

**HP 3000 SERIES II  
COMPUTER SYSTEM  
MANUAL OF STAND-ALONE DIAGNOSTICS**

**STAND-ALONE  
HP 30115A (7970B/E) NINE TRACK  
MAGNETIC TAPE (NRZI-PE) DIAGNOSTIC**

Diagnostic D433

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## I. INTRODUCTION

THE STAND-ALONE HP 30115A 9-TRACK MAGNETIC TAPE DIAGNOSTIC VERIFIES THE INPUTS, OUTPUTS AND CONTROL FUNCTIONS OF THE HP 30115A 9-TRACK MAGNETIC TAPE WHEN INSTALLED IN AN HP 3000 SERIES II COMPUTER SYSTEM. THE DIAGNOSTIC IS USED BY FIELD SERVICE, MANUFACTURING AND SYSTEM TEST

PERSONNEL TO DETECT AND ISOLATE (AT THE FUNCTIONAL LEVEL) TAPE, TAPE DRIVE AND CONTROLLER FAILURES.

## II. MINI-OPERATING INSTRUCTIONS

1. COLD LOAD DIAG FILE # FROM NON-CPU COLD LOAD TAPE
2. HP 30115A 9-TRACK MAGNETIC TAPE (D433X,YY,Z)  
WHERE: X=VERSION, YY=UPDATE LEVEL, Z=FIX LEVEL,  
(STAND-ALONE DIAGNOSTIC PROGRAM)  
Q010 TAPE DEVICE NUMBER? (DRT #)
3. Q011 TIMER DEVICE NUMBER? (DRT #)
4. Q012 MAXIMUM ERROR PRINT COUNT?
5. P005 TYPE FOLLOWING CONTROL  
A'CR'-AUTO, R'CR'-RESTART  
M'CR'-MANU, 'CR'-RESUME, YOUR CODE?
6. D015 PRESENT SECTION REGISTER:077414 DO YOU WISH TO CHANGE?(YES/NO)

### BIT SWITCH REGISTER OPTIONS:

- |    |                                    |
|----|------------------------------------|
| 0  | SELECT EXTERNAL REGISTER           |
| 1  | SET TO CHANGE SECTION REGISTER     |
| 2  | NOT USED                           |
| 3  | NOT USED                           |
| 4  | NOT USED                           |
| 5  | NOT USED                           |
| 6  | NOT USED                           |
| 7  | D,E-CLASS MESSAGES TO LINE PRINTER |
| 8  | NOT USED                           |
| 9  | SUPPRESS E-CLASS MESSAGES          |
| 10 | SUPPRESS D-CLASS MESSAGES          |
| 11 | LOOP ON CURRENT STEP               |
| 12 | HALT ON ERROR                      |
| 13 | HALT AT END OF CURRENT STEP        |
| 14 | HALT AFTER CURRENT SECTION         |
| 15 | HALT AFTER PASS THROUGH DIAGNOSTIC |

### BIT SECTION REGISTER OPTIONS:

- |    |  |
|----|--|
| 0  | NOT USED   |
| 1  | EXECUTE SECTION 1 (AUTO - BASIC CONTROL)               |
| 2  | EXECUTE SECTION 2 (AUTO - CONTROL, DEV, STATUS, SPACE) |
| 3  | EXECUTE SECTION 3 (AUTO - FILE MARK - 800 CPI ONLY)    |
| 4  | EXECUTE SECTION 4 (AUTO - CRCC, DROP-OUT)              |
| 5  | EXECUTE SECTION 5 (AUTO - TIMING)                      |
| 6  | EXECUTE SECTION 6 (AUTO - BOT, EOT, CREEPING)          |
| 7  | EXECUTE SECTION 7 (AUTO - READ/WRITE)                  |
| 8  | NOT USED   |
| 9  | NOT USED   |
| 10 | NOT USED   |
| 11 | EXECUTE SECTION 11 (MANU - HEAD TEST)                  |
| 12 | EXECUTE SECTION 12 (MANU - START/STOP)                 |
| 13 | EXECUTE SECTION 13 (MANU - REEL PROTECTION)            |
| 14 | EXECUTE SECTION 14 (MANU - TAPE TEST)                  |
| 15 | EXECUTE SECTION 15 (MANU - WRITE/READ)                 |

III. R E Q U I R E M E N T S

A. H A R D W A R E

1. MINIMUM HP 3000 SERIES II COMPUTER SYSTEM
2. HP 30115A 9-TRACK MAGNETIC TAPE (7970A)

B. S O F T W A R E

1. NON CPU COLD LOAD TAPE # 30000-10017/11017

#### IV. DETAILED OPERATING INSTRUCTION

##### A. OPERATING INSTRUCTIONS

###### 1. LOADING

TO LOAD THE DIAGNOSTIC REFER TO LOADING PROCEDURE IN THE SDUPII DIAGNOSTIC MANUAL MOD 03000-90125.

###### 2. RUNNING - TEST SEQUENCE

- A. UPON COMPLETION OF A SUCCESSFUL LOAD, THE FOLLOWING MESSAGES ARE PRINTED AT THE CONTROL TERMINAL:

HP 30115A 9-TRACK MAGNETIC TAPE (D433X,YY,Z)  
(STAND-ALONE DIAGNOSTIC PROGRAM)

Q010 TAPE DEVICE NUMBER?

- B. THE OPERATOR NOW ENTERS THE DECIMAL NUMBER OF THE CONTROLLER TO BE TESTED AND PRESSES CARRIAGE RETURN, THE FOLLOWING MESSAGE IS PRINTED:

Q011 TIMER DEVICE NUMBER?

- C. THE TEST OPERATOR NOW ENTERS THE DECIMAL NUMBER OF THE TIMER WHICH IS USUALLY 3 AND PRESSES CARRIAGE RETURN, THE FOLLOWING MESSAGE IS PRINTED:

Q99 03 MAXIMUM ERROR PRINT COUNT?

- D. THE TEST OPERATOR NOW ENTERS THE MAXIMUM NUMBER OF ERRORS TO BE LISTED AND PRESSES CARRIAGE RETURN, THE FOLLOWING MESSAGE IS PRINTED:

P005 TYPE FOLLOWING CONTROL  
A'CR'-AUTO R'CR'-RESTART  
M'CR'-MANU 'CR'-RESUME YOUR CODE?

THIS PROMPT APPEARS BOTH IN THIS SEQUENCE AND AFTER THE BREAK KEY IS PRESSED. 'A' TRANSFERS CONTROL TO AUTO-PROCESS AND 'M' TO MANUAL PROCESS. 'R' TRANSFERS CONTROL TO STEP 2A. (ABOVE). IF ONLY 'CR' IS PRESSED (IN THE REGULAR PROMPT SEQUENCE), THE DEFAULT WILL BE AUTO-PROCESS. IF 'CR' IS PRESSED AFTER A BREAK, PROCESSING WILL RESUME WHERE THE BREAK OCCURRED.

- E. THE TEST OPERATOR ENTERS ONE OF THE LETTERS AND CARRIAGE RETURN (OR ONLY CR) TO SPECIFY WHERE CONTROL IS TO BE TRANSFERRED. IN THE REGULAR SEQUENCE (NON-BREAK), THE FOLLOWING MESSAGE IS PRINTED:

D015 PRESENT SECTION REGISTER:%077414 DO YOU WISH TO CHANGE?(YES/NO)

- F. THE TEST OPERATOR CAN CHANGE THE PRESET VALUE BY REPLYING 'YES' AND FOLLOWING THE INSTRUCTIONS. AFTER ALTERING THE SECTION REGISTER THE PROGRAM PRINTS THE SAME MESSAGE AND A RESPONSE OF 'NO' TERMINATES THIS PROMPT SEQUENCE.



IF RESPONSE TO STEP '2D' IS 'A',

AUTO PROCESS IS SELECTED, AND THE FOLLOWING MESSAGES ARE PRINTED:

G. Q010 AUTO PROCESS: ENTER TAPE UNIT(B,E,NO) AT  
Q020 DRIVE 0?  
Q020 DRIVE 1?  
Q020 DRIVE 2?  
Q020 DRIVE 3?  
P003 UNLOAD PROGRAM TAPE - LOAD TEST TAPE(S)  
Q030 ALL DEFINITIONS CORRECT(YES/NO)?

H. THE TEST OPERATOR ANSWERS EACH QUESTION. THE RESPONSE IS B IF 800-CPI,  
E IF 1600-CPI, AND NO IF THE UNIT IS NOT TO BE TESTED, A FINAL 'YES'  
RESPONSE COMPLETES THE CONFIGURATION; OTHERWISE CONTROL RETURNS TO  
STEP 'D'. THE FOLLOWING MESSAGE IS PRINTED:

P011 UPDATE SWITCH REGISTER

I. THE SWITCH REGISTER IS INITIALIZED TO OCTAL 40 WHICH SPECIFIES SUPPRESSION  
OF D-MESSAGE. THE TEST OPERATOR CAN ALTER ITS CONTENTS MANUALLY BY  
ENTERING ANOTHER OCTAL VALUE AND PRESSING CARRIAGE RETURN.

J. THE CONTENTS OF THE NEW SWITCH REGISTER ARE PRINTED IF A CHANGE IS MADE  
IN STEP 'I', FOR EXAMPLE:

NEW INT.SW.REG 1 000 000 000 000 110

K. EXECUTION OF 'AUTO' PROCESS IS NOW STARTED.

IF RESPONSE TO STEP '2D' IS 'M', MANU (INTERACTIVE) PROCESS IS SELECTED, AND THE  
FOLLOWING MESSAGES ARE PRINTED:

L. P015 MANU PROCESS: UPDATE SWITCH REGISTER (CR)

M. SWITCH REGISTER IS INITIALIZED TO AN OCTAL 40 WHICH SPECIFIES D-MESSAGES.  
THE TEST OPERATOR CAN ALTER ITS CONTENTS MANUALLY BY ENTERING ANOTHER  
OCTAL VALUE AND PRESSING CARRIAGE RETURN.

N. THE CONTENTS OF THE NEW SWITCH REGISTER ARE PRINTED IF A CHANGE WAS  
MADE IN STEP 'J', FOR EXAMPLE:

NEW INT.SW.REG 1 000 000 000 000 110

O. EXECUTION OF 'MANU' PROCESS IS NOW STARTED.

THE DIAGNOSTIC PROGRAM IS DIVIDED INTO TWO SEPARATE PARTS:

1. - AUTO PROCESS CONSISTS OF SEVEN AUTOMATICALLY EXECUTABLE SECTIONS (1 TO 7). THE CONFIGURATION IS SET AT THE BEGINNING OF THIS PROCESS AND CAN BE CHANGED UPON REQUEST BY SETTING SWITCHES 0 AND 1. (SEE PART IV.A.2.D). THE SECTIONS ARE EXECUTED ONE BY ONE IN SEQUENCE ACCORDING TO THE SETTING OF CORRESPONDING BITS IN THE SECTION REGISTER (BIT 1 TO SECTION 1...ETC) AND AFTER THE LAST SECTION IS FINISHED, CONTROL RETURNS TO SECTION 1. EACH BIT SET IN THE SECTION REGISTER INDICATES THAT THE CORRESPONDING SECTION IS TO BE EXECUTED. IF BIT IS 0, THE SECTION IS SKIPPED. CONTROL CAN BE TRANSFERRED TO MANU (INTERACTIVE) - PROCESS OR BACK BY SETTING SWITCHES 0 AND 1 (SEE PART IV.A.2.D).
2. - MANU (INTERACTIVE) PROCESS CONSISTS OF FIVE SECTIONS WHICH ARE EXECUTED MANUALLY, ONE BY ONE, IN A SEQUENCE CORRESPONDING TO THE SETTING OF BITS IN THE SECTION REGISTER. (BIT 11 TO EXECUTE SECTION 11...ETC) EACH BIT SET SPECIFIES THE SECTION IS TO BE EXECUTED, OTHERWISE THE SECTION IS SKIPPED. CONTROL CAN BE TRANSFERRED TO AUTO-PROCESS OR BACK BY SETTING SWITCHES 0 AND 1 (SEE PART IV.A.2.D).

#### B. OPTIONS

THE INTERNAL SWITCH REGISTER IS USED TO SPECIFY PROGRAM OPTIONS DURING EXECUTION OF THE TEST. THE INTERNAL SWITCH REGISTER IS LOADED FROM THE EXTERNAL SWITCH REGISTER WHENEVER SWITCH ZERO OF THE EXTERNAL SWITCH REGISTER IS SET. THIS MEANS THAT THE EXTERNAL REGISTER IS FREE FOR OTHER USES DURING THE TEST, E.G., BREAKPOINT HALTS.

IF SWITCHES 0 AND 1 ARE SET, THE PROGRAM ASKS THE TEST OPERATOR FOR THE NEXT PROCESS (RESTART, AUTO PROCESS, MANU PROCESS, RESUME, OR EXIT). THE PROGRAM PRINTS THE EXISTING SECTION REGISTER ON THE CONTROL TERMINAL AND ASKS THE TEST OPERATOR TO ALTER ITS VALUE. IF IT IS ALTERED AND EXECUTION OF THE SECTIONS IS FINISHED, THE NEXT SELECTED PROCESS OR EXIT IS EXECUTED.

TABLE 2 SWITCH REGISTER SETTING

| BIT | FUNCTION : IF SET                  |
|-----|------------------------------------|
| 0   | SELECT EXTERNAL REGISTER           |
| 1   | SET TO CHANGE SECTION REGISTER     |
| 2   | NOT USED                           |
| 3   | NOT USED                           |
| 4   | NOT USED                           |
| 5   | NOT USED                           |
| 6   | NOT USED                           |
| 7   | D,E-CLASS MESSAGES TO LINE PRINTER |
| 8   | NOT USED                           |
| 9   | SUPPRESS E-CLASS MESSAGES          |
| 10  | SUPPRESS D-CLASS MESSAGES          |
| 11  | LOOP ON CURRENT STEP               |
| 12  | HALT ON ERROR                      |
| 13  | HALT AT END OF CURRENT STEP        |
| 14  | HALT AFTER CURRENT SECTION         |
| 15  | HALT AFTER PASS THROUGH DIAGNOSTIC |

TABLE 3 SECTION REGISTER SETTING

| BIT | FUNCTION IF SET  |
|-----|--|
| 0   | NOT USED   |
| 1   | EXECUTE SECTION 1 (AUTO - BASIC CONTROL)               |
| 2   | EXECUTE SECTION 2 (AUTO - CONTROL, DEV. STATUS, SPACE) |
| 3   | EXECUTE SECTION 3 (AUTO - FILE MARK - 800 CPI ONLY)    |
| 4   | EXECUTE SECTION 4 (AUTO - CRCC, DROP-OUT)              |
| 5   | EXECUTE SECTION 5 (AUTO - TIMING)                      |
| 6   | EXECUTE SECTION 6 (AUTO - BOT, EOT, CREEPING)          |
| 7   | EXECUTE SECTION 7 (AUTO - READ/WRITE)                  |
| 8   | NOT USED   |
| 9   | NOT USED   |
| 10  | NOT USED   |
| 11  | EXECUTE SECTION 11 (MANU - HEAD TEST)                  |
| 12  | EXECUTE SECTION 12 (MANU - START/STOP)                 |
| 13  | EXECUTE SECTION 13 (MANU - REEL PROTECTION)            |
| 14  | EXECUTE SECTION 14 (MANU - TAPE TEST)                  |
| 15  | EXECUTE SECTION 15 (MANU - WRITE/READ)                 |

### C. HALT AND MESSAGE TABLES

THE GENERAL FORMAT OF A DIAGNOSTIC MESSAGE TO THE OPERATOR INCLUDES A LETTER PREFIX, DECIMAL NUMBER OF MESSAGE, AND TEXT INCLUDING THE STEP NUMBER, TABLE 4 LISTS MESSAGES AND TABLE 5 LISTS HALTS.

THE LETTER PREFIX IDENTIFIES THE MESSAGE CLASS. THERE ARE FOUR MESSAGE CLASSES:

| MESSAGE CLASS | CONTENT  |
|---------------|--|
| D             | DATA INFORMATION WHICH REQUIRES NO OPERATOR RESPONSE.  |
| E             | ERROR MESSAGE WHICH INDICATES THAT DISC FILE FAILED IN SOME PORTION OF THE DIAGNOSTIC TEST.  |
| P             | DIAGNOSTIC PROGRAM HAS PAUSED, WAITING FOR OPERATOR ACTION. ENTER CARRIAGE RETURN AT TERMINAL TO CONTINUE TEST. IF MESSAGE HAS BEEN SUPPRESSED, PRESS RUN ON SOFTWARE CONTROL PANEL TO CONTINUE. |
| Q             | INPUT FROM OPERATOR AT CONTROL TERMINAL IS REQUIRED. TO CONTINUE THE TEST, PRESS CARRIAGE RETURN AFTER ENTERING RESPONSE.  |

#### EXAMPLE:

EXAMPLE OF PRINTOUT FROM STEP 177 WITH INCORRECT STATUS AFTER EXECUTION OF SIO PROGRAM.

```
E223 ACT,  US 1 000 000 000 001 110  STEP 0117
          EXPEC,US 1 DD0 1DD 1DD DD1 110
D043     STEP 0117 COMPLETED FOR DRIVE 1
```

NOTE: STATUS CHECKING CONSISTS OF COMPARING THE HARDWARE STATUS BIT BY BIT AGAINST THE EXPECTED STATUS. ANY BIT OF THE EXPECTED STATUS MAY BE IN A DON'T CARE STATE (EXPRESSED AS D).

TABLE 4. MESSAGES ( E R R O R - MESSAGES )

| MESS,<br>NOI | MESSAGE  | COMMENTS (IF ANY)              |
|--------------|--|--------------------------------|
| E111         | E111 STEP-XXXX BEFORE - AFTER SIO PROGRAM;                                     | TITLE OF SIO                   |
|              | NN XXXXXX YYYYYY   | SIO-LINE                       |
|              | NN XXXXXX YYYYYY ---> EXIT(MM)   | MM-EXP,EX,POINT                |
| E115         | E115 STEP-XXXX EXPECT,- OBTAIN. RESIDUE  |                                |
| E116         | E116 STEP-XXXX EXPECT,- OBTAIN.CRCC  |                                |
| E204         | E204 STEP-XXXX DATA (NNNN)=YYYYYY SHDBE=ZZZ7ZZ                                 |                                |
| E205         | E205 STEP-XXXX MISSING COND.CODE CCE AFTER CIO                                 |                                |
| E206         | E206 STEP-XXXX MISSING COND.CODE CCE AFTER SIO                                 |                                |
| E207         | E207 STEP-XXXX MISSING COND.CODE CCE AFTER SIN                                 |                                |
| E208         | E208 STEP-XXXX MISSING COND.CODE CCE AFTER TIO                                 |                                |
| E210         | E210 STEP-XXXX MISSING COND.CODE CCE   |                                |
| E212         | E212 STEP-XXXX EXCESS FORWARD CREEP  |                                |
| E213         | E213 STEP-XXXX REVERSE CREEP   |                                |
| E215         | E215 STEP-XXXX YYY READ ERRORS IN THIS STEP                                    |                                |
| E216         | E216 STEP-XXXX NO IGNORANCE RIO OR WIO   |                                |
| E218         | E218 STEP-XXXX ERROR IN NNN CYCLE  |                                |
| E220         | E220 STEP-XXXX INTERRUPT TAPE FLAG =XX   | XX=NUMBER OF INT.              |
| E221         | E221 STEP-XXXX WRONG INTERRUPT AFTER YYY                                       | YYY=STEPS                      |
| E222         | E222 STEP-XXXX NO INTERRUPT AFTER YYY  | YYY=STEPS                      |
| E223         | E223 ACT. DS X XXX XXX XXX XXX XXX STEP YYYY<br>EXPEC.DS Z ZZZ ZZZ ZZZ ZZZ ZZZ | DEV,STATUS                     |
| E227         | E227 NUMBER IS NOT BINARY FORM   | OPERATOR ENTERED<br>WRONG FORM |
| E231         | E231 STEP-XXXX NOISE AFTER GAP, CHANGE TAPE                                    | OPER.SHOULD<br>CHANGE TAPE     |

TABLE 4. MESSAGES ( E R R O R - MESSAGES )  
(CONT.)

| MESS. NO1 | MESSAGE  | COMMENTS (IF ANY)                |
|-----------|--|----------------------------------|
| E235      | E235 STEP-XXXX TRANSFER ERROR AFTER WRITE/READ   | RESPECTIVELY                     |
| E236      | E236 STEP-XXXX COMMAND REJECTED AFTER WRITE/READ   | RESPECTIVELY                     |
| E237      | E237 STEP-XXXX TAPE RUNAWAY AFTER WRITE/READ   | RESPECTIVELY                     |
| E238      | E238 STEP-XXXX TAPE ERROR AFTER WRITE/READ   | RESPECTIVELY                     |
| E240      | E240 STEP-XXXX NO SIO/OK BIT B0 (DS)   |                                  |
| E244      | E244 STEP-XXXX WRONG UNIT SELECTED   | UNIT NUMBER SHOULD BE 0,1,2,OR 3 |
| E245      | E245 STEP-XXXX NO EOT APPEARED   | END OF TAPE                      |
| E246      | E246 STEP-XXXX EOT IMPROPERLY SET<br>-XXXX AND TAPE (DRIVE #) IS NOT READY<br>NO INTERRUPT<br>HAS NO BOT<br>SIO NOT OK | *<br>*<br>*<br>* EITHER/OR       |
| E271      | E271 STEP-XXXX INTERRUPT REQ. B2 (DS) IMPROP. SET  |                                  |
| E274      | E274 STEP-XXXX COMP. AND READ CRCC ARE DIFFER.   |                                  |
| E275      | E275 STEP-XXXX COMP. AND READ CRCC ARE SAME  |                                  |
| E276      | E276 STEP-XXXX ELAPSED TIME IS OVER LIMIT  |                                  |
| E310      | E310 STEP-XXXX EXCE. TIME=XXXXXXMS, LIM=YYYYYYMS   | OVER TIME LIM.                   |
| E313      | E313 STEP-XXXX NEGATIVE IRG ERROR  |                                  |
| E330      | E330 STEP=XXXX WRONG SECTION NUMBER YYYY   |                                  |
| E331      | E331 STEP=XXXX WRONG STP NUMBER YYY  | STEP NUMBER                      |
| E332      | E332 STEP=XXXX WRONG CONVERTED (NUMBER)  |                                  |
| E337      | E337 STEP=XXXX WRONG ANSWER TRY IT AGAIN   |                                  |
| E342      | E342 STEP=XXXX ADDRESS DB+X IS WRONG   |                                  |
| E344      | E344 STEP-XXXX TIO DID NOT UPDATE DS   |                                  |

TABLE 4. MESSAGES ( E R R O R - MESSAGES )  
(CONT.)

| MESS.<br>NOI | MESSAGE  | COMMENTS (IF ANY) |
|--------------|--|-------------------|
| E346         | E346 STEP-XXXX NO END IN SIO AFTER 272 LINES   |                   |
| E347         | E347 STEP-XXXX NO TIMING ERROR AFTER 12 SENSE  |                   |
| E348         | E348 STEP-XXXX TIMING ERROR AFTER <12 SENSE    |                   |
| E350         | E350 STEP-XXXX NO RESPONSE TO SIO (CCL)        |                   |
| E400         | E400 GENERATION OF A/B PATTERNS HAS WRONG FORM |                   |

TABLE 4. MESSAGES (NON ERROR - MESSAGES)

| MESS.<br>NO1 | MESSAGE  | COMMENTS (IF ANY) |
|--------------|--|-------------------|
| D010<br>D012 | HP 3011SA 9-TRACK MAGNETIC TAPE (D433A,UU,F)<br>(STAND-ALONE DIAGNOSTIC PROGRAM) |                   |
| D015         | D015 PRESENT SECTION REGISTER:XXXXXX DO YOU<br>WISH TO CHANGE?(YES/NO)           |                   |
| D030         | D030 TEST SECTION XX STARTED   |                   |
| D031         | D031 TEST SECTION XX COMPL.  |                   |
| D043         | D043 STEP XXXX COMPLETED FOR DRIVE Y   |                   |
| D044         | D044 STEP XXXX STARTED FOR DRIVE Y   |                   |
| D060         | OLD INT,SW,REG X XXX XXX XXX XXX XXX   |                   |
| D061         | NEW INT,SW,REG Y YYY YYY YYY YYY YYY   |                   |
| D065         | D065 XXXXXX ERRORS IN SECTION YY   |                   |
| D066         | D066 XXXXXX TOTAL ERRORS   |                   |



TABLE 4. MESSAGES ( P - E R R O R - MESSAGES )

| MESS. NO: | MESSAGE   | COMMENTS (IF ANY) |
|-----------|---|-------------------|
| P001      | P001 RESET SW1 OF SWITCH REGISTER (CHANGE REQ)                          |                   |
| P003      | P003 UNLOAD PROGRAM TAPE - LOAD TEST TAPE(S)                            |                   |
| P005      | P005 TYPE FOLLOWING CONTROL:  |                   |
| P006      | A'CR' - AUTO, E'CR' - EXIT, R'CR' - RESTART                             |                   |
| P007      | M'CR' - MANU, I'CR' - RESUME, YOUR CODE?                                |                   |
| P008      | P008 HALT AT END OF STEP XXXX   |                   |
| P009      | P009 HALT AT END OF SECTION XX  |                   |
| P010      | P010 HALT AFTER COMPL. PROGRAM  |                   |
| P011      | P011 UPDATE SWITCH REGISTER (CR)  |                   |
| P012      | P012 STEP-XXXX HALT ON ERROR (REQUIRED)                                 |                   |
| P015      | P015 MANU PROCESS! UPDATE SWITCH REGISTER (CR)                          |                   |
| P019      | P019 ON-LINE/RESET TEST   |                   |
| P020      | P020 HEAD ADJUSTING! HP 9162-0027 (YES/NO)?                             |                   |
| P021      | P021 LOAD TAPE HP 9162-0027 (NO RING) IN DRIVE X                        |                   |
| P022      | P022 STEPXXXX WRITE/READ TEST (XNNNNNN) (YES/NO)?                       |                   |
| P025      | P025 LOAD TAPE (RING) IN DRIVE X AND RESPOND 'CR'                       |                   |
| P026      | P026 LOAD TAPE (RING), PUSH RESET, OFF AND TYPE RESPONSE 'CR'           |                   |
| P027      | P027 PUSH DRIVE X, ON-LINE AND TYPE RESPONSE 'CR'                       |                   |
| P028      | P028 PUSH RESET, OFF AND TYPE RESPONSE 'CR'                             |                   |
| P029      | P029 LOAD TAPE (RING), PUSH OFF, RESET, ON-LINE AND TYPE RESPONSE 'CR'. |                   |

TABLE 4. MESSAGES ( P - E R R O R - MESSAGES )  
(CONT.)

| MESS.<br>NO1 | MESSAGE  | COMMENTS(IF ANY) |
|--------------|--|------------------|
| P030         | P030 CHECK LIGHT 'WRITE-ENABLE', PUSH DRIVE X AND TYPE RESPONSE 'CR' |                  |
| P032         | P032 PUSH DRIVE X AND TYPE RESPONSE 'CR'                             |                  |
| P033         | P033 PUSH RESET, ON-LINE AND TYPE RESPONSE 'CR'                      |                  |
| P034         | P034 PUT TAPE (RING), PUSH OFF, RESET AND RESPOND 'CR'               |                  |
| P035         | P035 PUSH ON-LINE, DRIVE X AND TAPE RESPONSE 'CR'                    |                  |
| P036         | P036 PUSH RESET AND TYPE RESPONSE 'CR'                               |                  |
| P037         | P037 FSR/BSR-TEST; TYPE DRIVE NUMBER AND 'CR'(EXECUTE) OR 'CR'(EXIT) |                  |
| P038         | P038 PUSH DRIVE X BUTTON & TYPE RESPONSE 'CR'                        |                  |
| P039         | P039 CHECK LIGHT RESET, PUSH ON-LINE AND RESPOND 'CR'                |                  |
| P041         | P041 LOAD TAPE (RING), PUSH DRIVE X AND TYPE RESPONSE 'CR'           |                  |
| P042         | P042 REMOVE RING FROM REEL, PUT IT BACK AND TYPE RESPONSE 'CR'       |                  |
| P043         | P043 PUT RING BACK TO REEL, LOAD IT AND TYPE 'CR'(RESPONSE)          |                  |
| P044         | P044 STEP 1510 WRITE/READ ROUTINE                                    |                  |
| P046         | P046 TAPE TESTING - DROP OUT/NOISE (YES/NO)?                         |                  |
| P050         | P050 LOAD TESTED TAPE (WITH RING) IN DRIVE 1 AND TYPE 'CR'(RESPONSE) |                  |
| P052         | P052 HEAD RUN CAN BE STOPPED BY 'CR'                                 |                  |
| P054         | P054 WRITE/READ TEST (TESTX) (YES/NO)?                               |                  |
| P056         | P056 TYPE SELECTED DRIVE ?   |                  |

TABLE 4. MESSAGES ( P - E R R O R - MESSAGES )  
(CONT.)

| MESS,<br>NO: | MESSAGE                                  | COMMENTS (IF ANY) |
|--------------|--|-------------------|
| P060         | P060 NN PASS    XXXXXX TOTAL ERRORS      |                   |
| P061         | P061 STEP-1420 NNNNN DROPS IN YYYY FEET  |                   |
| P062         | P062 STEP-1422 NNNNN NOISES IN YYYY FEET |                   |
| P063         | P063 STEP-1422    NOISE CHECKING         |                   |
| P065         | P065 AUTO PROC, ENDS - MANU STARTS       |                   |
| P066         | P066 MANU PROC, ENDS - AUTO STARTS       |                   |

TABLE 5. H A L T S

| HALT<br>CODE: | SEGMENT<br>NUMBER: | MEANS:               | NOTE: |
|---------------|--------------------|----------------------|-------|
| 00            | 03                 | UNEXPECTED INTERRUPT |       |
| 04            | 03                 | NO RESPONSE TO CIO   | *     |
| 05            | 03                 | NO RESPONSE TO PIO   | *     |
| 07            | 03                 | NO RESPONSE TO SIO   |       |
| 11            | 03                 | NO RESPONSE TO TIO   | *     |

\* MEANS THE PROGRAM HALTS ONLY WHEN I/O ORDER WAS ISSUED TO TIMER (DRT=3), OTHERWISE THE PROGRAM PAUSES.

TABLE 4. MESSAGES ( Q - E R R O R - MESSAGES )

| MESS.<br>NO1 | MESSAGE                                       | COMMENTS(IF ANY) |
|--------------|---|------------------|
| Q010         | Q010 TAPE DEVICE NUMBER?                      |                  |
| Q011         | Q011 TIMER DEVICE NUMBER?                     |                  |
| Q012         | Q012 MAXIMUM ERROR PRINT COUNT?               |                  |
| Q019         | Q010 AUTO-PROCESSI ENTER TAPE UNIT(B,E,NO) AT |                  |
| Q020         | Q020 DRIVE X?                                 |                  |
| Q030         | Q030 ALL DEFINITIONS CORRECT(YES/NO)?         |                  |
| Q042         | Q042 TYPE 'YES' (OPERATOR STOPS RUN BY 'CR')  |                  |
| Q043         | Q043 'NO' (TAPE WILL RUN UNTIL END)           |                  |
| Q046         | Q046 STEP 1130 UNLIMITED READING RUN(YES/NO)? |                  |
| Q047         | Q047 STEP 1130 UNLIMITED WRITING RUN(YES/NO)? |                  |

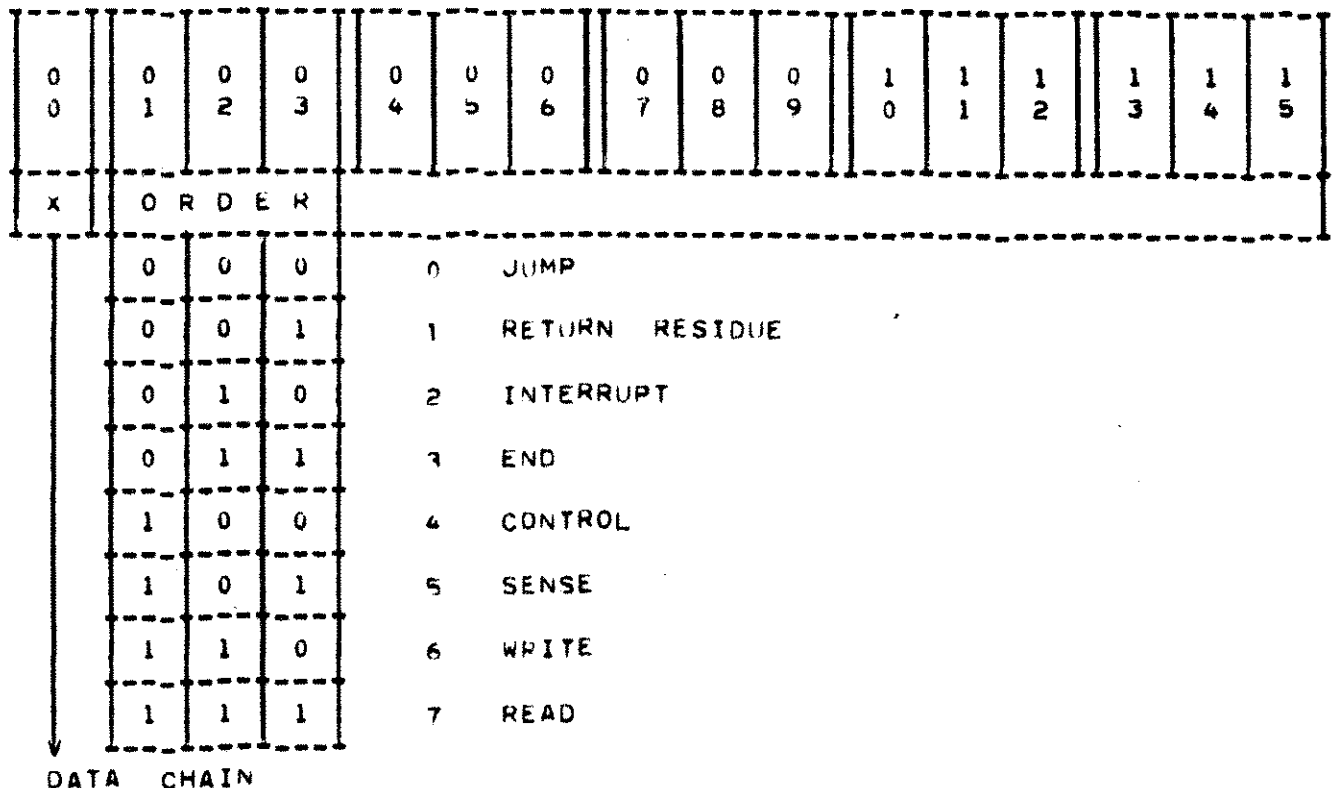
### D. P R E - C O N F I G U R A T I O N     O P T I O N S

1. THE DIAGNOSTIC PROGRAM HAS BEEN PRECONFIGURED IN THE BEST LOAD AND GO CONFIGURATION USING THE OPTIONS AVAILABLE FROM THE SWITCH AND SECTION REGISTER (CHAPTER III B). THE SWITCH REGISTER=%40 AND SECTION REGISTER=%77414 INDICATES ALL AUTO-SECTIONS ARE TO BE RUN WITH NON-ERROR MESSAGES SUPPRESSED. EXECUTION TIME DEPENDS ON THE LENGTH OF TAPE. A 100 FOOT TAPE IS THE MINIMUM IN WHICH CASE EXECUTION TAKES APPROXIMATELY 20 MIN.
  
2. THE FOLLOWING LOCATIONS MAY BE ALTERED DURING PRE-CONFIGURATION WITH SDUPII.

|      |                              |                 |
|------|------------------------------|-----------------|
| DB+0 | INTERNAL SWITCH REGISTER     | PRESET = %40    |
| DB+1 | SECTION REGISTER             | PRESET = %77414 |
| DB+2 | VERSION OF DIAGNOSTICSTER    | PRESET = 0      |
| DB+3 | DRY OF MAGNETIC TAPE         | PRESET = 0      |
| DB+4 | COUNT OF MAX. ERRORS PRINTED | PRESET = 0      |
| DB+5 | SECTION NUMBERER             | PRESET = 0      |
| DB+6 | STEP NUMBER                  | PRESET = 0      |
| DB+7 | DEVICE STATUS                | PRESET = 0      |

### E. C O N T R O L     A N D     S T A T U S     W O R D     F O R M A T S

#### 1. I O C W - F O R M A T

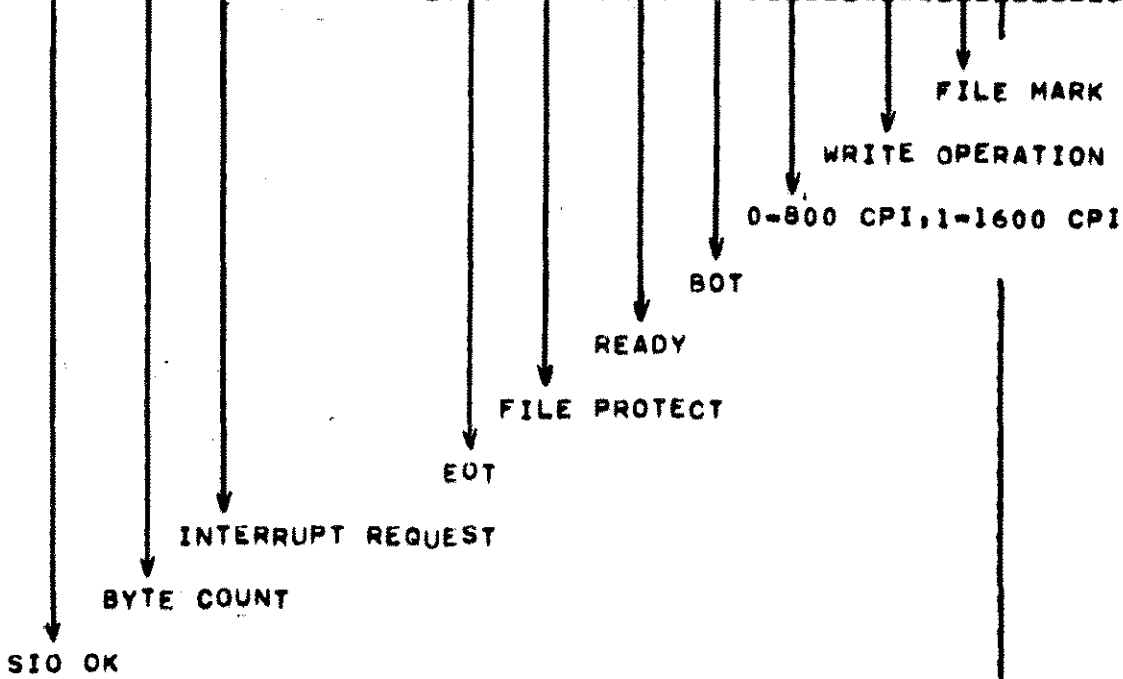


2. I O A W - FORMAT

| 0      | 0                                     | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0            | 1 | 1 | 1 | 1 | 1 | 1 |
|--------|---------------------------------------|---|---|---|---|---|---|---|---|--------------|---|---|---|---|---|---|
| 0      | 1                                     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0            | 1 | 2 | 3 | 4 | 5 |   |
| UNIT # |                                       |   |   |   |   |   |   |   |   | COMMAND CODE |   |   |   |   |   |   |
| 00     | SEL - SELECT (BITS 6,7 CONT. DRIVE #) |   |   |   |   |   |   |   |   |              | 0 | 0 | 0 | 0 |   |   |
| 01     | - ILLEGAL CODE, REJECTED              |   |   |   |   |   |   |   |   |              | 0 | 0 | 0 | 1 |   |   |
| 02     | - ILLEGAL CODE, REJECTED              |   |   |   |   |   |   |   |   |              | 0 | 0 | 1 | 0 |   |   |
| 03     | - ILLEGAL CODE, REJECTED              |   |   |   |   |   |   |   |   |              | 0 | 0 | 1 | 1 |   |   |
| 04     | WRR - WRITE RECORD                    |   |   |   |   |   |   |   |   |              | 0 | 1 | 0 | 0 |   |   |
| 05     | GAP - WRITE GAP                       |   |   |   |   |   |   |   |   |              | 0 | 1 | 0 | 1 |   |   |
| 06     | RDR - READ RECORD                     |   |   |   |   |   |   |   |   |              | 0 | 1 | 1 | 0 |   |   |
| 07     | FSR - FORWARD SPACE RECORD            |   |   |   |   |   |   |   |   |              | 0 | 1 | 1 | 1 |   |   |
| 10     | REW - REWIND                          |   |   |   |   |   |   |   |   |              | 1 | 0 | 0 | 0 |   |   |
| 11     | RST - REWIND AND RESET                |   |   |   |   |   |   |   |   |              | 1 | 0 | 0 | 1 |   |   |
| 12     | BSR - BACK SPACE RECORD               |   |   |   |   |   |   |   |   |              | 1 | 0 | 1 | 0 |   |   |
| 13     | BSF - BACK SPACE RECORD               |   |   |   |   |   |   |   |   |              | 1 | 0 | 1 | 1 |   |   |
| 14     | WRZ - WRITE WITH ZERO PARITY          |   |   |   |   |   |   |   |   |              | 1 | 1 | 0 | 0 |   |   |
| 15     | WFM - WRITE FILE (TAPE) MARK          |   |   |   |   |   |   |   |   |              | 1 | 1 | 0 | 1 |   |   |
| 16     | RDC - READ RECORD AND CRCC            |   |   |   |   |   |   |   |   |              | 1 | 1 | 1 | 0 |   |   |
| 17     | FSF - FORWARD SPACE FILE (TAPE) MARK  |   |   |   |   |   |   |   |   |              | 1 | 1 | 1 | 1 |   |   |

3. STATUS WORD - FORMAT

|   |   |   |        |   |   |   |   |   |   |   |            |   |   |   |   |
|---|---|---|--------|---|---|---|---|---|---|---|------------|---|---|---|---|
| 0 | 0 | 0 | 0      | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1          | 1 | 1 | 1 | 1 |
| 0 | 1 | 2 | 3      | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1          | 2 | 3 | 4 | 5 |
| S | B | I | UNIT   | E | F | R | B | B | W | F | ERROR CODE |   |   | 0 |   |
| O | C | R | NUMBER | O | P | D | O | E | O | M |            |   |   |   |   |
|   |   |   |        | T |   | Y | T |   |   |   |            |   |   |   |   |



- 00 UNIT READY INTERRUPT
- 01 TRANSFER ERROR
- 02 COMMAND REJECTED
- 03 TAPE RUNAWAY
- 04 TIMING ERROR
- 05 TAPE ERROR
- 06 RESERVED CODE
- 07 ERROR FREE

|   |   |   |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |
| 1 | 1 | 1 |

V. D E T A I L E D D E S C R I P T I O N O F T E S T S

1. - TEST SECTION - 1

THIS IS THE FIRST SECTION IN THE AUTO-PROCESS . IT CHECKS BASIC CONTROL FUNCTION AND INTERRUPTS OF DIRECT AND PROGRAMMED I/O COMMANDS AND ORDERS.

| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 100         | EXECUTES CIO (CONTROL I/O AND TIO (TEST I/O) COMMANDS AND CHECKS FOR OBTAINED DS (DATA STATUS). |
| 112         | EXECUTES TIO (TEST I/O) COMMAND AND CHECKS CONDITION CODE.                                      |
| 114         | EXECUTES CIO (CONTROL I/O) COMMAND WITH MASTER CLEAR CONTROL AND CHECKS CONDITION CODE (CCE).   |
| 117         | EXECUTES SIO (START I/O) PROGRAM AND CHECKS FOR DEVICE STATUS (DS) BEFORE AND AFTER INTERRUPT.  |
| 120         | EXECUTES RIO (READ I/O) COMMAND AND CHECKS THAT IT WAS IGNORED.                                 |
| 122         | EXECUTES WIO (WRITE I/O) COMMAND AND CHECKS THAT IT WAS IGNORED.                                |
| 124         | EXECUTE SIN (SET INTERRUPT) COMMAND AND CHECKS FOR INTERRUPT AND CONDITION CODE (CCE).          |
| 126         | EXECUTES SMSK (SET MASK) COMMAND AND CHECKS FOR CONDITION CODE                                  |
| 140         | EXECUTES SIO PROGRAM WITH SEL AND CHECK FOR THE OBTAINED DS.                                    |
| 142         | EXECUTES CIO ORDER WITH CLEAR INTERRUPT BIT AND CHECKS CCE.                                     |
| 144         | EXECUTES SIO PROGRAM WITH WFM COMMAND AND CHECKS FOR OBTAINED DS.                               |
| 146         | EXECUTES SIO PROGRAM WITH WRR COMMAND AND CHECKS FOR OBTAINED DS.                               |
| 147         | EXECUTES SIO PROGRAM WITH GAP COMMAND AND CHECKS FOR OBTAINED DS.                               |
| 150         | EXECUTES SIO PROGRAM WITH WRZ COMMAND AND CHECKS FOR OBTAINED DS. (TAPE ERROR STATUS)           |
| 152         | EXECUTES SIO PROGRAM WITH BSF COMMAND AND CHECKS FOR OBTAINED DS.                               |



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STEP  
NUMBER

FUNCTIONS  
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|     |  |
|-----|--|
| 154 | EXECUTES SIO PROGRAM WITH BSR COMMAND AND CHECKS FOR OBTAINED DS.  |
| 156 | EXECUTES SIO PROGRAM WITH RDR COMMAND AND CHECKS FOR OBTAINED DS.  |
| 157 | EXECUTES SIO PROGRAM WITH RDC COMMAND AND CHECKS FOR OBTAINED DS.  |
| 160 | EXECUTES SIO PROGRAM WITH FSR COMMAND AND CHECKS FOR OBTAINED DS.  |
| 162 | EXECUTES SIO PROGRAM WITH FSF COMMAND AND CHECKS FOR OBTAINED DS.  |
| 164 | EXECUTES SIO PROGRAM WITH REW COMMAND AND CHECKS FOR OBTAINED DS.  |
| 166 | EXECUTES SIO PROGRAM WITH WRR AND RDR COMMANDS AND CHECKS FOR OBTAINED DATA AND DS.  |
| 170 | EXECUTES TWO SIO PROGRAMS TO THE SAME DRIVE AND CHECKS FOR BOTH OBTAINED DS.   |
| 176 | EXECUTES TWO SIO PROGRAMS FOR TWO DIFFERENT DRIVES AND CHECKS FOR IGNORING OF UPPER BITS IN BOTH CONTROL ORDERS. BOTH CONTROL ORDERS = %17600. |

2. - TEST SECTION - 2

THIS IS THE SECOND SECTION IN THE AUTO-PROCESS. IT CHECKS ALL CONTROL FUNCTIONS, DEVICE STATUS SPACING IN MORE COMPLICATED SIO PROGRAMS.

| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 200         | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 2. REPEATS FOR EACH DRIVE (0 TO 3).    |
| 202         | EXECUTES SIO PROGRAM WITH SENSE ORDER AND CHECKS FOR OBTAINED DS.   |
| 204         | EXECUTES TWO SIO PROGRAMS WITH WRITE/READ COMMANDS AND CHECKS FOR OBTAINED DS AND RESIDUE. THE DATA COUNTERS ARE DIFFERENT. |
| 207         | TESTS INTERRUPT OF THREE RESERVED CODES (%01,%02,%03) SET AT IOAW COMMAND WORD.   |
| 211         | EXECUTES THREE SIO PROGRAMS WITH WRZ,BSF AND RDC RESPECTIVELY TO SIMULATE ODD NUMBER OF BYTE AND CHECKS FOR OBTAINED DS.    |
| 213         | EXECUTES SIO PROGRAM TO TEST EOT AND BOT BY OBTAINED DS.  |
| 223         | CHECKS 'UNIT INTERRUPT' OF THE ERROR CODE (BITS 12 TO 14 #0) BY OBTAINED DS FROM STEP 213.                                  |
| 224         | EXECUTES TWO SIO PROGRAMS WITH WRZ AND RDR RESPECTIVELY AND CHECKS FOR 'TAPE ERROR' BY OBTAINED DS.                         |
| 227         | EXECUTES TWO SIO PROGRAMS WITH READ ORDER FOLLOWING WRR AND WFM COMMANDS RESPECTIVELY AND CHECKS FOR THE REJECTION.         |
| 230         | EXECUTES TWO SIO PROGRAMS WITH WRITE ORDER FOLLOWING RDR AND WFM COMMANDS RESPECTIVELY AND CHECKS FOR THE REJECTION.        |
| 231         | EXECUTES TWO SIO PROGRAMS WITH CONTROL ORDER FOLLOWING RDR AND WRR COMMANDS RESPECTIVELY AND CHECKS FOR THE REJECTION.      |
| 233         | EXECUTES SIO PROGRAM WITH GAP COMMAND AND CHECKS THAT THERE IS A RECORD NOR FILEMARK IN THE NEXT 25 FEET.                   |

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STEP  
NUMBER

FUNCTIONS  
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- 236 EXECUTES SIO PROGRAM WITH WRZ AND TWO DROP-OUT ADJACENT CHARACTERS AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS, IT IS SIMULATED 'READ AFTER WRITE' ERROR.
- 237 EXECUTES SIO PROGRAM WITH WRZ AND LARGER GROUP OF DATA WITH DROPOUT CHARACTERS TO SIMULATE A VALID INTERRECORD GAP AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 243 EXECUTES SIO PROGRAM WITH WRZ TO SIMULATE THE PARALLEL PARITY ERROR AND CHECK FOR 'TAPE ERROR' IN OBTAINED DS.
- 244 EXECUTES SIO PROGRAM WITH WRZ AND DROPOUT CHARACTERS IN DATA TO SIMULATE A SITUATION WHERE AN ERROR IN THE CRCC\* IS NOT IDENTIFIABLE AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 245 EXECUTES SIO PROGRAM WITH WRZ AND ODD BIT CHARACTERS TO SIMULATE A SITUATION WHERE AN ERROR IN THE CRCC IS NOT IDENTIFIABLE AND CHECKS FOR 'NO TAPE' IN OBTAINED DS.
- 246 EXECUTES SIO PROGRAM WITH WRR AND SIMULATE NO ERROR AND CHECKS FOR NORMAL OBTAINED DS AND CRCC.
- 250 EXECUTES CIO WITH 'MASTER CLEAR' AND TIO AND CHECKS FOR NO INTERRUPT REQUEST BIT 2 IN OBTAINED DS. THEN ISSUES SIO PROGRAM WITH SENSE ORDER AND CHECKS FOR NORMAL OBTAINED DS.
- 251 EXECUTES SIO PROGRAM WITH SEL, RDR COMMANDS WITHOUT FOLLOWING 'READ' ORDER TO PUT THE CONTROL INTO MAILING LOOP AND CHECKS FOR SIO-OK AND NO INTERRUPT REQUEST SET IN OBTAINED DS.
- 252 ISSUES 'WRITE' ORDER TO PREVIOUS STEP 251 AND CHECKS FOR 'REJECT' ERROR CODE IN OBTAINED STATUS.
- 253 EXECUTES CIO WITH MASTER CLEAR AND TIO TO CLEAN UP CONTROLLER AND CHECKS FOR NO INTERRUPT REQUEST IN OBTAINED DS.
- 254 ISSUES SIO PROGRAM WITH SEL AND RDR COMMANDS WITHOUT READ TO PUT THE CONTROL INTO MAILING LOOP AND CHECKS FOR SIO/OK AND NO INTERRUPT REQUEST IN OBTAINED DS.

\*CRCC IS CYCLIC REDUNDANCY CHECK CHARACTER.

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STEP  
NUMBER                                  FUNCTIONS  
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- 255      EXECUTES SIO PROGRAM WITH SEL COMMAND TO PREVIOUS LOOPING SIO PROGRAM (STEP 254) AND CHECKS FOR 'REJECT' ERROR CODE IN OBTAINED DS.
- 256      EXECUTES CIO WITH 'MASTER CLEAR' AND TIO TO CLEAN UP CONTROLLER AND CHECKS FOR NO 'INTERRUPT REQUEST' IN OBTAINED STATUS, THEN ISSUES SIO PROGRAM WITH 'SENSE' ORDER AND CHECKS FOR NORMAL OBTAINED DS.
- 257      EXECUTES SIO PROGRAM WITH SEL, WRR COMMANDS WITHOUT FOLLOWING 'WRITE' ORDER TO PUT THE CONTROL INTO MAILING LOOP AND CHECKS FOR SIO/OK AND NO 'INTERRUPT REQUEST' IN OBTAINED DS.
- 260      ISSUES 'READ' ORDER TO PREVIOUS LOOPING SIO PROGRAM (STEP 257) AND CHECKS FOR 'REJECT' ERROR CODE IN OBTAINED DS.
- 261      EXECUTES CIO WITH 'MASTER CLEAR' AND TIO TO CLEAN UP CONTROLLER AND CHECKS FOR NO 'INTERRUPT REQUEST' IN OBTAINED DS, THEN ISSUES SIO PROGRAM WITH 'SENSE' ORDER AND CHECKS FOR NORMAL OBTAINED DS.
- 262      EXECUTES SIO PROGRAM WITH SEL AND WRR WITHOUT FOLLOWING 'WRITE' ORDER TO PUT THE CONTROL INTO MAILING LOOP AND CHECKS FOR SIO/OK AND NO 'INTERRUPT REQUEST' IN OBTAINED DS.
- 263      EXECUTES SIO PROGRAM WITH SEL COMMAND TO PREVIOUS LOOPING SIO PROGRAM (STEP 262) AND CHECKS FOR 'REJECT' ERROR CODE IN OBTAINED DS.
- 264      EXECUTES CIO WITH MASTER CLEAR AND TIO AND CHECKS FOR NO 'INTERRUPT REQUEST' IN OBTAINED DS, THEN ISSUES SIO PROGRAM WITH 'SENSE' AND CHECKS FOR NORMAL DS.

NOTE: THE FOLLOWING STEPS 265 TO 275 ARE SPACING TESTS.

- 265      PUTS BOT ON HEADS, EXECUTES SIO PROGRAM WITH BSR AND BSF RESPECTIVELY AND CHECKS FOR SIO/OK, BOT IN OBTAINED DB.
- 266      WRITES 100 GAPS AND CHECKS FOR NO NOISE AFTER EACH WRITING.

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STEP  
NUMBER

FUNCTIONS  
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- 275 EXECUTES SIO PROGRAM WITH REW AND CHECKS FOR INTERRUPT REQUEST AND NOT READY IN OBTAINED DS DURING REWINDING AND FOR NORMAL DS AFTER REWINDING IS FINISHED. THEN ISSUES THAT REW AND CHECKS FOR BOT AND NO INTERRUPT REQUEST IN OBTAINED DS.
- 270 EXECUTES SIO PROGRAM WITH RDR COMMAND TO CHECK FOR 'TAPE RUNAWAY' IN ERROR CODE IN OBTAINED DS. THEN ISSUES SIO PROGRAM WITH SEL TO CLEAR ERROR CODE AND CHECK FOR NORMAL DS. THEN ISSUES NEXT SIO PROGRAM WITH BSR COMMAND TO CHECK FOR BOT AND INTERRUPT REQUEST IN OBTAINED DS.
- 271 EXECUTES SIO PROGRAM WITH FSF COMMAND TO CHECK FOR 'TAPE RUNAWAY' ERROR CODE IN OBTAINED DS. THEN ISSUES SIO PROGRAM WITH BSF COMMAND TO CHECK FOR BOT AND INTERRUPT REQUEST IN OBTAINED DS.
- 272 WRITES TWO RECORDS OF PATTERN TEST A (ISA) WITH DATA CHAIN AND CHECKS FOR NORMAL DS. THEN ISSUES SIO PROGRAM WITH BSR.
- 274 EXECUTES SIO PROGRAM WITH RDR COMMAND AND CHECKS READ DATA AND DS.
- 275 EXECUTES SIO PROGRAM WITH BSR COMMAND TO CHECK NO BOT IN OBTAINED DS. THEN ISSUES NEW SIO PROGRAM WITH FSF COMMAND TO CHECK FOR 'TAPE RUNAWAY' IN OBTAINED DS.

3. - TEST SECTION - 3

THIS IS THE THIRD SECTION IN THE AUTO-PROCESS. IT CHECKS FOR FILEMARK(FM) GAP, END OF TAPE (EOT), BEGIN OF TAPE (BOT), AND REWINDING (REW). SECTION 3 IS EXECUTED ONLY IF B-TAPE IS SET (800 CPI).

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| STEP<br>NUMBER | FUNCTIONS  |
|----------------|--|
| 300            | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 3. REPEATS FOR EACH DRIVE (0 TO 3).                     |
| 310            | ISSUES A WRZ TO WRITE A SIMULATED TM WITH 9 CHARACTER SPACING AND WORD COUNT=160 AND CHECKS FOR 'TAPE ERROR' IN ERROR CODE IN OBTAINED DS.   |
| 311            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.  |
| 312            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR', NO FM AND NO BOT IN OBTAINED DS.   |
| 313            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.  |
| 314            | ISSUES A RDR COMMAND TO CHECK FOR NO FM IN OBTAINED DS AND FULL COUNT IN RETURN RESIDUE.   |
| 317            | ISSUES A WRZ TO WRITE A SIMULATED TM WITH 5 CHARACTER SPACING ON WORD =150 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.            |
| 320            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.  |
| 321            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR', ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.   |
| 322            | ISSUES A SEL COMMAND AND CHECKS FOR NO 'TAPE ERROR' ERROR CODE IN OBTAINED DS.   |
| 323            | ISSUES A BSR COMMAND TO CHECK FOR NO BOT IN OBTAINED DS.   |
| 324            | ISSUES A RDR COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.  |
| 327            | ISSUES A WRZ TO WRITE A SIMULATED TM WITH 12 CHARACTERS SPACING AND WORD COUNT=170 AND CHECKS FOR 'TAPE ERROR' IN ERROR CODE IN OBTAINED DS. |

| STEP<br>NUMBER | FUNCTIONS   |
|----------------|---|
| 330            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.   |
| 331            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR', NO FM AND NO BOT IN OBTAINED DS.  |
| 332            | ISSUES A BSR COMMAND TO CHECK FOR BOT IN OBTAINED DS.   |
| 333            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.   |
| 317            | ISSUES A WRZ TO WRITE A SIMULATED ERRONEOUS TM IN WHICH THE FIRST CHARACTER IS %3, THE SECOND IS %23 AND THE WORD COUNT IS 190 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS. |
| 337            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.   |
| 340            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.   |
| 341            | ISSUES A SEL COMMAND AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.   |
| 342            | ISSUES A WRZ TO WRITE A SIMULATED ERRONEOUS TM IN WHICH THE FIRST CHARACTER IS %21, THE SECOND IS %23 AND WORD COUNT IS 200 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.    |
| 343            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.   |
| 344            | ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR', NO FM AND NO BOT IN OBTAINED DS.  |
| 345            | ISSUES A SEL COMMAND TO CHECK FOR NO 'TAPE ERROR' ERROR CODE IN OBTAINED DS.  |
| 346            | ISSUES A WRZ TO WRITE A SIMULATED ERRONEUS TM IN WHICH THE FIRST CHARACTER IS %22, THE SECOND IS %23 AND WORD COUNT IS 200 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.     |
| 347            | ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.   |

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STEP  
NUMBER

FUNCTIONS  
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- 350 ISSUES A FSF COMMAND AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 351 ISSUES A SEL COMMAND AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.
- 352 ISSUES A BSH COMMAND TO CHECK FOR NO BOT IN OBTAINED DS.
- 353 ISSUES A RDR COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 356 ISSUES A WRZ TO WRITE A SIMULATED ERRONEOUS TM IN WHICH THE FIRST CHARACTER IS %23, THE SECOND CHARACTER IS %3 AND WORD COUNT IS 180 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 357 ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.
- 360 ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED STATUS.
- 361 ISSUES A WRZ TO WRITE A SIMULATED ERRONEOUS TM IN WHICH THE FIRST CHARACTER IS %23, SECOND CHARACTER IS %27 AND WORD COUNT IS 190 AND CHECK FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 362 ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.
- 363 ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.
- 366 ISSUES A WRZ COMMAND TO WRITE A SIMULATED DOUBLE TM WITH DATA CHARACTERS BETWEEN MARKS AND WORD COUNT OF 200 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 367 ISSUES A BSF COMMAND TO CHECK FOR NO FM AND BOT IN OBTAINED DS.
- 370 ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.
- 371 ISSUES A SEL COMMAND AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.



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STEP  
NUMBER

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- 372 ISSUES A BSR COMMAND TO CHECK FOR NO BOT AND NO FM IN OBTAINED DS.
- 373 ISSUES A FSR COMMAND AND CHECKS FOR NO TAPE ERROR AND NO FM IN OBTAINED DS.
- 375 ISSUES A WRZ COMMAND TO WRITE A RECORD IN WHICH THE FIRST AND EIGHTH CHARACTERS ARE %23 AND WORD COUNT IS 180 AND CHECKS FOR 'TAPE ERROR' ERROR CODE IN OBTAINED DS.
- 376 ISSUES A REW COMMAND TO CHECK FOR BOT IN OBTAINED DS.
- 377 ISSUES A FSF COMMAND TO CHECK FOR 'TAPE ERROR' ERROR CODE, NO FM AND NO BOT IN OBTAINED DS.

V. D E T A I L E D D E S C R I P T I O N O F T E S T S

4. - TEST SECTION - 4

THIS IS THE FOURTH SECTION IN THE AUTO-PROCESS IT CHECKS READ AFTER WRITE ERRORS AND READ ERRORS.

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| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 400         | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 4. REPEATS FOR EACH DRIVE (0 TO 3).  |
| 407         | ISSUES SEL AND WFM COMMANDS TO CHECK NORMAL OBTAINED DS.  |
| 410         | ISSUES A WRZ COMMAND TO SIMULATE 4 CHARACTER DROPOUT FROM A BLOCK AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.   |
| 411         | ISSUES A WRZ COMMAND TO SIMULATE DROPOUT OF MORE THAN 0.16 INCHES FROM THE START OF A DATA BLOCK AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.                    |
| 412         | ISSUES A WRZ COMMAND TO SIMULATE DROPOUT OF MORE THAN 0.16 INCHES FROM THE END OF DATA BLOCK AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.                        |
| 413         | ISSUES A WRZ COMMAND TO SIMULATE THE SECOND CHARACTER DROPOUT AND ODD BYTE COUNT AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.                                    |
| 414         | ISSUES BSR AND RDR COMMANDS AND CHECKS FOR ODD BYTE BIT IN OBTAINED DS.   |
| 415         | ISSUES BSR AND RDR COMMANDS WITH WORD COUNT LESS THAN RECORD LENGTH AND CHECKS FOR NO ODD-BYTE BIT IN OBTAINED DS.  |
| 416         | ISSUES A WRZ COMMAND WITH SINGLE PARITY ERROR CHARACTER GREATER THAN ONE HEADGAP SPACING FROM THE END OF DATA BLOCK AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS. |
| 417         | ISSUES SIO PROGRAM WITH 'RETURN RESIDUE' ORDER AND CHECKS TO SEE THAT BLOCK WAS FULLY WRITTEN.  |
| 420         | ISSUES BSR AND RDR COMMANDS WITH A WORD COUNT LESS THAN THE NUMBER OF WORDS PRECEDING THE PARITY ERROR AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.              |

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STEP  
NUMBER

FUNCTIONS  
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- 421 ISSUES A WRZ TO SIMULATE A SINGLE PARITY ERROR CHARACTER LESS THAN HEADGAP SPACING FROM THE END OF A DATA BLOCK AND CHECKS FOR 'TAPE ERROR' IN OBTAINED STATUS.
- 422 ISSUES A WRZ COMMAND TO SIMULATE THE CYCLIC REDUNDANCY CHECK CHARACTER (CRCC) THREE CHARACTER SPACE FROM THE END OF DATA BLOCK.
- 424 ISSUES BSR AND RDC COMMANDS AND CHECKS TO SEE THAT CRCC IS READ.
- 426 ISSUES WRZ TO SIMULATE CRCC FIVE CHARACTER SPACE FROM THE END OF BLOCK.
- 427 ISSUES BSR AND RDC COMMANDS AND CHECKS TO SEE THAT CRCC IS READ.
- 430 ISSUES A WRZ COMMAND TO WRITE A RECORD WITH A SIMULATED NOISE CHARACTER AFTER THE CRCC AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 432 ISSUES A WRZ COMMAND TO WRITE A RECORD WITH A SIMULATED ERRONEOUS CRCC AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 434 ISSUES BSR AND RDC COMMANDS TO CHECK FOR 'TAPE ERROR' IN OBTAINED DS.
- 436 ISSUES A WRZ COMMAND TO WRITE A RECORD WITH SIMULATED CRCC=0 AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.
- 437 ISSUES BSR AND RDC COMMANDS TO CHECK THAT THE CRCC=0.
- 440 ISSUES A WRZ COMMAND TO GENERATE A RECORD WITH A SIMULATED BAD CRCC=0 AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 442 ISSUES BSR AND RDC COMMANDS TO CHECK THAT THE CRCC=0 AND 'TAPE ERROR' IN OBTAINED DS.
- 444 ISSUES WRM AND WRZ COMMAND TO GENERATE A REPORT OF 16 ZERO CHARACTERS AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.

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- 445 ISSUES A BSR COMMAND TO CHECK FOR FM IN OBTAINED DS.
- 446 ISSUES WFM AND WRZ COMMAND TO WRITE A SIMULATED NOISE CHARACTER AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.
- 447 ISSUES A WRR COMMAND TO WRITE A NORMAL RECORD. THE INTER-RECORD GAP (IRG) IS THE WRONG POLARITY BECAUSE THE PREVIOUS WRZ COMMAND LEFT THE WRITE HEAD AT A NONERASE LEVEL. BECAUSE OF THIS, THE LONGITUDINAL REDUNDANCY CHECK CHARACTER (LRCC) GENERATED BY WRR COMMAND WILL BE WRONG.
- 450 ISSUES BSR AND RDR COMMANDS TO CHECK FOR NO 'TAPE ERROR' IN OBTAINED DS. IT SHOULD IGNORE ERRONEOUS LRCC.
- 452 ISSUES BSR AND WRR COMMANDS OVER SAME RECORD AND WRITES A NOISE CHARACTER BY STARTING WITH PROPER POLARITY.
- 454 ISSUES BSF, FSF AND RDR COMMANDS TO CHECK FOR 'TAPE ERROR' IN OBTAINED DS BECAUSE OF NOISE CHARACTERS IN IRG.

NOTE: THE NEXT STEPS 460 AND 461 ARE EXECUTABLE TO E-TAPE (1600 CPI) ONLY

- 460 ISSUES WRZ, BSR AND RDC COMMANDS TO WRITE A RECORD, TO COME BACK, TO READ RECORD WITH CRCC AND CHECKS NORMAL OBTAINED DS, RESIDUE AND DATA TO SEE THAT COMMANDS PERFORMED THE SAME AS WRR AND RDR COMMANDS.
- 461 ISSUES A NEW COMMAND.
- 462 EXECUTES SIO PROGRAM WITH TWO WRR COMMANDS TO WRITE TWO IDENTICAL RECORDS, THEN ISSUES TWO BSR AND EXECUTES SIO PROGRAM WITH TWO RDR COMMANDS AND CHECKS ELAPSED TIME.
- 463 ISSUES BSR AND WRR COMMANDS TO REWRITE THE SECOND RECORD 10 TIMES.
- 464 ISSUES BSR TWICE AND CHECKS FOR NO BOT IN OBTAINED DS.

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- 470 EXECUTES THE SIO PROGRAM WITH TWO RDR COMMANDS, MEASURES ELAPSED TIME AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.
- 471 COMPARES DIFFERENCE IN TIME FOR STEP 462 AND STEP 470 IF THE TIME OF STEP 462 > TIME OF STEP 470, PRINTS MESSAGE: 'REVERSE CREEPING'. IF TIME OF STEP 462 <= TIME OF STEP 470 PRINTS MESSAGE: 'CREEPING IS OVER LIMIT'.
- 472 EXECUTES 10 SIO PROGRAMS WITH WRW COMMAND (START-STOP) AND 2 MILLISECOND DELAY BETWEEN EACH COMMAND AND MEASURES THE TOTAL TIME. THEN ISSUES SIO PROGRAM WITH 10 BSF COMMANDS AND MEASURES TOTAL BACK MOTION TIME. THEN ISSUES 10 FSF COMMANDS AND MEASURES TOTAL FORWARD TIME.
- 473 EXECUTES THE SIO PROGRAM WITH 10 WFM COMMANDS (CONTINUOUS MOTION) AND MEASURES TOTAL TIME TAKEN. THEN ISSUES THE SIO PROGRAM WITH 10 BSF COMMANDS AND MEASURES TOTAL BACK MOTION TIME. THEN ISSUES THE SIO PROGRAM WITH 10 FSF COMMANDS AND COMPARES AVERAGE TIMES OBTAINED HERE AND IN STEP 472 AND REPORTS SIGNIFICANT DISCREPANCIES.
- 474 CHECKS TIMES OF BOTH PREVIOUS STEPS 472 AND 473 AND CHECKS FOR LIMITS AND IRG NO GREATER THAN 12% AND PRINTS AN ERROR MESSAGE IF ANY IS OVER LIMIT.

5. - TEST SECTION - 5

THIS IS THE FIFTH SECTION IN THE AUTO-PROCESS. IT CHECKS THE PARITY GENERATION, ERASE LENGTH AND 'TIMING ERROR' ERROR CODE OF STATUS.

| STEP NUMBER   | FUNCTIONS   |
|---|---|
| 500   | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 5. REPEATS FOR DRIVE (0 TO 3).   |
| NOTE: THE FOLLOWING TESTS 501 TO 510 WILL BE EXECUTED WITH B TAPE (800 CPI) ONLY. |   |
| 501   | ISSUES A WRZ COMMAND FOR A RECORD WITH PATTERN G AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 502   | ISSUES BSR AND RDR COMMANDS AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.   |
| 503   | ISSUES WRZ COMMAND FOR A RECORD WITH PATTERN H AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 504   | ISSUES BSR AND RDR COMMAND AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 505   | ISSUES A WRZ COMMAND FOR A RECORD WITH PATTERN I AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 506   | ISSUES BSR AND RDR COMMANDS AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.   |
| 507   | ISSUES WRZ COMMAND FOR A RECORD WITH PATTERN J AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 508   | ISSUES BSR AND RDR COMMAND AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.  |
| 512   | ISSUES WFM AND WRR COMMANDS WITH A RECORD OF 4,000 NON-ZERO CHARACTERS FOR 800 CPI (B-TAPE) AND 8,000 NON-ZERO CHARACTERS FOR 1600 CPI (E-TAPE) UNIT AND CHECKS FOR NORMAL OBTAINED DS. |
| 513   | ISSUES A BSF COMMAND AND CHECKS FOR NO BOT AND FM IN OBTAINED DS.   |

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- 514 ISSUES WFM AND RDR COMMANDS AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.
- 515 ISSUES FSF AND RDR COMMANDS AND CHECKS FOR NO 'TAPE ERROR' IN OBTAINED DS.
- 516 ISSUES WFM AND WRR COMMANDS WITH A RECORD OF 4,000 NON-ZERO CHARACTERS FOR 800 CPI (B-TAPE) OR 8,000 OF NON-ZERO CHARACTERS FOR 1600 CPI (E-TAPE) AND CHECKS FOR NORMAL OBTAINED DS.
- 517 ISSUES A BSF COMMAND AND CHECKS FOR NO BOT AND FM IN OBTAINED DS.
- 520 ISSUES WFM AND BSF COMMANDS AND CHECKS THAT BSF TOOK EXTENDED TIME TO MOVE FORWARD AND ERASE.
- 521 ISSUES FSF AND RDR COMMANDS WITH 8000 CHARACTERS FOR 1600 CPI (E-TAPE) OR 4000 CHARACTERS FOR 800 CPI (B-TAPE).
- 522 ISSUES WFM AND WRR COMMANDS WITH A RECORD OF 4000 NON-ZERO CHARACTERS FOR 800 CPI (B-TAPE) OR 8000 NON-ZERO CHARACTERS FOR 1600 CPI (E-TAPE) UNIT.
- 523 ISSUES A BSF COMMAND AND CHECKS FOR NO BOT IN OBTAINED DS.
- 524 ISSUES A WFM, GAP, AND BSF COMMANDS AND CHECKS FOR NORMAL OBTAINED DS.
- 525 ISSUES FSF AND RDR COMMANDS WITH 8000 CHARACTERS FOR 1600 CPI (E-TAPE) AND 4000 CHARACTERS FOR 800 CPI (B-TAPE) AND CHECKS FOR NORMAL DS.
- 531 ISSUES WFM AND WRR COMMANDS WITH A RECORD OF 4,000 NON-ZERO CHARACTERS FOR 800 CPI (B-TAPE) AND 8,000 NON-ZERO CHARACTERS FOR 1600 CPI (E-TAPE) UNIT AND CHECKS FOR NORMAL OBTAINED DS.
- 532 EXECUTES A READ PROGRAM WITH SEVERAL 'SENSE' ORDERS ALL WITH DATA CHAIN (DC) TO SIMULATE 'TIMING ERROR' IN OBTAINED DS.
- 533 EXECUTES A WRITE PROGRAM WITH SEVERAL 'SENSE' ORDERS, ALL WITH DATA CHAIN (DC) TO SIMULATE 'TIMING ERROR' IN OBTAINED DS.

6. - TEST SECTION - 6

THIS IS THE SIXTH SECTION IN THE AUTO-PROCESS. IT CHECKS THE 1600 CPI (E-TAPE) DRIVE COMMAND RECOGNITION AND CREEP CONTROL.

| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 600         | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 6. REPEATS FOR EACH DRIVE (0 TO 3)   |
| 612         | ISSUES REW,WFW COMMAND AND WRITES FIVE SETS OF RECORDS, WITH TM, EACH SET HAS BLOCKS INCREASING LENGTH AND CHECKS FOR OBTAINED DS.  |
| 614         | READS THE FIRST SET OF RECORDS 17 MSEC WAIT BETWEEN EACH BLOCK AND CHECKS OBTAINED DS FOR NO ERRORS, START/STOP PERIOD SHOULD BE 40 MSEC AND ELAPSED TIME 10 SEC.   |
| 616         | READS AND BACKSPACES OVER LAST RECORD OF THE FIRST SET FOR 10 SEC, AND CHECKS OBTAINED DS FOR NO ERRORS, THE FORWARD/REVERSE PERIOD SHOULD BE 25 MSEC.  |
| 620         | SAME AS STEP 614 ON SECOND SET WITH 20 MSEC WAIT FOR 33 MSEC PERIOD.  |
| 622         | SAME AS STEP 616 ON SECOND SET FOR 46 MSEC PERIOD.  |
| 624         | SAME AS STEP 614 ON THIRD SET WITH 25 MSEC WAIT FOR 50 MSEC PERIOD.   |
| 626         | SAME AS STEP 616 ON THIRD SET FOR 50 MSEC PERIOD.   |
| 630         | SAME AS STEP 614 ON FOURTH SET WITH 33 MSEC WAIT FOR 66 MSEC PERIOD.  |
| 632         | SAME AS STEP 616 ON FOURTH SET FOR 66 MSEC PERIOD.  |
| 634         | SAME AS STEP 614 ON FIFTH SET WITH 50 MSEC WAIT FOR 100 MSEC PERIOD.  |
| 636         | SAME AS STEP 616 ON FIFTH SET FOR 100 MSEC PERIOD.  |
| 640         | ISSUES GAP COMMANDS UNTIL EOT MARKER STATUS COMES UP, THEN ISSUES WFM,RSF AND BSR COMMANDS AND WAITS 200 MSEC, THEN EXECUTES A CIO TO STOP MOTION AND CHECKS OBTAINED DS TO SEE THAT EOT STATUS IS CLEAR. |



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- 642 ISSUES WFM, FSF AND BSF COMMANDS OVER EOT MARKER 10 TIMES AND CHECKS OBTAINED DS FOR PROPER LEVEL OF EOT BIT AFTER EACH OPERATION.
- 646 EXECUTES SIO PROGRAM WITH BIT COMBINATIONS WHICH ARE MOST DIFFICULT TO READ AND WRITE ON A RECORD AND LOOPS THIS RECORD BY BSR AND RDR COMMANDS EXECUTED 200 TIMES AND CHECKS NORMAL OBTAINED DS AFTER EACH OPERATION.
- 647 EXECUTES SIO PROGRAM WITH A SEQUENCE OF WRR, BSR COMMANDS, RDR, BSR COMMANDS, WRR, BSR COMMANDS ...ETC. COMBINATION UNTIL EOT MARKER COMES UP AND CHECKS FOR NORMAL OBTAINED DS. THE RECORDS ARE MOST DIFFICULT COMBINATIONS . (TEST B - ISA)

7. - TEST SECTION - 7

THIS IS THE SEVENTH SECTION IN THE AUTO-PROCESS. IT CHECKS THE LARGE WRITE/READ SIO PROGRAMS IN SINGLE AND MULTI-UNIT (IF MORE THAN ONE UNIT SET) MODES.

| STEP NUMBER | FUNCTIONS  |
|-------------|--|
| 700         | SETS THE DRIVE NUMBER AND TRANSFERS CONTROL TO ALL THE STEPS WHICH FOLLOW IN SECTION 7. REPEATS FOR EACH DRIVE (0 TO 3).   |
| 712         | WRITES A SINGLE WORD RECORD, THEN ISSUES BSR AND RDR COMMANDS AND CHECKS FOR READ DATA AND NORMAL OBTAINED DS.   |
| 714         | WRITES A 4096-WORD RECORD, THEN ISSUES BSR AND RDR COMMANDS AND CHECKS FOR READ DATA AND NORMAL OBTAINED DS. (PATTERN E,F)   |
| 716         | ISSUES BSR AND RDR COMMANDS WITH A WORD COUNT LESS THEN 4096 AND CHECKS FOR EXACT NUMBER OF WORDS READ, THEN REWINDS.  |
| 720         | WRITES A SERIES OF RECORDS OF RANDOM DATA OF VARIOUS LENGTHS UP 200 BLOCKS OR TO THE END OF TAPE (EOT), WHICHEVER COMES FIRST. EACH BLOCK HAS THE SAME CONTENT EXCEPT THE FIRST WORD CONTAINS A SEQUENCE NUMBER AND RECORD LENGTH. THE NUMBER OF WORDS IS 9 TO 1024.   |
| 722         | ISSUES TWO WFM COMMANDS AND REW COMMAND.   |
| 724         | READS EACH RECORD AND CHECKS FOR THE NORMAL OBTAINED DS, 'RETURN RESIDUE' EXACT NUMBER OF WORDS READ, SEQUENCE NUMBER AND READ DATAS.  |
| 726         | ISSUES A REW COMMAND AFTER TWO TM ARE READ.  |
| 727         | THIS STEP IS EXECUTED ONLY WHEN TWO OR MORE TAPE UNITS ARE TESTED. READS RECORDS FROM PRESENT DRIVE AND WRITES THEM ON THE NEXT DRIVE. THE DRIVE NUMBER IS PICKED-UP IN CYCLIC SEQUENCE 0->1->2->3->0... THE READ/WRITE TRANSFER RECORD BY RECORD IS EXECUTED UNTIL ALL OF THE RECORDS ARE READ OR UNTIL EOT IS ENCOUNTERED ON THE OBTAINED DS AND THE DATA WHICH IS READ IS VERIFIED. THEN ISSUES REW COMMANDS TO DRIVES. |
| 732         | READS RECORD BY RECORD FROM THE NEXT DRIVE AND CHECKS OBTAINED DS, 'RETURN RESIDUE', EXACT NUMBER OF WORDS READ, SEQUENCE NUMBER AND DATA. THE CRCC NUMBER IS CHECKED ALSO FOR 800 CPI (B-TAPE) UNITS.   |

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740 ISSUES THE SET OF REW, GAP AND BSR COMMANDS TO CLEAN TAPE UNTIL HEADS ARE ON BOT.

742 ISSUES A WFM COMMAND TO CHECK FOR FM IN OBTAINED DS.

743 ISSUES A CIO WITH 'MASTER CLEAR' TO SEE THAT FM REMAINS.

744 ISSUES A SEL TO RESET FM BIT IN OBTAINED DS.

745 ISSUES A BSF COMMAND TO CHECK FOR FM AND NO BOT IN OBTAINED DS.

746 ISSUES A FSF COMMAND TO CHECK FOR FM AND NO ERR IN OBTAINED DS.

747 ISSUES A BSR COMMAND TO CHECK FOR FM IN OBTAINED DS.

750 ISSUES A FSM COMMAND TO CHECK FOR FM IN OBTAINED DS.

751 ISSUES A BSR COMMAND TO CHECK FOR FM IN OBTAINED DS.

752 ISSUES A RDR COMMAND TO CHECK FOR FM IN OBTAINED DS AND FULL COUNT FROM 'RETURN RESIDUE' ORDER.

NOTE: THE "PEST" TESTS 760 TO 775 ARE APPLICABLE ON 800 CPI (8 TAPE) ONLY.

760 ISSUES THE WRZ COMMANDS WITH ODD NUMBERS OF BYTES IN THE LINEAR SEQUENCE 1 TO 376 AND WITH WORD COUNT = 64.

762 ISSUES A BSR COMMAND TO CHECK FOR NO BOT STATUS.

763 ISSUES A RDR COMMAND AND CHECKS DATA TO SEE THAT ALL CHARACTERS WERE WRITTEN.

770 ISSUES A WRZ COMMAND TO WRITE A SIMULATED FM WITH 7 CHARACTER SPACING AND CHECKS FOR 'TAPE ERROR' IN OBTAINED DS.

771 ISSUES A BSF COMMAND TO CHECK FOR FM IN OBTAINED DS.

772 ISSUES A FSF COMMAND TO CHECK FOR FM IN OBTAINED DS.

773 ISSUES A BSR COMMAND TO CHECK FOR FM IN OBTAINED DS.

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- 774 ISSUES A RDR COMMAND TO CHECK FOR FM IN OBTAINED DS AND FULL  
COUNT IN 'RETURN RESIDUE' ORDER.
- 775 ISSUES WFM COMMANDS UNTIL EITHER EOT COMES UP IN OBTAINING  
DS OR 1000 FM ORDERS ARE COMPLETED, WHICHEVER COMES SOONER  
AND CHECKS THEM.

8. - TEST SECTION - 11

THIS IS THE ELEVENTH SECTION IN THE MANU-PROCESS (INTERACTIVE). IT PERFORMS HEAD TESTING AND SCOPING USED FOR THE HEAD ADJUSTMENT.

| STEP<br>NUMBER | FUNCTIONS   |
|----------------|---|
| 1100           | EXECUTES HEAD TESTING WITH THE HP 9162-0027 TAPE.                 |
| 1114           | EXECUTES WRITE/READ TEST WITH 'ALL ONES' PATTERN.                 |
| 1116           | EXECUTES WRITE/READ TEST WITH PATTERN = %136274.                  |
| 1120           | EXECUTES WRITE/READ TEST WITH PATTERN = %041503.                  |
| 1124           | EXECUTES WRITE/READ TEST WITH PATTERN = A AND B (ISA STANDARD).   |
| 1130           | EXECUTES UNLIMITED READING/WRITING AND IGNORES ANY KIND OF ERROR. |

9. - TEST SECTION - 12

THIS IS THE TWELFTH SECTION IN THE MANU-PROCESS (INTERACTIVE)  
CHECKS START/STOP ROUTINES, READY INTERRUPT TESTS AND RESET AND  
ALL PANEL CONTROL SWITCHES.

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| STEP<br>NUMBER | FUNCTIONS  |
|----------------|--|
| 1210           | EXECUTES RESET/ON TESTING (INTERRUPT AFTER ON-LINE SWITCH AND DRIVE UNIT NUMBER SWITCHES).   |
| 1220           | EXECUTES RESET/ON TESTING (LIGHT 'WRITE' AND INTERRUPT AFTER SWITCH DRIVE UNIT NUMBER SET).  |
| 1224           | EXECUTES RESET/ON TESTING (NO INTERRUPT AFTER SWITCH 'RESET' PUSHED AND INTERRUPT AFTER SWITCH DRIVE UNIT NUMBER SET).                                   |
| 1226           | EXECUTES RESET/ON TESTING (NO INTERRUPT AFTER SWITCH 'RESET' PUSHED AND INTERRUPT AFTER SWITCH DRIVE NUMBER SET WHICH IS DIFFERENT FROM EXECUTING UNIT). |
| 1230           | EXECUTES THE DYNAMIC START/STOP TESTING UNTIL EOT COMES UP AND BACK UNTIL BOT COMES UP.  |
| 1232           | EXECUTES RST COMMAND AND CHECKS FOR RESET STATUS ON THE UNIT CONTROL PANEL.  |

10. - TEST SECTION - 13

THIS IS THE THIRTEENTH SECTION IN THE MANU-PROCESS (INTERACTIVE). IT CHECKS REEL PROTECTION.

| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 1310        | WRITES A FEW SINGLE RECORDS ON TAPE.  |
| 1312        | PRINTS A MESSAGE INSTRUCTING THE TEST OPERATOR TO REMOVE RINGS FROM TAPE REEL ON TAPE UNIT AND AFTER OPERATOR'S RESPONSE ISSUES WRR COMMAND TO CHECK NO WRITE CAPABILITY, 'FILE PROTECT' 'COMMAND REJECTED', AND 'INTERRUPT REQUEST' BITS SHOULD BE SET IN OBTAINED DS. |
| 1314        | PRINTS A MESSAGE INSTRUCTING THE TEST OPERATOR TO PUT RINGS BACK ON TAPE REELS, ISSUES WRR COMMAND TO VERIFY THE WRITING BY NORMAL OBTAINED DS.   |

11. - TEST SECTION - 14





THIS IS THE FOURTEENTH SECTION IN THE MANU-PROCESS (INTERACTIVE). IT CHECKS THE TAPE QUALITY (DROP-OUT AND NOISE).

| STEP<br>NUMBER | FUNCTIONS  |
|----------------|--|
| 1420           | EXECUTES A WRITE OF 'ALL-ONES' UNTIL EOT IS REACHED. SIO PROGRAM LOOPS EACH 12 INCHES ON 800 CPI (B-TAPE) AND 6 INCHES ON 1600 CPI (E-TAPE) AND CHECKS FOR NO DROP-OUT WITH READ-AFTER-WRITE. IF ANY DROP-OUT, A MESSAGE WITH THE NUMBER OF DROP OUTS AND DISTANCE IN FEET OF THE ERROR FURTHEST FROM BOT IS PRINTED |
| 1422           | WRITES GAP UNTIL EOT AND CHECKS FOR A NOISE. IF ONE APPEARS A MESSAGE WITH THE NUMBER OF ERRORS AND THE DISTANCE IN FEET OF THE ERROR FURTHEST FROM BOT IS PRINTED.  |
| 1424           | SAME AS STEP 1420.   |
| 1426           | READS RECORD UNTIL EOT COMES UP AND CHECKS FOR ERRORS. IF ANY ERROR APPEARS, A MESSAGE WITH THE NUMBER OF ERRORS AND THE DISTANCE IN FEET OF THE ERROR FURTHEST FROM BOT IS PRINTED.   |



12. - TEST SECTION - 15

THIS IS THE FIFTEENTH SECTION IN THE MANU-PROCESS (INTERACTIVE). IT PROVIDES AND EXECUTES THE WRITE/READ SIO PROGRAMS WITH PATTERNS WHICH ARE THE MOST DIFFICULT TO READ AND WRITE.

| STEP NUMBER | FUNCTIONS   |
|-------------|---|
| 1520        | EXECUTES WRITE/READ TEST WITH PATTERN A (ISA-STANDARD).   |
| 1521        | EXECUTES WRITE/READ TEST WITH PATTERN B (ISA-STANDARD).   |
| 1530        | EXECUTES WRITE/READ TEST WITH 'TOOTH' ARRAY TEST C (  ).   |
| 1531        | EXECUTES WRITE/READ TEST WITH 'TOOTH' ARRAY TEST D (  ). |
| 1532        | EXECUTES WRITE/READ TEST WITH 'TOOTH' ARRAY TEST E (  ). |
| 1533        | EXECUTES WRITE/READ TEST WITH 'TOOTH' ARRAY TEST F (  ). |

