11/8 12/6		*{8/30 9/6}	*{7/12 7/19}	*{6/28 7/19}	*{6/21 7/5}		*{8/30 9/6}	
	10 days	$1000										
	(Course includes: RTE-II/III operating system, batch spool monitor and file manager)											
22968A	MEASUREMENT & CONTROL		8/9 8/30 10/14 12/13	8/16 12/20								
	2 days	$ 200										
22969A	DISTB. SYS.		8/2 10/25 12/13	9/13		8/16	8/9					
	5 days	$ 500										
*22977A	IMAGE/DBMS 1000		8/23 9/27 11/8									
	5 days	$ 500										
22978	TCS		7/19 11/15									
	2 days	$ 200										
22979A	REAL TIME/ MULTITERMINAL BASIC		8/11 9/1 10/11 12/15	8/18 11/22								
	3 days	$ 300										

COURSE NUMBER	LENGTH	PRICE	CUPERTINO	ROCKVILLE	BOISE	BOBLINGEN	WINNERSH	GRENOBLE	MILAN	MADRID	STOCKHOLM	AMSTERDAM, BRU.
22980	HPIB MULTICOMPUTER BUS BASIC		9/27									
	3 days	$ 300										
22981	HPIB PROGRAMMING UNDER RTE		9/29									
	2 days	$ 200										

*Note: Dates within brackets are starting dates for week 1 and week 2 of the RTE course. In some cases there is a break between the two weeks of the class.

Course 22977A, IMAGE/DBMS 1000 replaces 22953A (2100 IMAGE); the new class adds additional material and extends the training from 3 to 5 days.

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