Floppy drives & Controller

PRODUCT CODE: MAINDEC-08-DIRXA-D-D

PRODUCT NAME: RX8/RX01 DIAGNOSTIC PROGRAM

DATE: JUNE, 1977

MAINTAINER: DIAGNOSTIC ENGINEERING

1. ABSTRACT
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THIS PROGRAM IS DESIGNED TO TEST THE RX01 FLEXIBLE DISKETTE SUBSYSTEM CONFIGURED AS A COMPLETE SUBSYSTEM, (RX8 INTERFACE, RX01 CONTROL, AND DISKETTE DRIVES), OR AS A PARTIAL SUBSYSTEM (INTERFACE, AND/OR CONTROL). OBVIOUSLY THE MAXIMUM RESOLUTION POSSIBLE IS ACHIEVED BY TESTING THE RX01 DISKETTE SUBSYSTEM CONFIGURED AS A COMPLETE SUBSYSTEM.

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REVISION C

THE ADDITION OF THE CONSOLE PACKAGE.
THE REMOVAL OF TEST THREE (3).
SEE LISTING LOCATION FOR EXPLINATION
THE REMOVAL OF DECIMAL CONVERSION ROUTINES.
THE ADDITION OF API-8 INTERFACES.

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REVISION D

THE ADDITION OF THE NEW CONSOLE PACKAGE.
COMPATABILITY FOR VT78 SYSTEMS.
ABILITY TO TEST 2 RX01 UNITS(4 DRIVES).
INTERLEAVING WAS MODIFIED FOR VT78.

2. REQUIREMENTS
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2.1 EQUIPMENT
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A PDP-8/E TYPE GENERATION COMPUTER WITH 4K OF CORE, CONSOLE SWITCHES, TELETYPE, AND AN RX01 DISKETTE SUBSYSTEM.

THE DIAGNOSTIC CAN RUN WITHOUT HARDWARE SWITCH IF THE CONSOLE PACKAGE IS USED. IF THE CONSOLE PACKAGE IS ACTIVE 8K OF CORE IS NEEDED.

2.2 STORAGE
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THIS PROGRAM IS DESIGNED TO BE RUN STAND ALONE AND MUST OCCUPY PROGRAM LOCATIONS 0 THRU 7577 OF FIELD 0.

THE CONSOLE PACKAGE OCCUPIES FIELD 1 LOCATIONS 0 TO 1100.

FIELD 1 IS NEEDED ONLY IF THE CONSOLE PACKAGE IS BEING USED.

2.3 PRELIMINARY DIAGNOSTIC PROGRAMS
////////////////////////////////////

THIS PROGRAM ASSUMES THAT THE HOST PDP IS FUNCTIONING CORRECTLY.

3. LOADING PROCEDURE

THIS PROGRAM IS IN BINARY FORMAT. TO LOAD THIS PROGRAM INTO CORE, FOLLOW THE INSTRUCTIONS PUBLISHED FOR THE PARTICULAR BINARY FORMAT LOADER BEING USED.

4. STARTING PROCEDURE

4.1 STARTING ADDRESS LOCATIONS

THIS PROGRAM HAS 2 STARTING ADDRESS LOCATIONS:

200 * DIAGNOSTIC PROGRAM *

STARTING THIS PROGRAM AT PROGRAM LOCATION 200, AND SUCCESSFULLY SUPPLYING THE NECESSARY TEST PARAMETERS REQUESTED, DIRECTS THIS PROGRAM TO BEGIN TESTING THE RX01 SUBSYSTEM AS A SUBSYSTEM OR PARTIAL SUBSYSTEM. THE ADDRESS THAT THE CONSOLE PACKAGE WILL START THE DIAGNOSTIC AT IS LOCATION 200.

201 * RESTART OF DIAGNOSTIC PROGRAM *

STARTING THIS PROGRAM AT PROGRAM LOCATION 201 DIRECTS THE PROGRAM TO CONTINUE TESTING THE RX01 SUBSYSTEM AS A SUBSYSTEM OR PARTIAL SUBSYSTEM USING THE PARAMETERS SUPPLIED AT STARTING ADDRESS 200.

4.2 OPERATOR ACTION

CONFIGURE THE ACCUMULATOR SWITCHES TO REPRESENT THE OCTAL PROGRAM STARTING ADDRESS LOCATION DESIRED, PRESS " LOAD ADDRESS ", PRESS " CLEAR ", AND FINALLY PRESS " CONT " INUE. IF THE CONSOLE PACKAGE IS ACTIVE

THEN ISSUEING THE R DIRXA COMMAND WILL LOAD THE PROGRAM FROM A DISKETTE.

loads and starts

4.3 PROGRAM ACTION
//////////////////

THE PROGRAM PRINTS THE TITLE OF THE PROGRAM AND THE PRESENT MAINDEC REVISION. IF THE PROGRAM STARTING ADDRESS IS 200 THE PROGRAM WILL REQUEST TEST PARAMETER INFORMATION TO BE SUPPLIED BY BY THE OPERATOR VIA THE PDP SWITCHES.

* 201 *

THE PROGRAM HAS RECONFIRMED PREVIOUS TEST PARAMETER SELECTIONS BY PRINTING APPROPRIATE MESSAGES ON THE TELEPRINTER, AND HAS RESUMED TESTING.

4.4 TEST PARAMETER SELECTIONS
//////////////////////////////

AFTER STARTING THIS PROGRAM AT STARTING ADDRESS 200, THE PROGRAM WILL PRINT "REMOVE DIAGNOSTIC DISKETTE" (REMOVE AND REPLACE WITH SCRATCH DISKETTE) " SELECT PARAMETERS (INCLUDING DEVICE CODE) " ~~AND HALT OR~~ PRINT THE SWITCH REGISTER QUESTION IF THE CONSOLE PACKAGE IS ACTIVE.

blank in each drive

THE OPERATOR WILL THEN CONFIGURE CONSOLE SWITCHES 0-2 TO REPRESENT DISKETTE UNIT/DRIVE SELECTION, CONSOLE SWITCHES 3, 4, AND 5 TO REPRESENT RX8 INTERFACE IOT DEVICE CODE, AND FINALLY CONSOLE SWITHCHES 7 - 11 TO REPRESENT THE [STARTING] TEST , AND THEN PRESS " CONT " INUE.(SEE RESTRICTIONS)

"return"

Put in: 0000 for all tests of both drives

C O N S O L E
S W I T C H E S

```
0  1  2    3  4  5    6  7  8    9 10 11
U  U  U/C  X  X  X    U  T  T    T  T  T
```

X=DEVICE CODE (0 DEFAULTS TO 75)
T=TESTS (0 FOR ALL TESTS)
C=RX01 MICROCONTROL CABLED TO RX8 INTERFACE
U=UNIT/DRIVES SELECTED FOR TEST

WHERE:	UNIT	DRIVE(S)
0000 =	A	0,1
1000 =	B	0,1
2000 =	A	0
3000 =	B	0
4000 =	A	1
5000 =	B	1

6000 = TEST CONTROL AND INTERFACE ONLY (NO DRIVES)
7000 = TEST CONTROL ONLY (NO CONTROL OR DRIVES)
0040 = TEST UNITS A AND B (ALL DRIVES)
2040 = DRIVES 0 BOTH UNITS
4040 = DRIVES 1 BOTH UNITS

THE PROGRAM WILL PRINT A CONFIRMATION MESSAGE, THEN BEGIN TESTING THE RX01 SUBSYSTEM AS A SUBSYSTEM OR PARTIAL SUBSYSTEM WITH THE FIRST TEST CONFIGURED WITHIN CONSOLE SWITCHES 7 THRU 11.

TO TEST THE RX01 DISKETTE SUBSYSTEM(RXA) AS A COMPLETE SUBSYSTEM, CONFIGURE CONSOLE SWITCHES 0, 1, AND 2 TO REPRESENT ZERO. THE PROGRAM WILL ASSUME ALL DRIVE(S) ARE READY (POWER APPLIED / DOOR CLOSED).

NOTE, HOWEVER, THAT TESTING THE RX01 DISKETTE SUBSYSTEM AS A PARTIAL SUBSYSTEM IS MORE THAN MERELY CONFIGURING CONSOLE SWITCHES 0, 1, AND 2 TO REPRESENT VALUES OTHER THAN ZERO.

IF ONLY THE CONTROL / INTERFACE PARTIAL SUBSYSTEM (NO DRIVES) IS THE THE UNIT UNDER TEST (UUT), THEN THE DISKETTE DRIVE(S) CABLE (IF ANY) MUST BE PHYSICALLY REMOVED FROM THE RX01 CONTROLLER, OR, THE DRIVES MUST BE RENDERED " NOT READY " (DOOR OPEN), THEN THE CONSOLE SWITCHES 0, AND 1 EACH MUST BE CONFIGURED TO REPRESENT A " 1 ".

IF ONLY THE INTERFACE PARTIAL SUBSYSTEM (NO DRIVES AND CONTROL) IS THE UUT THEN THE BC05-L CABLE FROM THE INTERFACE TO THE CONTROL MUST BE PHYSICALLY

REMOVED, ONLY THEN MAY CONSOLE SWITCHES 0, 1, AND 2 BE CONFIGURED TO RE-PRESENT A " 1 ".

4.4.1 RESTRICTIONS

A SELECT GROUP OF TESTS ARE DESIGNED TO CONFIRM THE RESULTS OF PREVIOUS TESTS. THE FOLLOWING IS AN OVERVIEW OF THOSE TESTS WHICH REQUIRE A PREVIOUS TESTS TO HAVE EXECUTED CORRECTLY.

...FOR THIS TEST TO FUNCTION CORRECTLY...		...THIS TEST MUST HAVE PREVIOUSLY EXECUTED CORRECTLY...
T14, T15	/	T13

TEST 14, AND TEST 15 EMPTY THE SECTOR BUFFER IN 12-BIT MODE COMPARING THE CONTENTS TO THE EXPECTED DATA PATTERN FILLED BY TEST 13.

T17, T20	/	T16

TEST 17, AND TEST 20 EMPTY THE SECTOR BUFFER IN 8-BIT MODE COMPARING THE CONTENTS TO THE EXPECTED DATA PATTERN FILLED WITHIN TEST 16.

T24, T25, T26	/	T22

THE SECTOR BUFFER SHOULD REMAIN UNCHANGED AND CONTAIN THE DATA PATTERN FILLED WITHIN TEST 22 AFTER THE RX01 CONTROL ATTEMPTS TO SEEK SECTOR 0.

T27	/	T22

THE CONTENTS OF THE SECTOR BUFFER SHOULD REMAIN UNCHANGED AND CONTAIN THE DATA PATTERN FILLED WITHIN TEST 22 AFTER THE RX01 CONTROLLER ATTEMPTS TO SEEK AN ILLEGAL TRACK GREATER THAN 114.

T32	/	T31

TEST 32 ISSUES AN INITIALIZE WHICH PERFORMS AN " IMPLIED READ " OF TRACK 1 / SECTOR 1. THE PROGRAM COMPARES THE DATA FROM THE SECTOR BUFFER WHICH SHOULD BE EQUIVALENT TO THE DATA WRITTEN WITHIN TEST 31 (FIRST WRITE EVER).

T33 / T31

TEST 33 ISSUES THE FIRST READ EVER OF THE TRACK / SECTOR WRITTEN WITHIN TEST 31 AND COMPARES THE DATA EXPECTING THE DATA PATTERN OF TEST 31.

5. OPERATING PROCEDURE

THE OPERATOR MAY CONTROL THE DYMANIC ACTION OF THE PROGRAM BY APPROPRIATELY CONFIGURING THE ACCUMULATOR SWITCHES AS DESCRIBED BELOW.

IF THE CONSOLE PACKAGE IS ACTIVE THEN THE SETTING OF THE SWITCH REGISTER UNDER DYMANIC CONDITIONS IS POSSIBLE BY TYPING CONTROL G THIS WILL PRINT THE SWITCH REGISTER QUESTION AND ALLOW CHANGES TO IT THEN CONTINUE RUNNING.

0 = 1 - INHIBIT ERROR HALT
1 = 1 - LOCK SCOPE LOOP ON ERROR
2 = 1 - LOCK SCOPE LOOP ON TEST (OK OR NOT)
3 = 1 - HALT AT THE END OF A TEST PASS
4 = 1 - INHIBIT ERROR PRINTOUTS
5 = 1 - (LONG) DATA COMPARISON ERROR PRINTOUT
6 = 1 - INHIBIT THE ISSUING OF [INIT] AT ERROR
11= 1 - DISABLE THE RINGING OF THE BELL AT AN ERROR

6. ERROR DETECTION

6.1 PROGRAM DEFINITIONS

THIS PROGRAM HAS DEFINED THE FOLLOWING AS ERRORS:

6.1.1 WRITE ERROR

A WRITE ERROR IS A READ ERROR IF THE DATA BEING READ IS OF UNKNOWN QUALITY (THE DATA BEING READ IS BEING READ FOR THE FIRST TIME AFTER ITS WRITING) .

6.1.2 READ (CRC) ERROR - (TRANSFER REGISTER STATUS BIT 11 = 1)

A READ ERROR IS A READ ERROR WHERE THE QUALITY OF THE DATA BEING READ IS KNOWN (THE DATA BEING READ HAD BEEN READ SUCCESSFULLY SOME TIME PREVIOUSLY).

6.1.3 CRC AND DATA ERROR
////////////////////////

6.1.4 NO CRC BUT DATA ERROR
////////////////////////////

6.1.5 CRC BUT NO DATA ERROR
////////////////////////////

THESE DATA ERRORS ARE DETECTED WHEN THE PROGRAM IS VERIFYING THE DATA THAT " SHOULD HAVE BEEN READ " WITH THE DATA THAT " ACTUALLY WAS READ " BY COMPARING THE " BAD " COLUMN TO THE " GOOD " COLUMN.

WORD#	GOOD	BAD
1	(TRACK IDENTIFICATION BITS 5-11)	
2	(SECTOR IDENTIFICATION BITS 8-11)	

WORDS 3 THRU 62 (IF 12-BIT MODE), OR
BYTES 3 THRU 126 (IF 8-BIT MODE) CONTAIN
THE OPERATORS PPP SELECTION.

63 (OR BYTE 127) = THE SUM OF ALL WORDS 1 THRU 62
OR BYTES 1 THRU 127.

64 OR (BYTE 128) = THE NEGATIVE OF 2 TIMES
THE VALUE OF WORD # 63 OR BYTE # 127.

6.1.5.1 SUMCHECK ERROR
//////////////////////

THE PROGRAM DETECTS A " SUM-CHECK " ERROR BY SUMMING ALL THE ACTUAL (BAD) DATA COLUMN AND COMPARING THAT SUM TO 0.

THE REASON FOR THE FIRST 2 WORDS/BYTES CONTAINING TRACK / SECTOR IDENTIFICATION CODES IS TO DETECT ADDRESSING ERRORS.

THE REASON FOR THE LAST 2 WORDS/BYTES CONTAINING CHECKSUM INFORMATION IS TO DISTINGUISH BETWEEN WHAT MIGHT RESEMBLE AN ADDRESSING ERROR (IF THE PROGRAM DETECTED AN ERROR WHEN COMPARING THE FIRST 2 WORDS/BYTES) AND A CRC ERROR.

6.1.6 SEEK ERROR - (NO ALLOCATED TRANSFER REGISTER STATUS BIT)
////////////////

A SEEK ERROR HAS BEEN DEFINED AS " NOT A CRC ", AND " NOT A PARITY " ERROR.

6.1.7 PARITY ERROR - (TRANSFER REGISTER STATUS BIT 10 = 1)
////////////////////

A PARITY ERROR IS AN ERROR WHICH RESULTS FROM AN INCORRECT TRANSFER OF THE COMMAND WORD FORM THE RX8 INTERFACE TO THE RX01 MICROPROCESSOR CONTROL.

6.2 DEFINITIVE ERROR CODES
//////////////////////////

THE RX01 MICROCONTROLLER HAS DEFINED ERROR CODES AND MEANINGS WHICH ARE AVAILABLE TO THE PROGRAM BY ISSUING COMMAND #7 TO " READ THE B-CODE ".

A DEFINITIVE ERROR CODE REPRESENTS (WHERE) WITHIN A MICRO-FUNCTION THE ERROR WAS DETECTED.

THE FOLLOWING ARE THE DEFINITIVE ERROR CODES AND MEANINGS:

0	-	NO ERROR
10	-	DRIVE 0 FAILED TO SEE HOME FROM INITIALIZE
20	-	DRIVE 1 FAILED TO SEE HOME FROM INITIZLIAE
30	-	HOME FOUND WHEN STEPPING OUT 10 TRACKS FROM INIT
40	-	TRIED TO ACCESS A TRACK GREATER THAN 77(DECIMAL)
50	-	HOME WAS FOUND BEFORE DESIRED TRACK
60	-	SELF DIAGNOSTIC ERROR
70	-	DESIRED SECTOR NOT FOUND AFTER SAMPLING 52 HEADERS
100	-	WRITE PROTECT ERROR
110	-	MORE THAN 40US AND NO SEP CLOCK DETECTED
120	-	A PREAMBLE COULD NOT BE FOUND
130	-	PREAMBLE FOUND BUT NO ID MARD FOUND IN TIME
140	-	CRC ERROR ON SUPPOSIDLY GOOD HEADER
150	-	GOOD HEADER(NO CRC ERROR) BUT TRACK COMPARE ERROR
160	-	IDAM NOT FOUND IN TOME
170	-	DATA AM NOT FOUND IN TIME
200	-	DATA CRC ERROR
210	-	ALL PARITY ERRORS

6.3 UNEXPECTED OR MISSING ERROR CONDITIONS

6.3.1 MISSING DD MARK

THIS ERROR MAY OCCUR WHEN THE PROGRAM EXPECTED A DELETED DATA MARK BUT NONE OCCURED.

6.3.2 UNEXPECTED DD MARK

THIS ERROR MAY OCCUR WHEN THE PROGRAM HAD NOT EXPECTED A DELETED DATA MARK BUT ONE OCCURED.

6.3.3 MISSING ERROR FLAG

THIS ERROR MAY OCCUR WHEN THE CONTENTS OF THE TRANSFER REGISTER AT DONE TIME ARE NOT 0, AND THE ERROR FLAG IS CLEARED.

6.3.4 UNEXPECTED RX01 IRQ

THIS ERROR MAY OCCUR WHEN THE PROGRAM HAS NOT YET ENABLED THE RX8 INTERRUPT ENABLE FLIP-FLOP BUT AN INTERRUPT OCCURED.

6.3.5 DEVICE TEST HUNG

THIS ERROR MAY OCCUR WHEN THE PROGRAM EXPECTS BUT FAILED TO RECIEVE A PROGRAM INTERRUPT REQUEST FROM THE RX01 SUBSYSTEM WITHIN AN ALLOTTED PERIOD OF TIME (APPROXIMATELY 4 SECONDS).

6.4 UNKNOWN IRQ

THIS ERROR MAY OCCUR WHEN THE PROGRAM HAS FAILED TO IDENTIFY THE DEVICE ISSUING A PROGRAM INTERRUPT REQUEST.

7. ERROR REPORTING
////////////////////

ALL ERRORS DETECTED WILL BE REPORTED IF AC SW 3 = 0. THE PROGRAM HAS TWO ERROR REPORTING SCHEMES.

7.1.1 EXAMPLES IF INTERFACE / CONTROL RELATED ERRORS

THE FOLLOWING INFORMATION IS PRINTED FOR ALL INTERFACE / CONTROL RELATED ERRORS.

```
ERR     FAT     FAST    -       EAC     GOOD    PASS
```

```
ERR     - PROGRAM ADDRESS OF THE ERROR
FAT     - FIRST ADDRESS OF THE TEST IN ERROR
FAST    - FIRST ADDRESS OF THE SUBTEST WITHIN THE TEST
-       - SEE ASSEMBLY LISTING FOR MAP
EAC     - ERROR AC (ACTUAL) RESULT OF TEST
GOOD    - EXPECTED RESULT OF TEST
PASS    - PASS # AT ERROR
```

7.1.2 EXAMPLES OF DRIVE / DATA RELATED ERRORS

THE FOLLOWING INFORMATION IS PRINTED FOR ALL DRIVE / DATA RELATED ERRORS.

```
CMND    XDR    CODE    RSTA    START      TARGET    PASS
```

```
CMND    - COMMAND TO THE RX01 MICROCONTROLLER
XDR     - CONTENTS OF THE TRANSFER REGISTER AT ERROR/DONE
CODE    - DEFINITIVE ERROR CODE (VIA COMMAND #7)
RSTA    - STATUS (VIA COMMAND #5)
START   - STARTING TRACK/SECTOR ACTUATOR POSITION
TARGET  - TARGET TRACK/SECTOR ACTUATOR POSITION
PASS    - PASS # AT ERROR (TO 16777215 DECIMAL)
```

7.1.2.1 SEEK ERROR

```
CMND    XDR     CODE    RSTA    START   TARGET  PASS
0014    0100    0120    0300    [HOME]  1    1
INIT    0       0120    0200    [HOME]  [HOME]
```

A SEEK ERROR OCCURED WHILE TRYING TO " WRITE DELETED DATA " (CMND #14) ONTO TRACK 1 SECTOR 1.

```
COMD    - WRITE DELETED DATA
XDR     - DELETED DATA MARK
CODE    - A PREAMBLE COULD NOT BE FOUND
RSTA    - DRIVE READY + DELETED DATA
START   - HOME POSITION
TARGET  - TRACK 1, SECTOR 1
```

THEN THE PROGRAM ISSUED AN INITIALIZE AT AN ATTEMPT TO RECOVER FROM THE " SEEK " ERROR.

```
CMND    - MEANS IOT 67X7 (INIT) WAS ISSUED
XDR     - MUST BE SEEK (NOT CRC OR PARITY)
CODE    - A PREAMBLE COULD NOT BE FOUND
RSTA    - DRIVE READY
START   - HOME POSITION
TARGET  - HOME POSITION
```

7.1.2.2 WRITE-CRC AND DATA ERROR

```
CMND    XDR     CODE    RSTA    START   TARGET  PASS
0026    0001    3200    0201    100,30  100,1
WRITE-CRC AND DATA ERROR
WORD    GOOD    BAD
4       5435    5473
5       6617    5437
6       6303    4606
SUMCHECK IS 1253
TOTAL BAD=60
```

WHILE READING SECTOR 7 OF TRACK 100 THE PROGRAM DETECTED A CRC ERROR.

THE PROGRAM EXPANDS THE STANDARD ERROR FORMAT TO INCLUDE DATA COMPARISON INFORMATION IF THE TEST IS A DATA COMPARISON TEST.

IF AC SWITCH 2 =1 THEN A (LONG) DATA COMPARISON PRINTOUT WOULD HAVE OCCURRED OF (ALL) THE WORDS/BYTES IN ERROR.

THE WORD " WRITE " WITHIN THE EXPANSION MEANS THAT THE DATA OF SECTOR 7 HAD NEVER BEEN READ BEFORE, THEREFORE THE PROGRAM ASSUMED IT WAS WRITTEN INCORRECTLY.

7.1.2.3 READ-CRC AND DATA ERROR

```
CMND    XDR     CODE    RSTA    START   TARGET  PASS
0026    0001    0200    0201    100,30  100,1
READ-CRC AND DATA ERROR
WORD    GOOD    BAD
4       5435    5477
5       6617    5437
6       6303    5406
SUM-CHECK IN 1257
TOTAL BAD=60
```

WHILE SEEKING SECTOR 1 OF TRACK 100 THE PROGRAM DETECTED A CRC ERROR.

THE PROGRAM EXPANDS THE STANDARD ERROR FORMAT TO INCLUDE DATA COMPARISON INFORMATION IF THE TEST IS A DATA COMPARISON TEST.

IF AC SWITCH 2 = 1 THEN A [LONG] DATA COMPARISON ERROR PRINTOUT WOULD HAVE OCCURRED OF [ALL] THE WORDS/BYTES IN ERROR.

THE WORD " READ " WITHIN THE EXPANSION MEANS THAT THE DATA OF SECTOR 7 HAD BEEN READ SOME TIME PREVIOUSLY, THEREFORE THE PROGRAM ASSUMES THAT THE DATA WAS WRITTEN CORRECTLY BUT READ INCORRECTLY.

7.1.2.4 WRITE-CRC BUT NO DATA ERROR

CMND	XDR	CODE	RSTA	START	TARGET	PASS
002D	0001	0200	0201	100,30	100,1	

WRITE - CRC BUT NO DATA ERROR

A CRC ERROR WAS DETECTED AFTER READING SECTOR 1 OF TRACK 100.

THE WORD " WRITE " WITHIN THE DATA EXPANSION MEANS THAT THE DATA OF SECTOR 1 TRACK 100 HAD NEVER BEEN READ BEFORE THEREFORE THE PROGRAM ASSUMED IT WAS WRITTEN INCORRECTLY, AND BECAUSE THE PROGRAM DID NOT DETECT A DATA COMPARISON ERROR, IT ASSUMED THAT THE 2 CRC CHARACTERS WERE WRITTEN INCORRECTLY.

7.2 ERROR RECOVERY

THE PROGRAM WILL ATTEMPT TO RETRY ALL ERRORING FUNCTIONS 10 TIMES. A RECOVERABLE ERROR (SOFT) IS ONE WHICH DISAPPEARS WITHIN 10 PROGRAM RETRYS. AN UNRECOVERABLE ERROR (HARD) IS ONE WHICH REMAINS AFTER 10 PROGRAM RETRYS.

THE PROGRAM WILL ISSUE IOT 67X7 [INIT] FOR ALL ERRORS BUT DEFINITIVE ERROR CODES 140, 200, AND 210.

140 - CRC ERROR ON SUPPOSIDELY GOOD HEADER
200 - DATA CRC ERROR
210 - PARITY ERROR

THESE ERRORS ARE [NOT] SEEK TYPE ACTUATOR RELATED ERRORS.

IF A HARD WRITE ERROR IS DETECTED THE PROGRAM ABORTS FURTHER TESTING THIS PASS OF THAT TRACK/SECTOR BUT CONTINUES TESTING TRACKS ON THE REMAINING

A SYMPATHETIC HARD READ ERROR MAY OCCUR (PATTERN DEPENDENT) IF THE HARD WRITE ERROR HAD OCCURRED WITHIN A TEST WHICH WOULD EVENTUALLY READ THAT SECTOR AND A SYMPATHETIC HARD DATA COMPARISON ERROR MAY OCCUR IF THAT TEST WAS TO VERIFY THE DATA TO A KNOWN PATTERN.

7.3 FATAL ERROR RECOVERY

IF THE PROGRAM DETECTS ANY OF THE SUCCEDING FATAL ERROR CONDITIONS, THE PROGRAMS RECOVERY WILL BE THAT OF EXITING THE PRESENT TEST.

(A) HARD PARITY ERROR
(B) A SELECTED DRIVE BECOMING NOT READY
(C) NO EXPECTED RX01 INTERRUPT REQUEST
(D) MISSING ERROR FLAG
(E) LOG OVERFLOW
(F) DEVICE TEST HUNG.

8. MANUAL INTERVENTION

8.1 FIELD ENGINEERING TROUBLE SHOOTING AIDS

THE FIELD ENGINEER, BY ALTERING THE CONTENTS OF SPECIFIC PROGRAM MAINTENANCE LOCATIONS, IS ABLE TO DIRECT THE PROGRAM TO PERFORM TESTING UPON A PARTICULAR AREA [WINDOW] OF THE DISKETTE INSTEAD OF THE ENTIRE SURFACE. THESE PROGRAM LOCATIONS ARE LABLED "OD" "ID", "FIRST, AND "LAST".

"OD" (OUTSIDE DIAMETER), PROGRAM LOCATION 30, IS THE INITIAL OUTERMOST TRACK THE PROGRAM WILL ACCESS.

"ID" (INSIDE DIAMETER), PROGRAM LOCATION 31, IS THE FINAL INNERMOST INNERMOST TRACK THE PROGRAM WILL ACCESS.

"FIRST", PROGRAM LOCATION 32, IS THE FIRST SECTOR TO BE ACCESSED OF A TRACK.

"LAST", PROGRAM LOCATION 33, IS THE LAST SECTOR TO BE ACCESSED OF A TRACK.

THE STANDARD ASSEMBLED CONTENTS OF THESE FIELD ENGINEERING MAINTENANCE LOCATIONS ARE:

```
        *30

OD,     52      /INITIAL TRACK TO TEST
ID,     53      /FINAL TRACK TO TEST
FIRST,  1       /FIRST SECTOR OF A TRACK
LAST,   32      /LAST SECTOR OF A TRACK
```

THESE ARE THE ONLY FIELD ENGINEERING MAINTENANCE PROGRAM LOCATIONS DESIGNED TO BE EXTERNALLY ALTERED.

THE PROGRAM WILL PRINT A MAINTENANCE VERIFICATION MESSAGE IF THE CONTENTS OF THE MAINTENANCE LOCATIONS ARE NOT THE ASSEMBLED STANDARDS.

THE OCTAL CONTENTS OF THESE MAINTENANCE LOCATIONS MUST BE WITHIN THE RESTRICTED LIMITS WHICH ARE:

```
0 <= OD <= ID
0 <= ID <= 114
1 <= FIRST <= LAST
1 <= LAST <= 32
```

THE PROGRAM VERIFIES THE CONTENTS OF EACH MAINTENANCE LOCATION. THE PROGRAM WILL SET INTO THE MAINTENANCE LOCATION THE STANDARD VALUE IF THE DESIRED CONTENTS WERE NOT WITHIN THE REQUIRED SPECIFIED LIMITS.

NOTE, THAT TRACK 0 IS NOT INCLUDED WITHIN THE STANDARD [WINDOW] OF TESTABLE TRACKS. THE REASONE FOR THIS IS NOT TO INADVERENTLY DESTROY THE FORMATTED CONTENTS OF TRACK 0.

TO EXPAND THE WINDOW OF TESTABLE TRACKS INCLUDING TRACK 0, THE CONTENTS OF PROGRAM LOCATIONS " OD " MUST BE ZERO.

IN SUMMARY, IF THE CONTENTS OF PROGRAM LOCATIONS OD, ID, FIRST, AND LAST WERE 30, 30, 1, 1, RESPECTIVELY, THE PROGRAM WOULD PERFORM SELECTED TESTING ONLY UPON TRACK 30, SECTOR 1.

9. DIAGNOSTIC TEST STRATEGY

THE PDP-8 DIAGNOSTIC PACKAGE, WHICH CONTAINS THE RX8/RX01 DIAGNOSTIC PROGRAM, "MAINDEC-08-DIRXA", AND THE RX8/RX01 DATA RELIABILITY/EXERCISER PROGRAM, "MAINDEC-08-DIRXB", IS DESIGNED TO COMPLETELY TEST THE RX8/RX01 SUBSYSTEM WHEN EACH PROGRAM IS RUN TO ITS NATURAL COMPLETION COMMENCING WITH THE RX8/RX01 DIAGNOSTIC PROGRAM.

THE RX8 DIAGNOSTIC PROGRAM CONTAINS EFFICIENT MAINTENANCE SCOPING LOOPS, WHILE THE RX8/RX01 DATA RELIABILITY/EXERCISER PROGRAM CONTAINS DISKETTE COMPATABILITY VERIFICATION.

10. CONSOLE PACKAGE

TABLE OF CONTENTS

10.1. ABSTRACT

THE CONSOLE PACKAGE HAS BEEN ADDED TO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN WITH NO HARDWARE SWITCH REGISTER AND TO HAVE COMMUNICATIONS WITH THE DIAGNOSTIC VIA A TERMINAL.

THE DIAGNOSTIC CAN BE RUN IN TWO MODES WITH THE CONSOLE PACKAGE . 1) RUNNING WITH THE CONSOLE PACKAGE ACTIVE - THIS ALLOWS THE OPERATOR CONTROL OF THE DIAGNOSTIC THROUGH THE TERMINAL. THE DIAGNOSTIC WILL ASK FOR THE VALUE OF THE PSEUDO SWITCH REGISTER,BEFORE COTINUING WITH EXECUTION OF THE DIAGNOSTIC ALL ERROR WILL BE PRINTED ON THE TERMINAL AND THE NUMBER OF PASSES WILL BE PRINTED. THERE WILL BE NO HALTS EXECUTIED .

2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE USE OF HALTS FOR ERROR, HALTS AT END OF PASS IF SELECTED,USE OF THE HARDWARE SWITCH REGISTER ,NOT ASKING THE SWITCH QUESTION.

VT78 MUST ALWAYS BE RUN WITH ACTIVE CONSOLE PACKAGE.

10.2. REQUIREMENTS

10.3. RESTRICTIONS

1) RUNNING THE CONSOLE PACKAGE REQUIRES THAT THE PSEUDO SWITCH REGISTER BE USED.

2) ONCE RUNNING THE CONSOLE PACKAGE NONACTIVE AND NOW DESIRE TO RUN IT ACTIVE, ONE MUST RELOAD THE DIAGNOSTIC AND INITILIZE FOR A ACTIVE CONSOLE PACKAGE.

3.) THE CONSOLE PACKAGE IS LOCATED IN FIELD 1 THERE MUST BE 8K OF CORE TO RUN THE CONSOLE PACKAGE.

10.4. STANDARD OPERATION PROCEDURE

10.4.1 INITIALIZATION

FOR A ACTIVE CONSOLE PACKAGE

1.) LOAD ADDRESS 0021

2.) SET TO 0000 INDICATOR FOR USING THE PSEUDO SWITCH REGISTER

3.) LOAD ADDRESS 0022

4.) SET SR3=1 (400) INDICATOR FOR USING A ACTIVE CONSOLE PACKAGE

5.) LOAD STARTING ADDRESS OF PROGRAM AND BEGIN

FOR A NON ACTIVE CONSOLE PACKAGE

1.) LOAD ADDRESS 0021

2.) SET SR0=1 (4000) TO INDICATE A HARDWARE SWITCH REGISTER

3.) LOAD ADDRESS 0022

4.) SET TO 0000 TO INDICATE A DEACTIVE CONSOLE PACKAGE

5.) LOAD STARTING ADDRESS OF PROGRAM AND BEGIN

FOR VT78

1) LOAD PROGRAM INTO CORE.

2) USING ODT SET LOC 21 TO 0000
   LOC 22 TO 1400.

3) SAVE

10.4.2 CONTROL CHARACTERS

CONTROL CHARACTERS ARE USED TO GIVE THE OPERATOR THE ABILITY TO PERFORM THE FOLLOWING FUNCTIONS.
NOTE: THE PROGRAM WILL RESPOND TO THE CONTROL CHARACTER IN FIVE (5) SECONDS OR LESS.

CONTROL G	PRINT UPARROW G, DO A CARRIAGE RETURN AND LINE FEED, AND PRINT SR=XXXX, WAIT FOR INPUT FROM OPERATOR.
CONTROL C	RETURN TO MONITOR
CARRIAGE RETURN	RETURN TO PROGRAM, NO CHANGE TO PSEUDO SWITCH REGISTER.
LINE FEED	RESTART PROGRAM , NO CHANGE TO PSEUDO SWITCH REGISTER.
1 TO 4 OCTAL DIGITS AND CARRIAGE RETURN	CHANGE PSEUDO SWITCH REGISTER AND RETURN TO THE PROGRAM.
1 TO 4 OCTAL DIGITS AND A LINE FEED	CHANGE PSEUDO SWITCH REGISTER AND RESTART THE PROGRAM.

1 TO 4 OCTAL DIGITS AND A CONTROL G	NO CHANGE TO PSEUDO SWITCH REGISTER SAME RESPONSE AS A CONTROL G.
ALL OTHER INPUT (ILLEGAL CHARACTERS OR 5 DIGITS)	NO CHANGE TO PSEUDO SWITCH REGISTER, ECHO THE CHARACTER, PRINT A QUESTION MARK, DO A CARRIAGE RETURN LINE FEED, PRINT SR=XXXX, WAIT FOR OPERATOR INPUT.
CONTROL S	THIS IS USED TO INHIBIT TRANSMISSION OF DATA TO THE OPERATORS TERMINAL. WHEN TYPED WHILE THE PROGRAM IS RUNNING MESSAGE PRINTING IS INHIBITED, BUT THE PROGRAM WILL CONTINUE TO RUN UNTIL A MESSAGE IS PENDING. IF TYPED WHILE A MESSAGE IS IN PROGRESS, THE PRINTOUT WILL BE INTERRUPTED. A CONTROL Q OR CONTROL C WILL RESUME PROGRAM ACTIVITY. THIS IS A NONPRINTING CHARACTER.
CONTROL Q	THIS ENABLES DATA TRANSMISSION TO OPERATORS TERMINAL IF A PREVIOUS CONTROL S WAS IN EFFECT. THIS IS A NONPRINTING CHARACTER.

10.4.4

SWITCH REGISTER MESSAGE

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER
BEFORE PROGRAM EXECUTION TAKES PLACE (OR IN RESPONSE TO A "G).
THE SWITCH REGISTER IS SETUP WHEN A CARRIAGE
RETURN IS TYPED

```
**************************************************************
SR=^000 4000
        ----
```

UNDER SCORING INDICATES OPERATOR RESPONCE

10.4.5

END OF PASS

A INDICATION WILL BE GIVEN WHEN THE DIAGNOSTIC HAS MADE A
SUCESSFULL PASS, THE PRINT OUT WILL INDICATE THE DIAGNOSTIC
MAINDEC NUMBER THE WORD PASS AND A FOUR DIGIT PASS NUMBER,
A PASS WILL BE A TIME PERIOD RATHER THAN A PROGRAM PASS
OF THE DIAGNOSTIC, THE TIME PERIOD WILL BE IN THE RANGE OF
ONE (1) TO FIVE (5) MINUTES, IF THE DIAGNOSTIC MAKES A PROGRAM
PASS IN THE 1 TO 5 MINUTE RANGE THEN THE PASS COUNT WILL BE THE
SAME AS THE NUMBER OF PROGRAM PASSES,IF THE PROGRAM MAKES A
PROGRAM PASS IN LESS THEN ONE MINUTE THEN THE PASS COUNT WILL
NOT BE THE SAME AS THE PASS COUNTER THE PASS COUNTER WILL
REFLECT MORE THEN ON PROGRAM PASS,
THE NUMBER OF PROGRAM PASSES REQUIRED FOR "A PASS MESSAGE
CAN BE FOUND IN LOCATION CALLED "CNTVAL".
IF HALT AT END OF PASS IS SET THEN THE PASS MESSAGE WILL BE
PRINTED AND A WAITING STATEMENT WILL ALSO BE PRINTED,
A CONTROL CHARACTER IS NEEDED TO CONTINUE FROM THIS MESSAGE,
THE FORMAT OF THE END OF PASS MESSAGE IS

```
NAME PASS 0001 ( - OR I OR C OR D )
                - AN ERROR OCCURED DURING I,C,D
                I INTERFACE TEST OK RX8
                C RX8 AND RX01 TESTED OK
                D RX8 AND RX01 AND DRIVE TESTED OK
**************************************************************
```

10.5. ERRORS

UPON DETECTION OF A ERROR THE DIAGNOSTIC WILL DO ONE OF THE FOLLOWING OPERATIONS:

1.) PRINT THE ERROR MESSAGE FOR THE ERROR CONDITION
    CHECK THE SWITCH REGISTER TO SEE IF THE PROGRAM SHOULD HALT
    IF HALT ON ERROR IS SELECTED THEN THE PSR WILL BE PRINTED.

REFER TO THE LISTING AT THE LOCATION PRINTED IN THE ERROR PC FOR THE CAUSE OF THE ERROR.

10.5.1 ERROR HALTS

CONSOLE PACKAGE DEACTIVE WILL CAUSE NO ERROR MESSAGE TO BE PRINTED.A HALT WILL REPLACE THE ERROR CALL IN THE CODE AND THE DIAGNOSTIC WILL THEN GO TO THAT HALT.
REFER TO THE LISTING FOR THE CAUSE OF THE ERROR,THE ERROR LOCATION WILL BE THE SAME IF THE CONSOLE PACKAGE WAS ACTIVE.

10.6. SWITCH REGISTER SETTINGS

THE FOLLOWING SWITCH REGISTER SETTINGS ARE USED BY THE CONSOLE PACKAGE. THESE SWITCH REGISTER SETTINGS ARE VALID WHEN USING THE HARDWARE SWITCH REGISTER AND THE PSEUDO SWITCH REGISTER.

10.6.1 OPERATING SWITCHES

THE CONSOLE PACKAGE USES THE LOCATIONS 20 21 22 FOR THE FOLLOWING PURPOSES.

LOCATION 20
PSEUDO SWITCH REGISTER

LOCATION 21
HARDWARE IDENTIFIER 1

LOCATION 22
HARDWARE IDENTIFIER 2

LOCATION 0022

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
0	4000	NOT ON ACT8A LINE	ON ACT 8A LINE
1	2000	NOT ON ACT 8E LINE	ON ACT 8E LINE
2	1000	NOT ON VT78	ON VT78
3	400	DEACTIVE CONSOLE PACKAGE	ACTIVE CONSOLE PACKAGE

6.2 ERROR RELATED SWITCHES

THESE ARE THE SWITCH REGISTER SETING THAT THE CONSOLE PACKAGE WILL RECOGNISE.

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
0	4000	STOP AFTER ERROR	CONT AFTER ERROR
1	2000	NO SCOPE LOOP ON ERROR	LOCK SCOPE LOOP ON ERROR
2	1000	NO SCOPE LOOP ON TEST	LOCK SCOPE LOOP ON TEST(OK OR NOT)
3	0400	CONTINUE AFTER END OF PASS	STOP AFTER END OF PASS
4	0200	PRINT ERROR MESSAGES	DO NOT PRINT ERRORS
5	0100	SHORT ERROR PRINTOUT	LONG DATA COMPARISON
6	0040	ISSUE[INIT]AT ERROR	DO NOT ISSUE [INIT] AT ERROR
11	0001	RING BELL ON ERROR	NO BELL RINGING

10.7. LOCATION CHANGES

THE FOLLOWING LOCATIONS CAN BE CHANGED TO MEET THE SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

CNTVAL — IS THE LOCATION FOR THE VALUE OF THE NUMBER OF PROGRAM PASSES NEED TO PRINT THE END OF PASS MESSAGE.

FILLER — IS THE LOCATION SET FOR THE NUMBER OF FILLER CHARACTERS AFTER A CRLF SET TO FOUR (4)

10.8. PROGRAM DESCRIPTION

PARAMETER SELECTIONS:
BITS 0-1
SELECT DRIVES: 0000 =SELECT DRIVES 0 AND 1(RXA)

SEE SECTION 4.4 TEST PARAMETER SELECTION

BITS 3-5
DEVICE CODE SELECTION
PUT ONE DIGITE DEVICE CODE IN HERE
THE PROGRAM ASSUMES THE FIRST DIGIT TO BE 7

EXAMPLE :IF DEVICE CODE IS 75 ENTER A 500
BITS 7-11

TEST SELECTION
PUT IN TEST YOU WISH TO RUN
A 00 TEST SELECTION IS ALL TESTS

10.9. DIALOGUE FOR CONSOLE PACKAGE

THE DIALOGUE FOR THIS DIAGNOSTIC IS:

```
R DIRXA (CR)

MAINDEC-08-DIRXA-D                  /THE -D IS THE REVISION LEVEL

REMOVE DIAGNOSTIC DISKETTE          /REMOVE AND REPLACE
                                    /WITH A SCRATCH DISKETTE

SELECT PARAMETERS(INCLUDING DEVICE CODES)
SR=0000                             /DEVICE CODE SELECTED IS 75
                                    /RXA DRIVES 0 AND 1
                                    /AND ALL TESTS SELECTED

TEST PARAMETERS: 0000               /VERIFICATION FOR PARAMETERS

OD=0001 ID=0114 FIRST= 0001 LAST= 0032  /DISKETTE RANGE SELECTED

SR=0000 0400                        /0400= SWITCH SETTING STOP ON ERROR AND
                                    /AT END OF PASS
```

11. APT-8 INTERFACES

11.1 DESCRIPTION

TWO INTERFACES HAVE BEEN PROVIDED WHICH WILL ALLOW THIS DIAGNOSTIC TO RUN UNDER THE STANDARD APT-8 SYSTEM, THESE INTERFACES ARE:

1. TIMING INTERFACE

2. ERROR INTERFACE

EACH WILL BE EXPLAINED IN MORE DETAIL.

11.2 SETUP

IN ORDER TO RUN UNDER APT-8, ADDRESSES 20 AND 22 MUST BE ESTABLISHED PRIOR TO RUNNING THE PROGRAM UNDER APT-8 CONTROL, THE FOLLOWING INFORMATION MUST BE INDICATED:

1. DEVICE CODE OF RX01 CONTROLLER UNDER TEST.

2. RX01 CONTROLLER CABLED TO INTERFACE.

3. DRIVE OR DRIVES TO BE TESTED.

4. DIAGNOSTIC RUNNING UNDER THE APT-8 SYSTEM.

5. STARTING TEST NUMBER IF OTHER THEAN THAT FOR ACCEPTANCE.

ADDRESS 20

ADDRESS 20 IS USED TO ESTABLISH ALL BUT ITEM 4.
THE SET UP IS THE SAME FOR THAT OF THE STANDARD SWITCH REGISTER FUNCTION.

```
        0  1  2  3  4  5  6  7  8  9 10 11

        U  U  C  X  X  X  -  T  T  T  T  T
                             (STARTING TEST)

                0 = 0   - DISKETTE DRIVE(S) IS READY
                1 = 0   - (POWER APPLIED / DOOR CLOSED)

                2 = 0   - RX01 MICROCONTROL CABLED TO
                          RX8 INTERFACE


                3 =     - FOR STANDARD DEVICE CODE
                4 =     - POSITION CONSOLE SWITCHES
                5 =     - 3-4-5 = 0

                7 =     - TO EXECUTE ALL TESTS
                8 =     - CONFIGURE CONSOLE SWITCHES
                9 =     - 7 THRU 11
                10=     - EQUIVALENT TO ZERO
                11=     - (THIS IS THE STARTING TEST)
```

NOTE: IF MORE THAN ONE DEVICE CODE IS AVAILABLE ON THE SYSTEM THE DIAGNOSTIC WILL HAVE TO RELOADED AND THE PROPER DEVICE CODE SELECTED.

ADDRESS 22

THIS ADDRESS IS USED TO INDICATE THAT THE PROGRAM IS RUNNING ON APT-8, THE NUMBER OF DRIVES TO BE DONE, AND IF SINGLE DRIVE TESTING.

BIT ZERO MUST BE A ONE (1) TO INDICATE THAT THE DIAGNOSTIC IS RUNNING ON APT-8.

CAUTION:

WHILE UNDER APT-8 CONTROL THE HARDWARE SWITCH REGISTER IS FUNCTIONAL, IT IS RECOMMENDED THAT THE SWITCH REGISTER BE SET TO ZERO PRIOR TO START-UP.

11.3 APT-8 INTERFACES.

11.3.1 TIMING

APT-8 IS NOTIFIED OF PROGRAM RUN BETWEEN .2 SECONDS AND 2.0 SECONDS. THIS WILL ALLOW THE DIAGNOSTIC TO RUN UNDER THE MUCH SLOWER MOS MEMORY WITHOUT CAUSING APT-8 TO GIVE A TIMEOUT ERROR.

11.3.2 ERRORS

ONLY THE ERROR PC IS REPORTED TO APT-8. THE TYPE OF ERROR CAN BE DETERMINED FROM THE CORRESPONDING ADDRESS IN THE PROGRAM LISTING. THERE IS A POSSIBILITY THAT A TIMEOUT ERROR MAY OCCUR. THIS IS CAUSED BY THE ERROR "HUNG DEVICE". THE PROGRAM WILL HAVE TO BE REPUN IN DUMP MODE IF THIS SHOULD HAPPEN.

11.4 LOADING PRECAUTIONS

THIS PROGRAM SHOULD BE LOADED IN SRCIPT MODE INDICATING TO APT-8 THAT CORE SUMCHECKS ARE TO BE IGNORED.

12. PROGRAM LISTING

```
                        /RX8 RX01 DIAGNOSTIC DIRXA-D
                0001            FIELD 1
                        / CONSOL PACKAGE
                        /PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE CONSOL
                        /EVERY FIVE SECONDS OR LESS
                        /SETUP CNTVAL FOR A RANGE OF 1 TO 4(8/E)  MINUTES FOR C8PASS TO PRINT PASS
                        /SETUP OF CNTVAL WILL BE FOUND IN C8PASS
                        /THIS VALUE SHOULD BE A POSITIVE NUMBER.
                        /CHANGE 1-7 APRIL ,1975
                        /VT78 MODIFICATIONS JUNE ,1977
                        /       1. NEW CONSOLE PACKAGE
                        /       2. CAPABILITY OF TESTING 2 FLOPPY UNITS(4 DRIVES)
                        /       3. MODIFIED INTERLEAVING
        6661            PSKF=   6661
        6662            PCLF=   6662
        6663            PSKE=   6663
        6664            PSTB=   6664
        6665            PSIE=   6665
        6004            GTF=    6004
        7701            ACL=    7701
        6007            CAF=    6007
        7421            MQL=    7421
        4461            HLT=    HALT
                        /#6
        7501            MQA=    7501
                        /#6
                        /XLIST
                        /IFDEF CONSOL <
                        /XLIST
        0024            *24
        4424            C8PASS= JMS I   .
0024    0600                     XC8PAS         /C8 PASS COMPLETION ROUTINE
        4425            C8CKSW= JMS I   .
0025    0673                     XC8SW          /CHECK SW REG SETTING
        4426            C8PRNT= JMS I   .
0026    1000                     XC8PNT         /C8 PRINT A BUFFER
        4427            C8OCTA= JMS I   .
0027    1035                     XC8OCT         /CONVERT TO ASCII AND PRINT
                        /*20                   /PSEUDO SWITCH REGISTER
                                               /4000=DO NOT INHIBIT ERROR HALT
                                               /2000=LOOP ON ERROR
                                               /1000=LOOP ON TEST IN SR 4-11
```



```
                                               /400=HALT AT END OF PASS
                        /*21                   /HARDWARE INDICATORS
                                               /4000=USE FRONT PANEL SWITCH REGISTER
                        /*22                   /SYSTEM CONFIGURATION
                                               /400=CONSOL PACKAGE SET ACTIVE
                        /*23                   /RESERVED FOR FUTURE USE
                        /XLIST>
                        /       C O N S O L E   P A C K A G E
                        /
                        /
                        /IF ENTERED WITH C8CHAR=0000 THE SWITCH REGISTER
                        /MODIFICATION ROUTINE IS ENTERED AUTOMATICALLY.
                        /IF ENTERED WITH C8CHAR NOT EQUAL TO 0000, THE
                        /KEYBOARD INPUT DECODER IS ENTERED AND IT IS ASSUMED
                        /THAT THE AC CONTAINS THE ASCII CODE TO BE
                        /CHECKED FOR A VALID CONTROL CHARACTER.
                        /
                        /
                        /
                        /
                        /
        7002            BSW=7002
                        /
0030    0000            C8TEMP, 0                       /TEMPORARY WORK AREA
0031    0000            C8CHAR, 0
0032    6203            C8CDI,  CIF CDF                 /USED TO CREATE CDI TO PROGRAM FIELD
0033    6201            C8CDF,  CDF                     /USED TO CREATE CDF TO CONSOLE FIELD
0034    0000            C8SWR,  0                       /SWITCH REGISTER SAVE AREA
0035    0000            C8MODE, 0                       /PRINT MODE SWITCH
0036    0000            C8CNTR, 0                       /USED AS COUNTER
0037    7775            C8M3,   -3                      /CONSTANT
0040    7774            C8M4,   -4                      /CONSTANT
0041    7773            C8M5,   -5                      /CONSTANT
0042    7770            C8M10,  -10                     /CONSTANT
0043    7520            C8M260, -260                    /CONSTANT
0044    0007            C8K7,   0007                    /CONSTANT
0045    0240            C8K240, 0240                    /CONSTANT
0046    0260            C8K260, 0260                    /CONSTANT
0047    0275            C8K275, 0275                    /CONSTANT
0050    0277            C8K277, 0277                    /CONSTANT
0051    0322            C8K322, 0322                    /CONSTANT
0052    0323            C8K323, 0323                    /CONSTANT
                        /
                        /
        0200            *200
0200    0000            C8ENTR, 0
0201    1777            TAD I   (21             /GET HCW1 FROM PROGRAM FIELD
0202    7710            SPA CLA                 /SKIP IF USING PSEUDO SWR
0203    7614            7614                    /GET HARDWARE SWR AND SKIP
0204    1776            TAD I   (20             /GET PSEUDO SWR
0205    3034            DCA     C8SWR           /SAVE SWITCH REGISTER
0206    1775            TAD I   (INMODE         /GET MESSAGE ACTIVE FLAG
0207    3035            DCA     C8MODE          /SAVE IT
```

```
                                        CDF 10                  /CHANGE DATA FIELD TO CONSOLE PACKAGE
                                        TAD     C8ENTR          /GET RETURN ADDRESS
                                        DCA     C8RTN           /SAVE FOR EXIT
                                        TAD     C8CHAR          /GET CHARACTER SAVED IN MAIN PROGRAM
                                        SZA                     /SKIP IF IT WAS ZERO
                                        JMP     C8CNTL          /AC NOT ZERO, GO CHECK CTRL CHAR
                                /
                                /PRINT OUT SR=XXXX WHERE XXXX IS THE CURRENT CONTENTS
                                /OF THE SWITCH REGISTER BEING USED (EITHER PSEUDO OR HARDWARE)
                                /
                        C8PSW,  JMS     C8CRLF          /DO A <CR> AND <LF>
                                TAD     C8K323          /GET ASCII CODE FOR "S"
                                JMS     C8TYP           /PRINT "S"
                                TAD     C8K322          /GET ASCII CODE FOR "R"
                                JMS     C8TYP           /PRINT "R"
                                TAD     C8K275          /GET ASCII CODE FOR "="
                                JMS     C8TYP           /PRINT "="
                                TAD     C8M4            /AC=-4
                                DCA     C8CNTR          /SET UP OCTAL DIGIT COUNTER
                                TAD     C8SWR           /GET SWITCH REGISTER
                                RAL                     /EXTRA ROTATE FOR LINK
                        C8LOPA, RAL
                                RTL                     /ROTATE OCTAL DIGITS FOR PRINTING
                                DCA     C8SWR           /SAVE ROTATED SWR
                                TAD     C8SWR           /GET ROTATED SWR
                                AND     C8K7            /MASK OFF DIGIT TO PRINT
                                TAD     C8K260          /ADD ASCII BASE CODE
                                JMS     C8TYP           /PRINT AN OCTAL DIGIT
                                TAD     C8SWR           /GET SWR
                                ISZ     C8CNTR          /INCREMENT LOOP COUNTER
                                JMP     C8LOPA          /GO PRINT NEXT DIGIT
                                /
                                /ACCEPT KEYBOARD INPUT OF OCTAL DIGITS, <CR>, <LF>
                                /CTRL/C OR CTRL/G.  ALL OTHER CHARACTERS ARE INVALID
                                /AND WILL BE ECHOED, FOLLOWED BY A "?",
                                /A CARRIAGE RETURN, LINE FEED, AND A RESTART OF
                                /THE SR=XXXX ROUTINE
                                /

                                CLA CLL
                                TAD     C8M5            /AC=-5
                                DCA     C8CNTR          /SET UP TO ACCEPT 5 CHARACTERS
                                DCA     C8BLD           /CLEAR SWITCH REG, BUILD AREA
                                DCA     C8FLG           /CLEAR SWR CHANGE SWITCH
                                TAD     C8K240          /GET ASCII CODE FOR SPACE
                                JMS     C8TYP           /SPACE OVER ONE POSITION
                        C8SRLP, JMS     C8TTY           /GO WAIT FOR KEYBOARD INPUT

                                DCA     C8TEMP          /SAVE INPUT CHARACTER
                                TAD     C8TEMP          /GET CHARACTER
                                TAD     (-203
                                SNA                     /SKIP IF NOT CTRL/C
                                JMP     C8CTLC          /GO TO CTRL/C ROUTINE
                                TAD     C8M4            /AC=-4
                                SNA                     /SKIP IF NOT CTRL/G
                                JMP     C8CTLG          /GO TO CTRL/G ROUTINE
```



```
                                TAD     C8M3            /SUBTRACT 3
                                SNA                     /SKIP IF NOT LINE FEED
                                JMP     C8EXT1          /GO TO LINE FEED EXIT
                                TAD     C8M3            /SUBTRACT 3
                                SNA CLA                 /SKIP IF NOT CARRIAGE RETURN
                                JMP     C8EXT2          /GO TO CARRIAGE RETURN EXIT
                                TAD     C8TEMP          /GET CHARACTER
                                JMS     C8TYP           /ECHO IT
                                TAD     C8TEMP          /GET CHARACTER
                                TAD     C8M260
                                SPA                     /SKIP IF >= TO ASCII CODE FOR ZERO
                                JMP     C8ERR           /INVALID CHARACTER  NOT OCTAL DIGIT
                                TAD     C8M10
                                SMA CLA                 /SKIP IF <= ASCII CODE FOR SEVEN
                                JMP     C8ERR           /INVALID CHARACTER  NOT OCTAL DIGIT
                                STA                     /AC=7777
                                DCA     C8FLG           /SET SWR CHANGE FLAG
                                TAD     C8TEMP          /GET CHARACTER
                                AND     C8K7            /MASK TO 3 BITS
                                DCA     C8TEMP          /SAVE OCTAL DIGIT
                                TAD     C8BLD           /GET SWR BUILD AREA CONTENTS
                                CLL RTL
                                RAL                     /ROTATE TO BUILD SWR
                                TAD     C8TEMP          /ADD NEXT OCTAL DIGIT
                                DCA     C8BLD           /SAVE NEW SWR
                                ISZ     C8CNTR          /INCREMENT OCTAL DIGIT COUNTER
                                JMP     C8SRLP          /CONTINUE ACCEPTING OCTAL DIGITS
                                /
                        C8ERR,  CLA CLL
                                TAD     C8K277          /GET ASCII CODE FOR "?"
                                JMS     C8TYP           /PRINT "?"
                                JMS     C8CRLF          /DO A <CR> AND <LF>
                                JMP     C8PSW           /GO START OVER
                                /
                                /
                                0541
                                0531
                                0457
                                0465
                                7575
                                0514
                                0403
                                0400
                                0502
                                0523
                                0420
                                0402
                                0351
                                0020
                                0021
                        PAGE
                                /
                        C8BLD,  0                       /SWITCH REGISTER BUILD AREA
                        C8STRT, RSTART                  /ADDRESS OF START OF PROGRAM
                        C8RTN,  0                       /STORAGE FOR RETURN ADDRESS
```

```
0403  0000    C8FLG,  0                       /SWR CHANGE SWITCH
0404  0000    C8SFLG, 0                       /CTRL/S ACTIVE FLAG
0405  0177    C8K177, 0177                    /CONSTANT
0406  0200    C8K200, 0200                    /CONSTANT
0407  0077    C8K77,  0077                    /CONSTANT
0410  7740    C8M40,  -40                     /CONSTANT
0411  0100    C8K100, 0100                    /CONSTANT
0412  0215    C8K215, 0215                    /CONSTANT
0413  0212    C8K212, 0212                    /CONSTANT
0414  0303    C8K303, 0303                    /CONSTANT
0415  0307    C8K307, 0307                    /CONSTANT
0416  0336    C8K336, 0336                    /CONSTANT
0417  7600    C87600, 7600
                /
                /       C O N T R O L   C H A R A C T E R
                /
                /       D E C O D E   R O U T I N E
                /
0420  1377    C8CNTL, TAD     (-203
0421  7450            SNA                     /SKIP IF NOT CTRL/C
0422  5265            JMP     C8CTLC          /CTRL/C TYPED  EXIT TO MONITOR
0423  1376            TAD     (-4
0424  7450            SNA                     /SKIP IF NOT CTRL/G
0425  5257            JMP     C8CTLG          /CTRL/G TYPED  GO PRINT "^G"
0426  1375            TAD     (-12
0427  7450            SNA                     /SKIP IF NOT CTRL/Q
0430  5255            JMP     C8CTLQ          /CTRL/Q TYPED
0431  1374            TAD     (-2
0432  7450            SNA                     /SKIP IF NOT CTRL/S
0433  5237            JMP     C8CTLS          /CTRL/S TYPED
0434  3035            DCA     C8MODE          /SET MESSAGE ACTIVE FLAG
0435  2204            ISZ     C8SFLG          /TEST CTRL/S ACTIVE FLAG
0436  5275            JMP     C8ECHO          /GO ECHO CHARACTER AND RETURN TO PROGRAM
                /
                /CTRL/S HANDLER
                /
0437  7240    C8CTLS, STA                     /AC=7777
0440  3204            DCA     C8SFLG          /SET CTRL/S ACTIVE FLAG
0441  1035            TAD     C8MODE          /GET MESSAGE ACTIVE FLAG
0442  7650            SNA CLA                 /SKIP IF CTRL/S TYPED WHILE MESSAGE ACTIVE
0443  5342            JMP     C8PFLD-1        /RETURN TO PROGRAM
                /
0444  7240    C8WAIT, STA                     /AC=7777
0445  3204            DCA     C8SFLG          /SET CTRL/S ACTIVE FLAG
0446  4314            JMS     C8TTY           /WAIT FOR KEYBOARD INPUT
0447  1377            TAD     (-203
0450  7450            SNA                     /SKIP IF NOT CTRL/C

0451  5265            JMP     C8CTLC          /CTRL/C TYPED  EXIT TO MONITOR
0452  1373            TAD     (-16
0453  7640            SZA CLA                 /SKIP IF CTRL/Q
0454  5244            JMP     C8WAIT          /NOT CTRL/C OR CTRL/Q  CONTINUE WAITING
0455  3204    C8CTLQ, DCA     C8SFLG          /CLEAR CTRL/S ACTIVE FLAG
0456  5342            JMP     C8PFLD-1        /RETURN TO MAIN PROGRAM
                /
                /CONTROL G HANDLER
```



```
                /
0457  4323    C8CTLG, JMS     C8CRLF          /DO A <CR> AND <LF>
0460  1216            TAD     C8K336          /GET ASCII CODE FOR UP ARROW
0461  4302            JMS     C8TYP           /PRINT UP ARROW
0462  1215            TAD     C8K307          /GET ASCII CODE FOR "G"
0463  4302            JMS     C8TYP           /PRINT "G"
0464  5772'           JMP     C8PSW           /GO TO "SR=XXXX" ROUTINE
                /
                /CONTROL C HANDLER
                /
0465  3204    C8CTLC, DCA     C8SFLG          /CLEAR CTRL/S ACTIVE FLAG
0466  1216            TAD     C8K336          /GET ASCII CODE FOR UP ARROW
0467  4302            JMS     C8TYP           /PRINT UP ARROW
0470  1214            TAD     C8K303          /GET ASCII CODE FOR "C"
0471  4302            JMS     C8TYP           /PRINT "C"
0472  6203            CIF CDF                 /CHANGE TO IF AND DF ZERO
0473  6007            CAF
0474  5617            JMP I   C87600          /RETURN TO MONITOR
                /
0475  1031    C8ECHO, TAD     C8CHAR          /GET CHARACTER
0476  4302            JMS     C8TYP           /ECHO IT
0477  1050            TAD     C8K277          /CODE FOR ?
0500  4302            JMS     C8TYP           /TYPE QUESTION MARK
0501  5342            JMP     C8PFLD-1        /RETURN TO PROGRAM
                /
                /
                /
                /
                /PRINT ONE CHARACTER
                /
0502  0000    C8TYP,  0
0503  2204            ISZ     C8SFLG          /TEST CTRL/S ACTIVE FLAG
0504  7410            SKP                     /SKIP IF CTRL/S NOT ACTIVE
0505  5244            JMP     C8WAIT          /GO WAIT FOR CTRL/Q OR CTRL/C
0506  6046            TLS                     /TRANSMIT CHARACTER
0507  6041            TSF                     /TEST TTY FLAG
0510  5307            JMP     .-1             /WAIT FOR TTY FLAG
0511  6042            TCF                     /CLEAR TTY FLAG
0512  7200            CLA                     /CLEAR AC DO NOT CLEAR LINK

0513  5702            JMP I   C8TYP           /RETURN
                /
                /WAIT FOR KEYBOARD INPUT THEN EXIT WITH ASCII CODE IN AC
                /
0514  0000    C8TTY,  0
0515  6031            KSF                     /SKIP IF KEYBOARD FLAG SET
0516  5315            JMP     .-1             /WAIT FOR KEYBOARD INPUT
0517  6036            KRB                     /READ KEYBOARD BUFFER  CLEAR FLAG
0520  0205            AND     C8K177          /MASK TO 7 BITS
0521  1206            TAD     C8K200          /SET BIT 4
0522  5714            JMP I   C8TTY           /RETURN
                /
                /EXECUTE A CARRIAGE RETURN AND LINE FEED
                /
0523  0000    C8CRLF, 0
```

```
0524  1212          TAD     C8K215          /GET ASCII CODE FOR CARRIAGE RETURN
0525  4302          JMS     C8TYP           /GO EXECUTE THE CARRIAGE RETURN
0526  1213          TAD     C8K212          /GET ASCII CODE FOR LINE FEED
0527  4302          JMS     C8TYP           /GO EXECUTE THE LINE FEED
0530  5723          JMP I   C8CRLF          /RETURN
                    /
                    /CONSOLE PACKAGE EXIT IF TERMINATED WITH LINE FEED
                    /
0531  4323    C8EXT1, JMS     C8CRLF          /DO A <CR> AND <LF>
0532  3031          DCA     C8CHAR          /CLEAR IT
0533  6203          CDF CIF 00              /MODIFIED CDI TO PROGRAM FIELD
0534  2203          ISZ     C8FLG           /TEST SWR CHANGE FLAG
0535  5601          JMP I   C8STRT          /RESTART PROGRAM WITHOUT CHANGE OF SWR
0536  1200          TAD     C8BLD           /GET NEW SWITCH REGISTER
0537  3771          DCA I   (20             /SAVE IT IN PROGRAM FIELD
0540  5601          JMP I   C8STRT          /RESTART PROGRAM WITH NEW PSEUDO SWR
                    /
                    /EXIT FROM CONSOLE PACKAGE IF TERMINATED WITH CARRIAGE RETURN
                    /
0541  4323    C8EXT2, JMS     C8CRLF          /DO A <CR> AND <LF>
0542  3031          DCA     C8CHAR          /CLEAR IT
0543  6203    C8PFLD, CDF CIF 00              /MODIFIED CDI TO PROGRAM FIELD
0544  7300          CLA CLL                 /CLEAR AC AND LINK FOR RETURN
0545  2203          ISZ     C8FLG           /TEST SWR CHANGE FLAG
0546  5602          JMP I   C8RTN           /RETURN TO PROGRAM WITHOUT CHANGE OF SWR
0547  1200          TAD     C8BLD           /GET NEW SWITCH REGISTER
0550  3771          DCA I   (20             /SAVE IT IN PROGRAM FIELD
0551  5602          JMP I   C8RTN           /RETURN TO PROGRAM
                    /
                    /
                    /
0571  0020
0572  0216
0573  7762
0574  7776
0575  7766
0576  7774
0577  7575
      0600          PAGE
                    /**********************************************************************
                    /C8PASS
                    /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
                    /THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
                    /THE PROGRAM TO COMPLEATE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
                    /RANGE
                    /       C8PASS=JMS      XC8PAS
                    /EX.            C8PASS

                    /               HLT                     /HALT IF NON CONSOL PACKAGE
                    /               JMP     START1          /CONTINUE RUNNING THIS PROGRAM
                    /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
                    /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0

0600  0000    XC8PAS, 0
0601  6211          CDF 10                  /CHANGE DATA FIELD TO CONSOLE PACKAGE
```



```
0602  4777'         JMS     C8CK22          /CHECK IF CONSOL IS ACTIVE
0603  5211          JMP     DOPACK          /IS CLASSIC
0604  4273          JMS     XC8SW                   /CHECK SR SETTING
0605  0376          AND     (400            /FOR HALT ON END OF C8PASS
0606  7640          SZA CLA                 /1= HALT 0 CONTINUE
0607  4461          HLT
0610  5240          JMP     C8BY1           /CONTINUE ON RUNNING PROGRAM
0611  4242    DOPACK, JMS     CKCOUT          /CLASS CHECK C8PASS COUNT
0612  5240          JMP     C8BY1           /C8PASS COUNT NOT DONE REDO PROGRAM
0613  2261          ISZ     PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
                    /#2
0614  4775'         JMS     C8CRLF
                    /#2
0615  4774'         JMS     XC8PNT                  /C8PRNT BUFFER
0616  0664          MESPAS                  /
0617  1261          TAD     PASCNT          /GET NUMBER
0620  4773'         JMS     XC8OCT                  /CONVERT IT TO ASCII
0621  6201          CDF 0
0622  1657          TAD I   XMX             /GET THE CHAR TO PRINT
0623  6211          CDF 10
0624  3242          DCA     CKCOUT          /STORE FOR PRINTING
0625  4774'         JMS     XC8PNT          /PRINT IT
0626  0642          CKCOUT
0627  4775'         JMS     C8CRLF                  /DO A CARRIAGE RETURN
0630  4273          JMS     XC8SW                   /CHECK A HALT AT END OF C8PASS
0631  0376          AND     (400            /MASK BIT
0632  7650          SNA CLA                 /HALT =1 NO SKIP CONTINUE =0
0633  5240          JMP     C8BY1           /NO HALT
0634  1200          TAD     XC8PAS          /GET RETURN ADDRESS
0635  3772'         DCA     C8ENTR          /PLACE IT AT START OF CONSOLE PACKAGE
                                            /ROUTINE - NEEDED FOR SETUP OF C8RTN
0636  6201          CDF 00
0637  5771'         JMP     C8ENTR+1        /GO TO CONSOLE PACKAGE TO PRINT PSR
0640  6203    C8BY1,  CDF CIF 00
0641  5600          JMP I   XC8PAS
0642  0000    CKCOUT, 0
0643  1262          TAD     DOSET           /CHECK IF SET UP NEEDED
0644  7640          SZA CLA                 /0=SET UP C8PASS COUNT VALUE
                                            /1=C8PASS COUNT VALUE OK
0645  5252          JMP     NOSET           /C8PASS COUNT VALUE ON
0646  1263          TAD     CNTVAL          /GET COUNT VALUE FOR THIS PROG
0647  7040          CMA                     /SET TO NEGATIVE
0650  3260          DCA     DOCNT           /STORE IN HERE
0651  2262          ISZ     DOSET           /INDICATE VALUE SET UP
                    /#2
0652  2260    NOSET,  ISZ     DOCNT           /COUNT THE NUMBER OF PASSES
                    /#2
0653  5240          JMP     C8BY1           /EXIT FOR ANOTHER PASS
0654  3262          DCA     DOSET           /SET TO C8PRNT C8PASS
0655  2242          ISZ     CKCOUT          /BUMP RETURN FOR
0656  5642          JMP I   CKCOUT          /C8PASS C8TYPE OUT
0657  0522    XMX,    MX              /LOCATION OF CHAR TO PRINT AT PASS FROM FLD 0
0660  0000    DOCNT,  0
0661  0000    PASCNT, 0                       /
0662  0000    DOSET,  0
```

```
0663  0000    CNTVAL, 0
0664  0411    MESPAS, TEXT    "DIRXA-D PASS "
0665  2230
0666  0155
0667  0440
0670  2001
0671  2323
0672  4000

                /*****************************************************************
                /C8CKSW
                /ROUTINE THAT WILL CHECK WHERE TO READ THE
                /C8 SWITCHES FROM IE, FROM PANEL OR PSEUDO C8SWIT REGISTER
                /
                /RETURN WITH AC = TO CONTENTS OF SWITCH REGISTER

0673  0000    XC8SW,  0
0674  7200            CLA                     /CLEAR AC
0675  6201            CDF 00
0676  1770            TAD I   (21             /GET WD FOR INDICATOR
0677  6211            CDF 10
0700  7710            SPA CLA                 /CHECK IF FROM PANEL 4000
0701  7614            7614                    /DO LAS AND SKIPGET FROM PANEL WITH LAS
0702  5304            JMP     C8GET1          /GET CONTENTS OF LOC 20 FLD 00
0703  5307            JMP     C8EXTB          /EXIT COMMON
0704  6201    C8GET1, CDF 00
0705  1767            TAD I   (20             /PSEUDO SW
0706  6211            CDF 10
0707  5673    C8EXTB, JMP I   XC8SW           /EXIT WITH STATUS BIT IN AC.


0767  0020
0770  0021
0771  0201
0772  0200
0773  1035
0774  1000
0775  0523
0776  0400
0777  1060
      1000            PAGE

                /*****************************************************************

                /*****************************************************************

                /C8PRNT

                /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
                /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL.  C8 PRINTING OF THE BUFFER
                /WILL STOP WHEN A 00 CHAR IS DETECTED, CHARACTERS ARE PACKED 2 PER WORD.
```



```
                /       C8PRNT= JMS XC8PNT


                /EX.    C8PRNT                  /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
                /       MESS77                  /LOCATION OF C8PRNT BUFFER
                /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
                /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0


1000  0000    XC8PNT, 0
1001  7300            CLA CLL
1002  1600            TAD I   XC8PNT          /GET C8PRNT BUFFERS STARTING LOCATION
1003  3233            DCA     PTSTOR          /STORE IN PTSTOR
1004  2200            ISZ     XC8PNT          /BUMP RETURN
1005  1633    C8D01,  TAD I   PTSTOR          /GET DATA WORD
1006  0377            AND     (7700           /MASK FOR LEFT BYTE
1007  7450            SNA                     /CHECK IF 00 TERMINATE
1010  5600            JMP I   XC8PNT          /EXIT
1011  7500            SMA                     /IS AC MINUS
1012  7020            CML                     /MAKE CHAR A 300 AFTER ROTATE
1013  7001            IAC                     /MAKE CHAR A 200 AFTER ROTATE
1014  7012            RTR
1015  7012            RTR
1016  7012            RTR                     /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
1017  4776'           JMS     C8TYP                   /C8PRNT IT ON CONSOLE
1020  1633            TAD I   PTSTOR          /GET DATA WORD
1021  0375            AND     (0077           /MASK FOR RIGHT BYTE
1022  7450            SNA                     /CHECK IF 00 TERMINATOR
1023  5600            JMP I   XC8PNT          //EXIT
1024  1374            TAD     (3740           /ADD FUDGE FACTOR TO DETERMINE IF 200
1025  7500            SMA                     /OR 300 IS TO BE ADD TO CHAR
1026  1373            TAD     (100            /ADD 100
1027  1372            TAD     (240            /ADD 200
1030  4776'           JMS     C8TYP                   /C8TYPE ONLY BITS 4-11
1031  2233            ISZ     PTSTOR          /BUMP POINTER FOR NEXT WORD
1032  5205            JMP     C8D01           /DO AGAIN
1033  0000    PTSTOR, 0                       /STOR FOR C8PRNT BUFFER
1034  0000    STOPNT, 0                       /0000 C8PRNT 7777=DO NOT C8PRNT


                /*****************************************************************

                /*****************************************************************
                /C8OCTA
                /OCTAL TO ASCII CONVERSION
                /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
                /THE RESULT WILL BE PRINTED ON THE CONSOL DISPLAY
                /       C8OCTA= JMS XC8OCT
                /
                /EX.    C8OCTA          /AC CONTAINS NUMBER TO BE CHANGE
                /
```

```
                                XC8OCT, 0
                                        CLL RTL
                                        RTL                     /POSITION THE FIRST CHAR FOR PRINTING
                                        DCA     C8TMP1          /SAVE CORRECT POSITIONED WORD HERE
                                        TAD     (-4
                                        DCA     C8CKP           /STORE COUNTER IN HERE
                                C8D04,  TAD     C8TMP1          /GET FIRST NUMBER
                                        AND     (0007           /MASK
                                        TAD     (260            /ADD THE PRINT CONSTANT
                                        JMS     C8TYP           /TYPE THE NUMBER
                                        TAD     C8TMP1          /
                                        RTL
                                        RAL                     /PUT NEXT NUMBER IN POSITION
                                        DCA     C8TMP1          /STORE IT
                                        ISZ     C8CKP           /DONE YET WITH FOUR NUMBERS
                                        JMP     C8D04           /NOT YET DO MORE
                                        JMP I   XC8OCT          /DONE WITH FOUR
                                C8TMP1, 0
                                C8CKP,  0

                        /*****************************************************************

                        /*************************************
                                /CHECK LOCATION 22 FIELD 0

                                C8CK22, 0
                                        CLA
                                        CDF 00
                                        TAD I   (22             /GET LOC 22 FIELD 0
                                        CDF 10
                                        AND     (400
                                        SNA CLA
                                        ISZ     C8CK22
                                        JMP I   C8CK22          /EXIT


                                /
                                0400
                                0022
                                0260
                                0007
                                7774

                                0240
                                0100
                                3740
                                0077
                                0502
                                7700
                                0000    FIELD 0
```



```
0000  000000000  00000000  00001111  11111111  11111111  11100000  00000000  00000000
0100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11100000  00000000  00000000  00000000  01111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11000000  00000000  01111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  00000000  00000000  00000000  00000000  00000000  00000001  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000
1100  00000000  00000000  00000000  00000000  00000000  00000000  00000111  11111111

1200
1300

1400
1500

1600
1700


2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300


7400
7500

7600
7700
```



```
  595
  596
  597
  598
  599                 / RX8/RX01 DIAGNOSTIC * MAINDEC-08-DIRXA-D
  600                 /
  601                 /STARTING ADDRESS 200 = (AC) = STARTUP SWITCHES
  602                 /
  603                 /STARTING ADDRESS 201 = RESTART (PARAMETERS ALREADY SELECTED AT START 200)
  604                 /
  605                 /STARING ADDRESS 202 = CHANGE DEVICE CODES.
  606                 /
  607                 /START-UP AC SWITCH DEFINITIONS (WHEN THE STARTING ADDRESS IS 200)
  608                 /
  609                 / AC   0 1 2   3 4 5   6 7 8   9 10 11
  610                 /      U U U/C X X X   U T T   T T  T
  611                 /
  612                 /       X=DEVICE CODE (0 DEFAULTS TO 75)
  613                 /       T=TESTS (0 FOR ALL TESTS)
  614                 /       C=RX01 MICROCONTROL CABLED TO RX8 INTERFACE
  615                 /       U=UNIT/DRIVES SELECTED FOR TEST
  616                 /         WHERE:      UNIT      DRIVE(S)
  617                 /               0000 = A        0,1
  618                 /               1000 = B        0,1
  619                 /               2000 = A        0
  620                 /               3000 = B        0
  621                 /               4000 = A        1
  622                 /               5000 = B        1
  623                 /               6000 = TEST CONTROL AND INTERFACE ONLY (NO DRIVES)
  624                 /               7000 = TEST INTERFACE ONLY (NO CONTROL OR DRIVES)
  625                 /       VT78    0040 = TEST UNITS A & B (ALL DRIVES)
  626                 /               4040 = DRIVES 1 BOTH UNITS
  627                 /               2040 = DRIVES 0 BOTH UNITS
  628                 /
  629                 /THE PRETEST IS NOT SWITCH SELECTABLE - THIS PRETEST IS ALWAYS
  630                 /EXECUTED PRIOR TO THE FIRST TTTTT SELECTION
  631                 /
  632                 /PRETEST - VERIFICATION OF INIT [KEY]
  633                 /
  634                 /    (PRETEST)  I8      - INIT PART I [KEY] / FLAG DETECTION PART I
  635                 /
  636                 /INTERFACE / CONTROL TESTS
  637                 /
  638                 /NOTE: * THE KEYBOARD IS " ALIVE " DURING TESTS 6, 7, 10, AND 11, AND 12
  639                 /IF A CHARACTER IS STRUCK AN ERROR MAY OCCUR
  640                 /
  641                 /     TTTTT
  642                 /
  643                 /       0       I       - FLAG DETECTION PART II / " C " LINES PART I
  644                 /       1       I8      - DIRECTION OF IOT XDR PART I / IOT DECODING PART I
  645                 /                       - " C " LINES PART II
  646                 /       2       I8      - FLAG DETECTION PART II / " C " LINES PART III
  647                 /       3       I8      - IOT DEVICE CODE VERIFICATION
  648                 /       4       I8      - DIRECTION OF IOT XDR PART II / " C " LINES PART IV
  649                 /       5       I       - IOT DECODING PATR II
```

```
                /    *  6      IB/I    - INTERRUPT TESTING PART I / IOT DECODING PART III
                /    *  7      IB      - INTERRUPT TESTING PART II
                /    *  10     IB      - INTERRUPT TESTING PART III
                /    *  11     I       - INTERRUPT TESTING PART IV
                /    *  12     IB/I    - INIT PART II [PROGRAMMED] / INTERRUPT TEST PART V
                /RX01 CONTROL TESTS
                /
                /       13     C       - FILL BUFFER 12-BIT MODE
                /       14     C       - EMPTY BUFFER 12-BIT MODE
                /       15     C       - VERIFICATION OF PREVIOUS TEST
                /       16     C       - FILL BUFFER 8-BIT MODE
                /       17     C       - EMPTY BUFFER 8-BIT MODE
                /       20     C       - VERIFICATION OF PREVIOUS TEST
                /       21     C       - FILL BUFFER 8-BIT MODE (ALL 0'S)
                /       22     C       - FILL BUFFER 8-BIT MODE (ALL 1'S)
                /
                /DISKETTE DRIVE TESTS
                /
                /       23     D       - STATUS BIT "DRIVE READY"
                /       24     D       - B-CODE VERIFICATION (70) PART I
                /       25     D       - B-CODE VERIFICATION (70) PART II
                /       26     D       - B-CODE VERIFICATION (70) PART III
                /       27     D       - B-CODE VERIFICATION (40) PART IV
                /       30     D       - SEEK AND CRC VERIFICATION
                /       31     D       - WRITE TEST
                /       32     D       - INIT PART III [PROGRAMMED] IMPLIED READ TRACK 1 SECTOR 1
                /       33     D       - READ TEST
                /       34     D       - WRITE-READ-PROGRAM VERIFY 12 BIT MODE
                /       35     D       - WRITE-READ-PROGRAM VERIFY  8 BIT MODE
                /       36     D       - WRITE-READ-PROGRAM VERIFY 12 BIT MODE WITH DELETED DATA
                /       37     D       - WRITE-READ-PROGRAM VERIFY  8 BIT MODE WITH DELETED DATA
                /
                /       I = MEANS RX8 INTERFACE TEST
                /       B = MEANS RX01 MAY BE CABLED TO RX8
                /       C = MEANS AN RX01 MUST BE CABLED TO THE RX8
                /       D = MEANS A DRIVE MUST BE READY
                /
                /OPERATIONAL AC SWITCH DEFINITIONS
                /
                /  AC 0 = (1) CONTINUE ON DETECTION OF ERROR
                /  AC 1 = (1) LOCK SCOPE LOOP ON ERROR
                /  AC 2 = (1) LOCK SCOPE LOOP ON TEST
                /  AC 3 = (1) HALT AT END OF PASS
                /  AC 4 = (1) DON'T PRINT AN ERROR MESSAGE
                /  AC 5 = (1) LONG DATA COMPARISON ERROR PRINTOUT
                /  AC 6 = (1) DISABLE THE ISSUING OF [INIT]
                /  AC 7 = (1) HALT AT END OF A TEST

                /  AC 8 =
                /  AC 9 =
                /  AC 10=
                /  AC 11= (1) DISABLE RINGING OF BELL AT ERROR
                /THE FOLLOWING MAP IS A SUMMARY OF ALL ERRORS.
                /
                /
                /       ERA    TEST    BLANK   EAC     GOOD    COMMENT:
```



```
                /
                /
1700  0412      E0PRE / PRETEST -       -       -       UNEXPECTED TRANSFER REQUEST FLAG
1701  0415      E2PRE /         -       -       -       UNEXPECTED ERROR FLAG
1702  0425      E3PRE /         -       -       -       MISSING DONE FLAG
1703  0445      E1PRE /         STATUS  STATUS
                /                 FROM    MINUS   4,      STATUS NOT = INIT DONE, OR
                /                 TR      DEL     204     DRIVE READY + INIT DONE
                /                         DATA
1704  0450      E4PRE /         -       -       -       UNEXPECTED DONE FLAG
                /
                /
1705  0607      E0 /    T0      -       X       0       IOT 67X1 DIDN'T CLEAR AC
1706  0613      E1 /            -       -       -       UNEXPECTED TRANSFER REQUEST FLAG
1707  0617      E2 /            -       -       -       UNEXPECTED ERROR FLAG
1710  0623      E3 /            -       -       -       UNEXPECTED DONE FLAG
                /
                /
                /       E11 /   T1      -       X       0       IOT 67X1 FAILED TO CLEAR AC
1711  0647      E10 /           -       X       200     TR NOT = 200 (DRIVE READY)
                /
                /
                /       E20 /   T2      -       -       -       MISSING DONE FLAG
1712  0660      E21 /           -       -       -       MISSING TR FLAG
1713  0663      E22 /           -       -       -       MISSING ERROR FLAG
1714  0666      E23 /           -       -       -       MISSING DONE FLAG
1715  0671      E24 /           -       -       -       MISSING TR FLAG
1716  0674      E25 /           -       -       -       MISSING ERROR FLAG
1717  0704      E26 /           -       X       7777    IOT 67X6 CLEARED AC
1720  0712      E27 /           -       X       7777    IOT 67X3 CLEARED AC
1721  0720      E28 /           -       X       7777    IOT 67X4 CLEARED AC
                /
                /
                /
1722  0744      E30 /   T3      -       X       67X5    (EAC) = ILLEGAL DEVICE CODE
                /
                /
                /
1723  1021      E42 /   T4      7776    X       200     IOT 67X1 CLEARED AC
                /
                /
1724  1044      E40 /           T0              376
                /                                 375     DATA TO TR NOT =
                /                                 373     DATA FROM TR
1725  1060      E41 /           7677              367     OR,
                /                                 357     DATA FROM TR NOT =
                /                                 337     DATA FROM TR PREVIOUSLY
                /                                 7677
1726  1102      E56 /   T5      -       X       0       (TR) NOT = 0
1727  1105      E50 /           -       -       -       MISSING DONE FLAG
1730  1111      E53 /           -       -       -       UNEXPECTED DONE FLAG
1731  1114      E51 /           -       -       -       MISSING TR FLAG
1732  1120      E54 /           -       -       -       UNEXPECTED TR FLAG
1733  1123      E52 /           -       -       -       MISSING ERROR FLAG
1734  1127      E55 /           -       -       -       UNEXPECTED ERROR FLAG
```

```
                        /
                        /
                        /
 1235  1142            E60 /   T6      -       -       -       UNEXPECTED RX01 IRQ
 1236  1154            E61 /           -       -       -       MISSING DONE FLAG
 1237  1157            E62 /           -       -       -       MISSING TR FLAG
 1240  1162            E63 /           -       -       -       MISSING ERROR FLAG
                        /
                        /
                        /
 1241  1212            E70 /   T7      -       -       -       MISSING RX01 IRQ
                        /
                        /
                        /
 1242  1226            E100 /  T10     -       -       -       UNEXPECTED RX01 IRQD
                        /
                        /
                        /
 1243  1252            E110 /  T11     -       -       -       UNXPECTED RX01 IRQ
                        /
                        /
                        /
 1244  1276            E124 /  T12     -       -       -       UNEXPECTED RX01 IRQ
 1245  1311            E120 /          -       -       -       UNEXPECTED DONE FLAG
 1246  1315            E121 /          -       -       -       UNEXPECTED TR FLAG
 1247  1321            E122 /          -       -       -       UNEXPECTED ERROR FLAG
 1250  1326            E123 /          -       X       0       (TR) NOT = 0
 1251  1412            EA120 / ALT 12  -       -       -       UNEXPECTED TR FLAG
 1252  1416            EA121 /         -       -       -       UNEXPECTED DONE FLAJG
 1253  1440            EA122 /         ACTUAL  ACTUAL  4 OR
                        /               STATUS  MINUS   204     STATUS NOT = 4, OR 204
                        /                       DEL DAT
 1254  1451            EA123 /         -       X       0       THE B-CODE NOT = 0
                       /THE " XRSTB " SUBROUTINE WHICH READS THE B-CODE STATUS BY ISSUING
                       /COMMAND # 7 IS ENTERED FROM TESTS:   ***   ALT12, (T24, T25, T26), AND T27
                       /
                       /THE CONTENTS OF " BLANK " = THE CONTENTS OF GOOD FROM TEST: ALT12
                       /
 1255  2405            E7000 /         4/204   -       -       UNEXPECTED TR FLAG
 1256  2416            E7001 /         4/204   STATUS  -       UNEXPECTED ERROR FLAG
 1257  2432            E7002 /         4/204   X       7000    SHIFT REGISTER NOT SHIFTING
                        /
                        /
                        /
                       /THE " XRST " SUBROUTINE TO READ THE STATUS REGISTER BY ISSUING COMMAND # 5
                       /IS ENTERED FROM TESTS:   ***   ALT12, AND T23
                       /
 1260  2446            E7003 /         4/204   -       -       UNEXPECTED TR FLAG
 1261  2457            E7004 /         4/204   STATUS  -       UNEXPECTED ERROR FLAG
 1262  2473            E7006 /         4/204   STATUS  5000    SHIFT REGISTER NOT SHIFTING
 1263  2511            E7005 /         4/204   STATUS  0/200
                        /
                        /
                        /
                       /SUBROUTINE " FBEB " TO FILL AND EMPTY THE BUFFER IS ENTERED FROM TESTS:
```



```
                       / T13, T16 (FILL THE BUFFER) / T14, T17 (EMPTY THE BUFFER)
                       /
 1264  1513            E130 /          COMMAND -       -       UNEXPECTED ERROR FLAG
 1265  1526            E131 /          COMMAND ACTUAL  EXPECT  # OF TR FLAGS NOT OK
                        /                                       (EAC) = # OF FLAGS
                        /                                       NEG. # MEANS NOT ENOUGH
                        /                                       >0 MEANS TO MANY
                        /
                        /
                        /
                       /ERROR # 140 MAY OCCUR WITHIN TESTS T14, T17, T15, AND T20
                       /
                       /THE CONTENTS OF " BLANK " IS EQUIVALENT TO THE WORD/BYTE COUNT AT THE ERROR
                       /
                       /THE CONTENTS OF THE " EAC " IS EQUIVALENT TO THE ACTUAL DATA FROM THE SECTOR
                       /BUFFER (8 OR 12-BIT MODE)
                       /
                       /THE CONTENTS OF " GOOD " IS EQUIVALENT TO THE EXPECTED CONTENTS OF THE
                       /SECTOR BUFFER
                       /
 1266  1661            E140 / *        #       ACTUAL  EXPECT  DATA COMPARISON ERROR
                       / " FB128BYTES " IS A SUBROUTINE WHICH FILLS THE SECTOR BUFFER WITH 128 BYTES
                       /OF DATA (ALL 1'S OR ALL 0'S) AND IS ENTERED FROM TESTS T21, AND T22
                       /
 1267  4557            E210 / *        -       -       -       UNEXPECTED ERROR FLAG
                        /
                        /
                       /SUBROUTINE " TX " EMPTIES THE SECTOR BUFFER AND COMPARES THE DATA TO AN
                       /EXPECTED PATTERN
                       /
                       /THIS SUBROUTINE IS ENTERED FROM TESTS: *** T21, T22, (T24, T25, T26), AND T27
                       /
 1270  2320            E211 /          #       ACAUAL  EXPECT  DATA COMPARISON ERROR
 1271  2332            E212 /          -       -       -       UNEXPECTED ERROR FLAG
                        /
                        /
                        /
                       /ERRORS E240, E245, E241, AND E242 MAY OCCUR WITHIN TESTS: T24, T25, T26
                       /
                       /
                       /
 1272  2030            E240 / *        CMND    X       2       # OF TR FLAGS NOT OK
 1273  2033            E245 /          CMND    -       -       MISSING ERROR FLAG
 1274  2070            E241 /          ACTUAL  X       T24/200,300
                        /                                       T25/200
                        /                                       T26/300
 1275  2101            E242 /          -       X       70      B-CODE NOT = 70
                        /
                        /
                        /
 1276  2135            E270 /  T27     115     # OF    2       # OF TR FLAGS NOT OK
                        /                       XFERS
 1277  2140            E271 /          -       -       -       MISSING ERROR FLAG
 1300  2151            E272 /          -       X       40      B-CODE NOT = 40
       0000            *0
```

```
0000  0303          303             / C  IS THE REVESION
              0001  *1
0001  5402          JMP I IPI
                    /
                    /PROGRAM LOCATION 2 CONTAINS THE INTERRUPT RETURN ADDRESS
                    /
                    /PROGRAM LOCATION 2 IS MODIFIED WITHIN CERTAIN TESTS
                    /
0002  5417    IPI,  PI
                    /
                    /
                    /AUTO INDEX REGISTER DEFINITION.
                    /
              0010  *10
0010  0000    A10,  0
0011  0000    A11,  0
0012  0000    A12,  0
0013  0000    A13,  0                         /TEST Q
              0020  *20
                    /
                    /THE FOLLOWING PROGRAM LOCATIONS (20, 21, AND 22, 23) ARE RESERVED FOR ACT8/A
                    /
0020  0000          0000            /SET FOR DRIVES 0 AND 1 DEVICE CODE 75
0021  4000          4000            /0000=PSEUDO SWITCH REGISTER IF ON ACTIVE CONSOLE
                                    /0000=VT78
                                    /4000=USE HARDWARE SWITCH REGISTER


0022  0000          0000            /0000=NOT ACTIVE CONSOLE PACKAGE
                                    /0400= ACTIVE CONSOLE PACKAGE
                                    /1400= VT78
              0024  *24
                    /*****************************************************************
                    /THE FOLLOWING CALLS ARE USED FOR THE CONSOLE PACKAGE
              4424  CHECKC8=        JMS I   .
0024  4516          XCHECK                  /USED TO CHECK IF THE CONSOLE IS ACTIVE
              4425  XC8ENTR=        JMS I   .
0025  0200          C8ENTP
              4426  C8PASS=         JMS I   .
0026  0600          XC8PASS                 /END OF PASS FOR CONSOL
              0200  RSTART=200              /RESTART ADDRESS FOR CONSOLE PACKAGE
                    /*****************************************************************
                    /
                    /THE FOLLOWING PROGRAM LOCATIONS "OD", "ID", "FIRST", AND "LAST" MAY BE
                    /CHANGED BY THE OPERATOR MANUALLY HOWEVER FOLLOWING THESE RESTRICTIONS.
                    /
                    /               1.  THE CONTENTS OF " OD " (MIN VAL 0) MUST BE <= THE
                    /                   CONTENTS OF " ID " (MAX VAL 114).
                    /
                    /               2.  THE CONTENTS OF "FIRST" (MIN VAL 1) MUST BE <= THE
```



```
                    /                   CONTENTS OF "LAST" (MAX VAL 32)
                    /
                    /THE PROGRAM INITIALLY SETS THESE VALUES AT PROGRAM LOAD TIME
                    /
                    / (OD) = 52, AND (ID) = 53
                    /
                    /BECAUSE TRACK 53 IS THE TRACK AT WHICH THE RX01 MICROCONTROLLER WILL
                    /DECREASE THE WRITE CURRENT IN HALF
                    /
0027  0001    OD,   1                       /OUTSIDE DIAMETER (MIN VALUE 0)
0030  0114    ID,   114                     /INSIDE DIAMETER (MAX VALUE 114)
0031  0001    FIRST,  1                     /FIRST SECTOR TO ACCESS (MIN VAL 1)
0032  0032    LAST,   32                    /LAST SECTOR TO ACCESS (MAX VAL 32)
                    /
                    /PDP-8/E AUGMENTED INSTRUCTIONS
                    /
              4433  BSW=JMS I .
0033  2600          XBSW            /BYTE SWAP
              6001  ION=6001
              6002  IOF=6002
              4572  LAS=CKSWIT
              7501  MQA=7501                / "OR" (MQ) WITH (AC)
              7421  MQL=7421                /MQ=AC (THEN CLEAR AC)
                    /
                    /DISKETTE IOT SUBROUTINES
                    /
              4434  TY8OCT=JMS I .
0034  5200          XTY8OCT                 /TYPE EIGHT OCTAL DIGITS.
              4435  SEL=JMS I.
0035  6200          XSEL
              4436  LCD=JMS I .
0036  6203          XLCD
              4437  LCDA=JMS I .
0037  6210          XLCDA
              4440  LCDB=JMS I .
0040  6235          XLCDB
              4441  XDRIN=JMS I .
0041  6400          XXDRIN
              4442  XDROUT=JMS I .
0042  6403          XXDROUT
              4443  STR=JMS I .
0043  6407          XSTR
              4444  SER=JMS I .
0044  6414          XSER
              4445  SDN=JMS I .
0045  6421          XSDN
              4446  INTR=JMS I .
0046  6426          XINTR
              4447  INIT=JMS I .
0047  6434          XINIT
              4450  INITB=JMS I .
0050  6450          XINITB
              4451  CKUNIT=JMS I .
0051  2335          XCKUNT
                    /OPERATING SYSTEM SUBROUTINES
```

```
                        /
                4452    ERROR=JMS I .
0052    2625                    XERROR
                5453    EXIT=JMP I .
0053    0452                    MORETESTS               /EXIT FROM A TEST (IF RX8 ONLY )
                4454    DONE=JMS I .
0054    4243                    XDONE           /               FORM: "DONE; NO; YES"
                4455    GETAPATTERN=JMS I .
0055    3035                    XGETAPATTERN
                4456    GETASECTOR=JMS I .
0056    4607                    XGETASECTOR
                4457    GETATRACK=JMS I .
0057    4261                    XGETATRACK      /GET A TRACK FOR IOT LCD-B (TRACK #)
                4460    GETUNIT=JMS I .
0060    4200                    XGETUNIT        /SELECT A DISKETTE DRIVE
                4461    HLT=HALT
                4461    HALT=JMS I .
0061    4121                    XHALT
                4462    INITSECTORS=JMS I .
0062    4600                    XINITSECTORS
                4463    INITTRACKS=JMS I .
0063    4250                    XINITTRACKS
                4464    LOCKUP=JMS I .
0064    2545                    XLOCKUP
                5453    NOTEST=EXIT
                4465    OK=JMS I .
0065    6123                    XOK                             /SKIP IF NOT ON APT.
                4466    TICK=JMS I .
0066    4133                    XTICK
                4467    AERROR=JMS I .
0067    4346                    XAERRO
                4470    APT8=JMS I .
0070    1545                    XAPT8
                4471    WAIT=JMS I .
0071    1722                    XWAIT
                4472    CHEK22=JMS I .
0072    5144                    XCHK22                          /CHECK FOR APT SYSTEM.
                4473    PRINT=JMS I .
0073    5244                    XPRINT          /PRINT A MESSAGE; FORM: "PRINT; MESSAGE"
                4474    READ=JMS I .
0074    3416                    XREAD
                4475    READCOMPARE=JMS I .
0075    3412                    XREADCOMPARE
                4476    RST=JMS I .
0076    2441                    XRST            /STATUS AFTER "RST" COMMAND (12)  /  5 TIMES 2
                4477    RST8=JMS I .
0077    2400                    XRST8           /STATUS AFTER READ B=CODES COMMAND (16)  7 X 2

                4500    SETUP=JMS I .
0100    4103                    XSETUP
                4501    SPECIALTYPE=JMS I .
0101    5352                    XSPECIALTYPE
                4502    SCOPE=JMS I .
0102    1333                    XSCOPE
                4503    SUBSCOPE=JMS I .
0103    1344                    XSSCOPE
```



```
                4504    TAB=JMS I .
0104    5215                    XTAB            /               FORM: " TAB; N "
                4505    TY4OCT=JMS I .
0105    5000                    XTY4OCT                 /TYPE (4) OCTAL ; FORM: " TY4OCT; OCTAL "
                4506    TYPEIT=JMS I .
0106    5305                    XTYPEIT                         /TYPE 1 8 BIT ASCII,AC =ASCII.
                4507    WAITTY=JMS I .
0107    5412                    XWAITTY
                4510    WRITE=JMS I .
0110    3200                    XWRITE
                        /
                        /ACCUMULATOR SWITCH REGISTER DEFINITIONS
                        /
                4000    SW0=4000
                2000    SW1=2000
                1000    SW2=1000
                0400    SW3=400
                0200    SW4=200
                0100    SW5=100
                0040    SW6=40
                0020    SW7=20
                0010    SW8=10
                0004    SW9=4
                0002    SW10=2
                0001    SW11=1
                        /OPERATING SYSTEM ALLOCATED STORAGE REFERENCES
                        /
0111    0000    BUSY,           0               / = 1 = PROCESSING AN RX01 PROGRAM INTERRUPT
0112    0000    COMMAND,        0               /DISKETTE COMMAND ; (AC) AT LCD
0113    0000    COMPRERROR,     0               /PROGRAM DATA COMPARE ERRORS
0114    0000    DTESTP,         0               /DIAGNOSTIC TEST PARAMETERS (SELECTED AT L/S )
0115    7777    FIRSTERROR,     7777            / (7777) IF 1ST ERROR ; (0) IF NOT
0116    0000    HANGER,         0               /COUNTER TO DETECT DEVICE TEST HUNG
0117    7777    K7777,          -1              /
0120    0000    RDC,            0               / = 0 IF A RDC TEST, = 7777 IF NOT
0121    7765    KRETRY,         -13             / 1 ORIGINAL TRY + 10 RETRYS
0122    7746    SECTORS,        -32             /NEGATIVE # OF SECTORS PER TRACK (1-32 OCTAL)
0123    0000    SSTART,         0               /SECTOR LAST ACCESSED ( 0 = "HOME" )
0124    0000    STARGET,        0               /TARGET SECTOR OF (UNITX)
0125    0000    START,          0               /TRACK LAST ACCESSED
0126    0000    ASTATUS,        0               /DISKETTE STATUS AT ERROR OR DONE
0127    0000    BSTATUS,        0               /RX01 DEFINITIVE ERROR CODE REGISTER
0130    0000    CSTATUS,        0               /STATUS FROM THE "READ STATUS" COMMAND
0131    0000    TARGET,         0               /TARGET TRACK OF (UNITX)
0132    0000    TESTP,          0               /TEST PARAMETERS (DYNAMIC BY PROGRAM)
0133    0000    XA10,           0
0134    0000    XA11,           0
0135    0000    UNITCK, 0               /VT78/AC11 (0)=RXA (1)=RXB
0136    7677    MASK,   7677            /VT78/ 7677 FOR STANDARD 8 = 277 FOR VT78
                        /
                        /PROGRAM LOCATION XXX IS A TEMPORARY STORAGE REGISTER FOR DATA
                        /OR ADDRESSES OF DATA WHICH ARE CALLED WITHIN SUBROUTINES WHICH
                        /DO NOT CALL SUBROUTINES WHICH CALL THESE STORAGE REGISTERS
                        /
                        /XXX IS CALLED WITHIN THE FOLLOWING SUBROUTINES
```

```
                        /
                        /D,D/RX-ERROR (2)
                        /COMPARE (2)
                        /XGETAPATTERN (6)
                        /RDORWR (2)
                        /
0137  0000      XXX,            0
                        /
0140  7765      R1RETRY,        -13     /WERRORS        /WRITE ERROR RECOVERY
0141  7765      R2RETRY,        -13     /RERRORS        /READ ERROR RECOVERY
0142  0000      DWSLOG,         0       /DATAERRORS     /DATA ERROR WITH CRC STATUS ERROR
0143  0000      DNSLOG,         0       /DNSERRORS      /DATA ERROR BUT NO CRC STATUS ERROR
0144  0000      SNDLOG,         0       /SNDERRORS      /CRC STATUS ERROR BUT NO DATA ERROR
0145  7765      SRETRY,         -13     /SERRORS        /SEEK ERROR RECOVERY
0146  7765      PRETRY,         -13     /PERRORS        /PARITY ERROR RECOVERY
                        / (TRACKS) ARE SET TO THE NEGATIVE DIFFERENCE BETWEEN (OD), AND (ID)
                        / IN THE SUBOROUTNE "INITTRACKS "
                        /
0147  7663      TRACKS,         -115            / -# OF TRACKS PER DISKETTE (-115 TO -1 DYNAMIC DECREMENT)
0150  0115      TTRACKS,        115             / # OF TRACKS PER DISKETTE (115 TO 1 STATIC)
0151  0000      XTARGET,        0               / ; (AC) = TRACK+SECTOR AT IOT LCD-8 ; DESTINATION
0152  0000      ECOMMAND,       0
0153  0000      H1,             0
0154  0000      GOBIT,          0               / > 0 MEANS EXPECTING AN RX01 PI, <= 0 MEANS NOT EXPECTING

                        /
                        / (PAT-SUMCHECK) IS A NUMBER GENERATED WITHIN SUBROUTINE " XGETAPATTERN"
                        /EQUIVALENT TO SUMCHECK OF 60/124  [ 12/8 BIT MODE] DATA WORDS
                        /
0155  0000      PATSUMCHECK,    0
                        /
                        / (WORDX) IS AN ADDRESS WHOSE CONTENTS = ; (PAT-SUMCHECK) + (WBUFFER) + (WBUFFER+1)
                        /
                        / (WORDY) IS AN ADDRESS FOR WHICH THE CONTENTS REPRESENT THE NEGATIVE-1
                        /OF 2 TIMES THE CONTENTS OF THE ADDRESS WITHIN PROGRAM LOCATION " WORDX "
                        /
                        /THE CONTENTS OF BOTH WORDX AND WORDY ARE GENERATED WITHIN SUBROUTINE " XGETASECTOR "
                        /
0156  0000      WORDX,          0
0157  0000      WORDY,          0
0160  0000      LSB,            0
0161  0000      MSB,            0
0162  0000      TTYBUSY,        0
0163  0000      PASS,           0
0164  0000              0               /PASS COUNT TO A MAGNITUDE OF 16777215(10)
0165  0000      RXHERE,         0               / = 7000 IF AN RX01 IS NOT CABLED TO THE RX8
0166  0000      GOOD,           0               /EXPECTED RESULT

0167  0000      EAC,            0               / (AC) AT ERROR "BAD" (ACTUAL RESULT)
0170  0000      BLANK,          0
0171  0600      TEST,           TO              /ADDRESS OF STARTING ADDRESS OF TEST
                        /*********************************************************************
                        /ADDITIONAL CALL FOR CONSOLE PACKAGE

                        
        4572    CKSWIT=         JMS I   .
```



```
0172  3400              XCKSWIT                 /CHECK IF LAS TO USE LOC 22 OR HARDWARE
0173  7000      K7000,  7000
0174  0007      K0007,  0007
0175  7777      XCNT,   -1
        4576    FORCE=JMS I .
0176  5525              XXFORCE
                        /STARTING ADDRESS 200 - (AC) = STARTUP SWITCHES
                        /
                        /STARTING ADDRESS 201 - RESTART (PARAMETERS ALREADY SELECTED AT START 200)
                        /
                        /
        0200    *200
                        /
                        /*************
                        /CONSOLE
                        /*************
0200  5202      C8START,        JMP     .+2                             /NORMAL PROGRAM ACTIVITY.
0201  5203                      JMP     .+2                         /RESTART WITH SAME PARAMETERS.
                        /THIS SECTION IS NORMAL PROGRAM ACTIVITY.
                        /DEVICE  CODE 75 IS  ASSUMED. ANY OTHER WILL CAUSE ERRORS.
0202  7240              STA
0203  3010              DCA     A10
0204  3162              DCA TTYBUSY
0205  3111              DCA BUSY
0206  3154              DCA GOBIT
0207  3163              DCA PASS
0210  3164              DCA PASS+1
0211  6211              CDF 10                  /CHANGE TO DATA FIELD OF CONSOLE PACKAGE
0212  3777'             DCA PASCNT              /CLEAR CONSOLE PASS COUNTER
0213  6201              CDF 0                   /CHANGE BACK TO PROGRAM DATA FIELD
0214  1376              TAD (-40)
0215  3116              DCA HANGER
0216  3123              DCA SSTART
0217  3131              DCA TARGET
0220  1010              TAD     A10
0221  7650              SNA CLA
0222  5233              JMP     AROUND                  /USE EXISTING PARAMETERS.

                        /**********************
0223  4775'             JMS     PNTID           /PRINT ID AND REMOVE DIAGNOSTIC
                        /**********************
0224  4424              CHECKC8                 /CONSOLE ACTIVE
0225  4425              XC8ENTR                 /ASK SR QUESTION.
0226  5230              JMP     .+2
0227  4461              HLT
0230  4572              LAS                             /GET PARAMETERS.
0231  3114              DCA     DTESTP
0232  4774'             JMS     CHNDEV                          /CHANGE DEVICE  CODES.
0233  1114      AROUND, TAD DTESTP              /GET PARAMETERS
0234  7040              CMA
0235  0373              AND (7000                       /MASK BITS 0-2
0236  7650              SNA CLA
0237  1373              TAD (7000
0240  3165              DCA RXHERE/ = 0 IF RX01 CABLED TO RX8
0241  1114              TAD DTESTP
```

```
1200  0242  7040          CMA
1201  0243  0372          AND (SW0+SW1)
1202  0244  3771'         DCA UNITS       / = UNITS(DRIVES) TO TEST
1203  0245  4770'         JMS SELUNT              /VT78/SELECT WHICH FLOPPY TO TEST
1204  0246  4473          PRINT
1205  0247  6533          MDTESTP                 /TEST PARAMETER CONFIRMATION MESSAGE
1206  0250  4505          TY4OCT
1207  0251  0114          DTESTP
1208                /THE PROGRAM WILL VERIFY THAT THE CONTENTS OF PROGRAM LOCATIONS:
1209                /
1210                /              OD, ID, FIRST, AND LAST
1211                /
1212                /WHICH ARE VARIABLE BY THE USER ARE WITHIN SELECTABLE LIMITS
1213                /
1214                / 0 <= OD <= 114
1215                /
1216  0252  1027          TAD OD
1217  0253  7700          SMA CLA
1218  0254  5257          JMP .+3
1219  0255  1367          TAD (52)
1220  0256  3027          DCA OD
1221  0257  1366          TAD (-114)
1222  0260  1027          TAD OD
1223  0261  7740          SMA SZA CLA
1224  0262  5255          JMP .-5
1225  0263  4473          PRINT
1226  0264  6674          MOD
1227  0265  4505          TY4OCT
1228  0266  0027          OD
1229                / 0 <= ID <= OD
1230                /
1231  0267  1030          TAD ID
1232  0270  7700          SMA CLA
1233  0271  5274          JMP .+3
1234  0272  1365          TAD (53)
1235  0273  3030          DCA ID
1236  0274  1030          TAD ID
1237  0275  7041          CIA
1238  0276  1027          TAD OD
1239  0277  7740          SMA SZA CLA
1240  0300  5272          JMP .-6
1241  0301  4473          PRINT
1242  0302  6700          MID
1243  0303  4505          TY4OCT
1244  0304  0030          ID
1245                / 0 < (FIRST) <= 32
1246                /

1247  0305  1031          TAD FIRST
1248  0306  7740          SMA SZA CLA
1249  0307  5312          JMP .+3
1250  0310  7301          CLL CLA IAC
1251  0311  3031          DCA FIRST
1252  0312  1031          TAD FIRST
1253  0313  1364          TAD (-32)
1254  0314  7740          SMA SZA CLA
```



```
1255  0315  5310          JMP .-5
1256  0316  4473          PRINT
1257  0317  6704          MFIRST
1258  0320  4505          TY4OCT
1259  0321  0031          FIRST
1260  0322  5763'         JMP TADLAST
1261                /IF THE TELEPRINTER IS BUSY (TTYBUSY = X), AND
1262                /
1263                /IF A KEYBOARD FLAG HAS OCCURED,
1264                /
1265                /THEN STOP TELEPRINTER OUTPUTS (IF A KRB = <CTRL>S ), OR
1266                /
1267                /THEN RESUME TELEPRINTER OUTPUTS (IF A KRB = <CTRL>Q
1268                /AND A PREVIOUS <CTRL> Q HAD OCCURED)
1269                /
1270  0323  6036    XKCC,   KRB                             /READ THE KEYBOARD BUFFER STATIC
1271  0324  0362            AND     (177
1272  0325  1361            TAD     (200                    /MAKE IT 8 BIT CODE
1273  0326  6211            CDF 10
1274  0327  3750            DCA I   XC8CHAR                 /STORE IN FIELD ONE CHAR
1275  0330  6201            CDF 0
1276  0331  1162            TAD TTYBUSY             /=1 IF BUSY
1277  0332  7012            RTR
1278  0333  7710            SPA CLA                 /WAS TELEPRINTER BUSY?
1279  0334  7040            CMA                     /YES
1280  0335  3351            DCA INMODE              /0=NOT BUSY  7777=BUSY
1281  0336  3162            DCA TTYBUSY             /CLEAR FLAG
1282                        /********
1283                        /CONSOLE
1284                        /********
1285
1286  0337  4424    C8TEST, CHECKC8                 /CONSOLE ACTIVE,
1287  0340  4425            XC8ENTR                 /CHECK CONSOLE CONTROL CHARACTERS
1288  0341  7000            NOP
1289  0342  7200            CLA
1290  0343  1351            TAD     INMODE
1291  0344  7650            SNA CLA                 /SKIP TO RESUME TYPEOUT
1292  0345  5760'           JMP     PIEXIT          /EXIT
1293  0346  3351            DCA     INMODE          /CLEAR ACTIVE MESSAGE FLAG
1294  0347  5757'           JMP     XTCF            /RESUME TYPEOUT
1295  0350  0031    XC8CHAR,        C8CHAR          /LOC IN FIELD 1
1296  0351  0000    INMODE, 0               /MESSAGE ACTIVE FLAG
1297
1298                        /********
1299                        /CONSOLE
1300                        /********
1301  0357  5344
1302  0360  5510
1303  0361  0200
1304  0362  0177
1305  0363  3273
1306  0364  7746
1307  0365  0053
1308  0366  7664
1309  0367  0052
```

```
 1310  0370  6127
 1311  0371  4235
 1312  0372  6000
 1313  0373  7000
 1314  0374  5067
 1315  0375  1531
 1316  0376  7740
 1317  0377  0661
       0400          PAGE
 1318              /PRETEST - INITIALIZE (KEY) PART I / FLAG DETECTION PART I
 1319              /
 1320              / (A)   IF AN RX01 MICROCONTROLLER IS (NOT) CABLED TO THE RX8 INTERFACE,
 1321              /       THEN ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR) , AND THE RX8
 1322              /       INTERFACE TRANSFER TEGISTER SHOULD HAVE BEEN CLEARED BY "KEY"
 1323              /       INITIALIZE (IF THEY WERE EVER SET).
 1324              /
 1325              / (B)   IF AN RX01 MICROCONTROLLER (IS) CABLED TO THE RX8 INTERFACE,
 1326              /       THEN "KEY" INITIALIZE SHOULD HAVE (SET) THE DONE FLAG BECAUSE
 1327              /       ANY (INIT) OF THE RX01 MICROCONTROLLER IS AN IMPLIED (READ SECTOR)
 1328              /       OF TRACK 0 SECTOR 1 (FOR SYSTEMS PROGRAMMING BOOTSTRAP APPLICATIONS).
 1329              /
 1330              /       THEREFORE, ANY ERROR (EXCEPT PARITY) THAT MAY OCCUR FROM A NORMAL
 1331              /       "READ SECTOR" COMMAND MAY OCCUR HERE CAUSEING THE ERROR FLAG TO SET, AND
 1332              /       DISPLAYING THE ERROR STATUS WITHIN THE TRANSFER REGISTER AT "DONE".
 1333              /
 1334              /       THE TRANSFER REQUEST FLAG SHOULD BE CLEARED.
 1335              /
 1336              /NOTE:
 1337              /
 1338              /SCOPE LOOPING IS NOT OFFERED BECAUSE THE "INIT" FUNCTION
 1339              /
 1340  0400  7240  PRETEST, STA
 1341  0401  3115          DCA FIRSTERROR          /FOR FIRST ERROR EVER THIS PASS
 1342  0402  3777'         DCA ERRORS                      /CLEAR "ERRORS" FOR FIRST "SCOPE" EVER
 1343  0403  4502          SCOPE                           /THIS "SCOPE" TO REFRESH "FAT" IF ERROR
 1344  0404  1776'         TAD PCSCOPE
 1345  0405  3171          DCA TEST                /TO REFRESH "FAT" FOR "ERROR"
 1346  0406  6007          CAF             /VT78/
 1347  0407  4451          CKUNIT                  /VT78/SETUP FOR UNIT A OR B
 1348  0410  4443          STR
 1349  0411  4465          OK
 1350  0412  4452  E0PRE,  ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
 1351  0413  4444          SER
 1352  0414  4465          OK
 1353  0415  4452  E2PRE,  ERROR                           /UNEXPECTED ERROR FLAG
 1354              /
 1355              /*****************************************************************************
 1356              /*****************************************************************************
 1357              /
 1358              /IF AN RX01 MICROCONTROLLER (IS) CABLED TO THE RX8 INTERFACE
 1359              /THEN THE DONE FLAG SHOULD BE SET
 1360              /
 1361  0416  1165          TAD RXHERE
 1362  0417  7640          SZA CLA
 1363  0420  5231          JMP NORX01                      /
```



```
 1364  0421  4471          WAIT
 1365  0422  4445          SDN
 1366  0423  5221          JMP     .-2                     /WAIT FOR DONE FLAG
 1367  0424  7410          SKP
 1368  0425  4452  E3PRE,  ERROR                           /MISSING DONE FLAG
 1369              /
 1370              /*****************************************************************************
 1371              /*****************************************************************************
 1372              /THE ENTIRE STATUS WORD IS DISPLAYED IN THE TRANSFER REGISTER AT ERROR/DONE TIME.
 1373              /
 1374              /IF AN RX01 CONTROLLER IS CABLED TO THE RX8 INTERFACE
 1375              / (AND DRIVE 0 IS READY THEN THE STATUS SHOULD INDICATE " SEL DRV RDY" ), ALSO
 1376              /DELETED DATA (MAY) = 1 IF TRACK 0/SECTOR 1 WAS WRITTEN WITH DELETED DATA
 1377              /AND "INIT DONE" SHOULD BE SET.
 1378              /
 1379  0426  5775'         JMP     TSTUNT                          /OFF PAGE BECAUSE OF ROOM.
 1380              /
 1381              /
 1382  0427  1374          TAD (40                 /PROGRAM EXPECTS DRIVE 0 TO BE READY
 1383              /
 1384              /
 1385              ////////////////////////////////////////////////////////////////////////////
 1386              /
 1387              /       4       5       -       -       8       9       10      11              /
 1388              /
 1389              /       SEL                             WRITE   INIT    PAR                     /
 1390              /       DRIVE   DD                      PROTECT (DONE)          CRC             /
 1391              /       RDY                                             (N/A)                   /
 1392              /
 1393              ////////////////////////////////////////////////////////////////////////////
 1394              /
 1395              /
 1396  0430  7107          CLL IAC RTL                     / 4  (INIT) DONE OR 204
 1397  0431  3166  NORX01, DCA GOOD
 1398  0432  4441          XDRIN
 1399  0433  3170          DCA BLANK                       /ACTUAL STATUS FROM (INIT)
 1400  0434  1170          TAD BLANK
 1401  0435  0773'         AND     COMP
 1402  0436  3167          DCA EAC                         /STATUS MINUS DELETED DATA (BIT 5)
 1403  0437  1167          TAD EAC
 1404  0440  7041          CIA
 1405  0441  1166          TAD GOOD                        /EXPECTED
 1406  0442  7650          SNA CLA
 1407  0443  5246          JMP .+3                         /OK
 1408  0444  1167          TAD EAC
 1409  0445  4452  E1PRE,  ERROR                           / (INIT) STATUS NOT = EXPECTED
 1410              /
 1411              /IF AN RX01 MICROCONTROLLER (IS) CABLED TO THE RX8 INTERFACE
 1412              /THEN THE PREVIOUS "SDN" SHOULD HAVE CLEARED THE DONE FLAG, BUT
 1413              /
 1414              /IF AN RX01 MICROCONTROLLER IS (NOT) CABLED TO THE RX8 INTERFACE
 1415              /THEN "KEY" INITIALIZE SHOULD HAVE CLEARED THE DONE FLAG
 1416              /
 1417              /TECHNICAL NOTE:
 1418              /
```

```
1419                    /IF THE DONE FLAG IS SET, AND IF THE INTERRUPT ENABLE FLIP-FLOP IS SET ILLEGALLY,
1420                    /THEN AN "UNEXPECTED RX01 INTERRUPT" WILL OCCUR IN T0 (IF AN RX01 CONTROLLER
1421                    / (IS) CABLED TO THE RX8 INTERFACE) OR IN T1 WHEN THE MAINTENANCE FLIP-
1422                    /FLOP "SETS ALL FLAGS"
1423                    /
1424    0446  4445              SDN
1425    0447  4465              OK
1426    0450  4452      E4PRE,  ERROR                           /UNEXPECTED DONE FLAG
1427                    /
1428                    /END OF PRE-TEST                        /END OF PRETEST
1429                    /
1430    0451  5311              JMP REBEGIN
1431                    /
1432    0452  4464      MORETESTS, LOCKUP
1433    0453  3777'     FIRSTTEST, DCA ERRORS
1434    0454  1413              TAD I A13
1435    0455  3171              DCA TEST                ' / FAT (FIRST ADDRESS OF TEST)
1436    0456  1171              TAD TEST
1437    0457  3776'             DCA PCSCOPE              / EQUIVALENT TO " SCOPE "
1438    0460  3772'             DCA WUNITS                      /FOR FIRST ENTRY INTO XGETUNIT THIS TEST
1439    0461  5571              JMP I TEST
1440                    /
1441                    /THERE ARE NO MORE TESTS
1442                    /
1443                    /PRINT AN END OF PASS INDICATOR
1444                    /
1445                    /               A = INTERFACE TEST OK (ONLY RX8 TO TEST)
1446                    /               C = RX8 AND RX01 TEST OK
1447                    /               D = RX8 AND RX01 AND DRIVE TESTING OK .
1448                    /
1449                    /               = = AN ERROR OCCURED (DURING A, B, OR D)
1450                    /
1451            0400    XD=0400
1452    0462  2771'             ISZ CHECKU              /VT78/ARE WE DONE ALL SELECTED UNITS?
1453    0463  5323              JMP NXTUNT              /VT78/NO -  DO NEXT UNIT(RX8)
1454    0464  1370              TAD (XD)
1455    0465  3322      NOMORETESTS, DCA MX                     / (XI), (XC), (XD), OR 0
1456    0466  4767'               JMS SELUNT                  /RESET UNIT COUNTER(CHECKU)
1457                    /
1458                    /NOTE:IF THE CONTENTS OF PROGRAM LOCATION FIRSTERROR = 0
1459                    /THEN AN ERROR HAS OCCURED FOR THIS PASS
1460                    /
1461    0467  1115              TAD FIRSTERROR
1462    0470  7640              SZA CLA
1463    0471  5274              JMP .+3
1464    0472  1366              TAD (5500)
1465    0473  3322              DCA MX          /  =

1466                            /*************
1467                            /CONSOLE
1468                            /*******
1469    0474  4424              CHECKC8
1470    0475  4426              C8PASS
1471    0476  5326              JMP C8RET2      /
1472                            /*************
1473    0477  4473              PRINT
```



```
1474    0500  0522              MX
1475    0501  2163              ISZ PASS
1476    0502  5305              JMP .+3
1477    0503  2164              ISZ PASS+1
1478    0504  7000              NOP
1479    0505  4572              LAS
1480    0506  0370              AND (SW3)
1481    0507  7640              SZA CLA
1482    0510  4461              HLT
1483    0511  1114      REBEGIN, TAD DTESTP
1484    0512  0365              AND (37)
1485    0513  1364              TAD (TESTS-1)
1486    0514  3013              DCA A13
1487    0515  7240              STA
1488    0516  3115              DCA FIRSTERROR          /FIRST ERROR SWITCH FOR EACH PASS
1489    0517  7340              CLL CLA CMA
1490    0520  3763'             DCA     CLKCNT                  /FOR APT TIMING
1491    0521  5253              JMP FIRSTTEST
1492                    /
1493    0522  1100      MX,     TEXT "I"                        / I, C, OR D
1494
1495    0523  7201      NXTUNT, CLA IAC
1496    0524  3135              DCA UNITCK              /SET UP TO TEST UNIT B
1497    0525  5200              JMP PRETEST             /START OVER
1498
1499                            /*************************************
1500                            /ROUTINE FOR CONSOLE PASS
1501
1502    0526  6001      C8RET2, ION     /CONSOLE PASS
1503    0527  2163              ISZ PASS
1504    0530  5333              JMP .+3
1505    0531  2164              ISZ PASS+1
1506
1507    0532  7000              NOP
1508    0533  5311              JMP REBEGIN             /CONTINUE WITH PROGRAM RETURN
1509                            /;*************************************
1510    0563  4151
1511    0564  4727
1512    0565  0037
1513    0566  5500
1514    0567  6127
1515    0570  0400
1516    0571  6151
1517    0572  4236
1518    0573  2746
1519    0574  0040
1520    0575  2732
1521    0576  1366
1522    0577  1365
              0600              PAGE
1523                    /TEST 0 - FLAG DETECTION PART II / " C " LINES VERIFICATION PART I
1524                    /
1525                    /*****************************************************************************
1526                    /*****************************************************************************
1527                    /
```

```
                        /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
                        /THEN DON'T EXECUTE THIS TEST
                        /BECAUSE ISSUING THE IOT LCD WITH THE AC = 177
                        /RESEMBLED A COMMAND TO THE RX01
                        /
0600  1165    TO,       TAD RXHERE
0601  7650              SNA CLA
0602  5453              NOTEST
0603  3166              DCA GOOD
                        /*****************************************************************************
                        /*****************************************************************************
                        /
                        /THE PURPOSE OF THIS TEST IS TO VERIFY THAT THE LCD (LOAD COMMAND REGISTER)
                        /IOT 67X1 DOES [NOT] SET THE MAINTENANCE FLIP-FLOP WHEN THE CONTENTS
                        /OF THE AC = 177 AT THE TIME THE LCD IOT IS ISSUED.
                        /
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF AN ERROR OCCURS, THEN IT IS ASSUMED [KEY] INIT FAILED TO CLEAR THE
                        /MAINTENANCE FLIP-FLOP, OR, THAT THE ISSUING OF THE LCD IOT REALLY
                        / [SET] THE MAINTENANCE FLIP-FLOP INSTEAD OF [CLEARING] .
                        /
                        / " C " LINES VERIFICATION PART I
                        /
0604  1377              TAD (177)
0605  4436              LCD                     /MAINTENANCE MODE <OFF>
                        /THE (AC) SHOULD = 0 BECAUSE IOT LCD 67X1 SHOULD CLEAR THE AC
                        /
0606  7440              SZA
0607  4452    E0,       ERROR                   / IOT 67X1 DID NOT CLEAR THE AC
0610  4503              SUBSCOPE
                        /
                        /FLAG DETECTION PART II
                        /
                        /THE PURPOSE OF THIS TEST IS TO VERIFY THAT ISSUING IOT LCD 67X1 WITH
                        /THE AC = 177 DOES NOT SET THE MAINTENANCE FLIP-FLOP
                        /WHICH IN TURN WOULD SET ALL FLAGS
                        /
                        /THEREFORE ALL FLAGS SHOULD BE CLEARED
                        /
0611  4443              STR
0612  4465              OK
0613  4452    E1,       ERROR                   /UNEXPECTED TRANSFER REQUEST FLAG
0614  4503              SUBSCOPE
0615  4444              SER
0616  4465              OK

0617  4452    E2,       ERROR                   /UNEXPECTED ERROR FLAG
0620  4503              SUBSCOPE
0621  4445              SDN
0622  4465              OK
0623  4452    E3,       ERROR                   /UNEXPECTED DONE FLAG
0624  4502              SCOPE
0625  5453              EXIT                    / END OF TEST 0
                        /
```



```
                        /TEST 1 - DIRECTION OF IOT XDR (67X2) PART I / IOT DECODING PART I
                        /
                        /       - " C " LINES VERIFICATON PART II
                        /
                        /THE PURPOSE OF THIS TEST IS TO VERIFY THAT
                        /ISSUING THE IOT XDR (TRANSFER DATA REGISTER) 67X2 DOES [NOT] CLEAR
                        /THE MAINTENANCE FLIP-FLOP
                        /
                        /TECHNICAL NOTE:
                        /
                        /THE IOT'S SDN (67X5), AND SER (67X4) ARE NOT TESTED HERE
                        /BECAUSE IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
                        /AND IF THE IOT LCD IS ISSUED WITH THE AC = 200
                        /REALLY CLEARS THE MAINTENANCE FLIP-FLOP
                        /THEN THE DONE FLAG, AND THE ERROR FLAG SHOULD BE CLEARED, AND
                        /TRANSFER REQUEST MAY BE SET
                        /BECAUSE THE CLEARING OF THE MAINTENANCE FLIP-FLOP WOULD HAVE
                        /RESEMBLED A COMMAND TO THE RX01 MICROCONTROLLER
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF THE CONTENTS OF THE TRANSFER REGISTER IS NOT = 200, THEN IS MUST
                        /BE ASSUMED THAT THE SECOND LCD IOT CLEARED THE MAINTENANCE FLIP-FLOP
                        /OR THAT IOT XDR CLEARED THE MAINTENANCE FLIP-FLOP
                        /
0626  3166    T1,       DCA GOOD
0627  1376              TAD (200)
0630  4436              LCD     / MAINTENANCE MODE <ON>
                        /THE (AC) SHOULD = 0 AFTER ISSUING IOT LCD 67X1
                        /
0631  7440              SZA
0632  4452    E11,      ERROR                   / IOT LCD 67X1 FAILED TO CLEAR AC
0633  4503              SUBSCOPE
                        /
0634  1376              TAD (200)
0635  4436              LCD                     / MAINTENANCE MODE <ON>, AGAIN
0636  4441              XDRIN                   /CONTENTS OF TRANSFER REGISTER
0637  3167              DCA EAC                 /SAVE
0640  1167              TAD EAC
0641  1375              TAD (-200)              /COMPARE WITH "EXPECTED"
0642  7650              SNA CLA
0643  5250              JMP .+5                 / OK
0644  1376              TAD (200)
0645  3166              DCA GOOD                / "EXPECTED" RESULT
0646  1167              TAD EAC                 / "ACTUAL" RESULT
0647  4452    E10,      ERROR                   /TRANSFER REGISTER NOT =200
0650  4502              SCOPE
0651  5453              EXIT                    / END OF TEST 1
                        /TEST 2 - FLAG DETECTION PART III / " C " LINES VERIFICATION PART III
                        /
                        / (A)   THE SETTING OF THE MAINTENANCE FLIP-FLOP SHOULD "DIRECT SET" ALL
                        /       FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
                        /
                        / (B)   IF AN RX01 MICROCONTROLLER [IS] CABLED TO THE RX8 INTERFACE,
                        /       THEN THE SETTING OF THE MAINTENANCE FLIP-FLOP WILL ASSERT THE "RUN"
```

```
                        /       LINE (RESEMBLING A FILL BUFFER COMMAND) THUS CAUSING THE RX01
                        /       CONTROLLER TO SETUP FOR A "FILL BUFFER", BUT, HOWEVER, BECAUSE THE
                        /       MAINTENANCE FLIP-FLOP [IS] SET, THE RX8 INTERFACE RECIEVERS
                        /       SHOULD BE DISABLED AND NOT REACTIVE TO THE RX01 MICROCONTROLLER.
                        /
                        /WITH ALL FLAGS SET, THE RX8 INTERFACE IOT'S:
                        /
                        / SDN = "SKIP ON DONE" (67X5), AND
                        / SER = "SKIP ON ERROR" (67X4), AND
                        / STR = "SKIP ON TRANSFER REQUEST" (67X3) SHOULD SKIP
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF FLAGS ARE "MISSING", IS THE MAINTENANCE MODE FLIP-FLOP REALLY SET ?
                        /
0652  1376    T2,       TAD (200)
0653  4436              LCD                     / / MAINTENANCE <ON>
0654  4445              SDN
0655  4452    E20,      ERROR                           /MISSING DONE FLAG
0656  4503              SUBSCOPE
0657  4443              STR
0660  4452    E21,      ERROR                           /MISSING TRANSFER REQUEST FLAG
0661  4503              SUBSCOPE
0662  4444              SER
0663  4452    E22,      ERROR                           /MISSING ERROR FLAG
0664  4503              SUBSCOPE
                        /
                        /ALL FLAGS SHOULD REMAIN " DIRECT SET "
                        /BECAUSE THE MAINTENANCE FLIP-FLOP SHOULD STILL BE SET.
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF THE FLAGS ARE "MISSING" THEN IT IS ASSUMED THAT THE PREVIOUS
                        /FLAG TESTING ACTUALLY [CLEARED] THE FLAGS.
                        /
0665  4445              SDN
0666  4452    E23,      ERROR                           /MISSING DONE FLAG
0667  4503              SUBSCOPE
0670  4443              STR
0671  4452    E24,      ERROR                           /MISSING TRANSFER REQUEST FLAG
0672  4503              SUBSCOPE
0673  4444              SER
0674  4452    E25,      ERROR                           /MISSING ERROR FLAG
0675  4503              SUBSCOPE
                        / " C " LINES VERIFICATION PART III
                        /
                        /THE FOLLOWING RX8 INTERFACE IOT'S SHOULD NOT CLEAR THE AC:
                        /
                        /IOT'S: SDN(67X5), SER(67X4), OR STR(67X3)
                        /
0676  7240              STA
0677  3166              DCA GOOD
0700  1166              TAD GOOD
0701  6755    K67X5B, 6755
0702  7000              NOP
```



```
0703  7650              SNA CLA
0704  4452    E26,      ERROR                           / IOT SDN (67X5) CLEARED THE AC
0705  4503              SUBSCOPE
0706  1166              TAD GOOD
0707  6753    K67X3B, 6753
0710  7000              NOP
0711  7650              SNA CLA
0712  4452    E27,      ERROR                           / IOT STR (67X3) CLEARED THE AC
0713  4503              SUBSCOPE
0714  1166              TAD GOOD
0715  6754    K67X4B, 6754
0716  7000              NOP
0717  7650              SNA CLA
0720  4452    E28,      ERROR                           / IOT SER (67X4) CLEARED THE AC
0721  4502              SCOPE
0722  5453              EXIT                            / END OF TEST 2
                        /TEST 3
                        /
                        /RX8 IOT DEVICE CODE VERIFICATION
                        /
                        /THE PURPOSE OF THIS TEST IS TO VERIFY THAT ONLY THE DEVICE CODE SELECTED
                        /BY THE OPERATOR (AC SWITCHES 3-4-5 AT THE START OF THIS PROGRAM) IS ACTIVE.
                        /
                        /FIRST SET THE MAINTENANCE FLIP-FLOP, WHICH HAS PREVIOUSLY BEEN VERIFIED TO
                        /DIRECT SET ALL FLAGS, THEN SEQUENCE THROUGH ALL DEVICE CODES (EXPECT THE
                        /DEVICE CODE SELECTED AT THE START OF THIS PROGRAM) BY ISSUING IOT SDN 67X5
                        / (SKIP ON DONE FLAG), WHICH HAS ALSO PREVIUOSLY BEEN VERIFIED TO "SKIP AND
                        /CLEAR " SUCCESSFULLY.
                        /
                        /NOTE:
                        /
                        /THE PROGRAM DOES NOT ISSUE THE DEVICE CODE 67X5 WHERE X = POSITION OF AC
                        /SWITCHES 3-4-5 AT THE START 200 OF THIS PROGRAM.
                        /*****************************************************************
                        /*****************************************************************
                        /THIS TEST HAS BEEN REMOVED
                        /THIS TEST IS NOT NEEDED IN A SYSTEM ENVIRERMENT.
                        /TO REPLACE TEST T3 CHANGE LOCATIONS:
                        /       LOCATION  FROM    TO
                        /       --------  ----    --
                        /       734       5464    1367
                        /
                        /       767         XXXX    0200
                        /REMOVED MAY 16,1975
                        ///
                        /
0723  5453    T3,       EXIT
0724  4436              LCD                     / MAINTENANCE <ON>
0725  1774'             TAD K67X5A
0726  3166              DCA GOOD
0727  1373              TAD (-7)
0730  3010              DCA A10
0731  1372              TAD (6705)
0732  3341    DCACTIVE, DCA ACTIVE
0733  4502              SCOPE                           /REFRESH PROGRAM LOCATION PCSCOPE
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1748  0734  1166          TAD GOOD
1749  0735  7041          CIA
1750  0736  1341          TAD ACTIVE
1751  0737  7650          SNA CLA
1752  0740  5346          JMP NEXTACTIVE
1753  0741  6775    ACTIVE, 6775
1754  0742  5346          JMP NEXTACTIVE
1755  0743  1341          TAD ACTIVE
1756  0744  4452    E30,  ERROR
1757  0745  4502          SCOPE                   / (AC) = ILLEGAL DEVICE CODE
1758  0746  1371    NEXTACTIVE, TAD (10)
1759  0747  1341          TAD ACTIVE
1760  0750  2010          ISZ A10
1761  0751  5332          JMP DCACTIVE
1762  0752  5453          EXIT                    / END OF TEST 3
1763  0771  0010
1764  0772  6705
1765  0773  7771
1766  0774  6422
1767  0775  7600
1768  0776  0200
1769  0777  0177
            1000          PAGE
1770                /TEST 4 - TRANSFER REGISTER DIRECTION TESTING (PART II)
1771                /
1772                /       - " C " LINES VERIFICATION PART IV
1773                /
1774                /WITH THE MAINTENANCE FLIP-FLOP SET THE PROGRAM WILL VERIFY THE DIRECTION
1775                /AND TRANSFER MODE (8-BIT MODE INCLUSIVE "OR", AND 12-BIT MODE "JAM")
1776                /TRAMSFERS INTO THE ACCUMULATOR FROM THE RX8 TRANSFER REGISTER BY ISSUING
1777                /IOT "XDR" (TRANSFER DATA REGISTER) 67X2 AFTER PREVIOUSLY [LOADING] THE
1778                /THE TRANSFER REGISTER WITH THE CONTENTS OF THE ACCUMULATOR REPRESENT-
1779                /ATIVE OF THE FLOLLOWING PATTERNS WHEN THE "LCD" IOT 67X1 IS ISSUED.
1780                /
1781                /               (1)     200     - MAINTENANCE MODE <ON>
1782                /               (2)     376     -
1783                /               (3)     375     -
1784                /               (4)     373     - (BYTES 2 THRU 7)
1785                /               (5)     367     - (INCLUSIVE "OR" )
1786                /               (6)     357     -
1787                /               (7)     337     -
1788                /               (8)    7677     - (WORD 8 = "JAM " )
1789                /
1790                /THE LCD IOT WILL BE ISSUED A TOTAL OF 8 TIMES.
1791                /
1792                /THE 1ST LCD IOT WILL BE ISSUED WITH THE AC = 200 WHICH INITIALLY SETS THE
1793                /MAINTENANCE FLIP-FLOP THEREBY GUARANTEEING THE CONTENTS OF THE TRANSFER
1794                /REGISTER [AFTER] EACH SUCCEEDING LCD IOT.
1795                /
1796                /LCD IOT'S 2 THUR 8 ARE ISSUED WITH THE ACCUMULATOR CONTAINING THE PATTERNS
1797                /DESCRIBED ABOVE.
1798                /
1799                /ALL PATTERNS EXCEPT WORD 8 (7677) TEST THE INCLUSIVE "OR" TRANSFER OF
1800                /THE RX8 INTERFACE TRANSFER REGISTER.  WORD 8 TESTS THE 12-BIT "JAM" TRANSFER.
1801                /
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1802  1000  1377    T4,   TAD (200)
1803  1001  4436          LCD                     /MAINTENANCE MODE <ON>
1804  1002  7350          CLL STA RAR             / 3777
1805  1003  3170          DCA BLANK
1806  1004  1170    T4B,  TAD BLANK
1807  1005  7120          STL
1808  1006  7500          SMA
1809  1007  7100          CLL
1810  1010  7004          RAL
1811  1011  3170          DCA BLANK
1812  1012  4502          SCOPE                   / REFRESH PROGRAM LOCATION PCSCOPE
1813  1013  1170          TAD BLANK               / (BLANK) = (AC) BEFORE LCD IOT 67X1
1814  1014  4436          LCD                     /  TO
1815                /
1816                / " C " LINES VERIFICATION PART IV
1817                /
1818                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT SUCCEEDING LCD IOT'S(67X1)
1819                /TRANSFER THE (AC) INTO THE DATA REGISTER CLEARING THE ACCUMULATOR
1820                /
1821  1015  3167          DCA EAC                 / (AC) AFTER ISSUING IOT LCD (67X1)
1822  1016  3166          DCA GOOD                / PROGRAM EXPECTS AC = 0
1823  1017  1167          TAD EAC
1824  1020  7440          SZA
1825  1021  4452    E42,  ERROR                   / IOT LCD (67X1) DIDN'T CLEAR THE AC
1826  1022  4503          SUBSCOPE
1827                /
1828                /TRANSFER DIRECTION PART II
1829                /
1830  1023  4441          XDRIN                   /  FROM
1831  1024  3167          DCA EAC
1832  1025  1376          TAD (100)
1833  1026  0170          AND BLANK
1834  1027  7106          CLL RTL
1835  1030  7006          RTL                     / LINK = 1 FOR 8-BIT MODE
1836  1031  7006          RTL
1837  1032  1170          TAD BLANK
1838  1033  7430          SZL
1839  1034  0375          AND (377)               / 8-BIT BYTE "GOOD" MASK
1840  1035  3166          DCA GOOD
1841  1036  1166          TAD GOOD                /EXPECTED RESULT
1842  1037  7041          CIA
1843  1040  1167          TAD EAC                 /ACTUAL RESULT
1844  1041  7650          SNA CLA
1845  1042  5245          JMP .+3                 /COMPARED OK
1846  1043  1167          TAD EAC
1847  1044  4452    E40,  ERROR                   / TRANSFER REGISTER NOT = "GOOD"
1848                /CHECK TO SEE IF RUNNING ON A VT78 SYSTEM
1849  1045  4365          JMS VT78CK              /VT78/ RETURN +1 IF NOT VT78
1850  1046  5261          JMP E41+1               /VT78 = SKIP FOLLOWING SUBTEST
1851
1852  1047  4503          SUBSCOPE
1853                /
1854                /THE TRANSFER REGISTER SHOULD REMAIN UNCHANGED
1855                /FROM THE PREVIUS XDR IOT (NOT SO ON VT78)
1856                /
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1857  1050  4441          XDRIN                       /  FROM
1858  1051  3167          DCA EAC
1859  1052  1167          TAD EAC                     /ACTUAL
1860  1053  7041          CIA
1861  1054  1166          TAD GOOD                    /EXPECTED
1862  1055  7650          SNA CLA
1863  1056  5261          JMP .+3                     /COMPARED OK
1864  1057  1167          TAD EAC
1865  1060  4452  E41,    ERROR                       / TRANSFER REGISTER NOT = "GOOD"
1866  1061  4502          SCOPE
1867  1062  1170          TAD BLANK
1868  1063  0376          AND (100)
1869  1064  7640          SZA CLA
1870  1065  5204          JMP T48                     /UNTIL (BLANK) = 7677
1871  1066  5453          EXIT                        / END OF TEST 4
1872                      /TEST 5
1873                      /
1874                      /RX8 IOT DECODING VERIFICATION PART II
1875                      /
1876                      /*****************************************************************************
1877                      /*****************************************************************************
1878                      /
1879                      /IF AN RX01 CONTROL IS CABLED TO THE RX8 INTERFACE
1880                      /THEN DON'T EXECUTE THIS TEST
1881                      /BECAUSE THE CLEARING OF THE MAINTENANCE F/F
1882                      /RESEMBLES A FILL BUFFER COMMAND (NOT SO ON VT78)
1883                      /
1884                      /CHECK TO SEE IF RUNNING ON A VT78 SYSTEM
1885  1067  4365          JMS VT78CK                  /VT78/ RETURN +1 IF NOT VT78
1886  1070  5274          JMP .+4                     /VT78 =ALWAYS EXECUTE TEST
1887
1888  1071  1165  T5,     TAD RXHERE
1889  1072  7650          SNA CLA
1890  1073  5453          NOTEST
1891  1074  3166          DCA GOOD
1892                      /*****************************************************************************
1893                      /*****************************************************************************
1894                      /
1895                      /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO SET AND CLEAR.
1896                      /THE IOT UNDER TEST SHOULD "SKIP AND CLEAR" [ONLY] ITS RESPECTIVE FLAG.
1897                      /ALL OTHER FLAGS SHOULD REMAIN UNCHANGED
1898                      /
1899                      / (I.E. THE SDN IOT 67X5 SHOULD SKIP AND CLEAR ONLY THE DONE FLAG, ALL
1900                      /OTHER FLAGS SHOULD REMAIN SET)
1901                      /
1902  1075  1377          TAD (200)
1903  1076  4436          LCD

1904  1077  4436          LCD             / MAINTENANCE <ON> / <OFF>
1905  1100  4441          XDRIN
1906  1101  7440          SZA
1907  1102  4452  E56,    ERROR                       /TRANSFER REGISTER NOT = 0
1908  1103  4503          SUBSCOPE
1909  1104  4445          SDN
1910  1105  4452  E50,    ERROR                       /DONE FLAG WASN'T SET, OR
1911  1106  4503          SUBSCOPE                    /IOT LCD OR XDR CLEARED THE DONE FLAG
```



```
1912  1107  4445          SDN
1913  1110  4465          OK
1914  1111  4452  E53,    ERROR
1915  1112  4503          SUBSCOPE                    /IOT SDN DIDN'T "SKIP AND CLEAR"
1916  1113  4443          STR
1917  1114  4452  E51,    ERROR                       /TRANSFER REQUEST FLAG WASN'T EVER SET, OR
1918  1115  4503          SUBSCOPE                    /IOT LCD, OR SDN OR XDR CLEARED THE TR FLAG
1919  1116  4443          STR
1920  1117  4465          OK
1921  1120  4452  E54,    ERROR
1922  1121  4503          SUBSCOPE                    /IOT STR DIDN'T "SKIP AND CLEAR"
1923  1122  4444          SER
1924  1123  4452  E52,    ERROR                       /ERROR FLAG WASN'T EVER SET, OR
1925  1124  4503          SUBSCOPE                    /IOTS LCD OR SDN OR XDR OR STR CLEARED THE ERROR FLAG
1926  1125  4444          SER
1927  1126  4465          OK
1928  1127  4452  E55,    ERROR
1929  1130  4502          SCOPE                       /IOT SER DIDN'T "SKIP AND CLEAR"
1930  1131  5453          EXIT                        / END OF TEST 5
1931                      /TEST 6 - INTERRUPT TEST PART I / IOT DECODING VERIFICATION PART III
1932                      /
1933                      /INTERRUPT TEST PART I
1934                      /
1935                      /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
1936                      / [SET] ALL FLAGS AND THE INTERFACE IOT =SKIP ON DONE= "SDN" 67X5 WAS
1937                      /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
1938                      /
1939                      /FIRST SET THE MAINTENANCE FLIP-FLOP WHICH IN TURN SETS ALL FLAGS.
1940                      /
1941                      /THEN ISSUE IOT INTR 67X6 WITH THE AC = 0 [CLEARING] THE RX8 INTERRUPT ENABLE
1942                      /NO INTERRUPTS SHOULD OCCUR
1943                      /
1944  1132  4507  T6,     WAITTY
1945  1133  1374          TAD (E60)
1946  1134  3002          DCA IPI
1947  1135  1377          TAD (200)
1948  1136  4436          LCD
1949  1137  4446          INTR                        /INTERRUPT ENABLE FLIP-FLOP <OFF>
1950  1140  7000          NOP                         /...WAIT
1951                /       NOP                     /...PLENTY
1952  1141  7410          SKP                         /...OF TIME
1953  1142  4452  E60,    ERROR                       /UNEXPECTED INTERRUPT
1954  1143  4503          SUBSCOPE
1955                      /
1956                      /*****************************************************************************
1957                      /*****************************************************************************
1958                      /
1959                      /IF AN RX01 MICRO-CONTROLLER IS CABLED TO THE RX8 INTERFACE
1960                      /THEN DON'T EXECUTE THE REMAINING PORTION OF THIS TEST
1961                      /BECAUSE THE CLEARING OF THE MAINTENANCE FLIP-FLOP RESEMBLES A FILL BUFFER COMMAND
1962                      /TO THE RX01 MICROCONTROLLER (NOT SO ON VT78)
1963                      /
1964                      /CHECK TO SEE IF RUNNING ON A VT78 SYSTEM
1965  1144  4365          JMS VT78CK                  /VT78/ RETURN +1 IF NOT VT78
1966  1145  5351          JMP .+4                     /VT78 =ALWAYS EXECUTE TEST
```

```
1967
1968    1146  1165            TAD RXHERE
1969    1147  7650            SNA CLA
1970    1150  5453            NOTEST
1971                  /
1972                  /*****************************************************************************
1973                  /*****************************************************************************
1974                  /
1975                  /IOT DECODING PART III- IOT INTR 67X6 DECODING VERIFICATION
1976                  /
1977                  /TECHNICAL NOTE:
1978                  /
1979                  /ALL FLAGS SHOULD REMAIN SET
1980                  /IF ANY FLAG IS MISSING,
1981                  /THEN IT IS ASSUMED THAT IOT "INTR" 67X6 CLEARED THE FLAG(S)
1982                  /
1983    1151  4436            LCD                             /MAINTENANCE MODE <OFF>
1984    1152  4446            INTR                            /DISABLE THE INTERRUPT ENABLE F/F
1985    1153  4445            SDN
1986    1154  4452    E61,    ERROR                           /MISSING DONE FLAG
1987    1155  4503            SUBSCOPE
1988    1156  4443            STR
1989    1157  4452    E62,    ERROR                           /MISSING TRANSFER REQUEST FLAG
1990    1160  4503            SUBSCOPE
1991    1161  4444            SER
1992    1162  4452    E63,    ERROR                           /MISSING ERROR FLAG
1993    1163  4502            SCOPE
1994    1164  5453            EXIT                            / END OF TEST 6
1995                  /ROUTINE TO CHECK IF RUNNING ON A VT78 SYSTEM
1996                  /
1997    1165  0000    VT78CK, 0
1998    1166  1022            TAD 22          /GET LOC 22 (HCW2)
1999    1167  0373            AND (1000       /TEST BIT 2
2000    1170  7650            SNA CLA         /IS THIS A VT78 SYSTEM?
2001    1171  2365            ISZ VT78CK      /NO - BUMP RETURN
2002    1172  5765            JMP I VT78CK    /RETURN
2003
2004    1173  1000
2005    1174  1142
2006    1175  0377
2007    1176  0100
2008    1177  0200
              1200            PAGE
2009                  /
2010                  /TEST 7 - INTERRUPT TEST PART II
2011                  /
2012                  /INTERRUPT TEST PART II

2013                  /
2014                  /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
2015                  / [SET] ALL FLAGS AND THE INTERFACE IOT -SKIP ON DONE- "SDN" 67X5 WAS
2016                  /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
2017                  /
2018                  /FIRST SET THE MAINTENANCE FLIP-FLOP
2019                  /WHICH SHOULD DIRECT SET THE DONE FLAG,
2020                  /THEN BY SETTING THE RX01 INTERRUPT ENABLE
```



```
2021                  /BY ISSUING THE IOT "INTR" 67X6 WITH THE AC = 1,
2022                  /
2023                  /AN INTERRUPT REQUEST SHOULD BE ASSERTED,
2024                  /
2025                  /THE PROGRAM IS EXPECTING AN INTERRUPT,
2026                  /
2027                  /TECHNICAL NOTE:
2028                  /
2029                  /IF AN INTERRUPT DOES NOT OCCUR, THEN IT IS ASSUMED THAT ISSUING THE IOT
2030                  / "INTR" 67X6 DID NOT SET THE RX8 INTERRUPT ENABLE, OR INTERRUPT REQUEST
2031                  /
2032    1200  4507    T7,     WAITTY
2033    1201  1377            TAD (200)
2034    1202  4436            LCD                     /MAINTENANCE <ON>
2035    1203  1376            TAD (T7OK)
2036    1204  3002            DCA IPI
2037    1205  6001            ION     /*SEE FOOTNOTE NEXT PAGE
2038    1206  7201            CLA IAC
2039    1207  4446            INTR                    /RX01 INTERRUPT ENABLE <ON>
2040    1210  7000            NOP
2041                  /       NOP
2042                  /PROGRAM NOTE:
2043                  /
2044                  /CLEAR PROGRAM LOCATION "GOBIT" BECAUSE THE TIME FOR THE INTERRUPT
2045                  /TO OCCUR HAS EXPIRED (IF IT WAS EVER GOING TO OCCUR THAT IS)
2046                  /
2047    1211  3154            DCA GOBIT
2048    1212  4452    E70,    ERROR                           /MISSING INTERRUPT
2049    1213  4502    T7OK,   SCOPE
2050    1214  5453            EXIT                            / END OF TEST 7
2051                  /TEST 10
2052                  /
2053                  /INTERRUPT TEST (PART III)
2054                  /
2055                  /IOT INTR 67X6 SHOULD CLEAR THE INTERRUPT ENABLE FLIP-FLOP, THEN
2056                  /
2057                  /WITH ALL FLAGS SET, NO INTERRUPTS SHOULD OCCUR
2058                  /
2059                  /TECHNICAL NOTE:
2060                  /
2061                  /IF AN UNEXPECTED PROGRAM INTERRUPT OCCURS FROM APPROXIMATELY THIS PC
2062                  /THEN THE RX PROGRAM INTERRUPT REQUEST TOOK TO LONG TO SET
2063                  /FROM THE PREVIOUS TEST,
2064                  /
2065                  / * FOOTNOTE:
2066                  /
2067                  /THIS IOT "ION" IS ISSUED HERE BECAUSE - IF AN UNEXPECTED PROGRAM
2068                  /INTERRUPT HAD OCCURED IN THE PREVIOUS TEST AND AC SW3 = 1 DIRECTING
2069                  /THE PROGRAM NOT TO PRINT AN ERROR - THEN THE PDP'S INTERRUPT FACILITY
2070                  /WOULD BE <OFF> - THEREFORE NEVER EXECUTING THIS TEST PROPERLY
2071                  /
2072    1215  4507    T10,    WAITTY
2073    1216  4446            INTR                            /DISABLE RX8 INTERRUPT ENABLE
2074    1217  1375            TAD (E100)
2075    1220  3002            DCA IPI
```

```
2076  1221  6001          ION     / *SEE FOOTNOTE ABOVE
2077  1222  1377          TAD (200)
2078  1223  4436          LCD
2079  1224  7000          NOP
2080  1225  7410          SKP
2081  1226  4452  E100,   ERROR                       /UNEXPECTED INTERRUPT
2082  1227  4502          SCOPE
2083  1230  5453          EXIT                        / END OF TEST 10
2084                /TEST 11
2085                /
2086                /INTERRUPT TEST (PART IV)
2087                /
2088                /*****************************************************************************
2089                /*****************************************************************************
2090                /
2091                /IF AN RX01 CONTROL IS CABLED TO THE RX8 INTERFACE
2092                /THEN DON'T EXECUTE THIS TEST
2093                /BECAUSE THE CLEARING OF THE MAINTENANCE F/F
2094                /RESEMBLES A FILL BUFFER COMMAND
2095                /
2096                /CHECK TO SEE IF RUNNING ON A VT78 SYSTEM
2097  1231  4774'          JMS VT78CK                  /VT78/ RETURN +1 IF NOT VT78
2098  1232  5236          JMP .+4                     /VT78 =ALWAYS EXECUTE TEST
2099
2100  1233  1165  T11,    TAD RXHERE
2101  1234  7650          SNA CLA
2102  1235  5453          NOTEST
2103                /*****************************************************************************
2104                /*****************************************************************************
2105                /
2106                /TOGGLING THE MAINTENANCE MODE <ON> / <OFF> SETS ALL FLAGS AND
2107                /
2108                /PERMITS IOT SDN TO CLEAR THE DONE FLAG
2109                /
2110                /THEREFORE NO INTERRUPTS SHOULD OCCUR (ONLY DONE FLAG RAISES AN INTERRUPT REQUEST)
2111                /
2112                / (EVEN THOUGH THE RX01 INTERRUPT ENABLE IS ! )
2113                /
2114  1236  4507          WAITTY
2115                /
2116  1237  1377          TAD (200)
2117  1240  4436          LCD
2118  1241  4436          LCD             /MAINTENANCE <ON> / <OFF>
2119  1242  4445          SDN
2120  1243  7000          NOP
2121                /       NOP                     /CLEAR THE DONE FLAG
2122  1244  1373          TAD (E110)

2123  1245  3002          DCA IPI
2124  1246  7201          CLA IAC
2125  1247  4446          INTR                        /RX01 INTERRUPT ENABLE <ON>
2126  1250  7000          NOP
2127                /       NOP
2128  1251  7330          STL CLA RAR
2129  1252  4446  E110,   INTR                        /RX01 INTERRUPT ENABLE <OFF>
2130  1253  1154          TAD GOBIT
```



```
2131  1254  7700          SMA CLA
2132  1255  4452          ERROR                       /UNEXPECTED INTERRUPT
2133  1256  4502          SCOPE
2134  1257  5453          EXIT                        / END OF TEST 11
2135                /TEST 12 - INITIALIZE TEST PART II (PROGRAMMED) / INTERRUPT TEST PART V
2136                /
2137                /*****************************************************************************
2138                /*****************************************************************************
2139                /
2140                /IF AN RX01 IS CABLED TO THE RX8 THEN DON'T EXECUTE T12
2141                /
2142                /BUT EXECUTE ALT12 (THE ALTERNATIVE TEST)
2143                /
2144  1260  1165  T12,    TAD RXHERE
2145  1261  7650          SNA CLA
2146  1262  5772'         JMP ALT12
2147                /*****************************************************************************
2148                /*****************************************************************************
2149                /
2150                /INTERRUPT TEST PART V / INITIALIZE TEST PART II (PROGRAMMED)
2151                /
2152                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT IOT INIT CLEARS THE INTERRUPT
2153                /ENABLE FLIP-FLOP WHEN SET
2154                /
2155  1263  1371          TAD (E124)
2156  1264  3002          DCA IPI
2157  1265  7201          CLA IAC
2158  1266  4446          INTR                        / SET THE RX8 INTERRUPT ENABLE F/F
2159  1267  4450          INITB
2160  1270  4451          CKUNIT                      /VT78/SETUP FOR UNIT A OR B
2161  1271  3154          DCA GOBIT                   / ISSUE INIT IOT 67X7
2162                /...BUT AN INTERRUPT SHOULD NOT OCCUR
2163                /
2164                /IF AN INTERRUPT OCCURS THEN IOT INIT FAILED TO CLEAR
2165                /
2166                /THE RX8 INTERRUPT ENABLE FLIP-FLOP
2167                /
2168  1272  1377          TAD (200)
2169  1273  4436          LCD
2170  1274  4436          LCD             / MAINTENANCE MODE <ON> / <OFF>
2171                /
2172                /THE DONE FLAG SHOULD BE SET, BUT NO INTERUPTS SHOULD OCCUR
2173                /
2174  1275  7330          STL CLA RAR
2175                /
2176                /RETURN TO HERE IF AN INTERRUPT OCCURED
2177                /
2178  1276  4446  E124,   INTR                        / RX8 INTERRUPT ENABLE <OFF>
2179  1277  1154          TAD GOBIT
2180  1300  7700          SMA CLA
2181  1301  4452          ERROR                       / IOT INIT 67X7 DID NOT CLEAR THE IE F/F
2182  1302  4503          SUBSCOPE
2183                /
2184                /IOT "INIT" 67X7 SHOULD CLEAR THE RX8 INTERFACE TRANSFER REGISTER, THE
2185                /MAINTENANCE FLIP-FLOP, AND ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
```

```
2186                    /
2187    1303  7240      STA
2188    1304  4436      LCD                     /ALL 1'S TO TRANSFER REGISTER
2189    1305  4450      INITB                     / IOT 67X7
2190    1306  4451      CKUNIT                  /VT78/SETUP FOR UNIT A OR B
2191    1307  4445      SDN
2192    1310  4465      OK
2193    1311  4452  E120, ERROR                           /UNEXPECTED DONE FLAG
2194    1312  4503      SUBSCOPE
2195    1313  4443      STR
2196    1314  4465      OK
2197    1315  4452  E121, ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
2198    1316  4503      SUBSCOPE
2199    1317  4444      SER
2200    1320  4465      OK
2201    1321  4452  E122, ERROR                           /UNEXPECTED ERROR FLAG
2202    1322  4503      SUBSCOPE
2203    1323  3166      DCA GOOD                        / PROGRAM EXPECTS TRANSFER REGISTER = 0
2204    1324  4441      XDRIN
2205    1325  7440      SZA
2206    1326  4452  E123, ERROR                           /TRANSFER REGISTER NOT = 0
2207    1327  4502      SCOPE
2208                    /
2209                    /*************************************************************************
2210                    /*************************************************************************
2211                    /
2212                    /NO MORE RX8 INTERFACE TESTS EXIST
2213                    /
2214                    /IF AN RX01 CONTROL IS CABLED TO THE RX8 INTERFACE
2215                    /
2216                    /THEN CONTINUE WITH THE NORMAL FLOW OF TESTING
2217                    /
2218            1100    XI=1100
2219                    /
2220                    / END OF PASS " I "
2221                    /
2222    1330  4464      LOCKUP
2223    1331  1370      TAD (XI)
2224    1332  5767'     JMP NOMORETESTS
2225                    /*************************************************************************
2226                    /*************************************************************************
2227    1333  1333  XSCOPE, .
2228    1334  7300      CLA CLL
2229    1335  1365      TAD ERRORS
2230    1336  7640      SZA CLA
2231    1337  5357      JMP SCOPING
2232                    /NO ERROR HAS BEEN DETECTED HERE

2233                    /
2234                    /JUST SET (PCSCOPE)=THE FIRST ADDRESS OF THE SCOPE LOOP
2235                    /
2236                    / (IN CASE ANY ERRORS ARE EVER DETECTED LATER)
2237                    /
2238    1340  3365  NOSCOPE, DCA ERRORS
2239    1341  1333      TAD XSCOPE
2240    1342  3366      DCA PCSCOPE
```



```
2241    1343  5733      JMP I XSCOPE
2242                    /  " SUBSCOPE "
2243                    /
2244    1344  1344  XSSCOPE, .
2245    1345  1344      TAD XSSCOPE
2246    1346  3333      DCA XSCOPE
2247    1347  1365      TAD ERRORS
2248    1350  7650      SNA CLA
2249    1351  5733      JMP I XSCOPE
2250                    /ERRORS DO EXIST
2251                    /
2252                    /IF THIS ERROR IS THE SAME AS THE ADDRESS WITHIN THE PROGRAM LOCATION
2253                    /PCSSCOPE, THEN THIS IS A SCOPE LOOP
2254                    /
2255                    /IF NOT, THEN EXIT
2256                    /
2257    1352  1333      TAD XSCOPE
2258    1353  7041      CIA
2259    1354  1364      TAD EPCSCOPE
2260    1355  7640      SZA CLA
2261    1356  5733      JMP I XSCOPE
2262                    /THIS IS A SCOPEING LOOP
2263                    /
2264    1357  4572  SCOPING, LAS            /TEST BIT 1
2265    1360  7004      RAL
2266    1361  7700      SMA CLA CLL
2267    1362  5340      JMP NOSCOPE
2268    1363  5766      JMP I PCSCOPE
2269    1364  0000  EPCSCOPE,       0               /ADDRESS +1 OF  "SCOPE" OR "SUBSCOPE"
2270    1365  0000  ERRORS,         0               / > 0 IF AN ERROR HAS BEEN DETECTED (FOR THIS TEST)
2271    1366  0000  PCSCOPE,        0               / FIRST ADDRESS OF SCOPE LOOP
2272    1367  0465
2273    1370  1100
2274    1371  1276
2275    1372  1400
2276    1373  1252
2277    1374  1165
2278    1375  1226
2279    1376  1213
2280    1377  0200
              1400      PAGE
2281                    /ALTERNATE TEST 12 - VERIFICATION OF (INIT)
2282                    /
2283                    /INITIALIZE TEST PART II
2284                    /
2285                    /THIS TEST IS EXECUTED IN PLACE OF T12
2286                    /
2287                    /BECAUSE AN RX01 CONTROLLER IS CABLED TO THE RX8 INTERFACE
2288                    /
2289                    /IOT "INIT" 67X7 WILL PERFORM AN IMPLIED READ OF TRACK 0 SECTOR 1
2290                    /
2291                    / (IF DRIVE 0 IS READY)
2292                    /
2293                    /THEREFORE THE DONE FLAG SHOULD SET AT THE END OF THAT IMPLIED READ.
2294                    /
```

```
                        /TECHNICAL NOTE:
                        /
                        /IF AN ERROR FLAG IS SET (AND DRIVE 0 IS READY) THEN THE ERROR MAY HAVE
                        /BEEN THE RESULT FROM THE [IMPLIED READ SECTOR 0]
                        /
2300    1400  4502      ALT12,  SCOPE
2301    1401  4450              INITB
2302    1402  4451              CKUNIT                  /VT78/SETUP FOR UNIT A OR B
2303    1403  4443      ALT12LOOP, STR
2304    1404  7410              SKP
2305    1405  5212              JMP EA120               /UNEXPECTED TRANSFER REQUEST FLAG
2306    1406  4445              SDN
2307    1407  5203              JMP ALT12LOOP           /WAIT FOR THE DONE FLAG
2308    1410  4443              STR
2309    1411  4465              OK
2310    1412  4452      EA120,  ERROR                           /UNEXPECTED TRANSFER REQUEST
2311    1413  4503              SUBSCOPE
2312    1414  4444              SER
2313    1415  4465              OK
2314    1416  4452      EA121,  ERROR                           /UNEXPECTED ERROR FLAG
2315    1417  4503              SUBSCOPE
2316    1420  1777'             TAD UNITS                       /UNITS SELECTED BY OPERATOR
2317    1421  7710              SPA CLA
2318    1422  1376              TAD (40                 /PROGRAM EXPECTS DRIVE 0 TO BE READY
                        /
                        /
                        ////////////////////////////////////////////////////////////////////////////////
                        /
                        /       4       5       -       -       8       9       10      11              /
                        /
                        /       SEL                             WRITE   INIT    PAR                     /
                        /       DRIVE   DD                      PROTECT [DONE]          CRC             /
                        /       RDY                                             (N/A)                   /
                        /
                        ////////////////////////////////////////////////////////////////////////////////
                        /
                        /
2332    1423  7107              CLL IAC RTL                     /  4 [INIT] DONE, OR 204
2333    1424  3166              DCA GOOD
2334    1425  4441              XDRIN                           / "ACTUAL" STATUS AT DONE
2335    1426  3170              DCA BLANK
2336    1427  1170              TAD BLANK
2337    1430  0136              AND MASK                /7677 FOR STANDARD 8 - 277 FOR VT78
2338    1431  3167              DCA EAC                         / "ACTUAL" MINUS DELETED DATA (IF ANY)
2339    1432  1167              TAD EAC
2340    1433  7041              CIA
2341    1434  1166              TAD GOOD                        /EXPECTED STATUS

2342    1435  7650              SNA CLA
2343    1436  5241              JMP .+3                         /COMPARED OK
2344    1437  1167              TAD EAC
2345    1440  4452      EA122,  ERROR                           /TRANSFER REGISTER NOT = "GOOD"
2346    1441  4503              SUBSCOPE        /NOTE:DRIVES NOT UNDER TEST MUST HAVE DOORS OPEN
                        /
                        /READ THE B-CODE STATUS AND EXPECT = 0
                        /
```



```
                        /PROGRAMMING NOTE:
                        /
                        /THE PROGRAM SAVES THE CONTENTS OF "GOOD" FOR REFERENCES WITHIN SUBROUTINE "XRST"
                        /
                        /BECAUSE "GOOD" IS REFRESHED WITHIN PROGRAM SUBROUTINE "XRSTB"
                        /
2356    1442  1166              TAD GOOD
2357    1443  3170              DCA BLANK
2358    1444  4477              RSTB
2359    1445  7650              SNA CLA
2360    1446  5252              JMP .+4
2361    1447  3166              DCA GOOD                        /PROGRAM EXPECTS 0
2362    1450  1167              TAD EAC
2363    1451  4452      EA123,  ERROR                           /B-CODE NOT = 0
2364    1452  4503              SUBSCOPE
                        /
                        /READ THE CONTENTS OF THE RX01 STATUS REGISTER USING THE COMMAND # 5
                        /
                        /THIS STATUS SHOULD = THE STATUS IN THE TRANSFER REGISTER AT ERROR/DONE
                        /
2370    1453  4476              RST                             / "READ STATUS" (COMMAND # 5)
                        /
2372    1454  5453              EXIT                            / END OF TEST ALT12 (TEST 12)
                        /THE PURPOSE OF THESE TESTS IS TO VERIFY THE TRANSFER LENGTH OF THE FUNCTION
                        / "FILL BUFFER" AND "EMPTY BUFFER" OF THE RX01 MICROCONTROLLER
                        /
                        /64 TRANSFERS SHOULD OCCUR FOR 12-BIT MODE, AND
                        /128 TRANSFERS SHOULD OCCUR FOR 8-BIT MODE
                        /
                        /THE SECTOR BUFFER IS FILLED WITH A COUNT PATTERN
                        /
                        /               WORD/BYTE 0 = 0
                        /
                        /               WORD 2 = 0202
                        /               BYTE 2 = 2
                        /
                        /               WORD 77 = 7777
                        /               BYTE 177 = 177
                        /
                        /FILL BUFFER 8-BIT MODE
                        /
2391    1455  1375      T16,    TAD (100)
                        /
                        /FILL BUFFER 12-BIT MODE
                        /
2395    1456  4436      T13,    LCD                                     /ISSUE THE COMMAND
2396    1457  1375              TAD (100)
2397    1460  0112              AND COMMAND
2398    1461  7640              SZA CLA
2399    1462  7307              CLL CLA IAC RTL         /  4
2400    1463  1374              TAD (6000)
2401    1464  3132              DCA TESTP
2402    1465  4455              GETAPATTERN
2403    1466  1373              TAD (WBUFFER-1)
2404    1467  3010              DCA A10         /PROGRAMS "WRITE" BUFFER
```

```
2405  1470 1372          TAD (-WBUFFER+1)
2406  1471 3133          DCA XA10              / -STARTING ADDRESS OF WRITE BUFFER
2407  1472 4277  FB,     JMS FBEB
2408  1473 5453          EXIT                  / ** END OF TESTS 13, OR 16
2409  1474 1410          TAD I A10
2410  1475 4442          XDROUT
2411  1476 5272          JMP FB          / AND "FILL THE BUFFER"
2412               / FILL / EMPTY BUFFER SUBROUTINE FOR TESTS:     ***     13, 16 / 14, 17 ***
2413               /
2414  1477 1477  FBEB,   .
2415  1500 4443          STR
2416  1501 5304          JMP .+3               /WAIT FOR TRANSFER REQUEST FLAG
2417  1502 2277          ISZ FBEB
2418  1503 5677          JMP I FBEB
2419  1504 4445          SDN
2420  1505 5300          JMP FBEB+1                  /WAIT FOR THE DONE FLAG
2421  1506 3006          DCA     6                   /FIRST TIME  FOR WAIT,
2422  1507 1112          TAD COMMAND
2423  1510 3170          DCA BLANK
2424  1511 4444          SER
2425  1512 4465          OK
2426  1513 4452  E130,   ERROR                       /UNEXPECTED ERROR FLAG
2427  1514 4503          SUBSCOPE
2428               /
2429               / 64 OR 128 BYTES SHOULD HAVE BEEN TRANSFERRED IN OR OUT
2430               /
2431  1515 1375          TAD (100)
2432  1516 0112          AND COMMAND           / 200 FOR 8-BIT MODE
2433  1517 1375          TAD (100)
2434  1520 3166          DCA GOOD
2435  1521 1166          TAD GOOD
2436  1522 7041          CIA                   / 100 FOR 12-BIT MODE
2437  1523 1010          TAD A10
2438  1524 1133          TAD XA10
2439  1525 7440          SZA                         /SKIP IF TRANSFERS OK
2440  1526 4452  E131,   ERROR                       / (AC) = - # MEANS NOT ENOUGH TRANSFERS
2441  1527 4502          SCOPE                       / (AC) > 0 MEANS TO MANY TRANSFERS
2442  1530 5677          JMP I   FBEB          /RETURN IS TO EXIT
2443
2444
2445                     /******************
2446                     /CONSOLE PACKAGE
2447                     /******************
2448                     /*************
2449                     /CONSOL
2450                     /*************
2451
2452  1531 0000  PNTID, 0                     /PRINT BEGIN MESSAGES
2453  1532 6007          CAF                  /TO REPLACE A CLEAR SWITCH
2454  1533 4470          APT8                 /TEST FOR APT SYSTEM,
2455  1534 4473          PRINT
2456  1535 6472          MIDENTIFICATION      /ID MESSAGE
2457  1536 4473          PRINT
2458  1537 6453          REMOVE               /REMOVE DIAGNOSTIC DISKETTE
2459  1540 4473          PRINT
```



```
2460  1541 6505          MSELECT              /SELECT PARAMETERS
2461  1542 7200          CLA
2462  1543 3135          DCA UNITCK           /CLEAR IT
2463  1544 5731          JMP I   PNTID               /EXIT PNTID
2464                     /************************************
2465               /
2466               /
2467               /
2468               /
2469               /
2470               /ROUTINE TO DETERMINE IF ON APT-8, IF APT-8 IS SELECTED
2471               /THEN CONSOLE AND TEST PARAMETER SELECTION FUNCTIONS ARE NOP,
2472               /IF NOT ROUTINE IS NOP,
2473               /
2474  1545 0000  XAPT8,  0
2475  1546 7300          CLA CLL
2476  1547 4472          CHEK22
2477  1550 7410          SKP                         /ON APT-8
2478  1551 5745          JMP I   XAPT8
2479  1552 1022          TAD     22
2480  1553 0361          AND     K7377               /NOP CONSOLE PACKAGE
2481  1554 3022          DCA     22                  /RESTORE 22
2482  1555 1173          TAD     K7000
2483  1556 3762          DCA I   HLTNOP
2484  1557 1020          TAD     20                  /GET TEST PARAMETERS,
2485  1560 5771'         JMP     AROUND-2            /MAIN FLOWOF PROGRAM,
2486  1561 7377  K7377,  7377
2487  1562 3316  HLTNOP, C8RET4-1
2488  1571 0231
2489  1572 0665
2490  1573 7113
2491  1574 6000
2492  1575 0100
2493  1576 0040
2494  1577 4235
       1600          PAGE
2495               /SECTOR BUFFER ADDRESSING VERIFICATION TESTS
2496               /
2497               /OPERATIONAL NOTE:
2498               /
2499               / (1).  FOR TEST 14 TO EMPTY THE BUFFER IN 12-BIT MODE SUCCESSFULLY, TEST 13
2500               /       MUST HAVE FILLED THE BUFFER IN 12-BIT MODE SUCCESSFULLY,
2501               /
2502               / (2).  FOR TEST 17 TO EMPTY THE BUFFER IN 8-BIT MODE SUCCESSFULLY, TEST 16
2503               /       MUST HAVE FILLED THE BUFFER IN 8-BIT MODE SUCCESSFULLY
2504               /
2505               /THE PURPOSE OF THESE TESTS IS TO VERIFY THAT THE CONTENTS OF THE SECTOR
2506               /BUFFER REMAIN UNCHANGED AFTER THE PREVIOUS EMPTY BUFFER 8-BIT MODE TEST, AND
2507               /AFTER THE PREVIOUS EMPTY BUFFER 12-BIT MODE TEST
2508               /
2509  1600 7410  T20,    SKP                      /VERIFY EMPTY BUFFER 8-BIT MODE
2510               /
2511  1601 7410  T15,    SKP                      /VERIFY EMPTY BUFFER 12-BIT MODE
2512               /
2513               /THE PURPOSE OF THESE TESTS IS TO VERIFY THE CONTENTS OF THE SECTOR BUFFER AFTER
```

```
                        /THE PREVIOUS FILL BUFFER 8-BIT MODE TEST, AND THE PREVIOUS FILL BUFFER
                        /12-BIT MODE TEST.
                        /
                        /EMPTY BUFFER 8-BIT MODE
                        /
1602  1377      T17,    TAD (40
                        /
                        /EMPTY BUFFER 12-BIT MODE
                        /
1603  7105      T14,    CLL IAC RAL
1604  4436              LCD                     /ISSUE THE COMMAND 2 OR 102
1605  1376              TAD (100)
1606  0112              AND COMMAND
1607  7640              SZA CLA
1610  7307              CLL CLA IAC RTL
1611  1375              TAD (6000)
1612  3132              DCA TESTP
1613  4455              GETAPATTERN     / COUNT PATTERN ( PATTERN #6)
1614  1374              TAD (RBUFFER-1)
1615  3010              DCA A10         /PROGRAMS "READ" BUFFER
1616  1373              TAD (-RBUFFER+1)
1617  3133              DCA XA10                / -STARTING ADDRESS OF READ BUFFER
1620  1010              TAD A10
1621  3011              DCA A11                 /
1622  4772'     EB,     JMS FBEB
1623  5230              JMP EBCOMPARE
1624  3410              DCA I A10
1625  4441              XDRIN
1626  3411              DCA I A11               / AND "EMPTY THE BUFFER"
1627  5222              JMP EB                                  /
                        /COMPARE THE CONTENTS OF THE SECTOR BUFFER
                        /
                        /WITH THE GOOD DATA IN "WBUFFER"
                        /
1630  1371      EBCOMPARE, TAD (WBUFFER-1)
1631  3133              DCA XA10                /EXPECTED
1632  1374              TAD (RBUFFER-1)
1633  3134              DCA XA11                /ACTUAL
1634  3113              DCA COMPRERROR                  / = 1 IF COMPARE ERROR
                        /
1635  2133      EBLOOP, ISZ XA10
1636  2134              ISZ XA11
1637  7100              CLL
1640  1376              IAD (100)
1641  0112              AND COMMAND
1642  7640              SZA CLA
1643  7120              STL                             /SET LINK IF 8-BIT MODE

1644  1533              TAD I XA10
1645  7430              SZL
1646  0370              AND (377)
1647  3166              DCA GOOD
1650  1166              TAD GOOD
1651  7041              CIA
1652  1534              TAD I XA11
1653  7650              SNA CLA
```



```
1654  5263              JMP EBOK
                        /A COMPARE ERROR HAS OCCURED
                        /
                        /INCORRECT DATA WAS TRANSFERRED FROM THE RX01 CONTROL SECTOR BUFFER
                        /TO THE RX8 INTERFACE AND SAVED WITHIN PROGRAM LOCATIONS BEGINNING WITH "RBUFFER"
                        /
                        /THAT DATA, HOWEVER, MAY HAVE BEEN TRANSFERRED INCORRECTLY  *TO*
                        /THE RX01 CONTROL FROM THE RX8 INTERFACE PREVIOUSLY WITHIN T12, OR T15
                        /
1655  1367              TAD (-WBUFFER)
1656  1133              TAD XA10
1657  3170              DCA BLANK
1660  1534              TAD I XA11                              /ACTUAL WORD/BYTE FROM SECTOR BUFFER
1661  4452      E140,   ERROR                                   /IS NOT = EXPECTED
1662  4502              SCOPE
1663  1376      EBOK,   TAD (100)
1664  0112              AND COMMAND
1665  1376              IAD (100)
1666  7041              CIA
1667  1133              TAD XA10
1670  1366              TAD (-WBUFFER+1)
1671  7640              SZA CLA
1672  5235              JMP EBLOOP
                        /END OF TESTS 14, 15, 17, OR 20
                        /
                        /...ALSO
                        /
                        /END OF TESTS 31, 32, OR 33
                        /
1673  5453              EXIT
                        /
                        /SECTOR BUFFER DATA TESTING
                        /
                        /THE PURPOSE OF THESE TESTS IS TO VERIFY THAT ALL 1'S AND ALL 0'S CAN BE
                        /SET INTO THE SECTOR BUFFER
                        /
                        /SECTOR BUFFER DATA TESTING
                        /
                        /FILL THE SECTOR BUFFER WITH ALL 1'S
                        /
1674  1370      T22,    TAD (377)                               / " GOOD " = ALL 1'S
                        /
                        /FILL THE SECTOR BUFFER WITH ALL 0'S
                        /
                        /FILL THE SECTOR BUFFER WITH 128 BYTES OF "GOOD"
                        /
1675  4765'     T21,    JMS FB128BYTES
1676  4764'             JMS TX                  / "GOOD " = ALL 0'S
                        /*****************************************************************************
                        /*****************************************************************************
                        /
                        /IF THIS IS TEST #22
                        /
                        /THEN TEST FOR A DRIVE SELECTION
                        /
```

```
                        /IF NO DRIVES ARE ENABLED WITHIN PROGRAM LOCATION " DTESTP "
                        /
                        /THEN THERE ARE NO MORE RX01 CONTROL TESTS TO EXECUTE
                        /
1677  1171              TAD TEST
1700  1363              TAD (-T22)
1701  7640              SZA CLA
1702  5453              EXIT    / END OF TEST 21
1703  1762'             TAD UNITS
1704  7640              SZA CLA
1705  5453              EXIT            / END OF TEST 22
      0300        XC=0300
                        /
                        / END OF PASS " C "
                        /
1706  7340              CLL CLA CMA
1707  3761'             DCA     COUNT                   /INIT TIMING FOR APT IF ONLY
                                                      /INTERFACE IS TO BE TESTED.
1710  4760'             JMS     XTICK
1711  4464              LOCKUP
1712  1357              TAD (XC)
1713  5773'             JMP NOMORETESTS
                        /*****************************************************************************
                        /*****************************************************************************
1714  7327        T24,    CLA STL IAC RTL
1715  5756'             JMP IRDWR       / 6  (READ)
1716  7307        T25,    CLL CLA IAC RTL
1717  5756'             JMP IRDWR       / 4  (WRITE)
1720  1355        T26,    TAD (14)
1721  5756'             JMP IRDWR               / 14  (WRITE DELETED DATA)
                        /
                        /THE PURPOSE OF THESE TESTS IS TO VERIFY
                        /THE RX01 CONTROL CLOCK SET OF THE ERROR FLAG
                        /
                        /BY FORCING A SEEK ERROR TO OCCUR
                        / (ATTEMPTING TO PERFORM A FUNCTION ON A NON-EXISTANT SECTOR #0 )
                        /
                        /NOTE;THE CONTENTS OF THE SECTOR BUFFER SHOULD REMAIN UNCHANGED AND CONTAIN
                        /     THE PATTERN OF ALL 1'S AS FILLED WITHIN TEST 22 BECAUSE THE READ SHOULD
                        /     HAVE NEVER OCCURED.
                        /
                        /  1.  THE STATUS WITHIN THE TRANSFER REGISTER AT ERROR SHOULD = 0
                        /  2.  THE B=CODE STATUS SHOULD = 70 (UNABLE TO FIND SECTOR)
                        /  3.  THE STATUS FROM THE RST COMMAND (12) SHOULD = DRIVE READY (200)
                        /
                        /THE LENGTH ( # OF TRANSFERS TO THE RX01 CONTROL) SHOULD BE TWO
                        / (ONE EACH FOR THE SECTOR AND FOR THE TRACK)
                        /
                        /GET ONE UNIT ONLY (UNIT 1 IF UNIT 0 IS NOT READY)
                        /
                        /ROUTINE TO WAIT FOR SKIP ON AN IOT. IF SKIP DOES NOT OCCUR
                        /THE ROUTINE WILL PRINT PC POINT IN ERROR AND GO BACK ABOUT ITS
                        /BUSINESS.
                        /
1722  0000        XWAIT,  0
```



```
1723  1006              TAD     6
1724  7650              SNA CLA
1725  5330              JMP     .+3
1726  7240              STA
1727  3006              DCA     6
1730  2153              ISZ     H1
1731  5722              JMP I   XWAIT
1732  2116              ISZ     HANGER
1733  5722              JMP I   XWAIT
1734  1322              TAD     XWAIT                   /GET ERROR PC
1735  1354              TAD     (-E3PRE
1736  7710              SPA CLA                         /DID CALL COME FROM PRETEST.
1737  5753'             JMP     E3PRE                   /YES. REPRORT ERROR.
1740  1322              TAD     XWAIT                   /GET BACK ERROR
1741  5752'             JMP     HUNGUP
                        /
1752  3341
1753  0425
1754  7353
1755  0014
1756  2000
1757  0300
1760  4133
1761  4152
1762  4235
1763  6104
1764  2303
1765  4541
1766  0665
1767  0664
1770  0377
1771  7113
1772  1477
1773  0465
1774  7313
1775  6000
1776  0100
1777  0040
      2000              PAGE
2000  3112        IRDWR,  DCA COMMAND
2001  3777'             DCA WUNITS
2002  4460              GETUNIT
2003  1112              TAD COMMAND
2004  1776'             TAD UNIT
2005  3170              DCA BLANK
2006  1170              TAD BLANK
2007  4436              LCD                     / 6,  4,  OR  14
2010  3167              DCA EAC
2011  5214              JMP .+3
2012  2167              ISZ EAC
2013  4442              XDROUT
2014  4443              STR
2015  7410              SKP
2016  5212              JMP .-4                         /SECTOR 0 = TRACK 0
2017  4445              SDN
```

```
2733  2020  5214          JMP .-4                         /WAIT FOR DONE FLAG
2734  2021  7344          CLL STA RAL
2735  2022  1167          TAD EAC
2736  2023  7650          SNA CLA
2737  2024  5231          JMP .+5
2738  2025  7305          CLL CLA IAC RAL
2739  2026  3166          DCA GOOD                        / 2 TRANSFERS WERE EXPECTED
2740  2027  1167          TAD EAC
2741  2030  4452  E240,   ERROR                           / # OF TRANSFER REQUEST FLAGS NOT OK
2742  2031  4503          SUBSCOPE                        / (AC) = # OF TRANSFERS OCCURED
2743                      /
2744                      /THE ERROR FLAG SHOULD = 1
2745                      /
2746  2032  4444          SER
2747  2033  4452  E245,   ERROR                           / MISSING ERROR FLAG
2748  2034  4503          SUBSCOPE
2749                      /IF THIS IS T24, THEN DELETED DATA (MAY) BE SET (BUT THAT'S OK FOR NOW),
2750                      /THE STATUS AT ERROR SHOULD = X (100 MAYBE DELETED DATA)+200 DRIVE READY
2751                      /
2752                      /IF THIS IS T25, THEN DELETED DATA (SHOULD NOT) BE SET, THEREFORE
2753                      /THE CONTENTS OF THE TRANSFER REGISTER (THE STATUS AT THE ERROR) SHOULD = 200
2754                      /
2755                      /IF THIS IS T26, THEN DELETED DATA (MUST) BE SET, THEREFORE
2756                      /THE STATUS SHOULD = 300 (200 DRIVE READY)+(100 (DELETED DATA)
2757                      /
2758  2035  1171          TAD TEST                        /FOR T #
2759  2036  1375          TAD (-T25)
2760  2037  7650          SNA CLA
2761  2040  5245          JMP .+5                         / T25 THEN " JMP .+5 "
2762  2041  1171          TAD TEST
2763  2042  1374          TAD (-T26)
2764  2043  7650          SNA CLA
2765  2044  1373          TAD (100)                       / T26 MEANS EXPECT DELETED DATA
2766  2045  3166          DCA GOOD                        / T24
2767  2046  4441          XDRIN                           /ACTUAL STATUS
2768  2047  3170          DCA BLANK
2769  2050  1170          TAD BLANK
2770  2051  0372          AND (377              /VT78/
2771  2052  3167          DCA EAC
2772                      /
2773                      /IF THIS IS T24, THEN DELETED DATA (MAY) BE SET, (BUT THAT'S OK FOR NOW)
2774                      /
2775  2053  1171          TAD TEST                        / FOR T #
2776  2054  1371          TAD (-T24)
2777  2055  7640          SZA CLA                         / T24 ?
2778  2056  5262          JMP .+4
2779  2057  1136          TAD MASK                        / YES

2780  2060  0170          AND BLANK                       /ACTUAL STATUS MINUS DELETED DATA
2781  2061  3167          DCA EAC
2782  2062  1167          TAD EAC
2783  2063  7041          CIA
2784  2064  1166          TAD GOOD                        /EXPECTED
2785  2065  7650          SNA CLA
2786  2066  5271          JMP .+3
2787  2067  1167          TAD EAC
```



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2788  2070  4452  E241,   ERROR                           /STATUS NOT = "GOOD"
2789  2071  4503          SUBSCOPE
2790                      /
2791                      /THE B-CODE SHOULD = 70 (UNABLE TO FIND SECTOR)
2792                      /
2793  2072  4477          RSTB                            /RETURN WITH AC = CODE
2794  2073  1370          TAD (-70)
2795  2074  7650          SNA CLA
2796  2075  5302          JMP .+5
2797  2076  1367          TAD (70)
2798  2077  3166          DCA GOOD
2799  2100  1167          TAD EAC
2800  2101  4452  E242,   ERROR                           /B-CODE STATUS NOT = CODE # 70
2801  2102  4502          SCOPE
2802                      /THE CONTENTS TO THE SECTOR BUFFER SHOULD REMAIN UNCHANGED
2803                      /
2804                      /THE CONTENTS OF THE SECTOR BUFFER SHOULD = ALL BYTES OF 1'S
2805                      /
2806  2103  1372          TAD (377)
2807  2104  3166          DCA GOOD                /EXPECT ALL 1'S
2808  2105  4766'         JMS TX                          /VERIFY SECTOR BUFFER SUBROUTINE
2809  2106  5453          EXIT                            / END OF TEST 24, 25, 26
2810                      /
2811                      / TEST 27 - SEEK AND CRC VERIFICATION (FIRST PROGRAMMED HEAD MOVEMENT)
2812                      /
2813                      /THE PURPOSE OF THIS TEST IS TO VERIFY THAT SUPPLYING THE RX01 WITH A TRACK
2814                      /WHOSE VALUE IS GREATER THAN 114 (OCTAL) EXPECTS A B-CODE ERROR OF 40
2815                      /
2816  2107  1365  T27,    TAD (115)
2817  2110  3170          DCA BLANK
2818  2111  7327          STL CLA IAC RTL
2819  2112  4436          LCD             / ISSUE READ COMMAND
2820  2113  3167          DCA EAC
2821  2114  7410          SKP
2822  2115  2167          ISZ EAC                         / + TO TRANSFER COUNT
2823  2116  1170          TAD BLANK                       / SECTOR TRACK
2824  2117  4442          XDROUT                          /TO RX01 CONTROL
2825  2120  4443          STR                             / WAIT FOR TRANSFER REQUEST FLAG
2826  2121  7410          SKP
2827  2122  5315          JMP .-5
2828  2123  4445          SDN                             / WAIT FOR DONE FLAG
2829  2124  5320          JMP .-4
2830  2125  3006          DCA     6                       /WAIT POINTER
2831  2126  7344          CLL STA RAL                     / ONLY 2 TRANSFER REQUESTS WERE EXPECTED
2832  2127  1167          TAD EAC                         / ACTUAL # OF TRANSFER REQUEST OCCURED
2833  2130  7650          SNA CLA
2834  2131  5336          JMP .+5
2835  2132  7305          CLL CLA IAC RAL
2836  2133  3166          DCA GOOD
2837  2134  1167          TAD EAC
2838  2135  4452  E270,   ERROR                           / # OF TRANSFER REQUEST FLAGS NOT OK
2839  2136  4503          SUBSCOPE                        / (AC) CONTAINS THE # OF REQUEST OCCURED
2840                      /
2841                      /THE ERROR FLAG SHOULD = 1
2842                      /
```

```
2843  2137  4444          SER
2844  2140  4452  E271,   ERROR                          / MISSING ERROR FLAG
2845  2141  4503          SUBSCOPE
2846                      /THE B-CODE SHOULD = 40
2847                      /
2848  2142  4477          RSTB
2849  2143  1364          TAD (-40)
2850  2144  7650          SNA CLA
2851  2145  5352          JMP .+5
2852  2146  1363          TAD (40
2853  2147  3166          DCA GOOD
2854  2150  1167          TAD EAC
2855  2151  4452  E272,   ERROR                          / B-CODE NOT = 40
2856  2152  4502          SCOPE
2857                      /
2858                      /THE CONTENTS OF THE SECTOR BUFFER SHOULD REMAIN UNCHANGED
2859                      /
2860  2153  1372          TAD (377)
2861  2154  3166          DCA GOOD                 / EXPECT ALL 1'S
2862  2155  4766'         JMS TX
2863                      /
2864  2156  5453          EXIT                           / END OF TEST 27
2865  2163  0040
2866  2164  7740
2867  2165  0115
2868  2166  2303
2869  2167  0070
2870  2170  7710
2871  2171  6064
2872  2172  0377
2873  2173  0100
2874  2174  6060
2875  2175  6062
2876  2176  4242
2877  2177  4236
      2200          PAGE
2878                      /TEST 30 - SEEK AND CRC VERIFICATION
2879                      /
2880                      /READ ALL SECTORS OF ALL TRACKS
2881                      /
2882                      /IF THE DATA IS OF KNOWN QUALITY THEN MONITOR FOR CRC ERRORS
2883                      /
2884  2200  3132  T30,    DCA TESTP
2885  2201  5777'         JMP TEST4
2886                      /TEST 31 - FIRST WRITE EVER
2887                      /
2888                      /WRITING TO THE DISK SHOULD NOT DESTROY THE CONTENTS OF THE SECTOR BUFFER
2889                      /
2890                      /TECHNICAL NOTE:
2891                      /
2892                      /THIS TEST WRITES ON ONE UNIT ONLY - UNIT 0, BUT IF UNIT 0 WAS
2893                      /NOT SELECTED BY THE OPERATOR AT THE START OF THIS PROGRAM
2894                      /THEN THIS TEST WRITES ON UNIT 1
2895                      /
2896                      /PROGRAMMING NOTE:
```



```
2897                      /
2898                      /THIS "DCA WUNITS" IS NECESSARY IF THIS TEST IS LOCKED WITH SW5
2899                      /
2900  2202  3776'  T31,    DCA WUNITS
2901                      /
2902  2203  7307          CLL CLA IAC RTL                / 4 (WRITE 8-BIT MODE)
2903  2204  1375          TAD (6000)
2904  2205  3132          DCA TESTP              /COUNT PATTERN 6
2905  2206  7240          STA
2906  2207  3120          DCA RDC
2907                      / "GETATRACK"
2908                      /
2909  2210  1027          TAD OD
2910  2211  3131          DCA TARGET             / TRACK = (OD)
2911                      / "GETASECTOR"
2912                      /
2913  2212  1031          TAD FIRST
2914  2213  3124          DCA STARGET            / SECTOR = (FIRST)
2915                      /GET UNIT 0 (OR UNIT 1 IF UNIT 0 NOT SELECTED)
2916                      /
2917  2214  4460          GETUNIT
2918                      /
2919                      / "INITSECTOR"
2920                      /
2921  2215  7240          STA
2922  2216  3122          DCA SECTORS            / 1 SECTOR (FIRST) TO WRITE
2923  2217  1374          TAD (.+3)
2924  2220  3773'         DCA XWRITE             / RETURN ADDRESS FROM WRITE SUBROUTINE
2925  2221  5772'         JMP REWRITE+1                  / JMP TO WRITE SUBROUTINE
2926                      /
2927                      /RETURN HERE FROM SUBROUTINE " XWRITE "
2928                      /
2929                      / JMP  TO T17 TO VERIFY THE CONTENTS OF THE SECTOR BUFFER
2930                      /
2931  2222  5771'         JMP T17
2932                      /TEST 32 - INIT [PROGRAMMED] PART III / IMPLIED READ OF TRACK 1 SECTOR 1
2933                      /
2934                      /*****************************************************************************
2935                      /*****************************************************************************
2936                      /
2937                      /IF THE CONTENTS OF PROGRAM LOCATIONS:
2938                      /
2939                      /  " OD " = 1, AND
2940                      / " FIRST " = 1,
2941                      /
2942                      /AND IF UNIT 0 WAS SELECTED BY THE OPERATOR AT THE START OF THIS PROGRAM
2943                      /
2944                      /THEN EXECUTE THIS TEST
2945                      /
2946  2223  1031  T32,    TAD FIRST
2947  2224  7110          CLL RAR
2948  2225  7640          SZA CLA
2949  2226  5453          NOTEST
2950  2227  1027          TAD OD
2951  2230  7110          CLL RAR
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2952  2231  7640          SZA CLA
2953  2232  5453          NOTEST
2954  2233  1770'         TAD UNITS
2955  2234  7700          SMA CLA
2956  2235  5453          NOTEST
2957                /*************************************************************************
2958                /*************************************************************************
2959                /
2960                /
2961                /THE PURPOSE OF THIS TEST IS TO VERIFY THE "IMPLIED READ" OF TRACK 1 SECTOR 1
2962                /AS PART OF THE INITIALIZE FUNCTION
2963                /
2964                /FIRST FILL THE SECTOR BUFFER WITH ALL 0'S, THEN ISSUE IOT INIT 67X7
2965                /
2966                /INIT SHOULD READ THE CONTENTS OF TRACK 1 SECTOR 1 OF UNIT 0
2967                /
2968                /INTO THE SECTOR BUFFER
2969                /
2970  2236  4767'          JMS FB128BYTES              / FILL THE SECTOR BUFFER
2971  2237  4447          INIT                        /OF UNIT 0
2972                /
2973                /JMP TO TEST 17 TO VERIFY THE CONTENTS OF THE SECTOR BUFFER
2974                /
2975  2240  5771'          JMP T17                     / TO TEST 17
2976                /TEST 33 - FIRST READ [PROGRAMMED] EVER
2977                /
2978                /FIRST FILL THE SECTOR BUFFER WITH ALL 0'S
2979                /
2980                /THEN READ FROM THE DISK TRACK # (OD), SECTOR # (FIRST)
2981                /
2982                /THE CONTENTS OF THE SECTOR BUFFER SHOULD BE THAT OF THE PREVIOUS TEST
2983                /
2984                /PROGRAMMING NOTE:
2985                /
2986                /THIS "DCA WUNITS" IMPERATIVE IF T27 WAS EXECUTED PREVIOUSLY THIS PASS
2987                /
2988  2241  3776'   T33,    DCA WUNITS
2989  2242  4767'          JMS FB128BYTES              / FILL THE SECTOR BUFFER
2990  2243  7307          CLL CLA IAC RTL
2991  2244  3132          DCA TESTP       / 4 (READ 8-BIT MODE)
2992                /PROGRAMMING NOTE:
2993                /
2994                /THE FOLLOWING CODE TO " JMP T17 " IS IMPERATIVE HOUSEKEEPING PRIMING THE
2995                / " READ " SUBROUTINE
2996                /
2997  2245  7240          STA
2998  2246  3120          DCA RDC

2999                / "GETATRACK"
3000                /
3001  2247  1027          TAD OD
3002  2250  3131          DCA TARGET
3003                / "GETASECTOR"
3004                /
3005  2251  1031          TAD FIRST
3006  2252  3124          DCA STARGET
```



```
3007                /GET ONE UNIT ONLY (UNIT 1 IF UNIT 0 IS NOT READY)
3008                /
3009  2253  4460          GETUNIT                     / SELECT A UNIT
3010  2254  7240          STA
3011  2255  3140          DCA R1RETRY             /SO NO "REWRITES" OCCUR
3012                / "INITSECTOR"
3013                /
3014  2256  7240          STA
3015  2257  3122          DCA SECTORS             / 1 SECTOR TO READ (#FIRST)
3016  2260  1366          TAD (.+4)
3017  2261  3765'         DCA XREAD               /RETURN ADDRESS FROM " READ " SUBROUTINE
3018  2262  5764'         JMP READRETRY           / JMP TO READ SUBROUTINE
3019                /THIS "WRITE" IS IMPERATIVE FOR REFERENCES WITHIN "XREAD"
3020                /
3021  2263  4510          WRITE                       / "WRITE" FOR PROGRAM REFERENCES ONLY
3022                /
3023                /RETURN HERE FROM SUBROUTINE " XREAD "
3024                /
3025                /
3026                /JMP TO TEST 17 TO VERIFY THE CONTENTS OF THE SECTOR BUFFER
3027                /
3028  2264  5771'          JMP T17                     / TO TEST 17
3029                /TEST 23 - DRIVE READY SELECTION (ALL UNITS SELECTED BY OPERATOR)
3030                /
3031                /THE PURPOSE OF THIS TEST IS TO VERIFY THE "SEL DRV RDY" STATUS BIT 4
3032                /
3033  2265  1363    T23,    TAD (200)
3034  2266  3170          DCA BLANK
3035  2267  4460          GETUNIT
3036  2270  1762'         TAD UNIT
3037  2271  4476          RST
3038  2272  4454          DONE
3039  2273  5265          JMP T23
3040  2274  5453          EXIT                        / END OF TEST 27
3041                /
3042                /THE PURPOSE OF THESE TESTS IS TO WRITE-READ-AND PROGRAM VERIFY THE DATA
3043                /ON ALL TRACKS FROM (OD) TO (ID), AND ALL SECTORS FROM (FIRST) TO (LAST),
3044                /EXERCISING 8-BIT MODE, 12-BIT MODE, AND DELETED DATA
3045                /
3046                /A PATTERN OF ALL 1'S ARE WRITTEN ON THE DISK
3047                /
3048                /               WORD/BYTE 1 IS THE TRACK ID (BITS 5 THRU 11)
3049                /               WORD/BYTE 2 IS THE SECTOR ID (BITS 7 THRU 11)
3050                /
3051                /               WORDS 3 THRU 62 IS THE ALL 1'S DATA
3052                /
3053                /               BYTES 3 THRU 126 IS THE ALL 1'S DATA
3054                /
3055                /               WORDS 63, AND 64 ARE SPECIAL SUMCHECK WORDS
3056                /
3057                /               BYTES 127, AND 128 ARE SPECIAL SUMCHECK WORDS
3058                /
3059                /TEST 37 - 8 BIT MODE WITH DELETED DATA
3060                /
3061  2275  7305    T37,    CLL CLA IAC RAL             / 6 (DELETED DATA - 8/BIT MODE)
```

```
                        /
                        /TEST 35 - 8 BIT MODE
                        /
2276  1361  T35,    TAD (2)                         / 4 (8/BIT MODE)
                        /
                        /TEST 36 - 12 BIT MODE WITH DELETED DATA
                        /
2277  1361  T36,    TAD (2)                         / 2 (DELETED DATA - 12/BIT MODE)
                        /
                        /TEST 34 - 12 BIT MODE
                        /
2300  1360  T34,    TAD (1000)                      /ALL 1'S PATTERN
2301  3132           DCA TESTP                       /  (12/BIT MODE)
2302  5757'          JMP THETEST
                        /THIS SUBROUTINE IS ENTERED FROM TESTS:   ***   T21, T22, (T24, T25, T26), T27
                        /
                        /EMPTY THE BUFFER TO VERIFY THE CONTENTS = ALL 1'S OR ALL 0'S
                        /
2303  2303  TX,       .
2304  3170           DCA BLANK                               / BYTE # 1 TO 128
2305  1356           TAD (102)
2306  4436           LCD                             /EMPTY BUFFER 8-BIT MODE
2307  5322           JMP T20STR-1
2310  4441  T20XDRIN, XDRIN
2311  3167           DCA EAC                 /DATA FROM SECTOR BUFFER
2312  1167           TAD EAC
2313  7041           CIA
2314  1166           TAD GOOD                        /COMPARED WITH EXPECTED DATA
2315  7650           SNA CLA
2316  5321           JMP .+3
2317  1167           TAD EAC
2320  4452  E211,    ERROR                                   /DATA "TO" NOT = DATA "FROM"
2321  4503           SUBSCOPE
2322  2170           ISZ BLANK                               / 1 TO 128
2323  4443  T20STR,  STR
2324  7410           SKP
2325  5310           JMP T20XDRIN
2326  4445           SDN
2327  5323           JMP T20STR
2330  4444           SER
2331  4465           OK
2332  4452  E212,    ERROR                                   /UNEXPECTED ERROR FLAG
2333  4502           SCOPE
2334  5703           JMP I TX
                        /VT78/ ROUTINE TO RESELECT UNIT UNDER TEST.
                        /ON VT78 A CAF OR INIT INSTRUCTION AUTOMATICALLY
                        /RESELECTS UNIT A(RXA).

                        /THE FLAGS ARE CLEARED AT THIS TIME DUE TO POSSIBLE
                        /GLITCHES IN THE RX8 INTERFACE.
2335  0000  XCKUNT, 0
2336  7300           CLA CLL
2337  1135           TAD UNITCK              /0=UNIT A  1=UNIT B
2340  4435           SEL                     /RESETS UNIT SELECT TO UNIT UNDER TEST
2341  4445           SDN             /CLEAR FLAGS
2342  7000           NOP
```



```
2343  4444           SER
2344  7000           NOP
2345  4443           STR
2346  7300           CLA CLL
2347  5735           JMP I XCKUNT
2356  0102
2357  3000
2360  1000
2361  0002
2362  4242
2363  0200
2364  3425
2365  3416
2366  2264
2367  4541
2370  4235
2371  1602
2372  3207
2373  3200
2374  2222
2375  6000
2376  4236
2377  2514
      2400     PAGE
                        /READ THE B-CODE STATUS
                        /
                        /THIS SUBROUTINE IS ENTERED FROM TESTS:  ***  ALT12, (T24, T25, T26), T27
                        /
2400  2400  XRSTB,    .
2401  1377           TAD (16)
2402  4436           LCD             /ISSUE COMMAND # 7
2403  4443           STR
2404  4465           OK
2405  4452  E7000,   ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
2406  4503           SUBSCOPE
2407  4445           SDN
2410  5203           JMP .-5
2411  4441           XDRIN
2412  3167           DCA EAC                         /ACTUAL STATUS
2413  4444           SER
2414  5217           JMP .+3
2415  1167           TAD EAC
2416  4452  E7001,   ERROR                           /UNEXPECTED ERROR FLAG
2417  4776'          JMS VT78CK              /GO CHECK IF ON VT78 SYSTEM
2420  5233           JMP E7002+1             /VT78 - SKIP THIS SUBTEST
2421  4503           SUBSCOPE
2422  1167           TAD EAC
2423  0375           AND (7000)                      /BITS 0,1,2 ARE RESIDUAL FROM COMMAND SHIFT
2424  1374           TAD (1000)
2425  7650           SNA CLA
2426  5233           JMP .+5
2427  1375           TAD (7000)
2430  3166           DCA GOOD
2431  1167           TAD EAC
2432  4452  E7002,   ERROR                           / SHIFT REGISTER NOT SHIFTING OK
```

```
3171  2433  4503          SUBSCOPE
3172  2434  1167          TAD EAC
3173  2435  0373          AND (377)
3174  2436  3167          DCA EAC
3175  2437  1167          TAD EAC
3176  2440  5600          JMP I XRSTB
3177                /
3178                /READ STATUS SUBROUTINE
3179                /
3180                /THE CONTENTS OF THE AC AT ENTRY = BIT 7 (UNIT SELECT)
3181                /
3182                /READ THE STATUS AT DONE BY ISSUING COMMAND # 5
3183                /
3184                /THIS SUBROUTINE IS ENTERED FROM TESTS:   ***   ALT12, AND T27
3185                /
3186  2441  2441    XRST,   .
3187  2442  1372          TAD (12)
3188  2443  4436          LCD             / ISSUE COMMAND # 5 (AC AT ENTRY = UNIT)
3189  2444  4443          STR
3190  2445  4465          OK
3191  2446  4452    E7003,  ERROR                         /UNEXPECTED TRANSFER REQUEST FLAG
3192  2447  4503          SUBSCOPE
3193  2450  4445          SDN
3194  2451  5244          JMP .-5                       /WAIT FOR DONE FLAG
3195  2452  4441          XDRIN
3196  2453  3167          DCA EAC                       /ACTUAL STATUS
3197  2454  4444          SER
3198  2455  5260          JMP .+3
3199  2456  1167          TAD EAC
3200  2457  4452    E7004,  ERROR                         /UNEXPECTED ERROR FLAG
3201  2460  4776          JMS VT78CK              /GO CHECK IF ON VT78 SYSTEM
3202  2461  5274          JMP E7006+1             /VT78 - SKIP THIS SUBTEST
3203  2462  4503          SUBSCOPE
3204                /
3205                /THE PURPOSE OF THIS SUBTEST IS TO VERIFY THE SHIFTING OF THE RX8 INTERFACE
3206                /
3207                /TRANSFER REGISTER BY THE RX01 MICROCONTROLLET
3208                /
3209                /BITS 0, 1, AND 2 OF THE RX8 INTERFACE TRANSFER REGISTER SHOULD BE REMNANTS
3210                /
3211                /OF THE PREVIOUS COMMAND (COMMAND # 5), THEREFORE BITS 0, 1, AND 2 SHOULD = 101 (BINARY)
3212                /(NOT TRUE ON VT78)
3213  2463  1167          TAD EAC
3214  2464  0375          AND (7000)
3215  2465  1371          TAD (3000)
3216  2466  7650          SNA CLA
3217  2467  5274          JMP .+5

3218  2470  1370          TAD (5000)
3219  2471  3166          DCA GOOD
3220  2472  1167          TAD EAC
3221  2473  4452    E7006,  ERROR
3222  2474  4503          SUBSCOPE
3223                /
3224                /THE CONTENTS OF THE RST STATUS SHOULD = DRIVE READY (200)
3225                /
```



```
3226                / (IF UNIT-S WERE SELECTED AT L/S 200 OTHERWISE THE STATUS SHOULD = 0 )
3227                /
3228  2475  1170          TAD BLANK                     / (GOOD) SAVED PRIOR TO ENTRY INTO " XRST "
3229  2476  0367          AND (-4-1)                    / MINUS " INIT DONE " BIT
3230  2477  3166          DCA GOOD
3231  2500  1167          TAD EAC                       / ACTUAL STATUS MINUS " DELETED DATA "
3232  2501  0366          AND (277)
3233  2502  3170          DCA BLANK
3234  2503  1166          TAD GOOD                      /EXPECTED
3235  2504  7041          CIA
3236  2505  1170          TAD BLANK                     /ACTUAL (MASSAGED)
3237  2506  7650          SNA CLA
3238  2507  5312          JMP .+3
3239  2510  1167          TAD EAC                       / ACTUAL ACTUAL STATUS
3240  2511  4452    E7005,  ERROR                         /EXPECTED STATUS NOT = (GOOD)
3241  2512  4502          SCOPE
3242  2513  5641          JMP I XRST
3243                /SUB-TEST SELECTIONS
3244                /
3245                /
3246                /       TEST   0 = " THE TEST "
3247                /       TEST 001 = WRITE - READ (PARITY CHECK)
3248                /       TEST 010 = WRITE - READ - READ CHECK (PROGRAM VERIFY)
3249                /       TEST 011 = READ - READ CHECK (COMPATABILITY)
3250                /       TEST 100 = READ (PARITY CHECK)
3251                /       TEST   5 = WRITE ONLY
3252                /       TEST 110 = EMPTY BUFFER
3253                /       TEST 111 =
3254                /
3255                /
3256  2514  1365    TEST4,  TAD (READ)
3257  2515  7410          SKP
3258  2516  1364    TEST3,  TAD (READCOMPARE)
3259  2517  3337          DCA DOB
3260  2520  1375          TAD (NOP)
3261  2521  5331          JMP DCADOA
3262  2522  1364    TEST2,  TAD (READCOMPARE)
3263  2523  7410          SKP
3264  2524  1365    TEST1,  TAD (READ)
3265  2525  7410          SKP
3266  2526  1375    TEST5,  TAD (NOP)
3267  2527  3337          DCA DOB
3268  2530  1363          TAD (WRITE)
3269  2531  3336    DCADOA, DCA DOA
3270                /
3271  2532  4455    TESTX,  GETAPATTERN
3272  2533  4463          INITTRACKS
3273  2534  4460          GETUNIT
3274  2535  4457    TESTXL, GETATRACK
3275  2536  4510    DOA,    WRITE
3276  2537  4474    DOB,    READ
3277  2540  2147          ISZ TRACKS
3278  2541  5335          JMP TESTXL
3279  2542  4454          DONE
3280  2543  5332          JMP TESTX
```

```
3281    2544  5453            EXIT
3282                  /AC SW 7 = 1 TO HALT AT END OF TEST
3283                  /
3284    2545  2545    XLOCKUP, .
3285    2546  4572            LAS
3286    2547  0362            AND (SW7)
3287    2550  7640            SZA CLA
3288    2551  4461            HLT
3289                  /AC SW 2 = 1 TO LOCK SCOPE LOOP ON TEST
3290                  /
3291    2552  4572            LAS
3292    2553  0374            AND (SW2)
3293    2554  7640            SZA CLA
3294    2555  5571            JMP I TEST
3295    2556  5745            JMP I XLOCKUP
3296    2562  0020
3297    2563  4510
3298    2564  4475
3299    2565  4474
3300    2566  0277
3301    2567  7773
3302    2570  5000
3303    2571  3000
3304    2572  0012
3305    2573  0377
3306    2574  1000
3307    2575  7000
3308    2576  1165
3309    2577  0016
              2600            PAGE
3310                  /
3311                  /BYTE SWAP SUBROUTINE
3312                  /
3313                  /THE CONTENTS OF THE AC AT ENTRY WILL BE SWAPPED
3314                  /
3315    2600  2600    XBSW,   .
3316    2601  3223            DCA BSWAC
3317    2602  7010            RAR
3318    2603  3224            DCA BSWLINK
3319    2604  1377            TAD (-6)
3320    2605  3222            DCA BSWRAL
3321    2606  1223            TAD BSWAC
3322    2607  7100            CLL
3323    2610  7510            SPA
3324    2611  7120            STL
3325    2612  7004            RAL
3326    2613  2222            ISZ BSWRAL

3327    2614  5207            JMP .-5
3328    2615  3223            DCA BSWAC
3329    2616  1224            TAD BSWLINK
3330    2617  7104            CLL RAL
3331    2620  1223            TAD BSWAC
3332    2621  5600            JMP I XBSW
3333    2622  7772    BSWRAL, -6
3334    2623  0000    BSWAC,  0
```



```
3335    2624  0000    BSWLINK, 0
3336    2625  2625    XERROR, .
3337    2626  3167            DCA EAC
3338    2627  1167            TAD     EAC                     /GET ERROR PC,
3339    2630  4467            AERROR
3340    2631  2111            ISZ BUSY
3341    2632  1225            TAD XERROR
3342    2633  7001            IAC
3343    2634  3776'           DCA EPCSCOPE    / ERROR RETURN ADDRESS + 1
3344    2635  7301            CLL CLA IAC
3345    2636  3775'           DCA ERRORS
3346                  /IF AC SW 4 = 0 THEN PRINT AN ERROR MESSAGE
3347                  /
3348    2637  4572            LAS
3349    2640  0374            AND (SW4)
3350    2641  7640            SZA CLA
3351    2642  5315            JMP XNOPRINT
3352                  /IF THIS IS THE FIRST ERROR FOR THIS PASS THEN PRINT THE HEADER LINE
3353                  /
3354    2643  2115            ISZ FIRSTERROR
3355    2644  5247            JMP .+3
3356    2645  4473            PRINT
3357    2646  6545            MXEHEADER
3358    2647  4473            PRINT
3359    2650  6602            MCRLF
3360                  /               ERR  FAT  FAST      EAC  GOOD PASS
3361                  /
3362                  / ERR   = ERROR ADDRESS ( E # )
3363                  / FAT   = FIRST ADDRESS OF TEST
3364                  / FAST  = FIRST ADDRESS OF SUB-TEST
3365                  /       =*SEE MAP
3366                  / EAC   = CONTENTS OF THE ACCUMULATOR AT THE ERROR
3367                  / PASS  = PASS IN WHICH ERROR OCCURED
3368                  /
3369    2651  7240            STA
3370    2652  1225            TAD XERROR
3371    2653  3160            DCA LSB
3372    2654  4505            TY4OCT
3373    2655  0160            LSB
3374    2656  4504            TAB
3375    2657  0005            5
3376    2660  1171            TAD TEST
3377    2661  3160            DCA LSB
3378    2662  4505            TY4OCT
3379    2663  0160            LSB
3380    2664  4504            TAB
3381    2665  0012            12
3382    2666  4505            TY4OCT
3383    2667  1366            PCSCOPE
3384    2670  4504            TAB
3385    2671  0017            17
3386    2672  4505            TY4OCT
3387    2673  0170            BLANK
3388    2674  4504            TAB
3389    2675  0024            24
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3390  2676  4505          TY4OCT
3391  2677  0167          EAC
3392  2700  4504          TAB
3393  2701  0031          31
3394  2702  4505          TY4OCT
3395  2703  0166          GOOD
3396  2704  4504          TAB
3397  2705  0036          36
3398  2706  4434          TY8OCT
3399  2707  0163          PASS
3400  2710  4572          LAS
3401  2711  7700          SMA CLA
3402  2712  5315          JMP .+3
3403  2713  4504          TAB
3404  2714  0043          43
3405        0207    BELL=207
3406                /
3407  2715  4572    XNOPRINT, LAS
3408  2716  0373          AND (SW11)
3409  2717  7640          SZA CLA
3410  2720  5323          JMP .+3
3411  2721  4501          SPECIALTYPEIT
3412  2722  0207          BELL
3413  2723  3115          DCA FIRSTERROR
3414  2724  4572          LAS
3415  2725  7700          SMA CLA
3416  2726  4461          HLT
3417                /
3418  2727  3111          DCA BUSY
3419  2730  6001          ION
3420  2731  5625          JMP I XERROR
3421                /
3422                /
3423                /ROUTINE TO DETERMINE WHETHER TO TEST DRIVE ZERO
3424                /OR IF NO DRIVES ARE TO BE TESTED.
3425                /
3426  2732  4772' TSTUNT, JMS VT78CK              /GO CHECK IF ON VT78 SYSTEM
3427  2733  4350          JMS CHGMSK              /VT78/ GO CHANGE MASKING CONSTANT
3428  2734  1771'         TAD UNITS                       /UNITS SELECTED BY OPERATOR
3429  2735  0370          AND     (4000                   /ISOLATE DRIVE ZERO.
3430  2736  7640          SZA CLA                         /IS DRIVE ZERO THERE.
3431  2737  5343          JMP     DRVZRO                  /YES.
3432  2740  1347          TAD     MASK1                   /DON'T TEST DRIVE ZERO.
3433  2741  3346          DCA     COMP                    /IT IS NOT ANERROR IF DRIVE
3434                                                      /ZERO IS OPERATIONAL.
3435  2742  5767'         JMP     NORX01=1
3436  2743  1136    DRVZRO, TAD     MASK

3437  2744  3346          DCA     COMP
3438  2745  5766'         JMP     NORX01=2                        /DRIVE ZERO THERE SO INDICATE IT.
3439                /
3440  2746  0000    COMP,   0
3441  2747  7477    MASK1,  7477
3442                /
3443                /ROUTINE TO CHANGE MASKING CONSTANT FOR USE ON VT78
3444                /BITS 0-2 ARE NOT RESIDUAL ON VT78
```



```
3445                /
3446  2750  0000    CHGMSK, 0
3447  2751  1365          TAD     (277
3448  2752  3136          DCA     MASK
3449  2753  1364          TAD     (77
3450  2754  3347          DCA     MASK1
3451  2755  5750          JMP I   CHGMSK
3452                /
3453  2764  0077
3454  2765  0277
3455  2766  0427
3456  2767  0430
3457  2770  4000
3458  2771  4235
3459  2772  1165
3460  2773  0001
3461  2774  0200
3462  2775  1365
3463  2776  1364
3464  2777  7772
            3000    PAGE
3465                /
3466  3000  4455    THETEST, GETAPATTERN
3467  3001  4463          INITTRACKS
3468  3002  4460          GETUNIT
3469                /
3470                /FORCE THE ACTUATOR SEQUENCE = 0 (INCREMENTAL 0-114)
3471                /
3472  3003  1377    THEL,   TAD (XTHEL)
3473  3004  3776'         DCA XGETATRACK
3474  3005  1131          TAD TARGET
3475  3006  3125          DCA START
3476  3007  1150          TAD TTRACKS
3477  3010  1147          TAD TRACKS
3478  3011  7640          SZA CLA
3479  3012  5775'         JMP SEQ000
3480  3013  1027          TAD OD
3481  3014  3131          DCA TARGET
3482  3015  5775'         JMP SEQ000
3483  3016  4510    XTHEL,  WRITE
3484  3017  4475          READCOMPARE
3485  3020  2147          ISZ TRACKS
3486  3021  5203          JMP THEL
3487  3022  4454          DONE
3488  3023  5201          JMP THETEST+1
3489                /ACTUATOR MOVEMENT IS THAT SELECTED OF BITS 6,7,8 OF (TESTP)
3490                /
3491  3024  4463    XXTHEL, INITTRACKS
3492  3025  4460          GETUNIT
3493  3026  4457    XYTHEL, GETATRACK
3494  3027  4475          READCOMPARE
3495  3030  2147          ISZ TRACKS
3496  3031  5226          JMP XYTHEL
3497  3032  4454          DONE
3498  3033  5224          JMP XXTHEL
```

```
3499  3034  5453          EXIT
3500                /GET A PATTERN
3501                /
3502  3035  3035    XGETAPATTERN, .
3503                /
3504                /ONLY GENERATE A PATTERN, HOWEVER, IF THE CONTENTS OF PROGRAM LOCATIONS
3505                /
3506                /ERRORS = 0 (MEANS NO ERRORS),
3507                /
3508                /AND AC SW2 = 0 (NOT TO LOCK ON TEST OK)
3509                /
3510                /AND TEST = T13, T16, T34, T35, T36, T37
3511                /
3512  3036  4572          LAS
3513  3037  0374          AND (SW2)
3514  3040  1773'         TAD ERRORS
3515  3041  7640          SZA CLA
3516  3042  5635          JMP I XGETAPATTERN
3517  3043  1372          TAD (GENTESTS-1)
3518  3044  3012          DCA A12
3519  3045  1412          TAD I A12
3520  3046  7450          SNA
3521  3047  5635          JMP I XGETAPATTERN
3522  3050  1171          TAD TEST
3523  3051  7640          SZA CLA
3524  3052  5245          JMP .-5
3525  3053  1371          TAD (WBUFFER+1)
3526  3054  3010          DCA A10
3527  3055  3155          DCA PATSUMCHECK
3528  3056  7307          CLL CLA IAC RTL
3529  3057  0132          AND TESTP       / 8/12 MODE MASK
3530  3060  7640          SZA CLA
3531  3061  1370          TAD (-100)              /124 DATA WORDS
3532  3062  1367          TAD (-74)
3533  3063  3011          DCA A11         / 60 DATA WORDS
3534                /WORD X AND WORD Y CONTAIN THE ADDRESSES OF THE LAST 2 SUMCHECK WORDS
3535                /
3536  3064  1011          TAD A11
3537  3065  7041          CIA
3538  3066  1366          TAD (WBUFFER+2)
3539  3067  3156          DCA WORDX
3540  3070  7301          CLL CLA IAC
3541  3071  1156          TAD WORDX
3542  3072  3157          DCA WORDY
3543  3073  1365          TAD (7000)
3544  3074  0132          AND TESTP
3545  3075  7106          CLL RTL

3546  3076  7006          RTL
3547  3077  1364          TAD (TAD PATTERNS)
3548  3100  3301          DCA .+1
3549  3101  1315          TAD PATTERNS
3550  3102  3303          DCA XPATTERNS
3551  3103  4763'   XPATTERNS, JMS RANGEN
3552  3104  3137          DCA XXX
3553                /DEVELOP A 12 BIT SUMCHECK FOR THE 60/124 DATA WORDS
```



```
3554                /
3555                /NOTE:
3556                /
3557                /THE SUMCHECK WRITTEN IS THIS DEVELOPED SUMCHECK WITH THE FIRST 2 ID WORDS, AND
3558                /THE LAST 2 OVERALL SUMCHECK WORDS APPENDED WITHIN SUBROUTINE XGETASECTOR
3559                /
3560  3105  1155          TAD PATSUMCHECK
3561  3106  1137          TAD XXX
3562  3107  3155          DCA PATSUMCHECK
3563  3110  1137          TAD XXX
3564  3111  3410          DCA I A10
3565  3112  2011          ISZ A11
3566  3113  5303          JMP XPATTERNS
3567  3114  5635          JMP I XGETAPATTERN
3568                /THE FOLLOWING ARE THE ALLOCATED PATTERN POINTERS
3569                /
3570  3115  4763'   PATTERNS,       JMS RANGEN
3571  3116  7240                    STA                     / 1
3572  3117  1325                    TAD PAT2
3573  3120  1326                    TAD PAT3
3574  3121  1327                    TAD PAT4
3575  3122  1330                    TAD PAT5
3576  3123  5340                    JMP PAT6
3577  3124  7200                    CLA
3578                /
3579                /       12 BIT MODE     8 BIT MODE
3580                /
3581  3125  1463    PAT2,   1463            / 63            / 0011  00110011
3582  3126  6314    PAT3,   6314            / 314           / 1100  11001100
3583  3127  5252    PAT4,   5252            / 252           / 1010  10101010
3584  3130  2525    PAT5,   2525            / 125           / 0101  01010101
3585                /
3586  3131  6322    GENTESTS, -T13
3587  3132  6323            -T16
3588  3133  5500            -T34
3589  3134  5502            -T35
3590  3135  5501            -T36
3591  3136  5503            -T37; 0
      3137  0000
3592                /PROGRAMMING NOTE:
3593                /
3594                /PATTERN 6 IS A COUNT PATTERN FROM 0 TO 7777, OR FROM 0 TO 177
3595                /
3596                /THIS COUNT PATTERN IS A " PURE " PATTERN
3597                /
3598                /A CHECKSUM IS NOT GENERATED FOR THIS PATTERN AS FOR ALL OTHER PATTERNS
3599                /
3600                /               WORD/BYTE 0 = 1
3601                /               WORD/BYTE 1 = 1
3602                /
3603                /               WORD 2 = 0202
3604                /               BYTE 2 = 2
3605                /
3606                /               WORD 77 = 7777
3607                /               BYTE 177 = 177
```

```
3608                    /
3609    3140  7307      PAT6,   CLL CLA IAC RTL                 / 4
3610    3141  0132              AND TESTP
3611    3142  7440              SZA
3612    3143  7120              STL                             / LINK = 1 FOR 8-BIT MODE (128 BYTES)
3613    3144  5351              JMP .+5
3614    3145  7001      XPAT6,  IAC
3615    3146  7420              SNL
3616    3147  1362              TAD (100)
3617    3150  1137              TAD XXX
3618    3151  3137              DCA XXX
3619    3152  1137              TAD XXX
3620    3153  3410              DCA I A10
3621    3154  2011              ISZ A11
3622    3155  5345              JMP XPAT6
3623    3156  5635              JMP I XGETAPATTERN
3624    3162  0100
3625    3163  4712
3626    3164  1315
3627    3165  7000
3628    3166  7116
3629    3167  7704
3630    3170  7700
3631    3171  7115
3632    3172  3130
3633    3173  1365
3634    3174  1000
3635    3175  4306
3636    3176  4261
3637    3177  3016
              3200              PAGE
3638                    /WRITE ONLY
3639                    /
3640                    /WRITE ALL SELECTED SECTORS OF THAT TRACK
3641                    /
3642    3200  3200      XWRITE, .
3643    3201  7330              STL CLA RAR
3644    3202  3120              DCA RDC         / THIS IS A WRITE (RDC = 4000)
3645                    /
3646    3203  4462              INITSECTORS
3647    3204  4456      WRITEL, GETASECTOR
3648    3205  7410              SKP
3649    3206  1377      REWRITE, TAD (JMP WHICHREAD)
3650    3207  3263              DCA JMPWHICHREAD
3651                    /THE PROGRAM WILL ISSUE AN INIT FOR ALL SEEK ERRORS
3652                    /
3653                    /NOTE:
3654                    /
3655                    /THE FUNCTION OF THE INIT IS TO SEEK TRACK 0/SECTOR 1, AND
3656                    /TRANSFER INTO THE SECTOR BUFFER THE CONTENTS OF SECTOR 1, THEREFORE
3657                    /TO RECOVER FROM A SEEK ERROR, THE PROGRAM MUST RE-FILL THE SECTOR BUFFER
3658                    /THEN RE-SEEK
3659                    /
3660    3210  1121              TAD KRETRY
3661    3211  3145              DCA SRETRY
```



```
3662    3212  1121      WRESEEK, TAD KRETRY
3663    3213  3146              DCA PRETRY              /PARITY RETRY COUNTER
3664                    /FILL RX01 SECTOR BUFFER
3665                    /
3666    3214  1376      REFILL, TAD (WBUFFER-1)
3667    3215  3010              DCA A10
3668    3216  4437              LCDA
3669    3217  5237              JMP FILLOK
3670    3220  5226              JMP FILLERROR
3671                    /RETURN TO HERE IS FROM SUBROUTINE XLCDA
3672                    /
3673    3221  4443      FILL,   STR
3674    3222  5221              JMP FILL
3675    3223  1410              TAD I A10
3676    3224  4442              XDROUT
3677    3225  5221              JMP FILL
3678                    /AC SW (4) = 0 ; INHIBIT INTERFACE PARITY RECOVERY
3679                    /
3680    3226  2146      FILLERROR, ISZ PRETRY
3681    3227  7410              SKP
3682    3230  5600              JMP I XWRITE
3683    3231  4572              LAS
3684    3232  0375              AND (SW1)
3685    3233  7640              SZA CLA
3686    3234  5214              JMP REFILL
3687    3235  3146              DCA PRETRY
3688    3236  5600              JMP I XWRITE
3689                    /THE SECTOR BUFFER HAS SUCCESSFULLY BEEN FILLED AND CONTAINS THE
3690                    /PATTERN SELECTED - ALL SOFT PARITY ERRORS HAVE BEEN LOGGED
3691                    /
3692    3237  1121      FILLOK, TAD KRETRY
3693    3240  3146              DCA PRETRY
3694    3241  7305              CLL CLA IAC RAL         /  2
3695    3242  0132              AND TESTP               /TESTP FOR DELETED DATA SELECTION
3696    3243  7007              IAC RTL                 / 4 IF WRITE OR 14 IF WRITE DELETED DATA
3697    3244  4440              LCDB
3698    3245  5257              JMP WRITEOK
3699                    /RETURN TO HERE IS FROM A PI (IF AN RX01 ERROR FLAG)
3700                    /
3701                    /AC SW (1) = 0 ; INHIBIT WRITE RETRY
3702                    /
3703    3246  2145      WRITERROR, ISZ SRETRY
3704    3247  7410              SKP
3705    3250  5264              JMP WNOTOK
3706    3251  4572              LAS
3707    3252  0375              AND (SW1)
3708    3253  7640              SZA CLA
3709    3254  5212              JMP WRESEEK
3710    3255  3145              DCA SRETRY
3711    3256  5264              JMP WNOTOK
3712                    /NOTE: THE ONLY ERROR EXPECTED HERE EVER IS A "SEEK" ERROR
3713                    /
3714                    /RETURN TO HERE IS FROM A PI (IF ONLY AN RX01 DONE FLAG)
3715                    /
3716    3257  1131      WRITEOK, TAD TARGET
```

```
3717  3260  3125          DCA START
3718  3261  1124          TAD STARGET
3719  3262  3123          DCA SSTART
3720  3263  5267    JMPWHICHREAD, JMP WHICHREAD     /CONTAINS 0 OR MODIFIED TO JMP WHICHREAD
3721                /
3722  3264  2122    WNOTOK, ISZ SECTORS
3723  3265  5204          JMP WRITEL
3724  3266  5600          JMP I XWRITE
3725                /IF THIS IS A WRITE AFTER READ, "JMP READRETRY", BUT
3726                /
3727                /IF A HARD SEEK ERROR, "JMP NUREAD"
3728                /
3729  3267  1145    WHICHREAD, TAD SRETRY
3730  3270  7650          SNA CLA
3731  3271  5774'         JMP NUREAD              /HARD SEEK ERROR
3732  3272  5773'         JMP READRETRY           /SOFT
3733                /
3734                / 0 < (LAST) => (FIRST)
3735                /
3736  3273  1032    TADLAST, TAD LAST
3737  3274  7740          SMA SZA CLA
3738  3275  5300          JMP .+3
3739  3276  1372          TAD (32)
3740  3277  3032          DCA LAST
3741  3300  1032          TAD LAST
3742  3301  7041          CIA
3743  3302  1031          TAD FIRST
3744  3303  7740          SMA SZA CLA
3745  3304  5276          JMP .-6
3746  3305  4473          PRINT
3747  3306  6711          MLAST
3748  3307  4505          TY4OCT
3749  3310  0032          LAST
3750  3311  4504          TAB
3751  3312  0005          5                       /TAB TO MOVE TELEPRINTER HEAD
3752                      /**********
3753                      /CONSOLE
3754                      /***********
3755
3756
3757  3313  4424          CHECKC8                 /IS CONSOLE ACTIVE
3758  3314  4425          XC8ENTR                 /YES PRINT SWITCH REGISTER QUESTION
3759                                              /FOR RUNNING SWITCHES
3760  3315  5317          JMP     C8RET4
3761  3316  4461          HLT
3762  3317  5771'         C8RET4,JMP PRETEST
3763                /ENTRY TO HERE IS FROM RX01 PI ERROR SERVICE ROUTINE

3764                /
3765                /CONTROLLER FAILURES
3766                /
3767  3320  1370    SDNUNEXPECTED, TAD (MSDNUNEXPECTED)
3768  3321  7410          SKP
3769  3322  1367    NOSER,  TAD (MNOSER)
3770  3323  3334          DCA XMESSAGE
3771  3324  4572          LAS
```



```
3772  3325  0366          AND (SW4)
3773  3326  7640          SZA CLA
3774  3327  5335          JMP QUIET
3775  3330  4576          FORCE
3776  3331  1334          TAD     XMESSAGE        /POINTS TO ERROR MESSAGE THAT WOULD HAVE BEEN PRINTED.
3777  3332  4467          AERROR                  /REPORT ERROR TO APT IF REQUIRED.
3778  3333  4473          PRINT
3779  3334  0000          XMESSAGE, 0
3780  3335  4572    QUIET,  LAS
3781  3336  7710          SPA CLA
3782  3337  4461          HLT
3783  3340  5765'         JMP ERETURN
3784                /
3785                /ENTRY TO HERE FROM SUBROUTINES XSER, OR XSDN
3786                /
3787  3341  2111    HUNGUP, ISZ BUSY
3788  3342  3353          DCA HUNGPC
3789  3343  4576          FORCE
3790                /
3791                /THE LABLE "XHUNG" MUST RESIDE HERE BECAUSE OF REFERENCES MADE WITHIN "FORCE"
3792                /
3793  3344  4473    XHUNG,  PRINT
3794  3345  6612          MHUNGPC
3795  3346  4505          TY4OCT
3796  3347  3353          HUNGPC
3797  3350  1364          TAD (-40)
3798  3351  3116          DCA HANGER
3799  3352  5453          NOTEST
3800  3353  0000    HUNGPC, 0
3801                /
3802  3354  7740
3803  3355  5520
3804  3356  0200
3805  3357  7056
3806  3360  7043
3807  3361  0400
3808  3362  0032
3809  3363  3425
3810  3364  3521
3811  3365  2000
3812  3366  7113
3813  3367  5267
      3400    PAGE
3814                /
3815                /ROUTINE IS USED INPLACE OF THE LAS INSTRUCTION WILL READ CORRECT SWITCHES
3816                /
3817                /
3818  3400  0000    XCKSWIT,        0
3819  3401  7200          CLA
3820  3402  1022          TAD     22              /CHECK BIT 0 FOR APT
3821  3403  7710          SPA CLA                 /ON APT?
3822  3404  5600          JMP  I  XCKSWIT         /YES RETURN WITH CLEARED AC
3823  3405  1021          TAD     21              /CHECK STATUS WORD
3824  3406  7710          SPA CLA                 /0=ACTIVE CONSOLE
3825  3407  7614          7614                                    /LAS AND SKIP
```

```
3826  3410 1020          TAD    20                    /GET PSEUDO SW REG
3827  3411 5600          JMP I  XCKSWIT               /EXIT XCKSWIT
3828                /READ VERIFY
3829                /
3830  3412 3412     XREADCOMPARE, .
3831  3413 1212          TAD XREADCOMPARE
3832  3414 3216          DCA XREAD
3833  3415 5220          JMP XRDC
3834                /READ AND READ AFTER WRITE SUBROUTINE
3835                /
3836                /*************************************************************************
3837                /
3838                /IF THIS IS A READ AFTER WRITE, THEN 1 PROGRAM LOCATION PRECEEDING
3839                /THE PROGRAM LOCATION CONTAINING THE "READ" WILL CONTAIN "WRITE"
3840                /
3841                /*************************************************************************
3842                /
3843                /IF THIS IS A READ ONLY, THEN THE CONTENTS OF " RDC " WILL = 1
3844                /
3845                /IF THIS IS A READ VERIFY, THEN THE CONTENTS OF " RDC " WILL = 0
3846                /
3847                /READ ALL SELECTED SECTORS OF THAT TRACK
3848                /
3849  3416 3416     XREAD, .
3850  3417 7301          CLL CLA IAC
3851  3420 3120     XRDC,  DCA RDC
3852  3421 4462          INITSECTORS
3853  3422 1121     READL, TAD KRETRY
3854  3423 3140          DCA R1RETRY
3855  3424 4456          GETASECTOR
3856  3425 1121     READRETRY, TAD KRETRY
3857  3426 3141          DCA R2RETRY
3858                /REFRESH PROGRAM LOCATION SNDLOG BECAUSE THE CONTENTS MIGHT BE RESIDUAL
3859                /IF A PREVIOUS SND (STATUS NO DATA) ERROR EVER OCCURED
3860                /
3861  3427 3144          DCA SNDLOG
3862  3430 3142          DCA DWSLOG
3863  3431 3143          DCA DNSLOG
3864
3865                /
3866  3432 1121     REREAD, TAD KRETRY
3867  3433 3145          DCA SRETRY
3868  3434 1121     RESEEK, TAD KRETRY
3869  3435 3146          DCA PRETRY
3870  3436 7327          CLA STL IAC RTL
3871  3437 4440          LCDB
3872  3440 5331          JMP READOK

3873                /RETURN TO HERE IS FROM A PI (IF AN RX01 ERROR FLAG)
3874                /
3875                /AN ERROR HAS BEEN DETECTED
3876                /
3877                /IF NOT A CRC ERROR THEN ASSUME A SEEK ERROR
3878                /
3879  3441 7301     READERROR, CLL CLA IAC
3880  3442 0126          AND ASTATUS              /CRC MASK
```



```
3881  3443 7640          SZA CLA
3882  3444 5256          JMP CRCERROR
3883  3445 2145          ISZ SRETRY
3884  3446 7410          SKP
3885  3447 5347          JMP RLOGGED
3886  3450 4572          LAS
3887  3451 0377          AND (SW1)
3888  3452 7640          SZA CLA
3889  3453 5234          JMP RESEEK
3890  3454 3145          DCA SRETRY
3891  3455 5347          JMP RLOGGED
3892                /
3893                /PROGRAMMING NOTE:
3894                /
3895                /ANY RECOVERABLE SEEK ERRORS ARE NOTED AT PROGRAM LOCATION " DNS "
3896                /
3897                /AN ERROR HAS OCCURED
3898                /
3899        3510    SND=DNS
3900        3510    DWS=SND
3901                /
3902                /THE SECTOR BUFFER CONTAINS THE DATA READ
3903                /
3904                /ANY PARITY ERRORS WOULD HAVE PREVIOUSLY BEEN DETECTED AND LOGGED
3905                /
3906                /THIS ERROR IS NOT A SEEK ERROR, THEREFORE IT IS ASSUMED TO BE A
3907                /
3908                /                        CRC ERROR
3909                /
3910                /COMPARE THE DATA WITHIN THE SECTOR BUFFER TO DETECT CRC STATUS
3911                /WITHOUT DATA ERRORS (SND)
3912                /
3913                /IF AT THE END OF THE COMPARE, STATUS NO DATA ERRORS HAVE BEEN DETECTED
3914                /THEN PRINT AN APPROPRIATE MESSAGE
3915                /
3916  3456 1120     CRCERROR, TAD RDC
3917  3457 7640          SZA CLA
3918  3460 5305          JMP XCRCERROR
3919  3461 4776'         JMS COMPARE
3920  3462 1113          TAD COMPRERROR
3921  3463 7450          SNA
3922  3464 1775'         TAD INSUMCHECK
3923  3465 7640          SZA CLA
3924  3466 5310          JMP DWS
3925  3467 2144          ISZ SNDLOG
3926                /
3927                /IF AC SW (4) = 1 THEN DO NOT PRINT THE ERROR INFORMATION
3928                /
3929  3470 4572          LAS
3930  3471 0374          AND (SW4)
3931  3472 7640          SZA CLA
3932  3473 5305          JMP XCRCERROR
3933  3474 4352          JMS RDORWR
3934  3475 5301          JMP .+4
3935  3476 4473          PRINT
```

```
3936    3477  6716          MWRITE
3937    3500  5303          JMP .+3
3938    3501  4473          PRINT
3939    3502  6722          MREAD
3940    3503  4473          PRINT
3941    3504  6740          MSNDERROR
3942    3505  4572    XCRCERROR, LAS
3943    3506  7700          SMA CLA
3944    3507  4461    HLT7,   HLT
3945                  /
3946    3510  1121    DNS,    TAD KRETRY
3947    3511  3145          DCA SRETRY
3948    3512  2141          ISZ R2RETRY
3949    3513  7410          SKP
3950    3514  5324          JMP UREAD
3951                  /AC SW (1) = 0 ; INHIBIT READ RETRY
3952                  /
3953    3515  4572          LAS
3954    3516  0377          AND (SW1)
3955    3517  7640          SZA CLA
3956    3520  5232          JMP REREAD
3957                  /A HARD FILL BUFFER PARITY ERROR OR A HARD PARITY ERROR ON THE COMMAND/
3958                  /SECTOR/TRACK WORDS, OR
3959                  /A HARD SEEK ERROR WHICH HAS BEEN LOGGED WITHIN THE WRITE SUBROUTINE, OR
3960                  /A HARD CRC ERROR WHICH OCCURED WHILE WITHIN THE READ SUBROUTINE
3961                  /
3962    3521  3140    NUREAD, DCA R1RETRY
3963    3522  3141          DCA R2RETRY
3964    3523  5347          JMP RLOGGED
3965                  /IF THIS IS A READ AFTER WRITE THEN RE-WRITE THE SECTOR IN ERROR
3966                  /
3967                  /BECAUSE THIS IS A HARD PROGRAM COMPARE DATA ERROR
3968                  /
3969    3524  4352    UREAD,  JMS RDORWR
3970    3525  5321          JMP NUREAD
3971    3526  2140          ISZ R1RETRY
3972    3527  5773'         JMP REWRITE
3973    3530  5347          JMP RLOGGED
3974                  /IF THIS IS A READ COMPARE TEST
3975                  /
3976                  /THEN " JMS COMPARE ", BUT ...
3977                  /
3978                  /IF A STATUS ERROR WITH NO DATA ERROR HAS PREVIOUSLY BEEN DETECTED
3979                  /
3980                  /THEN DO NOT RE- " JMS COMPARE ", AND
3981                  /
3982                  /DO NOT RESET PROGRAM LOCATION " START " WITH " TARGET "
3983                  /
3984                  /PROGRAMMING NOTE:
3985                  /
3986                  /ANY RECOVERABLE SEEK ERRORS WHICH OCCURED PRIOR TO CRC OR DATA ERRORS
3987                  /
3988                  /ARE LOGGED AT PROGRAM LOCATION " DNS "
3989                  /
3990    3531  1144    READOK, TAD SNDLOG
```



```
3991    3532  1120          TAD RDC
3992    3533  7640          SZA CLA
3993    3534  5343          JMP ROK
3994    3535  4776'         JMS COMPARE
3995    3536  1113          TAD COMPRERROR
3996    3537  7450          SNA
3997    3540  1775'         TAD INSUMCHECK
3998    3541  7640          SZA CLA
3999    3542  5310          JMP DNS
4000    3543  1131    ROK,    TAD TARGET
4001    3544  3125          DCA START
4002    3545  1124          TAD STARGET
4003    3546  3123          DCA SSTART
4004    3547  2122    RLOGGED, ISZ SECTORS
4005    3550  5222          JMP READL
4006    3551  5616          JMP I XREAD
4007                  /IF THE PROGRAMMED INSTRUCTION IMMEDIATELY BEFORE " READ "
4008                  /IS A " WRITE " , THEN THIS IS A WRITE DATA ERROR, IF NOT,
4009                  /THEN THIS IS A READ DATA ERROR
4010                  /
4011                  /FORM: JMS RDORWR; (READ RETURN); (WRITE RETURN)
4012                  /
4013    3552  3552    RDORWR, .
4014    3553  7344          CLL STA RAL
4015    3554  1216          TAD XREAD
4016    3555  3137          DCA XXX
4017    3556  1537          TAD I XXX
4018    3557  1372          TAD (-WRITE)
4019    3560  7650          SNA CLA
4020    3561  2352          ISZ RDORWR
4021    3562  5752          JMP I RDORWR
4022    3572  3270
4023    3573  3206
4024    3574  0200
4025    3575  3762
4026    3576  3601
4027    3577  2000
              3600          PAGE
4028    3600  5601    JMPICOMPARE, JMP I COMPARE
4029                  /
4030                  /THE FOLLOWING INFORMATION IS ALWAYS PRINTED IF A PROGRAM COMPARE DATA ERROR
4031                  /
4032                  /                       DATA ERROR
4033                  /                       WORD GOOD BAD
4034                  /
4035                  /WHERE " WORD " IS THE WORD NUMBER (0-127),
4036                  /AND " GOOD " IS THE DATA WORD WRITTEN,
4037                  /AND " BAD " IS THE DATA WORD READ (IN ERROR)
4038                  /
4039                  /WORDS 0 AND 1 ARE HEADER WORDS (8 BIT BYTES)
4040                  /
4041                  / WORD 0 = TRACK # (BITS 5-11)
4042                  / WORD 1 = SECTOR (BITS 7-11)
4043                  /
4044                  /
```

```
4045                    /AC SW (4) = 1 ; INHIBIT READ DATA ERROR TYPEOUT
4046                    /
4047                    /
4048    3601  3601       COMPARE, .
4049                    /
4050                    /EMPTY BUFFER
4051                    /
4052                    /SAVE THE PREVIOUS READ'S A-STATUS REGISTER
4053                    /
4054    3602  7301              CLL CLA IAC
4055    3603  0126              AND ASTATUS
4056    3604  3361              DCA XASTATUS
4057    3605  1121              TAD KRETRY
4058    3606  3146              DCA PRETRY
4059    3607  3362              DCA INSUMCHECK
4060    3610  4777'             JMS EMPTYL
4061    3611  1132              TAD TESTP
4062    3612  0376              AND (4
4063    3613  7640              SZA CLA           /IS IT 12 BIT MODE?
4064    3614  1375              TAD (7400               /NO (-377)
4065    3615  7040              CMA                     /YES
4066    3616  3363              DCA BITMODE             /SAVE MASK
4067                    /
4068                    /AC SW (4) = 1 ; INHIBIT FURTHER READ DATA ERROR TYPEOUTS
4069                    /
4070                    /...BUT STAY IN THIS LOOP UNTIL THE RX01 SECTOR BUFFER IS EMPTIED
4071                    /
4072    3617  4443      EMPTY,  STR
4073    3620  5217              JMP EMPTY
4074                    /
4075                    /DISABLE THE RX01 INTERRUPT
4076                    /
4077    3621  7300              CLA CLL
4078    3622  6756      K67X6B, 6756
4079                    /
4080                    /TRANSFER DATA FROM THE SECTOR BUFFER INTO THE ACCUMULATOR
4081                    /
4082    3623  6752      K67X2C, 6752                    / "ACTUAL"  (BAD)  DATA
4083    3624  3133              DCA XA10
4084                    /
4085                    /ASSUME A 12 BIT SUMCHECK EVEN IF 8 BIT MODE FOR NOW
4086                    /
4087                    /NOTE: THE CONTENTS OF PROGRAM LOCATION " INSUMCHECK " SHOULD = 0
4088                    / (AFTER ALL WORDS HAVE COME IN)
4089                    /
4090    3625  1133              TAD XA10
4091    3626  1362              TAD INSUMCHECK

4092    3627  3362              DCA INSUMCHECK
4093    3630  1534              TAD I XA11
4094    3631  0363              AND BITMODE             /377 FOR 8 BIT   7777 FOR 12 BIT
4095    3632  7041              CIA
4096    3633  1133              TAD XA10
4097    3634  7640              SZA CLA
4098    3635  5243              JMP DATAERR
4099    3636  7301      ENDCOMPARE,     CLA CLL IAC
```



```
4100    3637  6756      K67X6C, 6756
4101    3640  2134              ISZ XA11
4102    3641  6001              ION
4103    3642  5217              JMP EMPTY
4104                    /
4105                    /A PROGRAM COMPARE DATA ERROR HAS BEEN DETECTED
4106                    /
4107                    /NOTATION:
4108                    /
4109                    /THE CONTENTS OF PROGRAM LOCATION XASTATUS REFLECTS THE STATUS OF THE
4110                    /RX01 AT THE COMPLETION OF THE PREVIOUS " READ SECTOR "
4111                    /
4112                    /IF A CRC ERROR EXISTS THEN THIS IS A DATA ERROR WITH STATUS ERROR
4113                    /
4114                    /IF A CRC ERROR DOESN'T EXIST THEN THIS IS A DATA ERROR WITH NO ERROR STATUS
4115                    /
4116    3643  1361      DATAERR,        TAD XASTATUS            / A-STATUS OF PREVIOUS READ
4117    3644  7450              SNA
4118    3645  2143              ISZ DNSLOG              /NO CRC STATUS
4119    3646  7640              SZA CLA
4120    3647  2142              ISZ DWSLOG              /CRC STATUS
4121                    /
4122                    /AC SW (4) TO INHIBIT ERROR PRINTOUT
4123                    /
4124                    /IF THIS IS A READ ONLY TEST (NOT READ COMPARE) OR IF AC SW 4 = 1
4125                    /THEN DO NOT PRINT ERROR INFORMATION
4126                    /
4127                    /BUT,
4128                    /
4129                    /IF THIS IS A READ COMPARE TEST AND AC SW 4 = 0
4130                    /THEN PRINT ERROR INFORMATION
4131                    /
4132    3650  4572              LAS
4133    3651  0374              AND (SW4)
4134    3652  1120              TAD RDC
4135    3653  7640              SZA CLA
4136    3654  5357              JMP ISZCOMPRERROR
4137                    /IF THIS IS THE FIRST COMPARE ERROR THEN PRINT HEADER INFORMATION
4138                    /
4139    3655  1113              TAD COMPRERROR
4140    3656  7640              SZA CLA
4141    3657  5320              JMP CNOTFIRST
4142                    /
4143                    /IF A DATA NO CRC STATUS ERROR (DNS) THEN PRINT ENTIRE ERROR INFORMATION
4144                    /
4145    3660  1143              TAD DNSLOG
4146    3661  7640              SZA CLA
4147    3662  4576              FORCE
4148                    /IF THE PROGRAMMED INSTRUCTION IMMEDIATELY BEFORE " READ "
4149                    /IS A " WRITE " , THEN THIS IS A WRITE DATA ERROR, IF NOT,
4150                    /THEN THIS IS A READ DATA ERROR
4151                    /
4152    3663  4773'     XCOMPARE, JMS RDORWR
4153    3664  5270              JMP .+4
4154    3665  4473              PRINT
```

```
4155    3666  6716            MWRITE
4156    3667  5272            JMP .+3
4157    3670  4473            PRINT
4158    3671  6722            MREAD
4159                  /NOTATION:
4160                  /
4161                  /THE CONTENTS OF PROGRAM LOCATION XASTATUS REFLECTS THE STATUS OF THE
4162                  /RX01 AT THE COMPLETION OF THE PREVIOUS " READ SECTOR "
4163                  /
4164                  /IF A CRC ERROR EXISTS THEN THIS IS A DATA ERROR WITH STATUS ERROR
4165                  /
4166                  /IF A CRC ERROR DOESN'T EXIST THEN THIS IS A DATA ERROR WITH NO ERROR STATUS
4167                  /
4168    3672  1361            TAD XASTATUS
4169    3673  7640            SZA CLA
4170    3674  5300            JMP DWESERROR
4171    3675  4473            PRINT
4172    3676  6726            MDNSERROR
4173    3677  5302            JMP .+3
4174    3700  4473      DWESERROR, PRINT
4175    3701  6734            MDWESERROR
4176    3702  4473            PRINT
4177    3703  6753            MDATAERROR
4178                  /PRINT " WORD " IF 12-BIT MODE, OR PRINT " BYTE " IF 8-BIT MODE
4179                  /
4180    3704  1372            TAD (MWORD)
4181    3705  3315            DCA XFLENGTH
4182    3706  7307            CLL CLA IAC RTL
4183    3707  0132            AND TESTP
4184    3710  7650            SNA CLA
4185    3711  5314            JMP .+3
4186    3712  1371            TAD (MBYTE)
4187    3713  3315            DCA XFLENGTH
4188    3714  4473            PRINT
4189    3715  6762      XFLENGTH, MWORD
4190    3716  4473            PRINT
4191    3717  6770            MGB
4192                  / AC 5 = 0 - PRINT ONLY FIRST 3 COMPARE ERRORS
4193                  / AC 5 = 1 - PRINT ALL COMPARE ERRORS
4194                  /
4195    3720  4572      CNOTFIRST, LAS
4196    3721  0370            AND (SW5)
4197    3722  7640            SZA CLA
4198    3723  5330            JMP .+5
4199    3724  7346            CLL STA RTL
4200    3725  1113            TAD COMPRERROR
4201    3726  7700            SMA CLA

4202    3727  5357            JMP ISZCOMPREPROR
4203    3730  4473            PRINT
4204    3731  6602            MCRLF
4205    3732  1367            TAD (-WBUFFER)
4206    3733  1134            TAD XA11
4207    3734  3160            DCA LSB
4208    3735  4505            TY4OCT
4209    3736  0160            LSB
```



```
4210    3737  4504            TAB
4211    3740  0005            5
4212                  /IF 8-BIT MODE THEN MASK THE 12-BIT "GOOD" WORDS (377)
4213                  /
4214    3741  7307            CLL CLA IAC RTL
4215    3742  0132            AND TESTP
4216    3743  7112            CLL RTR
4217    3744  7010            RAR
4218    3745  1534            TAD I XA11
4219    3746  7430            SZL
4220    3747  0366            AND (377)
4221    3750  3160            DCA LSB
4222    3751  4505            TY4OCT
4223    3752  0160            LSB
4224    3753  4504            TAB
4225    3754  0012            12
4226    3755  4505            TY4OCT
4227    3756  0133            XA10
4228    3757  2113      ISZCOMPRERROR, ISZ COMPRERROR
4229    3760  5236            JMP ENDCOMPARE
4230                  /THE CONTENTS OF THE XASTATUS PROGRAM LOCATION REFLECTS THE STATUS AT THE
4231                  /COMPLETION OF THE PREVIOUS READ FUNCTION
4232                  /
4233                  /THE PREVIOUS STATUS IS SAVED BECAUSE A SUCCEEDING ERROR
4234                  / (PARITY ERROR ON THE COMMAND WORD) MAY OCCUR
4235                  /
4236    3761  0000      XASTATUS, 0
4237                  /
4238                  /THE CONTENTS OF " INSUMCHECK " IS THE SUMCHECK DERIVED FROM THE SUM OF ALL
4239                  /DATA WORDS COMING IN (THE SUM OF ALL " BAD " ), AND
4240                  /SHOULD BE EQUIVALENT TO 0 AT THE END OF THE EMPTY BUFFER
4241                  /
4242    3762  0000      INSUMCHECK, 0
4243    3763  0000      BITMODE, 0
4244    3766  0377
4245    3767  0664
4246    3770  0100
4247    3771  6765
4248    3772  6762
4249    3773  3552
4250    3774  0200
4251    3775  7400
4252    3776  0004
4253    3777  4000
              4000            PAGE
4254                  /
4255    4000  0000      EMPTYL, 0
4256    4001  1377            TAD (WBUFFER)
4257    4002  3134            DCA XA11
4258    4003  7305            CLL CLA IAC RAL
4259    4004  4437            LCDA
4260    4005  5222            JMP EMPTYOK
4261    4006  5211            JMP EMPTYERROR
4262                  /RETURN TO HERE FROM SUBROUTINE XLCDA
4263                  /
```

```
4264  4007  3113          DCA COMPRERROR
4265  4010  5600          JMP I EMPTYL            /RETURN
4266                /
4267                /THIS INTERFACE PARITY ERROR MUST BE ON THE COMMAND WORD TO "EMPTY BUFFER"
4268                /
4269                /NOTE: IT CAN'T BE ANY OTHER ERROR
4270                /
4271  4011  2146    EMPTYERROR, ISZ PRETRY
4272  4012  7410          SKP
4273  4013  5272          JMP XEMPTYOKNOTOK
4274  4014  4572          LAS
4275  4015  0376          AND (SW1)
4276  4016  7640          SZA CLA
4277  4017  5200          JMP EMPTYL
4278  4020  3146          DCA PRETRY
4279  4021  5272          JMP XEMPTYOKNOTOK
4280                /IF AC SW (4) = 0
4281                /
4282                /PRINT A VALUE SYMBOLIC OF THE TOTAL # OF COMPARE ERRORS DETECTED
4283                /
4284                /IF 8-BIT MODE THEN THE "SUMCHECK" WILL OVERFLOW INTO BITS 0 TO 3
4285                /
4286                /THEREFORE MASK THE CONTENTS OF " INSUMCHECK "
4287                /
4288                /THE RESULT OF THE SUBTRACTION SHOULD = 0
4289                /
4290                /NO MASK IS NEEDED FOR 12-BIT MODE
4291                /
4292  4022  7307    EMPTYOK, CLL CLA IAC RTL
4293  4023  0132          AND TESTP
4294  4024  7112          CLL RTR
4295  4025  7010          RAR
4296  4026  1775'         TAD INSUMCHECK
4297  4027  7430          SZL
4298  4030  0374          AND (377)
4299  4031  3775'         DCA INSUMCHECK
4300  4032  4572          LAS
4301  4033  0373          AND (SW4)
4302  4034  7640          SZA CLA
4303  4035  5272          JMP XEMPTYOK
4304                /IF A SUMCHECK ERROR EXISTS WITHOUT A "COMPRERROR" THEN "FORCE" A TYPEOUT
4305                /
4306  4036  1113          TAD COMPRERROR
4307  4037  7640          SZA CLA
4308  4040  5245          JMP .+5
4309  4041  1775'         TAD INSUMCHECK
4310  4042  7650          SNA CLA

4311  4043  5272          JMP XEMPTYOK
4312  4044  4576          FORCE
4313  4045  4473          PRINT
4314  4046  6775          MSUMCHECK
4315  4047  1775'         TAD INSUMCHECK
4316  4050  7640          SZA CLA
4317  4051  5255          JMP .+4
4318  4052  4473          PRINT
```



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4319  4053  7005          MQA
4320  4054  5260          JMP .+4
4321  4055  4505          TY4OCT
4322  4056  3762          INSUMCHECK
4323  4057  5263          JMP .+4
4324  4060  1113          TAD COMPRERROR
4325  4061  7650          SNA CLA
4326  4062  5272          JMP XEMPTYOK
4327  4063  4473          PRINT
4328  4064  7007          MDESUMMARY
4329  4065  4505          TY4OCT
4330  4066  0113          COMPRERROR
4331  4067  4504          TAB
4332  4070  0005          5
4333  4071  5272          JMP XEMPTYOK
4334                /
4335                /AC SW 0 = 1 ; HALT ON ERROR
4336                /
4337  4072  1113    XEMPTYOK, TAD COMPRERROR
4338  4073  7450          SNA
4339  4074  1775'         TAD INSUMCHECK
4340  4075  7650          SNA CLA
4341  4076  5772'         JMP JMPICOMPARE
4342  4077  4572          LAS
4343  4100  7710          SPA CLA
4344  4101  4461          HLT6, HLT
4345  4102  5772'         JMP JMPICOMPARE
4346  4103  4103    XSETUP, .
4347  4104  4507          WAITTY
4348  4105  1371          TAD (ANDRETURN)
4349  4106  3770'         DCA XPRINT
4350  4107  1703          TAD I XSETUP
4351  4110  3320          DCA XANDRETURN
4352  4111  2303          ISZ XSETUP
4353  4112  5703          JMP I XSETUP
4354                /
4355                /AND RETURN TO HERE WAITING FOR ENTIRE NUMERICAL OUTPUT
4356                /
4357  4113  4507    ANDRETURN, WAITTY
4358                /
4359                /THEN EXIT FROM HERE FOR MAIN LINE CODE
4360                /
4361  4114  1720    THENEXIT, TAD I XANDRETURN
4362  4115  3320          DCA XANDRETURN
4363  4116  3162          DCA TTYBUSY
4364  4117  5720          JMP I XANDRETURN
4365  4120  4120    XANDRETURN, .
4366                /
4367  4121  4121    XHALT, .
4368  4122  4507          WAITTY
4369                      /***********
4370                      /CONSOLE
4371                      /***********
4372  4123  4424          CHECKC8
4373  4124  4425          XC8ENTR
```

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4374  4125  5331          JMP C8RET3      /
4375                      /************
4376  4126  7240          STA
4377  4127  1321          TAD XHALT
4378  4130  7402          7402
4379  4131  7200          C8RET3,CLA
4380  4132  5721          JMP I XHALT
4381                /
4382                /ROUTINE TO NOTIFY OF OF RUNNING IF NEED BE DONE
4383                /
4384  4133  0000    XTICK,  0
4385  4134  4472          CHEK22
4386  4135  7410          SKP                         /ON APT.
4387  4136  5733          JMP I   XTICK
4388  4137  2351          ISZ     CLKCNT
4389  4140  5733          JMP I   XTICK
4390  4141  1352          TAD     COUNT
4391  4142  3351          DCA     CLKCNT              /INIT CLOCK COUNTER
4392  4143  6002          IOF
4393  4144  6201          CDF     00
4394  4145  6272          CIF     70
4395  4146  4750          JMS I   K6500               /NOTIFY APT-8
4396  4147  5733          JMP I   XTICK               /EXIT.
4397                /
4398  4150  6500    K6500,  6500
4399  4151  7777    CLKCNT, -1
4400  4152  7763    COUNT,  -15
4401  4170  5244
4402  4171  4113
4403  4172  3600
4404  4173  0200
4405  4174  0377
4406  4175  3762
4407  4176  2000
4408  4177  7114
            4200          PAGE
4409                /SEQUENCE TO THE NEXT AVAILABLE DISKETTE
4410                /
4411  4200  4200    XGETUNIT,       .
4412  4201  3240          DCA UNITZ       /CLEAR FOR A NEW DISKETTE
4413  4202  1236          TAD WUNITS      /WORKING UNIT COUNTER
4414  4203  7450          SNA
4415  4204  1235          TAD UNITS       /EXAUSTED ALL DISKETTES ; RESET
4416  4205  3236          DCA WUNITS
4417  4206  3237          DCA POLL        /CLEAR POLLER
4418  4207  7120          STL             /START
4419  4210  1237    NEXT,   TAD POLL

4420  4211  7010          RAR             /NEXT
4421  4212  3237          DCA POLL
4422  4213  1237          TAD POLL
4423  4214  7430          SZL             /DISKETTE
4424  4215  4461          HLT             /NO UNITS AVAILABLE ; CATASTROPHIC
4425  4216  0236          AND WUNITS
4426  4217  7450          SNA
4427  4220  2240          ISZ UNITZ       /ACTIVE DISKETTE
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4428  4221  7450          SNA
4429  4222  5210          JMP NEXT        /TRY AGAIN
4430                /A DISKETTE IS AVAILABLE AND SELECTED FOR OPERATIONS
4431  4223  3241          DCA UNITX       /A CODED VERSION OF UNIT
4432  4224  1241          TAD UNITX
4433  4225  7040          CMA             /...DELETE FROM
4434  4226  0236          AND WUNITS      /...AVAILABLE UNIT LIST (WUNITS)
4435  4227  3236          DCA WUNITS      /...AND CREATE NEW LIST
4436  4230  1240          TAD UNITZ
4437  4231  7106          CLL RTL
4438  4232  7006          RTL     /BIT 7 OF COMMAND REGISTER
4439  4233  3242          DCA UNIT        /FOR COMMAND REGISTER LOAD LATER
4440  4234  5600          JMP I XGETUNIT
4441  4235  6000    UNITS,  6000            /AVAILABLE UNIT LIST (MAX SYS CONFIGURATION)
4442  4236  0000    WUNITS, 0               /CODED WORKING UNIT LIST (UNITS YET TO BE EXERCISED)
4443  4237  0000    POLL,   0               /DISKETTE POLL
4444                /
4445                /UNITZ ; UNIT 1 LOOKS LIKE 0001
4446                /UNITX ; UNIT 1 LOOKS LIKE 2000
4447                /UNIT  ; UNIT 1 LOOKS LIKE 0020 (RX01 COMMAND WORD BIT 7)
4448                /
4449  4240  0000    UNITZ,  0               /ACTIVE DISKETTE
4450  4241  0000    UNITX,  0               /ACTIVE DISKETTE IN CODED FORM
4451  4242  0000    UNIT,   0               /A CODED VERSION OF UNIT Z (FOR COMMAND REGISTER LOAD)
4452                /
4453                /IF (WUNITS) = 0 ; ALL SELECTED DISKETTE DRIVES HAVE SEQUENCED
4454                /
4455  4243  4243    XDONE,  .
4456  4244  1236          TAD WUNITS
4457  4245  7650          SNA CLA
4458  4246  2243          ISZ XDONE       / DONE ; (WUNITS) = 0
4459  4247  5643          JMP I XDONE
4460                /INITIALIZE THE NUMBER OF TRACKS ACCESSED VIA THE DIFFERENCE BETWEEN
4461                /THE CONTENTS OF PROGRAM LOCATIONS " OD " AND " ID ".
4462                /
4463  4250  4250    XINITTRACKS, .
4464  4251  1030          TAD ID
4465  4252  7040          CMA
4466  4253  1027          TAD OD
4467  4254  3147          DCA TRACKS
4468  4255  1147          TAD TRACKS
4469  4256  7041          CIA
4470  4257  3150          DCA TTRACKS
4471  4260  5650          JMP I XINITTRACKS
4472                / OD (OUTSIDE DIAMETER) ACTUATOR POSITION INITIALIZED TO (0)
4473                /
4474                / ID (INSIDE DIAMETER) ACTUATOR POSITION INITIALIZED TO 114 (76 DECIMAL)
4475                /
4476                / " XGETATRACK " WILL GET A TRACK VALUE BETWEEN THE LIMITS OF THE CONTENTS OF
4477                /PROGRAM LOCATION OD (MIN 0), AND THE CONTENTS OF ID (MAX 114).
4478                /
4479                /GET A DISKETTE TRACK TO BE (AC) WITHIN IOT LCD-B
4480                /
4481                / IF THIS IS THE " FIRSTMOVE ", (START) IS NOT APPLICABLE HERE, BUT
4482                / WILL BECOME APPLICABLE WITHIN SUBROUINE " XGETASECTOR ".
```

```
4483                    /
4484    4261  4261      XGETATRACK,     .
4485    4262  1131              TAD TARGET      /PRESENT ACTUATOR POSITION (FROM PREVIOUS LCD=B)
4486    4263  3125              DCA START       /BECOMES  STARTING ACTUATOR POSITION
4487    4264  1377              TAD (70)
4488    4265  0132              AND TESTP
4489    4266  7110              CLL RAR
4490    4267  7012              RTR
4491    4270  1376              TAD (TAD SEQ)
4492    4271  3272              DCA .+1
4493    4272  1276              TAD SEQ
4494    4273  3275              DCA .+2
4495    4274  5675      RESEQUENCE, JMP I .+1
4496    4275  4306              SEQ000
4497                    /TRACK ACCESS SEQUENCE IS SELECTED VIA AC SWITCHES 6,7,8 AT L/S 200
4498                    /
4499                    / 0 = INCREMENTAL (1=114=0)
4500                    / 1 = DECREMENTAL (114=0)
4501                    / 2 = 1=114, 113=0
4502                    / 3 = BOUNCE ID TO OD ONLY
4503                    / 4 = BOUNCE: (114, 0 ; 113, 1 ; 112, 2 ; ...ETC TO 47, 45)
4504                    / 5 =
4505                    / 6 = STROBE: (77, 0 ; 76, 0 ; 75, 0 ; ...ETC TO 1, 0)
4506                    / 7 = RANDOM
4507                    /
4508    4276  4306      SEQ,    SEQ000
4509    4277  4317              SEQ001
4510    4300  4400              SEQ010
4511    4301  4422              SEQ3
4512    4302  4444              SEQ100
4513    4303  5453              NOTEST
4514    4304  4465              SEQ6
4515    4305  4330              SEQ111
4516                    /
4517                    /INCREMENTAL ACTUATOR ACCESS (OD INCREMENTALLY TO ID)
4518                    /
4519    4306  1150      SEQ000, TAD TTRACKS
4520    4307  1147              TAD TRACKS
4521    4310  7640              SZA CLA
4522    4311  5314              JMP .+3
4523    4312  1027              TAD OD
4524    4313  5332              JMP DCATARGET
4525    4314  1131              TAD TARGET
4526    4315  7001              IAC
4527    4316  5332              JMP DCATARGET
4528                    /DECREMENTAL ACTUATOR ACCESS (ID TO OD)
4529                    /

4530    4317  1150      SEQ001, TAD TTRACKS
4531    4320  1147              TAD TRACKS
4532    4321  7640              SZA CLA
4533    4322  5325              JMP .+3
4534    4323  1030              TAD ID
4535    4324  5332              JMP DCATARGET
4536    4325  1131              TAD TARGET
4537    4326  1117              TAD K7777
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4538    4327  5332              JMP DCATARGET
4539                    /RANDOM ACTUATOR ACCESS
4540                    /
4541    4330  4775'     SEQ111, JMS RANGEN
4542    4331  0374              AND (177)
4543    4332  3131      DCATARGET, DCA TARGET
4544                    /PREVIOUSLY AT L/S THE FOLLOWING CONDITION WAS TRUE
4545                    /
4546                    /               0 <= (OD) <= (ID) <= 32
4547                    /
4548                    /THEREFORE TEST FOR THE CONDITION
4549                    /
4550                    /               (TARGET) <= (ID)
4551                    /
4552    4333  1030      XSEQ,   TAD ID
4553    4334  7041              CIA
4554    4335  1131              TAD TARGET
4555    4336  7740              SMA SZA CLA
4556    4337  5274              JMP RESEQUENCE
4557                    /AND TEST FOR THE CONDITION
4558                    /
4559                    /               (OD) <= (TARGET)
4560                    /
4561    4340  1131              TAD TARGET
4562    4341  7041              CIA
4563    4342  1027              TAD OD
4564    4343  7740              SMA SZA CLA
4565    4344  5274              JMP RESEQUENCE
4566    4345  5661              JMP I XGETATRACK
4567                    /
4568                    /ERROR REPORTER FOR APT, INDICATES TEST PC IN ERROR, THE ONLY EXCEPTIONS
4569                    /ARE FOR AN UNEXPECTED RX01 INTERRUPT,
4570                    /AND A MISSING ERROR FLAG,
4571                    /
4572    4346  0000      XAERRO, 0
4573    4347  3137              DCA     XXX                             /STORE ERROR PC,
4574    4350  4472              CHEK22
4575    4351  7410              SKP
4576    4352  5746              JMP I   XAERRO
4577    4353  6002              IOF
4578    4354  1137              TAD     XXX                     /GET BACK ERROR PC,
4579    4355  6201              CDF     00
4580    4356  6272              CIF     70
4581    4357  5761              JMP I   K6520
4582    4360  4461              HLT                             /SOMETHING WENT WRONG ON
4583                                                            /ON REPORTING ERROR TO APT
4584    4361  6520      K6520,  6520
4585    4374  0177
4586    4375  4712
4587    4376  1276
4588    4377  0070
              4400              PAGE
4589                    / OD+1 INCREMENTALLY TO ID; ID-1 DECREMENTALLY TO OD
4590                    /
4591    4400  1150      SEQ010, TAD TTRACKS
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4592  4401  1147          TAD TRACKS
4593  4402  7640          SZA CLA
4594  4403  5213          JMP XSEQ2
4595  4404  1147          TAD TRACKS
4596  4405  7104          CLL RAL
4597  4406  1377          TAD (2)
4598  4407  3147          DCA TRACKS      / (TRACKS X 2)-2 = 152(MAX VAL)
4599  4410  1147          TAD TRACKS
4600  4411  7041          CIA
4601  4412  3150          DCA TTRACKS
4602                /INCREMENT IF (TRACKS) < [ (ID)-(OD) ]
4603                /DECREMENT IF (TRACKS) => [ (ID)-(OD) ]
4604  4413  1027    XSEQ2,  TAD OD
4605  4414  7041          CIA
4606  4415  1030          TAD ID
4607  4416  1147          TAD TRACKS
4608  4417  7700          SMA CLA
4609  4420  5776'         JMP SEQ001      / ID-1 TO OD
4610  4421  5775'         JMP SEQ000      / OD+1 TO ID
4611                /
4612                /BOUNCE; ID,OD ONLY
4613                /
4614  4422  1150    SEQ3,   TAD TTRACKS
4615  4423  1147          TAD TRACKS
4616  4424  7640          SZA CLA
4617  4425  5233          JMP XSEQ3
4618  4426  7344          CLL STA RAL
4619  4427  3147          DCA TRACKS
4620  4430  1147          TAD TRACKS
4621  4431  7041          CIA
4622  4432  3150          DCA TTRACKS
4623  4433  1131    XSEQ3,  TAD TARGET
4624  4434  7041          CIA
4625  4435  1027          TAD OD
4626  4436  7650          SNA CLA
4627  4437  1030          TAD ID
4628  4440  7450          SNA
4629  4441  1027          TAD OD
4630  4442  3131          DCA TARGET
4631  4443  5774'         JMP XSEQ
4632                /BOUNCE ; ID TO OD
4633                /
4634                /THEREFORE 76 (NOT 77) TRACKS ARE TESTED
4635                /
4636  4444  1150    SEQ100, TAD TTRACKS
4637  4445  1147          TAD TRACKS
4638  4446  7640          SZA CLA

4639  4447  5254          JMP Q4OD
4640                /FIRST ENTRY INTO SEQUENCE # 4
4641                /
4642                /IF (TRACKS) = [ (ID)-(OD) ] IS A NEGATIVE ODD THEN INCREMENT (TRACKS)
4643                /
4644  4450  7201          CLA IAC
4645  4451  0147          AND TRACKS
4646  4452  7640          SZA CLA
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```
4647  4453  2147          ISZ TRACKS
4648                /IF (TRACKS) = -ODD ; BOUNCE TO OUTSIDE DIAMETER, BUT
4649                /
4650                /IF (TRACKS) = -EVEN ; BOUNCE TO INSIDE DIAMETER
4651                /
4652  4454  7201    Q4OD,   CLA IAC
4653  4455  0147          AND TRACKS
4654  4456  7650          SNA CLA
4655  4457  5305          JMP Q46ID
4656  4460  7240          STA
4657  4461  1150          TAD TTRACKS
4658  4462  1147          TAD TRACKS
4659  4463  7110          CLL RAR
4660  4464  5313          JMP Q46OD
4661                // (TRACKS) = -EVEN ; THEREFORE THE BOUNCE IS TO THE INSIDE DIAMETER
4662                //
4663                /Q4ID,  TAD TTRACKS; TAD TRACKS; CLL RAR; CIA; TAD ID; DCA TARGET; JMP XSEQ
4664                /STROBE ID, OD ; ID-1, OD ; ID-2, OD ; ...ETC...
4665                /
4666  4465  1150    SEQ6,   TAD TTRACKS
4667  4466  1147          TAD TRACKS
4668  4467  7640          SZA CLA
4669  4470  5300          JMP Q6OD
4670                /FIRST ENTRY INTO SEQUENCE # 6
4671                /
4672  4471  1147          TAD TRACKS
4673  4472  7105          CLL IAC RAL
4674  4473  3147          DCA TRACKS
4675  4474  1147          TAD TRACKS
4676  4475  7041          CIA
4677  4476  3150          DCA TTRACKS
4678  4477  5305          JMP Q46ID
4679                /
4680                / IF (TARGET) = (OD), THEN STROBE TO INSIDE DIAMETER
4681                /
4682  4500  1131    Q6OD,   TAD TARGET
4683  4501  7041          CIA
4684  4502  1027          TAD OD
4685  4503  7640          SZA CLA
4686  4504  5313          JMP Q46OD
4687                /
4688                /
4689                /
4690  4505  1150    Q46ID,  TAD TTRACKS
4691  4506  1147          TAD TRACKS
4692  4507  7110          CLL RAR
4693  4510  7041          CIA
4694  4511  1030          TAD ID
4695  4512  7410          SKP
4696  4513  1027    Q46OD,  TAD OD
4697  4514  3131          DCA TARGET
4698  4515  5774'         JMP XSEQ
4699                      /**********
4700                      /CONSOLE
4701                      /***********
```

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4702
4703
4704    4516  0000    XCHECKC8, 0
4705    4517  7200            CLA                     /CHECK IF CONSOL IS ACTIVE
4706    4520  1022            TAD     22
4707    4521  0373            AND     (400
4708    4522  7650            SNA CLA
4709    4523  5337            JMP     NOTCL8          /NOT ON ACTIVE CONSOLE
4710    4524  1716            TAD I   XCHECKC8        /GET CONSOLE CALL
4711    4525  3331            DCA     PACKDO  /STORE IT IN THIS LOC
4712    4526  4507            WAITTY                  /WAIT FOR PRINTING TO FONISH
4713    4527  6002            IOF                     /KILL INTERRUPT
4714    4530  6212            CIF 10                  /CHANGE INST FIELD TO FIELD ONE
4715    4531  0000            PACKDO, 0000            /DO CONSULE CALL
4716    4532  7000            NOP
4717    4533  6001            ION                     /RETURN FROM CALL
4718    4534  2316    EXITCK, ISZ     XCHECKC8        /BUMP RETURN
4719    4535  7200            CLA
4720    4536  5716            JMP I   XCHECKC8        /EXIT XCHECK
4721    4537  2316    NOTCL8, ISZ     XCHECKC8        /BUMP FOR NOT CONSOL CALL +2
4722    4540  5334            JMP     EXITCK          /LEAVE BY THIS MEANS
4723
4724
4725                            /***********
4726                            /CONSOLE
4727                            /***********
4728                    /THIS SUBROUTNE IS ENTERED FROM TESTS:  T21, T22, T32, T33
4729                    /
4730                    /THE CONTENTS OF THE AC AT ENTRY IS THE PATTERN TO FILL THE BUFFER WITH
4731                    /
4732    4541  4541    FB128BYTES, .
4733    4542  3166            DCA GOOD                        /THE CONTENTS OF GOOD IS THE PURE PATTERN
4734    4543  1372            TAD (100)
4735    4544  4436            LCD                     /FILL BUFFER (8-BIT MODE)
4736    4545  5350            JMP .+3                         /START BY WAITING FOR TRANSFER REQUEST
4737    4546  1166            TAD GOOD
4738    4547  4442            XDROUT                  /TRANSFER OUT TO SECTOR BUFFER
4739    4550  4443            STR
4740    4551  7410            SKP
4741    4552  5346            JMP .-4                 /WAIT FOR TRANSFER REQUEST FLAG
4742    4553  4445            SDN
4743    4554  5350            JMP .-4                 /WAIT FOR DONE FLAG
4744    4555  4444            SER
4745    4556  4465            DK
4746    4557  4452    E210,   ERROR                           /UNEXPECTED ERROR FLAG
4747    4560  4502            SCOPE
4748    4561  5741            JMP I FB128BYTES

4749    4562  0100
4750    4563  0400
4751    4564  4333
4752    4565  4306
4753    4566  4317
4754    4567  0002
              4600            PAGE
4755                    /INITIALIZE THE NUMBER OF SECTORS AVAILABLE TO ACCESS (PER TRACK) VIA THE
```



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4756                    /DIFFERENCE BETWEEN THE CONTENTS OF PROGRAM LOCATIONS " FIRST " AND " LAST ".
4757                    /
4758    4600  4600    XINITSECTORS, .
4759    4601  1032            TAD LAST
4760    4602  7040            CMA
4761    4603  1031            TAD FIRST
4762    4604  3122            DCA SECTORS
4763    4605  3311            DCA XSTARGET
4764    4606  5600            JMP I XINITSECTORS
4765                    /
4766                    /GET A SECTOR
4767                    /
4768                    /SECTOR ACCESS 1-32 (OCTAL)
4769                    /
4770    4607  4607    XGETASECTOR, .
4771                    /
4772                    /SET (SSTART)
4773                    /
4774    4610  7301    XXGETASECTOR, CLL CLA IAC       / 1
4775    4611  3310            DCA IF
4776    4612  1120            TAD RDC
4777    4613  7450            SNA
4778    4614  2310            ISZ IF                  / + 1 RDC
4779    4615  7710            SPA CLA
4780    4616  5222            JMP .+4                 / + 1 WRITE
4781    4617  7307            CLL CLA IAC RTL
4782    4620  0132            AND TESTP
4783    4621  7640            SZA CLA
4784    4622  2310            ISZ IF                  / + 1 8-BIT MODE
4785    4623  4777*           JMS     VT78CK          /GO CHECK IF ON VT78 SYSTEM
4786    4624  2310            ISZ     IF              /INCREASE (IF) FOR VT78
4787                    /
4788                    / (IF) IS:
4789                    /
4790                    / 1 IF READ
4791                    / 2 IF WRITE
4792                    / 2 IF WRITE 8-BIT MODE
4793                    / 2 IF READ AND PROGRAM VERIFY
4794                    / 3 IF READ AND PROGRAM VERIFY 8-BIT MODE
4795                    / 2 IF READ 8-BIT MODE
4796                    /
4797    4625  1311    NEXTSECTOR, TAD XSTARGET
4798    4626  7440            SZA
4799    4627  1310            TAD IF                  /INTERLEAVE FACTOR 1, 2, 3
4800    4630  7001            IAC                     /NOW INTERLEAVE FACTOR IS 2, 3, 4
4801    4631  3311            DCA XSTARGET
4802    4632  1311            TAD XSTARGET
4803    4633  1376            TAD (-33)
4804    4634  7510            SPA
4805    4635  5243            JMP OKSTARGET           / < 33
4806    4636  7640            SZA CLA                 /SKIP IF = 33
4807    4637  7240            STA
4808    4640  1375            TAD (-31)
4809    4641  1311            TAD XSTARGET
4810    4642  3311            DCA XSTARGET
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4811    4643  7200    OKSTARGET, CLA
4812    4644  1311            TAD XSTARGET
4813    4645  3124            DCA STARGET
4814                  /
4815                  /PREVIOUSLY AT L/S THE FOLLOWING CONDITION WAS TRUE
4816                  /
4817                  /               0 < (FIRST) <= (LAST)
4818                  /
4819                  /THEREFORE TEST FOR THE CONDITION
4820                  /
4821                  /               (STARGET) <= (LAST)
4822                  /
4823    4646  1032            TAD LAST
4824    4647  7041            CIA
4825    4650  1124            TAD STARGET
4826    4651  7740            SMA SZA CLA
4827    4652  5225            JMP NEXTSECTOR
4828                  /
4829                  /AND FOR THE CONDITION
4830                  /
4831                  /               (FIRST) <= (STARGET)
4832                  /
4833    4653  1124            TAD STARGET
4834    4654  7041            CIA
4835    4655  1031            TAD FIRST
4836    4656  7740            SMA SZA CLA
4837    4657  5225            JMP NEXTSECTOR
4838                  /FORMAT (XTARGET) BITS 0-6 TRACK ; AND BITS 7-11 SECTOR
4839                  /
4840    4660  1131            TAD TARGET
4841    4661  7104            CLL RAL
4842    4662  7006            RTL
4843    4663  7006            RTL
4844    4664  1124            TAD STARGET
4845    4665  3151            DCA XTARGET
4846                  /AND SET THE HEADER WORDS 0, AND 1 OF THE WRITE BUFFER FOR RDC I,D,
4847                  /
4848                  /WORD 0 IS THE TRACK
4849                  /WORD 1 IS THE UNIT (BIT 4) AND THE SECTOR (BITS 7-11)
4850                  /
4851    4666  1131            TAD TARGET
4852    4667  3774*           DCA WBUFFER
4853    4670  1773*           TAD UNITZ
4854    4671  7106            CLL RTL
4855    4672  7006            RTL
4856    4673  7006            RTL
4857    4674  7004            RAL

4858    4675  1124            TAD STARGET
4859    4676  3772*           DCA WBUFFER+1
4860                  /WORDS 63 AND 64 OR 127 AND 128 ARE OUT-SUMCHECK WORDS
4861                  /
4862    4677  1155            TAD PATSUMCHECK
4863    4700  1774*           TAD WBUFFER
4864    4701  1772*           TAD WBUFFER+1
4865    4702  3556            DCA I WORDX
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4866    4703  1556            TAD I WORDX
4867    4704  1556            TAD I WORDX
4868    4705  7041            CIA
4869    4706  3557            DCA I WORDY
4870    4707  5607            JMP I XGETASECTOR
4871                  /
4872    4710  0000    IF,     0
4873    4711  0000    XSTARGET, 0             / 1 TO 32
4874                  /
4875                  /RANDOM NUMBER GENERATOR
4876                  / (EXIT IS WITH THE RANDOM # IN THE ACCUMULATOR)
4877    4712  4712    RANGEN, .
4878    4713  7301            CLL CLA IAC
4879    4714  1326            TAD R1
4880    4715  1327            TAD R2
4881    4716  7106            CLL RTL
4882    4717  3326            DCA R1
4883    4720  1327            TAD R2
4884    4721  7012            RTR
4885    4722  1326            TAD R1
4886    4723  3327            DCA R2
4887    4724  1327            TAD R2
4888    4725  5712            JMP I RANGEN
4889    4726  1234    R1,     1234
4890    4727  0765    R2,     0765
4891                  /
4892                  /TESTS
4893                  /
4894    4730  0600    TESTS,  T0
4895    4731  0626            T1
4896    4732  0652            T2
4897    4733  0723            T3
4898    4734  1000            T4
4899    4735  1071            T5
4900    4736  1132            T6
4901    4737  1200            T7
4902    4740  1215            T10
4903    4741  1233            T11
4904    4742  1260            T12
4905    4743  1456            T13
4906    4744  1603            T14
4907    4745  1601            T15
4908    4746  1455            T16
4909    4747  1602            T17
4910    4750  1600            T20
4911    4751  1675            T21
4912    4752  1674            T22
4913    4753  2265            T23
4914    4754  1714            T24
4915    4755  1716            T25
4916    4756  1720            T26
4917    4757  2107            T27
4918    4760  2200            T30
4919    4761  2202            T31
4920    4762  2223            T32
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 4921   4763  2241            T33
 4922   4764  2300            T34
 4923   4765  2276            T35
 4924   4766  2277            T36
 4925   4767  2275            T37
 4926   4770  0462            NOMORE=3
 4927   4772  7115
 4928   4773  4240
 4929   4774  7114
 4930   4775  7747
 4931   4776  7745
 4932   4777  1165
               5000            PAGE
 4933                 /
 4934                 /TYPE 4 OCTAL
 4935                 /
 4936   5000  5000    XTY4OCT, .
 4937   5001  7410            SKP
 4938   5002  3162            DCA     TTYBUSY                 /INITIALIZE TTYBUSY INDICAOR.
 4939   5003  4500            SETUP
 4940   5004  5000            XTY4OCT
 4941   5005  1600            TAD I XTY4OCT
 4942   5006  2200            ISZ XTY4OCT
 4943   5007  3262            DCA XOCTAL      /FOR " OCTAL " ADDRESS
 4944   5010  1662            TAD I XOCTAL
 4945   5011  3262            DCA XOCTAL      /OCTAL
 4946   5012  7346            CLL STA RTL     / =3
 4947   5013  1117            TAD K7777       / =1
 4948   5014  3263            DCA DIGITS
 4949   5015  7346    SHIFT,  CLL STA RTL     / =3
 4950   5016  3265            DCA SHIFTS
 4951   5017  1262            TAD XOCTAL
 4952   5020  7100    XSHIFT, CLL
 4953   5021  7510            SPA
 4954   5022  7020            CML
 4955   5023  7004            RAL
 4956   5024  2265            ISZ SHIFTS
 4957   5025  5220            JMP XSHIFT
 4958   5026  3262            DCA XOCTAL      /NEW
 4959   5027  1262            TAD XOCTAL
 4960   5030  0174            AND K0007                       /OCTAL MASK
 4961   5031  7450            SNA
 4962   5032  5242    JMPDIG, JMP     ISZDIG                  /DO NOT PRINT LEADING ZEROS.
 4963   5033  3264            DCA     XXDMP                   /STORE NUMBER TO BE PRINTED
 4964   5034  1173            TAD     K7000
 4965   5035  3232            DCA     .-3                     /NOP JMP ISZDIG, LEADING ZEROS WILL NOT BE PRINTED
 4966   5036  1264            TAD     XXDMP                   /RETURN VALUE TO BE PRINTED.

 4967   5037  1377            TAD (260)                       /FOR ASCII COMPONENT
 4968   5040  4506            TYPEIT
 4969   5041  2266            ISZ     CCNT                    /INDICATES A CHARACTER HAS BEEN PRINTED
 4970   5042  2263    ISZDIG, ISZ DIGITS                      /INDEX DIGIT COUNT
 4971   5043  5215            JMP SHIFT
 4972   5044  2175            ISZ     XCNT                    /TY8OCT?
 4973   5045  5202            JMP     XTY4OCT+2               /YES
 4974   5046  1266            TAD     CCNT
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 4975   5047  7650            SNA CLA                         /PRINT ONLY A ZERO??
 4976   5050  5257            JMP     ZERO                    /YES
 4977   5051  7340            CLL CLA CMA
 4978   5052  3175            DCA     XCNT                    /INIT COUNTER
 4979   5053  3266            DCA     CCNT
 4980   5054  1376            TAD     (JMP    ISZDIG)         /ESTABLISH FIRST TIME SWITCH.
 4981   5055  3232            DCA     JMPDIG
 4982   5056  5775'           JMP     THENEXIT
 4983   5057  1377    ZERO,   TAD     (260)
 4984   5060  4506            TYPEIT
 4985   5061  5251            JMP     .-10
 4986   5062  0000    XOCTAL, 0               / " OCTAL " FOR TYPEOUT
 4987   5063  7775    DIGITS, -3
 4988   5064  0000    XXDMP,  0
 4989   5065  7775    SHIFTS, -3
 4990   5066  0000    CCNT,   0
 4991                 /THIS ROUTINE WILL DETERMINE DEVICE CODE TO USE IN PLACE
 4992                 /OF THE STANDARD 75 CODE.
 4993                 /
 4994                 /************************************************************
 4995   5067  0000    CHNDEV, 0
 4996   5070  1114            TAD     DTESTP                  /GET TESTING PARAMETERS.
 4997   5071  0374            AND     (700                    /ISOLATE DEVICE CODE TO USE.
 4998   5072  7450            SNA                             /USE 75??
 4999   5073  5667            JMP I   CHNDEV                  /YES.
 5000   5074  7112            CLL RTR
 5001   5075  7010            RAR                             /MOVE TO BIT POSITION 6-8.
 5002   5076  1373            TAD (6700)
 5003                 /PROPER DEVICE CODE SHOULD  NOW BE ESTABLISHED.
 5004                 /IF THE OPERATOR HAS MADE AN ERROR THE PROGRAM HAS NO WAY
 5005                 /OF KNOWING IT.
 5006                 /
 5007   5077  3010            DCA A10                         /SET DEVICE CODE = 67X-
 5008   5100  1372            TAD (XDEVIC-1)
 5009   5101  3011            DCA A11         /INTO APPLICABLE PROGRAM
 5010   5102  1411            TAD I A11
 5011   5103  7450            SNA
 5012   5104  5312            JMP .+6         /DEVICE CODE LOCATIONS
 5013   5105  3166            DCA GOOD
 5014   5106  1010            TAD A10
 5015   5107  3566            DCA I GOOD      /SPECIFIED AT
 5016   5110  2010            ISZ A10
 5017   5111  5302            JMP .-7         /PROGRAM LOCATION "DEVICE"
 5018   5112  1735            TAD I XK67X2A
 5019   5113  3771'           DCA K67X2B      /DUPLICATE IOT CODE 67X2
 5020   5114  1735            TAD I XK67X2A
 5021   5115  3770'           DCA K67X2C      /DUPLICATE IOT CODE 67X2
 5022   5116  1736            TAD I XK67X3A
 5023   5117  3767'           DCA K67X3B      /DUPLICATE IOT CODE 67X3
 5024   5120  1737            TAD I XK67X4A
 5025   5121  3766'           DCA K67X4B      /DUPLICATE IOT CODE 67X4
 5026   5122  1740            TAD I XK67X5A
 5027   5123  3765'           DCA K67X5B      /DUPLICATE IOT CODE 67X5
 5028   5124  1741            TAD I XK67X6A
 5029   5125  3764'           DCA K67X6B      /DUPLICATE IOT CODE 67X6
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5030  5126  1741          TAD I XK67X6A
5031  5127  3763'         DCA K67X6C      /DUPLICATE IOT CODE 67X6
5032  5130  1742          TAD I XK67X7A
5033  5131  3762'         DCA K67X7B      /DUPLICATE IOT CODE 67X7
5034  5132  5667          JMP I   CHNDEV                  /EXIT AND RUN PROGRAM.
5035                /PROGRAM DEVICE CODE TABLE
5036                /
5037  5133  6201    XDEVICE,        K67X0           /VT78/SEL - SELECT UNIT A OR UNIT B
5038  5134  6206          K67X1
5039  5135  6401    XK67X2A,        K67X2A                  /XDR TRANSFER DATA REGISTER
5040  5136  6410    XK67X3A, K67X3A                         / STR (SKIP ON TRANSFER REQUEST FLAG)
5041  5137  6415    XK67X4A, K67X4A                         / SER (SKIP ON ERROR FLAG)
5042  5140  6422    XK67X5A, K67X5A                         / SDN (SKIP ON DONE FLAG)
5043  5141  6431    XK67X6A, K67X6                          / CLEAR (AC = 0) / SET (AC = 1) INTERRUPT ENABLE
5044  5142  6435    XK67X7A, K67X7A                         / INIT (INITIALIZE / IMPLIED READ TRACK 0 SECTOR 1)
5045  5143  0000          0                               /
5046                /
5047                /
5048                /
5049                /
5050                /
5051                /
5052                /ROUTINE TO DETERMINE IF ON APT.
5053                /
5054  5144  0000    XCHK22, 0
5055  5145  1022          TAD     22
5056  5146  0361          AND     (4000
5057  5147  7640          SZA CLA
5058  5150  5744          JMP I   XCHK22
5059  5151  2344          ISZ     XCHK22
5060  5152  5744          JMP I   XCHK22
5061
5062  5161  4000
5063  5162  6451
5064  5163  3637
5065  5164  3622
5066  5165  0701
5067  5166  0715
5068  5167  0707
5069  5170  3623
5070  5171  6404
5071  5172  5132
5072  5173  6700
5073  5174  0700
5074  5175  4114
5075  5176  5242
5076  5177  0260

      5200          PAGE
5077                /
5078                /ROUTINE TO TYPE 8 OCTAL DIGITS.
5079                /FORMAT TY8OCT; MSB(STARTING ADDRESS OF DOUBLE LOG TO BE PRINTED).
5080                /
5081  5200  0000    XTY8OCT,        0
5082  5201  1600          TAD I   XTY8OCT                 /GET STARTING ADDRESS
5083  5202  3212          DCA     .+10
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5084  5203  1600          TAD I   XTY8OCT
5085  5204  7001          IAC                             /SECOND ADDRESS
5086  5205  3211          DCA     .+4
5087  5206  7344          CLL CLA CMA RAL                 /-2
5088  5207  3175          DCA     XCNT
5089  5210  4505          TY4OCT
5090  5211  7000          NOP                             /REPLACED WITH POINTER TO BE
5091  5212  7000          NOP                             /PRINTED
5092  5213  2200          ISZ     XTY8OCT                 /UPDATE RETURN
5093  5214  5600          JMP I   XTY8OCT                 /EXIT
5094                /SUBROUTINE ; TAB
5095                /ENTRY ; TAB; +N
5096                /COMMENT ; PRINT " N " SPACES WHERE N IS VIA INDEXED XTAB
5097                /
5098  5215  5215    XTAB,   .
5099  5216  4500          SETUP
5100  5217  5215          XTAB
5101  5220  3243          DCA XXTAB       /FOR COUNT
5102  5221  7200    XTABL,  CLA
5103  5222  1243          TAD XXTAB
5104  5223  1615          TAD I XTAB      /FOR " N "
5105  5224  3243          DCA XXTAB
5106  5225  1320          TAD CHARLINE    / # OF CHARACTERS ALREADY TYPED ON THIS LINE
5107  5226  1377          TAD (110)       / 72 CHARACTER LINE STANDARD
5108  5227  7041          CIA
5109  5230  1243          TAD XXTAB
5110  5231  7550          SPA SNA
5111  5232  5221          JMP XTABL
5112  5233  7041          CIA
5113  5234  3243          DCA XXTAB
5114  5235  2215          ISZ XTAB
5115  5236  1376          TAD (240)
5116  5237  4506          TYPEIT
5117  5240  2243          ISZ XXTAB
5118  5241  5236          JMP .-3
5119  5242  5775'         JMP THENEXIT
5120  5243  0000    XXTAB,  0
5121                /
5122                /SUBROUTINE ; PRINT
5123                /ENTRY ;
5124                /COMMENT ; PRINT A " MESSAGE ",  AND A <CR><LF> AT EACH _
5125                /
5126                /  CALL SYNTAX FOR PRINT
5127                /
5128                /  1.  PRINT; MTEXT
5129                /
5130  5244  5244    XPRINT, .
5131  5245  4472          CHEK22
5132  5246  5341          JMP     PNTEXT
5133  5247  4507          WAITTY
5134  5250  1644          TAD I XPRINT    / " TEXT"
5135  5251  2244          ISZ     XPRINT
5136  5252  3262          DCA MESSAGE     /ADDRESS
5137  5253  1662    NUWORD, TAD I MESSAGE
5138  5254  4263          OUTPUT          /LEFT BYTE
```

```
5139  5255  1662          TAD I MESSAGE
5140  5256  2262          ISZ MESSAGE
5141  5257  4433          BSW
5142  5260  4263          OUTPUT          /RIGHT BYTE
5143  5261  5253          JMP NUWORD
5144  5262  0000    MESSAGE,0
5145        4263    OUTPUT=JMS .
5146  5263  5263    XOUTPUT,.
5147  5264  0374          AND (=100)      /MASK MS BITS 0-5
5148  5265  7440          SZA
5149  5266  5271          JMP .+3
5150  5267  3162          DCA TTYBUSY
5151  5270  5773'         JMP PIEXIT
5152  5271  1372          TAD (4100)
5153  5272  7450          SNA
5154  5273  5302          JMP NULINE      /
5155  5274  1371          TAD (=4100+2)   /CODE 200
5156  5275  7500          SMA
5157  5276  7001          IAC             /CODE 300
5158  5277  4433          BSW
5159  5300  4506          TYPEIT
5160  5301  5663          JMP I XOUTPUT
5161  5302  1263    NULINE, TAD XOUTPUT
5162  5303  3305          DCA XTYPEIT
5163  5304  5311          JMP XNULINE
5164  5305  5305    XTYPEIT,.
5165  5306  4321          JMS TY1ASC
5166  5307  2320          ISZ CHARLINE
5167  5310  5705          JMP I XTYPEIT
5168  5311  1370    XNULINE,TAD (15)        / <CR>
5169  5312  4321          JMS TY1ASC
5170  5313  1367          TAD (12)        / <LF>
5171  5314  4321          JMS TY1ASC
5172  5315  1366          TAD (=110)
5173  5316  3320          DCA CHARLINE    / 72 CHARACTER LINE (NEGATIVE NOTATION)
5174  5317  5705          JMP I XTYPEIT
5175  5320  7670    CHARLINE,       =110    / # CHARACTERS PER LINE ARE COUNTED HERE
5176                      /
5177        0014    A14=14
5178                      /
5179  5321  5321    TY1ASC, .
5180  5322  6002          IOF
5181  5323  3014          DCA A14
5182  5324  4472          CHEK22
5183  5325  5341          JMP     PNTEXT
5184  5326  4765'         JMS     CKSFLG          /GO CHECK IF ^S IS ACTIVE
5185  5327  1014          TAD A14

5186  5330  6046          TLS
5187  5331  7200          CLA
5188  5332  1162          TAD TTYBUSY
5189  5333  7640          SZA CLA
5190  5334  5773'         JMP PIEXIT
5191  5335  2162          ISZ TTYBUSY
5192  5336  1364          TAD (PI)
5193  5337  3002          DCA IPI
```



```
5194  5340  7410          SKP
5195  5341  2244    PNTEXT, ISZ     XPRINT                  /UPDATE RETURN.
5196  5342  6001          ION
5197  5343  5644          JMP I XPRINT
5198                      /
5199                      /
5200  5344  6042    XTCF,   TCF
5201  5345  1014          TAD A14
5202  5346  1363          TAD (=207)
5203  5347  7650          SNA CLA
5204  5350  5705          JMP I XTYPEIT
5205  5351  5721          JMP I TY1ASC
5206                      /
5207                      /
5208                      /
5209  5352  5352    XSPECIALTYPEIT, .
5210  5353  4500          SETUP
5211  5354  5352          XSPECIALTYPEIT
5212  5355  1752          TAD I XSPECIALTYPEIT
5213  5356  2352          ISZ XSPECIALTYPEIT
5214  5357  4506          TYPEIT
5215  5360  5775'         JMP THENEXIT
5216  5363  7571
5217  5364  5417
5218  5365  5400
5219  5366  7670
5220  5367  0012
5221  5370  0015
5222  5371  3702
5223  5372  4100
5224  5373  5510
5225  5374  7700
5226  5375  4114
5227  5376  0240
5228  5377  0110
            5400    PAGE
5229                /ROUTINE TO CHECK IF ^S IS ACTIVE
5230                /
5231  5400  0000    CKSFLG, 0
5232  5401  7001          IAC             /AC=1
5233  5402  6211          CDF 10
5234  5403  1777'         TAD     C8SFLG          /GO GET FLAG (7777 IF SET)
5235  5404  6201          CDF 0
5236  5405  7640          SZA CLA         /IS FLAG SET?
5237  5406  5600          JMP I   CKSFLG          /NO = RETURN
5238  5407  6212          CIF 10                  /CHANGE INSTR FIELD TO CONSOLE PACKAGE
5239  5410  4776'         JMS     C8ENTR          /GO TO CONSOLE PACKAGE
5240  5411  5600          JMP I   CKSFLG          /RETURN
5241                      /
5242                      /
5243                      /
5244                      /
5245  5412  5412    XWAITTY, .
5246  5413  1162          TAD TTYBUSY
5247  5414  7640          SZA CLA
```

```
5248  5415  5213          JMP .-2
5249  5416  5612          JMP I XWAITTY
5250                /ENTRY TO THIS POINT WAS CAUSED BY A PROGRAM INTERRUPT REQUEST
5251                /
5252  5417  3315    PI,   DCA XAC
5253  5420  7010          RAR
5254  5421  3316          DCA XLINK       /SAVE (AC) AND (LINK)
5255  5422  6031          KSF
5256  5423  7410          SKP
5257  5424  5775'         JMP XKCC        /IGNORE KEYBOARD IRQ
5258  5425  6041          TSF
5259  5426  5234          JMP PISDN
5260                /IF THIS TELEPRINTER FLAG IS EXPECTED (TTYBUSY) = 1
5261                /THEN "JMP XTCF"
5262                /IF NOT THEN "JMP PIEXIT"
5263                /
5264  5427  1162          TAD TTYBUSY
5265  5430  7740          SMA SZA CLA
5266  5431  5774'         JMP XTCF
5267  5432  6042          TCF
5268  5433  5310          JMP PIEXIT
5269                /IF (BUSY) = 1, THEN AN RX01 PI IS ALREADY BEING PROCESSED
5270                /
5271                /IF (GOBIT) = 0, THEN THIS DISKETTE IRQ IS UNEXPECTED
5272                /
5273                /DISABLE RX01 INTERRUPT
5274                /
5275                /READ RX01 STATUS REGISTER
5276                /
5277  5434  1162    PISDN,  TAD TTYBUSY
5278  5435  1111          TAD BUSY
5279  5436  7640          SZA CLA
5280  5437  5310          JMP PIEXIT
5281  5440  2111          ISZ BUSY
5282                /REFRESH PROGRAM LOCATION " FORCE "
5283                /
5284  5441  3325          DCA XXFORCE
5285                /
5286  5442  4445          SDN
5287  5443  5305          JMP UNKNOWN
5288  5444  1154          TAD GOBIT
5289  5445  7750          SPA SNA CLA
5290  5446  5773'         JMP SDNUNEXPECTED
5291  5447  4446          INTR
5292  5450  4441          XDRIN
5293  5451  0372          AND (377)
5294  5452  3126          DCA ASTATUS

5295                /IF THIS IS TEST # 30 THEN IGNORE DELETED DATA MARKS (IF ANY)
5296                /
5297  5453  1171          TAD TEST
5298  5454  1371          TAD (-T30)
5299  5455  7650          SNA CLA
5300  5456  5275          JMP DDIGNORE
5301                /TECHNICAL NOTE:
5302                /
```



```
5303                /THE COMMANDS "FILL BUFFER" (0), AND "EMPTY BUFFER" (2)
5304                /NEVER SHOULD ATTRACT THE "DELETED DATA" STATUS (100)
5305                /
5306  5457  1370          TAD (16)                /COMMAND MASK
5307  5460  0112          AND COMMAND             /FB (0), OR EB (2)
5308  5461  7440          SZA                     /SKIP IF FILL BUFFER COMMAND (0)
5309  5462  7112          CLL RTR
5310  5463  7640          SZA CLA                 /SKIP IF EMPTY BUFFER COMMAND (2)
5311  5464  7305          CLL CLA IAC RAL         /  2
5312  5465  0132          AND TESTP
5313  5466  7112          CLL RTR                 /PUT TO LINK
5314  5467  1367          TAD (100)               / 100
5315  5470  0126          AND ASTATUS             / A STATUS D.D. MASK
5316                /
5317                /IF (L) = 0 AND (AC) = 0, O.K. - NO D.D. MARK
5318                /
5319                /IF (L) = 0 AND (AC) > 0  (=100), UNEXPECTED D.D.
5320                /
5321                /IF (L) = 1 AND (AC) = 0, D.D. MARK EXPECTED DIDN'T OCCUR
5322                /
5323                /IF (L) = 1 AND (AC) > 0  (=100), O.K. - D.D. MARK OCCURED
5324                /
5325  5471  7430          SZL
5326  5472  7640          SZA CLA                 / (L) = 1
5327  5473  7440          SZA                     / (L) = 0, OR (L) = 1 AND (AC) > 0
5328  5474  5337          JMP DDERROR             / (L) = 0 AND (AC) > 0  (=100)  , OR (L) = 1 AND (AC) = 0
5329  5475  4444    DDIGNORE, SER
5330  5476  5300          JMP VERIFY              /RX01 OK - RETURN TO INLINE CODE
5331  5477  5771'         JMP RXERROR
5332                /
5333                /VERIFY THAT THE CONTENTS OF THE A-STATUS REGISTER = 0
5334                /
5335                /WHEN NO RX01 ERROR FLAG EXISTS
5336                /
5337                /MASK BITS 4 (DRIVE READY), AND 5 (DELETED DATA)
5338                /
5339  5500  1126    VERIFY, TAD ASTATUS
5340  5501  0366          AND (73)
5341  5502  7640          SZA CLA
5342  5503  5765'         JMP NOSER
5343  5504  5321          JMP XRETURN
5344                /
5345                /AN UNKNOWN PROGRAM INTERRUPT OCCURED
5346                /
5347  5505  4473    UNKNOWN, PRINT
5348  5506  7070          MUNKNOWN
5349  5507  3111          DCA BUSY
5350                /
5351  5510  1316    PIEXIT, TAD XLINK
5352  5511  7104          CLL RAL
5353  5512  1315          TAD XAC
5354  5513  6001          ION
5355  5514  5400          JMP I 0
5356  5515  0000    XAC,  0
5357  5516  0000    XLINK,  0
```

```
5358                    /THE CONTENTS OF RETURN ARE SETUP WITHIN THE SUBROUTINES "LCD-A" AND "LCD-B"
5359                    /TO REPRESENT THE RETURN ADDRESS OF THE INLINE TESTING
5360                    /
5361    5517  0000      RETURN, 0
5362                    /
5363    5520  2317      ERETURN, ISZ RETURN                     /INCREMENT FOR ERROR RETURN ADDRESS
5364                    /
5365                    /ENTRY TO HERE FROM PI SERVICE
5366                    /
5367                    /NO RX01 ERROR FLAG EXISTS
5368                    /
5369    5521  3111      XRETURN, DCA BUSY
5370    5522  4466              TICK                          /TIMING FOR APT IF NEEDED.
5371    5523  6001              ION
5372    5524  5717              JMP I RETURN
5373                    /...ENTRY TO THIS POINT MAY HAVE BEEN FROM WITHIN THE SUBROUTINE "COMPARE"
5374                    /WHICH DETECTED A DATA NO STATUS ERROR (DNS) , OR
5375                    /...ENTRY TO THIS POINT MAY HAVE BEEN FROM ROUTINES "XHUNGUP" OR "HUNGUP"
5376                    /THEREBY FORCING AN ERROR INFORMATION PRINTOUT
5377                    /
5378    5525  0000      XXFORCE,        0
5379    5526  2111              ISZ BUSY
5380    5527  5771'             JMP RXERROR
5381    5530  7240      XFORCE, STA
5382    5531  1111              TAD BUSY
5383    5532  3111              DCA BUSY
5384    5533  6001              ION
5385    5534  5725              JMP I XXFORCE
5386    5535  7020      DTYPE,  MEDDDIDNOT
5387    5536  7031              MUDDDID
5388                    /A DISKETTE DELETED DATA MALFUNCTION HAS BEEN DETECTED
5389                    /
5390                    / IF (AC) = 0 - EXPECTED D,D, DIDN'T OCCUR
5391                    / IF (AC) = 100 - UNEXPEDTED D,D, OCCURED
5392                    /
5393    5537  7640      DDERROR,        SZA CLA                 / 0 OR 1
5394    5540  7001              IAC
5395    5541  1364              TAD (DTYPE)
5396    5542  3137              DCA XXX
5397                    /PROGRAMMING NOTE: "SER" TO CLEAR ACCOMPANYING ERROR FLAG (IF ANY)
5398                    /
5399    5543  4444              SER
5400    5544  7000              NOP
5401    5545  1537              TAD I XXX
5402    5546  5771'             JMP RXERROR
5403    5564  5535
5404    5565  3322

5405    5566  0073
5406    5567  0100
5407    5570  0016
5408    5571  5600
5409    5572  0377
5410    5573  3320
5411    5574  5344
5412    5575  0323
```



```
5413    5576  0200
5414    5577  0404
              5600              PAGE
5415                    /A DISKETTE ERROR HAS BEEN DETECTED
5416                    /
5417                    / (DMTYPE) NOT = 0 IF A D,D, ERROR EXISTS
5418                    / (DMTYPE) = 0 IF NO D,D, ERROR EXISTS
5419                    /
5420    5600  3777'     RXERROR, DCA DMTYPE
5421                    /
5422    5601  1112              TAD COMMAND
5423    5602  3152              DCA ECOMMAND
5424    5603  1776'             TAD XXFORCE
5425    5604  1375              TAD (-XHUNG)
5426    5605  7650              SNA CLA
5427    5606  5246              JMP EERROR
5428    5607  1776'             TAD XXFORCE
5429    5610  1374              TAD (-XCOMPARE
5430    5611  7650              SNA CLA
5431    5612  5246              JMP EERROR
5432    5613  1373      SAVEBSTATUS, TAD (16)
5433    5614  4436              LCD
5434    5615  4471              WAIT
5435    5616  4445              SDN
5436    5617  5215              JMP     .-2
5437    5620  3006              DCA     6                     /WAIT POINTER
5438    5621  4444              SER
5439    5622  7000              NOP
5440    5623  4441              XDRIN
5441    5624  0372              AND (377)
5442    5625  3127              DCA BSTATUS
5443    5626  1771'     SAVECSTATUS, TAD UNIT
5444    5627  1370              TAD (12)
5445    5630  4436              LCD
5446    5631  4471              WAIT
5447    5632  4445              SDN
5448    5633  5231              JMP     .-2
5449    5634  3006              DCA     6                     /WAIT POINTER
5450    5635  4444              SER
5451    5636  7000              NOP
5452    5637  4441              XDRIN
5453    5640  0372              AND (377)
5454    5641  3130              DCA CSTATUS
5455                    /PRINT AN ERROR MESSAGE IF AC SW 4 = 0
5456                    /
5457    5642  4572      LASSW4, LAS
5458    5643  0367              AND (SW4)
5459    5644  7640              SZA CLA
5460    5645  5766'             JMP NOPRINT
5461                    /THE FOLLOWING INFORMATION IS PRINTED FOR ALL ERRORS DETECTED
5462                    /
5463                    /THE ERROR HEADER TEXT IS INHIBITED IF THE ERROR IS NOT THE FIRST ERROR EVER
5464                    /
5465                    /
5466                    /
```

```
                        /       FAT   CMND  XDR   CODE  RST   START     TARGET     XXXX   PASS
                        /
                        /
                        /
5646  1171              EERROR, TAD     TEST                            /GET TEST IN ERROR
5647  4467                      AERROR                          /REPORT ERROR TO APT.
5650  2115                      ISZ FIRSTERROR
5651  5255                      JMP NOHEADER
5652  4473                      PRINT
5653  6627                      MEHEADER
5654  5271                      JMP ONECRLF
                        /IF THIS IS =NOT= A FORCED TYPEOUT, AND IF THERE ARE NO DATA COMPARE
                        /ERRORS (COMPRERROR=0), THEN PRINT ONLY 1=CRLF
                        /BECAUSE
                        /
                        /THIS ERROR MUST BE AN ERROR AT THE END OF THE EMPTY BUFFER DONE FLAG
                        /WHICH WOULD BE ASSOCIATED TO ANY PREVIOUS FORCED TYPEOUT OF DATA ERRORS
                        /
5655  1776'             NOHEADER, TAD XXFORCE
5656  7650                      SNA CLA
5657  5267                      JMP TWOCRLF
5660  1113                      TAD COMPRERROR
5661  7640                      SZA CLA
5662  5271                      JMP ONECRLF
                        /IF THIS IS A FORCED TYPEOUT FROM " XXINIT " THEN PRINT 1 CRLF
                        /
5663  1776'                     TAD XXFORCE
5664  1365                      TAD (=XXINIT)
5665  7650                      SNA CLA
5666  5271                      JMP ONECRLF
5667  4473              TWOCRLF, PRINT
5670  6602                      MCRLF
5671  4473              ONECRLF, PRINT
5672  6602                      MCRLF
5673  4505                      TY4OCT
5674  0171                      TEST
5675  4504                      TAB
5676  0005                      5
5677  4764'                     JMS INITSWITCH
5700  5305                      JMP .+5
                        /IF AN ERROR FROM THE RECAL THEN PRINT [INIT] FOR THE COMAND
                        /
5701  1776'                     TAD XXFORCE
5702  1365                      TAD (=XXINIT)
5703  7640                      SZA CLA
5704  5310                      JMP .+4
5705  4473                      PRINT

5706  6671                      MINIT
5707  5312                      JMP TAB12
5710  4505                      TY4OCT
5711  0152                      ECOMMAND
5712  4504              TAB12,  TAB
5713  0012                      12
                        /
                        /IF THE DEVICE TEST IS HUNG, THEN THE A=, B=, AND C= STATUS IS NOT APPLICABLE
```



```
                        /
5714  1776'                     TAD XXFORCE
5715  1375                      TAD (=XHUNG)
5716  7650                      SNA CLA
5717  5325                      JMP DASHALL
                        /IF THIS IS A " FORCED " TYPEOUT THEN THE B= AND C=STATUS REGISTERS
                        /ARE NOT APPLICABLE TO THIS TYPEOUT BECAUSE THEY ARE RESIDUAL FROM THE
                        /PREVIOUS COMMAND WHICH WOULD HAVE HAD A PREVIOUS ERROR TYPE OUT
                        /RELATING TO THE B= AND C=STATUS REGISTERS IF AN ERROR HAD OCCURED
                        /
                        /A DATA NO ERROR STATUS HAS BEEN DETECTED PRIOR TO THE COMPLETION OF
                        /THE EMPTY BUFFER FUNCTION
                        /
5720  1776'                     TAD XXFORCE
5721  1374                      TAD (=XCOMPARE)
5722  7640                      SZA CLA
5723  5340                      JMP TYASTATUS
5724  5331                      JMP DASHBC
5725  4473              DASHALL, PRINT
5726  7017                      MDASH
5727  4504                      TAB
5730  0017                      17
5731  4473              DASHBC, PRINT
5732  7017                      MDASH
5733  4504                      TAB
5734  0024                      24
5735  4473                      PRINT
5736  7017                      MDASH; JMP TAB31
5737  5763'
5740  4505              TYASTATUS, TY4OCT
5741  0126                      ASTATUS
5742  4504                      TAB
5743  0017                      17
5744  4505                      TY4OCT
5745  0127                      BSTATUS
5746  4504                      TAB
5747  0024                      24
5750  5762'                     JMP TYCSTATUS
5762  6000
5763  6002
5764  6115
5765  1332
5766  6061
5767  0200
5770  0012
5771  4242
5772  0377
5773  0016
5774  4115
5775  4434
5776  5525
5777  6060
      6000                      PAGE
6000  4505              TYCSTATUS, TY4OCT
6001  0130                      CSTATUS
```

```
5576  6002  4504  TAB31,  TAB
5577  6003  0031          31
5578  6004  4315          JMS INITSWITCH
5579  6005  5211          JMP .+4
5580                /IF (SSTART) = 0 THEN PRINT "HOME" BECAUSE A RECAL HAS TAKEN PLACE
5581                /THEREFORE THE ACTUATOR IS AT TRACK 0 (HOME)
5582                /
5583  6006  1123          TAD SSTART
5584  6007  7640          SZA CLA
5585  6010  5214          JMP .+4
5586  6011  4473          PRINT
5587  6012  6665          MHOME
5588  6013  5222          JMP TAB43
5589  6014  4505          TY40CT
5590  6015  0125          START
5591  6016  4504          TAB
5592  6017  0036          36
5593  6020  4505          TY40CT
5594  6021  0123          SSTART
5595  6022  4504  TAB43,  TAB
5596  6023  0043          43
5597  6024  4315          JMS INITSWITCH
5598  6025  5232          JMP PHOME
5599                /IF (FORCE) = THE ADDRESS OF "XXINIT" THEN ALSO PRINT [HOME] FOR THE TARGET
5600                /
5601  6026  1777'         TAD XXFORCE
5602  6027  1376          TAD (-XXINIT)
5603  6030  7640          SZA CLA
5604  6031  5235          JMP .+4
5605  6032  4473  PHOME,  PRINT
5606  6033  6665          MHOME
5607  6034  5243          JMP .+7
5608  6035  4505          TY40CT
5609  6036  0131          TARGET
5610  6037  4504          TAB
5611  6040  0050          50
5612  6041  4505          TY40CT
5613  6042  0124          STARGET
5614  6043  4504          TAB
5615  6044  0055          55
5616  6045  4505          TY40CT
5617  6046  0132          TESTP
5618  6047  4504          TAB
5619  6050  0002          2
5620  6051  4434          TY80CT
5621  6052  0163          PASS
5622  6053  0164          PASS+1

5623  6054  1260          TAD DMTYPE
5624  6055  7650          SNA CLA
5625  6056  5261          JMP .+3
5626  6057  4473          PRINT
5627  6060  0000  DMTYPE, 0
5628                /
5629                /AC SW 11 TO INHIBIT RINGING OF BELL AT ERROR
5630                /
```



```
5631  6061  3115  NOPRINT, DCA FIRSTERROR
5632  6062  4572          LAS
5633  6063  0375          AND (SW11)
5634  6064  7640          SZA CLA
5635  6065  5270          JMP .+3
5636  6066  4501          SPECIALTYPEIT
5637  6067  0207          BELL
5638                /IF ENTRY WAS FROM A "JMS FORCE" THEN EXIT BY A "JMP I FORCE"
5639                /
5640  6070  1777'         TAD XXFORCE
5641  6071  7640          SZA CLA
5642  6072  5774'         JMP XFORCE
5643                /
5644                /DEFINITIVE ERROR CODES AND MEANINGS
5645                /
5646                /       0       /NO ERROR
5647                /       10      /DRIVE 0 FAILED TO SEE HOME ON INITIALIZE
5648                /       20      /DRIVE 1 FAILED TO SEE HOME ON INITIALIZE
5649                /       30      /FOUND HOME WHEN STEPPING OUT 10 TRACKS FOR INIT
5650                /       40      /TRIED TO ACCESS A TRACK GREATER THAN 77
5651                /       50      /HOME WAS FOUND BEFORE DESIRED TRACK WAS REACHED
5652                /       60      /SELF DIAGNOSTIC ERROR
5653                /       70      /DESIRED SECTOR COULD NOT BE FOUND AFTER LOOKING AT 52 HEADERS
5654                /       100     /WRITE PROTECT ERROR
5655                /       110     /MORE THAN 40US AND NO SEP CLOCK SEEN
5656                /       120     /A PREAMBLE COULD NOT BE FOUND
5657                /       130     /PREAMBLE FOUND BUT NO ID MARD FOUND WITHIN ALLOWABLE TIME
5658                /       140     /HEADER CRC ERROR
5659                /       150     /THE HEADER TRACK ADDRESS OF A GOOD HEADER DOES NOT COMPARE
5660                /               /WITH THE DESIRED TRACK
5661                /       160     /TO MANY TRIES FOR A IDAM
5662                /       170     /DATA AM NOT FOUNT WITHIN ALLOTED TIME
5663                /       200     /DATA CRC ERROR
5664                /       210     /ALL PARITY ERRORS
5665                /
5666                /RECAL IF DEFINITIVE ERROR CODE IS A SEEK ERROR
5667                /
5668                / (NOT CODES 140, 200, OR 210)
5669                /
5670  6073  4572  RECALIF, LAS
5671  6074  0373          AND (SW6)
5672  6075  7640          SZA CLA
5673  6076  5311          JMP LASSWO
5674  6077  1127          TAD BSTATUS
5675  6100  1372          TAD (-140)
5676  6101  7450          SNA
5677  6102  5311          JMP LASSWO
5678  6103  1371          TAD (-40)
5679  6104  7450          SNA
5680  6105  5311          JMP LASSWO
5681  6106  1370          TAD (-10)
5682  6107  7640          SZA CLA
5683  6110  4447          INIT
5684  6111  4572  LASSWO, LAS
5685  6112  7700          SMA CLA
```

```
5686  6113  4461          HLT16, HLT      /AC SW 0 = 1 (HALT ON ERROR)
5687  6114  5767'         JMP ERETURN
5688                      /
5689  6115  6115    INITSWITCH, .
5690  6116  1766'         TAD XWAIT
5691  6117  1365          TAD (-SDNSECOND)
5692  6120  7640          SZA CLA
5693  6121  2315          ISZ INITSWITCH
5694  6122  5715          JMP I INITSWITCH
5695                      /
5696                      /GENERATES TIMING FOR APT IF NEEDED.
5697                      /
5698  6123  0000    XOK,  0
5699  6124  7000          NOP
5700  6125  2323          ISZ   XOK                         /SKIP.
5701  6126  5723          JMP I XOK
5702                      /
5703                      /VT78/ROUTINE TO SELECT WHICH FLOPPY UNITS TO TEST
5704                      /
5705  6127  0000    SELUNT, 0
5706  6130  1114          TAD   DTESTP          /GET TEST PAPAMETERS
5707  6131  0373          AND   (40             /TEST BIT 6
5708  6132  7640          SZA CLA               /DO ONE OR BOTH UNITS?
5709  6133  7001          IAC                   /BOTH
5710  6134  7040          CMA                   /EITHER A OR B
5711  6135  3351          DCA   CHECKU          /7777=EITHER , 7776=BOTH
5712  6136  1351          TAD   CHECKU
5713  6137  7001          IAC
5714  6140  7640          SZA CLA
5715  6141  5346          JMP   SETUNT          /BOTH UNITS SELECTED- DO A THEN B
5716  6142  1114          TAD   DTESTP
5717  6143  0364          AND   (1000           /TEST BIT 2
5718  6144  7640          SZA CLA               /A OR B?
5719  6145  7001          IAC                   /B ONLY
5720  6146  3135    SETUNT, DCA   UNITCK        /UNIT A=0  UNIT B=1
5721  6147  4451          CKUNIT                /SET UP FOR UNIT A OR UNIT B
5722  6150  5727          JMP I SELUNT          /RETURN
5723  6151  0000    CHECKU, 0
5724  6164  1000
5725  6165  1340
5726  6166  1722
5727  6167  5520
5728  6170  7770
5729  6171  7740
5730  6172  7640
5731  6173  0040
5732  6174  5530

5733  6175  0001
5734  6176  1332
5735  6177  5525
            6200          PAGE
5736                      /VT78/ SELECT IOT TO SELECT EITHER UNIT A OR UNIT B
5737                      /IF AC11 (0) SELECT UNITA,  IF AC11 (1) SELECT UNIT B
5738                      /
5739  6200  0000    XSEL,  0
```



```
5740  6201  6750    K67X0,  6750
5741  6202  5600          JMP I XSEL
5742                      /THE CONTENTS OF THE AC AT ENTRY ARE THE CONTENTS OF PROGRAM LOCATION "TCOMMAND"
5743                      /
5744  6203  6203    XLCD,   .
5745  6204  3112          DCA COMMAND
5746  6205  1112          TAD COMMAND
5747  6206  6751    K67X1,  6751
5748  6207  5603          JMP I XLCD
5749                      /LOAD THE COMMAND FOR: FILL BUFFER, AND EMPTY BUFFER
5750                      /WITH THE RX01 INTERRUPT ENABLED
5751                      /
5752                      /FORM: (AC) IS  COMMAND; LCDA; NORMAL RETURN; ERROR RETURN
5753                      /
5754  6210  6210    XLCDA,  .
5755  6211  1777'         TAD UNIT
5756  6212  3112          DCA COMMAND
5757                      /THE CONTENTS OF THE AC WILL = 100 IF 8 BIT MODE
5758                      /
5759  6213  7307          CLL CLA IAC RTL
5760  6214  0132          AND TESTP
5761  6215  7640          SZA CLA
5762  6216  1376          TAD (100)
5763  6217  1112          TAD COMMAND
5764  6220  3112          DCA COMMAND
5765  6221  1112          TAD COMMAND
5766  6222  4436          LCD
5767  6223  1210          TAD XLCDA
5768  6224  3775'         DCA RETURN
5769  6225  2210          ISZ XLCDA
5770  6226  2210          ISZ XLCDA
5771  6227  1374          TAD (PI)
5772  6230  3002          DCA IPI
5773  6231  7201          CLA IAC
5774  6232  4446          INTR
5775  6233  6001          ION
5776  6234  5610          JMP I XLCDA
5777                      /
5778                      /LOAD THE COMMAND AND THE TRACK AND SECTOR ADDRESSES AND GO WITH INTERRUPT ENABLE !
5779                      /
5780                      /FORM: (AC) IS COMMAND; LCDB; NORMAL RETURN; ERROR
5781                      /
5782  6235  6235    XLCDB,  .
5783  6236  1777'         TAD UNIT                  / 0 OR 20
5784  6237  3112          DCA COMMAND               /TEMPORARY STORAGE
5785                      /
5786                      /WHEN THE CONTENTS OF " GOBIT " ARE = 0 ; NO PROGRAM IRQ IS EXPECTED FROM THE DISK
5787                      /
5788  6240  7307          CLL CLA IAC RTL           / 4
5789  6241  0132          AND TESTP                 /TESTP FOR 8/12 BIT MODE SELECTION
5790  6242  7640          SZA CLA
5791  6243  1376          TAD (100)                 / 100 FOR 8 BIT MODE SELECTION
5792  6244  1112          TAD COMMAND               / 4, 14 OR 6
5793  6245  3112          DCA COMMAND
5794  6246  1112    LCDBL,  TAD COMMAND
```

```
5795    6247  4436            LCD
5796                  /
5797                  /LOAD THE TRACK AND SECTOR ADDRESSES FOR THE COMMANDS:
5798                  /
5799                  /WRITE, OR WRITE DELETED DATA, OR READ SECTOR
5800                  /
5801    6250  1373            TAD (LCDBRETURN)
5802    6251  3775'           DCA RETURN
5803    6252  1372            TAD (NOP)
5804    6253  3315            DCA XLCDBRETURN
5805    6254  7201            CLA IAC
5806    6255  4446            INTR                    /ENABLE RX01 INTERRUPT
5807    6256  4443            STR
5808    6257  5256            JMP .-1                 /SKIP ON TRANSFER REQUEST FLAG
5809    6260  1124            TAD STARGET
5810    6261  4442            XDROUT          / SECTOR
5811    6262  4443            STR
5812    6263  5262            JMP .-1                 /SKIP ON TRANSFER REQUEST FLAG
5813    6264  1131            TAD TARGET
5814    6265  4442            XDROUT          / TRACK
5815    6266  1374            TAD (PI)
5816    6267  3002            DCA IPI
5817                  /
5818                  /WAIT FOR A PROGRAM INTERRUPT REQUEST
5819                  /
5820                  / ; BUT WHILE WAITING, DISPLAY IN THE MQ THE CODED INFORMATION
5821                  /AS INDICATED BY ACCUMULATOR SWITCHES 9, 10, AND 11 AT RUN-TIME
5822                  /
5823                  /               0 = TARGET TRACK AND SECTOR
5824                  /               1 = TEST PARAMETERS (SELECTED FROM SA 200)
5825                  /               2 = " A " STATUS
5826                  /               3 = " COMMAND " WORD TO RX01
5827                  /
5828    6270  6001    XPI,    ION
5829    6271  1371            TAD (-40)
5830    6272  3116            DCA HANGER
5831    6273  4572            LAS
5832    6274  0370            AND (SW10+SW11)
5833    6275  1367            TAD (TAD I DISPLAY)
5834    6276  3277            DCA .+1
5835    6277  1710            TAD I DISPLAY
5836    6300  7421            MQL
5837    6301  2153            ISZ H1
5838    6302  5273            JMP XPI+3
5839    6303  2116            ISZ HANGER
5840    6304  5273            JMP XPI+3
5841    6305  7200            CLA

5842    6306  1366            TAD (XPI)
5843    6307  5765'           JMP HUNGUP
5844    6310  0151    DISPLAY, XTARGET
5845    6311  0132            TESTP
5846    6312  0126            ASTATUS
5847    6313  0112            COMMAND
5848                  /RETURN TO HERE IF ANY ERROR OCCURS (OF IF "DONE" FLAG OCCURS)
5849                  /
```



```
5850                  /IF A PARITY ERROR OCCURS THEN RETRY TO LOAD THE COMMAND
5851                  /
5852                  /IF NOT A PARITY ERROR THEN THIS MUST BE THAT "DONE" FLAG I MENTIONED
5853                  /
5854    6314  5326    LCDBRETURN, JMP OTHERRORS               / "JMP OTHERRORS" IF RETURN IS OK
5855    6315  7000    XLCDBRETURN, NOP
5856    6316  7305            CLL CLA IAC RAL
5857    6317  0126            AND ASTATUS
5858    6320  7650            SNA CLA
5859    6321  5326            JMP OTHERRORS
5860                  /PARITY ERROR = RETRY
5861                  /
5862    6322  2146            ISZ PRETRY
5863    6323  5246            JMP LCDBL
5864    6324  4502            SCOPE
5865    6325  5453            EXIT
5866                  /
5867                  /THESE ARE ALL OTHER ERRORS WHICH MAY OCCUR
5868                  /
5869    6326  1364    OTHERRORS, TAD (JMP OTHERRORS)
5870    6327  3315            DCA XLCDBRETURN
5871                  /
5872    6330  1373            TAD (LCDBRETURN)
5873    6331  7041            CIA
5874    6332  1775'           TAD RETURN
5875    6333  1235            TAD XLCDB
5876    6334  3235            DCA XLCDB
5877    6335  5635            JMP I XLCDB
5878                  /TRANSFER DATA REGISTER (FROM) THE RX01 CONTROL
5879                  /
5880    6364  5326
5881    6365  3341
5882    6366  6270
5883    6367  1710
5884    6370  0003
5885    6371  7740
5886    6372  7000
5887    6373  6314
5888    6374  5417
5889    6375  5517
5890    6376  0100
5891    6377  4242
              6400            PAGE
5892    6400  6400    XXDRIN, .
5893    6401  6752    K67X2A, 6752
5894    6402  5600            JMP I XXDRIN
5895                  /TRANSFER DATA REGISTER (TO) THE RX01 CONTROL
5896                  /
5897    6403  6403    XXDROUT, .
5898    6404  6752    K67X2B, 6752
5899    6405  7200            CLA
5900    6406  5603            JMP I XXDROUT
5901                  /SKIP ON TRANSFER REQUEST
5902                  /
5903    6407  6407    XSTR,   .
```

```
 5904    6410  6753    K67X3A, 6753
 5905    6411  5607            JMP I   XSTR
 5906    6412  2207            ISZ     XSTR
 5907    6413  5607            JMP I   XSTR
 5908                    /
 5909    6414  6414    XSER,   .
 5910    6415  6754    K67X4A, 6754
 5911    6416  5614            JMP I   XSER
 5912    6417  2214            ISZ     XSER
 5913    6420  5614            JMP I   XSER
 5914                    /SKIP ON RX01 DONE FLAG
 5915                    /
 5916    6421  6421    XSDN,   .
 5917    6422  6755    K67X5A, 6755
 5918    6423  5621            JMP I   XSDN
 5919    6424  2221            ISZ     XSDN
 5920    6425  5621            JMP I   XSDN
 5921                    /ENABLE / DISABLE RX01 INTERRUPT ENABLE
 5922                    /
 5923                    /   AC = 1 AT ENTRY TO ENABLE INTERRUPT
 5924                    /
 5925                    /FORM: (AC = 0, OR 1); INTR
 5926                    /
 5927                    / (GOBIT) = 0, NO RX01 PI IS EXPECTED
 5928                    /
 5929                    / (GOBIT) = 1, AN RX01 PI IS EXPECTED
 5930                    /
 5931    6426  6426    XINTR,  .
 5932    6427  3154            DCA GOBIT
 5933    6430  1154            TAD GOBIT
 5934    6431  6756    K67X6, 6756
 5935    6432  7200            CLA
 5936    6433  5626            JMP I XINTR
 5937                    /INITIALIZE (POWER CLEAR) THE RX01 SUBSYSTEM
 5938                    /
 5939    6434  6434    XINIT,  .
 5940    6435  6757    K67X7A, 6757
 5941                    /THE LABLE " SDNSECOND " MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN " ERROR "
 5942                    /
 5943    6436  4451            CKUNIT                  /GO CHECK IF ON UNIT A(RXA) OR UNIT B
 5944    6437  4471            WAIT
 5945    6440  4445    SDNSECOND, SDN
 5946    6441  5237            JMP     .-2
 5947    6442  3006            DCA     6                       /WAIT POINTER
 5948    6443  4444            SER
 5949    6444  5246            JMP XXINIT
 5950                    /AN ERROR HAS OCCURED FROM THE "INIT"

 5951                    /
 5952                    / [HOME] WAS THE TARGET
 5953                    /
 5954    6445  4576            FORCE
 5955    6446  3123    XXINIT, DCA SSTART
 5956    6447  5634            JMP I XINIT
 5957                    /
 5958                    /
```



```
 5959                    /
 5960    6450  6450    XINITB, .
 5961    6451  6757    K67X7B, 6757
 5962    6452  5650            JMP I XINITB
 5963    6453  3737    REMOVE, TEXT    "__REMOVE DIAGNOSTIC DISKETTE"
         6454  2205
         6455  1517
         6456  2605
         6457  4004
         6460  1101
         6461  0716
         6462  1723
         6463  2411
         6464  0340
         6465  0411
         6466  2313
         6467  0524
         6470  2405
         6471  0000
 5964    6472  3737    MIDENTIFICATION,TEXT    "__MAINDEC-08-DIRXA-D"
         6473  1501
         6474  1116
         6475  0405
         6476  0355
         6477  6070
         6500  5504
         6501  1122
         6502  3001
         6503  5504
         6504  0000
 5965    6505  3737    MSELECT,        TEXT "__SELECT PARAMETERS (INCLUDING DEVICE CODE)"
         6506  2305
         6507  1405
         6510  0324
         6511  4020
         6512  0122
         6513  0115
         6514  0524
         6515  0522
         6516  2340
         6517  5011
         6520  1603
         6521  1425
         6522  0411
         6523  1607
         6524  4004
         6525  0526
         6526  1103
         6527  0540
         6530  0317
         6531  0405
         6532  5100
 5966    6533  3737    MDTESTP,        TEXT  "__TEST PARAMETERS: "
         6534  2405
         6535  2324
```

```
                6536  4020
                6537  0122
                6540  0115
                6541  0524
                6542  0522
                6543  2372
                6544  4000
 5967           6545  3737    MXEHEADER,      TEXT "__ERR  FAT  FAST      EAC  GOOD PASS"
                6546  0522
                6547  2240
                6550  4006
                6551  0124
                6552  4040
                6553  0601
                6554  2324
                6555  4040
                6556  4040
                6557  4040
                6560  0501
                6561  0340
                6562  4007
                6563  1717
                6564  0440
                6565  2001
                6566  2323
                6567  0000
 5968           6570  3727    MX2HEADER,      TEXT "_WORD GOOD BAD"
                6571  1722
                6572  0440
                6573  0717
                6574  1704
                6575  4002
                6576  0104
                6577  0000
 5969           6600  5440    MCOMMA,         TEXT ", "
                6601  0000
 5970           6602  3700    MCRLF,          TEXT "_"
 5971           6603  3705    MEOT,           TEXT "_END OF TEST "
                6604  1604
                6605  4017
                6606  0640
                6607  2405
                6610  2324
                6611  4000
 5972           6612  3704    MHUNGPC,        TEXT "_DEVICE TEST HUNG AT PC "
                6613  0526
                6614  1103

                6615  0540
                6616  2405
                6617  2324
                6620  4010
                6621  2516
                6622  0740
                6623  0124
                6624  4020
```



```
                6625  0340
                6626  0000
 5973           6627  3737    MEHEADER,       TEXT "__FAT  CMND XDR  CODE  RSTA  START     TARGET    TEST PASS"
                6630  0601
                6631  2440
                6632  4003
                6633  1516
                6634  0440
                6635  3004
                6636  2240
                6637  4003
                6640  1704
                6641  0540
                6642  4022
                6643  2324
                6644  0140
                6645  4023
                6646  2401
                6647  2224
                6650  4040
                6651  4040
                6652  4024
                6653  0122
                6654  0705
                6655  2440
                6656  4040
                6657  4024
                6660  0523
                6661  2440
                6662  2001
                6663  2323
                6664  0000
 5974           6665  3310    MHOME,          TEXT "[HOME]"
                6666  1715
                6667  0535
                6670  0000
 5975           6671  1116    MINIT,          TEXT "INIT"
                6672  1124
                6673  0000
 5976           6674  3737    MOD,            TEXT "__OD = "
                6675  1704
                6676  4075
                6677  4000
 5977           6700  4011    MID,            TEXT " ID = "
                6701  0440
                6702  7540
                6703  0000
 5978           6704  4006    MFIRST,         TEXT " FIRST = "
                6705  1122
                6706  2324
                6707  4075
                6710  4000
 5979           6711  4014    MLAST,          TEXT " LAST = "
                6712  0123
                6713  2440
```

```
                6714  7540
                6715  0000
5980            6716  3727    MWRITE,         TEXT "_WRITE="
                6717  2211
                6720  2405
                6721  5500
5981            6722  3722    MREAD,          TEXT "_READ="
                6723  0501
                6724  0455
                6725  0000
5982            6726  1617    MDNSERROR,      TEXT "NO CRC BUT"
                6727  4003
                6730  2203
                6731  4002
                6732  2524
                6733  0000
5983            6734  0322    MDWESERROR,     TEXT "CRC AND"
                6735  0340
                6736  0116
                6737  0400
5984            6740  0322    MSNDERROR,      TEXT "CRC BUT NO DATA ERROR"
                6741  0340
                6742  0225
                6743  2440
                6744  1617
                6745  4004
                6746  0124
                6747  0140
                6750  0522
                6751  2217
                6752  2200
5985            6753  4004    MDATAERROR,     TEXT " DATA ERROR_"
                6754  0124
                6755  0140
                6756  0522
                6757  2217
                6760  2237
                6761  0000
5986            6762  2717    MWORD,          TEXT "WORD"
                6763  2204
                6764  0000
5987            6765  0231    MBYTE,          TEXT "BYTE"
                6766  2405
                6767  0000
5988            6770  4007    MGB,            TEXT " GOOD BAD"
                6771  1717
                6772  0440

                6773  0201
                6774  0400
5989            6775  3723    MSUMCHECK,      TEXT "_SUM=CHECK IS "
                6776  2515
                6777  5503
                7000  1005
                7001  0313
                7002  4011
```



```
                7003  2340
                7004  0000
5990            7005  1713    MOK,            TEXT "OK"
                7006  0000
5991            7007  3724    MDESUMMARY,     TEXT "_TOTAL BAD = "
                7010  1724
                7011  0114
                7012  4002
                7013  0104
                7014  4075
                7015  4000
5992            7016  7200    MCOLON,         TEXT ":"
5993            7017  5500    MDASH,          TEXT "-"
5994            7020  3715    MEDDDIDNOT,     TEXT "_MISSING DD MARK"
                7021  1123
                7022  2311
                7023  1607
                7024  4004
                7025  0440
                7026  1501
                7027  2213
                7030  0000
5995            7031  3725    MUDDDID,        TEXT "_UNEXPECTED DD MARK"
                7032  1605
                7033  3020
                7034  0503
                7035  2405
                7036  0440
                7037  0404
                7040  4015
                7041  0122
                7042  1300
5996            7043  3725    MSDNUNEXPECTED, TEXT "_UNEXPECTED RX01 IRQ"
                7044  1605
                7045  3020
                7046  0503
                7047  2405
                7050  0440
                7051  2230
                7052  6061
                7053  4011
                7054  2221
                7055  0000
5997            7056  3715    MNOSER,         TEXT "_MISSING ERROR FLAG"
                7057  1123
                7060  2311
                7061  1607
                7062  4005
                7063  2222
                7064  1722
                7065  4006
                7066  1401
                7067  0700
5998            7070  3737    MUNKNOWN,       TEXT "__UNKNOWN IRQ"
                7071  2516
```

```
                7072  1316
                7073  1727
                7074  1640
                7075  1122
                7076  2100
 5999           7077  3704    MDEV,   TEXT "-DEVICE CODE TO BE USED  "
                7100  0526
                7101  1103
                7102  0540
                7103  0317
                7104  0405
                7105  4024
                7106  1740
                7107  0205
                7110  4025
                7111  2305
                7112  0440
                7113  4000
 6000                   /THE FOLLOWING IS THE WRITE BUFFER ALLOCATED STORAGE
 6001                   /
 6002           7114    WBUFFER=.
 6003           7314    RBUFFER=WBUFFER+200
 6004           7514            *RBUFFER+200
 6005
 6006
 6007
 6008
 6009           0200                    *200                    /AUTO START BINARY
 6010
 6011                   $$$
```



```
0000  11100000  11110000  11101111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11000001  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11110000  00000000  00000000  00011111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11100000  00000000  01111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11100000  01111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11000000  00111111  11111111  11111111


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111110  00011111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  00000011  11111111  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111110  00111111  11111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111100  00001111  11111111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111110  00111111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11110000  00001111  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11100000  00111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11110011  11111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11100000  00000000  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00001111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10111111


5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11100000  01111111  11111111

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  10011111  11111111

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111110  00000000  00001111  11111111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  10000000  00111111  11111111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11000000  00001111  11111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111100  00000000  00000000  00001111  11111111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


7000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7100  11111111  11110000  00000000  00000000  00000000  00000000  00000000  00000000

7200
7300


7400
7500

7600
7700
```



```
A10       0010        C8K212    0413        CKUNIT    4451        E2        0617
A11       0011        C8K215    0412        CLKCNT    4151        E20       0655
A12       0012        C8K240    0045        CNOTFI    3720        E21       0660
A13       0013        C8K260    0046        CNTVAL    0663        E210      4557
A14       0014        C8K275    0047        COMMAN    0112        E211      2320
ACL       7701        C8K277    0050        COMP      2746        E212      2332
ACTIVE    0741        C8K303    0414        COMPAR    3601        E22       0663
AERROR    4467        C8K307    0415        COMPRE    0113        E23       0666
ALT12     1400        C8K322    0051        COUNT     4152        E24       0671
ALT12L    1403        C8K323    0052        CRCERR    3456        E240      2030
ANDBET    4113        C8K336    0416        CSTATU    0130        E241      2070
APTR      4470        C8K7      0044        DASHAL    5725        E242      2101
APOUND    0233        C8K77     0407        DASHBC    5731        E245      2033
ASTATU    0126        C8LOPA    0231        DATAER    3643        E25       0674
BELL      0207        C8M10     0042        DCACTI    0732        E26       0704
BITMOD    3763        C8M260    0043        DCADOA    2531        E27       0712
BLANK     0170        C8M3      0037        DCATAR    4332        E270      2135
BSTATU    0127        C8M4      0040        DDERRO    5537        E271      2140
BSW       4433        C8M40     0410        DDIGNO    5475        E272      2151
BSWAC     2623        C8M5      0041        DIGITS    5063        E28       0720
BSWLIN    2624        C8MODE    0035        DISPLA    6310        E2PRE     0415
BSWRAL    2622        C8OCTA    4427        DMTYPE    6060        E3        0623
BUSY      0111        C8PASS    4426        DNS       3510        E30       0744
C87600    0417        C8PFLD    0543        DNSLOG    0143        E3PRE     0425
C8BLD     0400        C8PRNT    4426        DOA       2536        E40       1044
C8BV1     0640        C8PSW     0216        DOB       2537        E41       1060
C8CDF     0033        C8RET2    0526        DOCNT     0660        E42       1021
C8CDI     0032        C8RET3    4131        DONE      4454        E4PRE     0450
C8CHAR    0031        C8RET4    3317        DOPACK    0611        E50       1105
C8CK22    1060        C8RTN     0402        DOSET     0662        E51       1114
C8CKP     1057        C8SFLG    0404        DRVZRO    2743        E52       1123
C8CKSW    4425        C8SRLP    0252        DTESTP    0114        E53       1111
C8CNTL    0420        C8STAR    0200        DTYPE     5535        E54       1120
C8CNTR    0036        C8STRT    0401        DWESER    3700        E55       1127
C8CRLF    0523        C8SWR     0034        DWS       3510        E56       1102
C8CTLC    0465        C8TEMP    0030        DWSLOG    0142        E60       1142
C8CTLG    0457        C8TEST    0337        E0        0607        E61       1154
C8CTLQ    0455        C8TMP1    1056        E0PRE     0412        E62       1157
C8CTLS    0437        C8TTY     0514        E1        0613        E63       1162
C8DO1     1005        C8TYP     0502        E10       0647        E70       1212
C8DO4     1043        C8WAIT    0444        E100      1226        E7000     2405
C8ECHO    0475        CAF       6007        E11       0632        E7001     2416
C8ENTR    0200        CCNT      5066        E110      1252        E7002     2432
C8ERR     0316        CHARLI    5320        E120      1311        E7003     2446
C8EXI1    0531        CHECKC    4424        E121      1315        E7004     2457
C8EXT2    0541        CHECKU    6151        E122      1321        E7005     2511
C8EXTB    0707        CHEK22    4472        E123      1326        E7006     2473
C8FLG     0403        CHGMSK    2750        E124      1276        EA120     1412
C8GET1    0704        CHNDEV    5067        E130      1513        EA121     1416
C8K100    0411        CKCOUT    0642        E131      1526        EA122     1440
C8K177    0405        CKSFLG    5400        E140      1661        EA123     1451
C8K200    0406        CKSWIT    4572        E1PRE     0445        EAC       0167
```

```
EB          1622        INMODE  0351        MDASH   7017        NUREAD  3521
EBCOMP      1630        INSUMC  3762        MDATAE  6753        NUWORD  5253
EBLOOP      1635        INTR    4446        MDESUM  7007        NXTUNT  0523
EBOK        1663        IOF     6002        MDEV    7077        OD      0027
ECOMMA      0152        ION     6001        MDNSER  6726        OK      4465
EERROR      5646        IPI     0002        MDTEST  6533        OKSTAR  4643
EMPTY       3617        IRDWR   2000        MDWESE  6734        ONECRL  5671
EMPTYE      4011        ISZCOM  3757        MEDDDI  7020        OTHERR  6326
EMPTYL      4000        ISZDIG  5042        MEHEAD  6627        OUTPUT  4263
EMPTYO      4022        JMPDIG  5032        MEOT    6603        PACKDO  4531
ENDCOM      3636        JMPICO  3600        MESPAS  0664        PASCNT  0661
EPCSCO      1364        JMPWHI  3263        MESSAG  5262        PASS    0163
EPETUR      5520        K0007   0174        MFIRST  6704        PAT2    3125
EPROR       4452        K6500   4150        MGB     6770        PAT3    3126
ERRORS      1365        K6520   4361        MHOME   6665        PAT4    3127
EXIT        5453        K67X0   6201        MHUNGP  6612        PAT5    3130
EXITCK      4534        K67X1   6206        MID     6700        PAT6    3140
FB          1472        K67X2A  6401        MIDENT  6472        PATSUM  0155
FB198B      4541        K67X2B  6404        MINIT   6671        PATTER  3115
FBER        1477        K67X2C  3623        MLAST   6711        PCLF    6662
FILL        3221        K67X3A  6410        MNOSER  7056        PCSCOP  1366
FILLER      3226        K67X3B  0707        MOD     6674        PHOME   6032
FILLOK      3237        K67X4A  6415        MOK     7005        PI      5417
FIRST       0031        K67X4B  0715        MORETE  0452        PIEXIT  5510
FIRSTE      0115        K67X5A  6422        MQA     7501        PISDN   5434
FIRSTT      0453        K67X5B  0701        MQL     7421        PNTEXT  5341
FORCE       4576        K67X6   6431        MREAD   6722        PNTID   1531
GENTES      3131        K67X6B  3622        MSB     0161        POLL    4237
GETAPA      4455        K67X6C  3637        MSDNUN  7043        PRETES  0400
GETASE      4456        K67X7A  6435        MSELEC  6505        PRETRY  0146
GETATR      4457        K67X7B  6451        MSNDER  6740        PRINT   4473
GETUNI      4460        K7000   0173        MSUMCH  6775        PSIE    6665
GUBTT       0154        K7377   1561        MUDDDI  7031        PSKE    6663
GOOD        0166        K7777   0117        MUNKNO  7070        PSKF    6661
GTF         6004        KRETRY  0121        MWORD   6762        PSIB    6664
H1          0153        LAS     4572        MWRITE  6716        PTSTOR  1033
HALT        4461        LASSW0  6111        MX      0522        Q461D   4505
HANGER      0116        LASSW4  5642        MX2HEA  6570        Q46OD   4513
HLT         4461        LAST    0032        MXEHEA  6545        Q4OD    4454
HLT16       6113        LCD     4436        NEXT    4210        Q6OD    4500
HLTA        4101        LCDA    4437        NEXTAC  0746        QUIET   3335
HLTT        3507        LCDB    4440        NEXTSE  4625        R1      4726
HLTNOP      1562        LCDBL   6246        NOHEAD  5655        R1RETR  0140
HUNGPC      3353        LCDBRE  6314        NOMORE  0465        R2      4727
HUNGUP      3341        LOCKUP  4464        NOPRIN  6061        R2RETR  0141
ID          0030        LSB     0160        NORX01  0431        RANGEN  4712
IF          4710        MASK    0136        NOSCOP  1340        RBUFFE  7314

INIT        4447        MASK1   2747        NOSER   3322        RDC     0120
INITB       4450        MBYTE   6765        NOSET   0652        RDORWR  3552
INITSE      4462        MCOLON  7016        NOTCL8  4537        READ    4474
INITSW      6115        MCOMMA  6600        NOTEST  5453        READCO  4475
INITTR      4463        MCRLF   6602        NULINE  5302        READER  3441
```



```
READL       3422        SW0     4000        TADLAS  3273        XAC     5515
READOK      3531        SW1     2000        TARGET  0131        XAERRO  4346
READRE      3425        SW10    0002        TEST    0171        XANDRE  4120
REBRGI      0511        SW11    0001        TEST1   2524        XAPT8   1545
RECALI      6073        SW2     1000        TEST2   2522        XASTAT  3761
REFILL      3214        SW3     0400        TEST3   2516        XBSW    2600
REMOVE      6453        SW4     0200        TEST4   2514        XC      0300
RERRAD      3432        SW5     0100        TEST5   2526        XC8CHA  0350
RESEEK      3434        SW6     0040        TESTP   0132        XC8ENT  4425
RESPOU      4274        SW7     0020        TESTS   4730        XC8OCT  1035
RETURN      5517        SW8     0010        TESTX   2532        XC8PAS  0600
REWRIT      3206        SW9     0004        TESTXL  2535        XC8PNT  1000
RLORGE      3547        T0      0600        THEL    3003        XC8SW   0673
ROK         3543        T1      0626        THENEX  4114        XCHECK  4516
RST         4476        T10     1215        THETES  3000        XCHK22  5144
RSTART      0200        T11     1233        TICK    4466        XCKSWI  3400
RSTR        4477        T12     1260        TRACKS  0147        XCKUNT  2335
RXERRO      5600        T13     1456        TSTUNT  2732        XCNT    0175
RXHERE      0165        T14     1603        TTRACK  0150        XCOMPA  3663
SAVEBS      5613        T15     1601        TTYBUS  0162        XCRCER  3505
SAVECS      5626        T16     1455        TWOCRL  5667        XD      0400
SCODE       4502        T17     1602        TX      2303        XDEVIC  5133
SCODIN      1357        T2      0652        TY1ASC  5321        XDONE   4243
SDN         4445        T20     1600        TY4OCT  4505        XDRIN   4441
SDNSEC      6440        T20STR  2323        TY8OCT  4434        XDROUT  4442
SDNUNE      3320        T20XDR  2310        TYASTA  5740        XEMPTY  4072
SECTOR      0122        T21     1675        TYCSTA  6000        XERROR  2625
SEL         4435        T22     1674        TYPEIT  4506        XFLENG  3715
SELUNT      6127        T23     2265        UNIT    4242        XFORCE  5530
SEQ         4276        T24     1714        UNITCK  0135        XGETAP  3035
SEQ000      4306        T25     1716        UNITS   4235        XGETAS  4607
SEQ001      4317        T26     1720        UNITX   4241        XGETAT  4261
SEQ010      4400        T27     2107        UNITZ   4240        XGETUN  4200
SEQ100      4444        T3      0723        UNKNOW  5505        XHALT   4121
SEQ111      4330        T30     2200        UREAD   3524        XHUNG   3344
SEQ3        4422        T31     2202        VERIFY  5500        XI      1100
SEQ6        4465        T32     2223        VT78CK  1165        XINIT   6434
SER         4444        T33     2241        WAIT    4471        XINITB  6450
SETUNT      6146        T34     2300        WAITTY  4507        XINITS  4600
SETUP       4500        T35     2276        WBUFFE  7114        XINITT  4250
SHIFT       5015        T36     2277        WHICHR  3267        XINTR   6426
SHIFTS      5065        T37     2275        WNOTOK  3264        XK67X2  5135
SND         3510        T4      1000        WORDX   0156        XK67X3  5136
SNDLOG      0144        T4B     1004        WORDY   0157        XK67X4  5137
SPECIA      4501        T5      1071        WRESEE  3212        XK67X5  5140
SRETRY      0145        T6      1132        WRITE   4510        XK67X6  5141
SSTART      0123        T7      1200        WRITEL  3204        XK67X7  5142
STARGE      0124        T70K    1213        WRITEO  3257        XKCC    0323
START       0125        TAB     4504        WRITER  3246        XLCD    6203
STOPNT      1034        TAB12   5712        WUNITS  4236        XLCDA   6210
STR         4443        TAB31   6002        XA10    0133        XLCDB   6235
SUBRO       4503        TAB43   6022        XA11    0134        XLCDBR  6315
```

```
XLINK   5516            XXX     0137
XLOCKU  2545            XYTHEL  3026
XMESSA  3334            ZERO    5057
XMX     0657
XNOPRI  2715
XNULIN  5311
XOCTAL  5062
XOK     6123
XOUTPU  5263
XPAT6   3145
XPATTE  3103
XPI     6270
XPRINT  5244
XRDC    3420
XREAD   3416
XREADC  3412
XRETUR  5521
XRST    2441
XRSTB   2400
XSCOPE  1333
XSDN    6421
XSEL    6200
XSEQ    4333
XSEQ2   4413
XSEQ3   4433
XSER    6414
XSETUP  4103
XSHIFT  5020
XSPECI  5352
XSSWOP  1344
XSTARG  4711
XSTR    6407
XTAB    5215
XTABL   5221
XTARGE  0151
XTCF    5344
XTHEL   3016
XTICK   4133
XTY4OC  5000
XTYAUC  5200
XTYDEI  5305
XWAIT   1722
XWAITT  5412
XWRTIE  3200
XXDMP   5064
XXDPIN  6400
XXDPOU  6403

XXFORC  5525
XXGETA  4610
XXINIT  6446
XXTAB   5243
XXTWEL  3024
```



```
ERRORS DETECTED: 0

LINKS GENERATED: 179

RUN-TIME:  10 SECONDS

3K CORE USED
```

SEQ 0154

SEQ 0155

```
CKSFLG   5184   5231#  5237   5240
CKSWIT    945   1144#
CKUNIT    977#  1347   2160   2190   2302   5721   5943
CLKCNT   1490   4388   4391   4399#
CNOTFI   4141   4195#
CNTVAL    424    439#
COMMAN   1063#  2397   2422   2432   2526   2558   2585   2717   2720   5307   5422   5745   5746   5756
         5763   5764   5765   5784   5792   5793   5794   5847
COMP     1401   3433   3437   3440#
COMPAR   3919   3994   4028   4048#
COMPRE   1064#  2552   3920   3995   4139   4200   4228   4264   4306   4324   4330   4337   5488
COUNT    2640   4390   4400#
CRCERR   3882   3916#
CSTATU   1077#  5454   5575
DASHAL   5526   5540#
DASHBC   5539   5544#
DATAER   4098   4116#
DCACII   1746#  1761
DCADOA   3261   3269#
DCATAR   4524   4527   4535   4538   4543#
DDERRO   5328   5393#
DDIGNO   5300   5329#
DIGITS   4948   4970   4987#
DISPLA   5833   5835   5844#
DMTYPE   5420   5623   5627#
DNS      3899   3946#  3999
DNSLOG   1101#  3863   4118   4145
DOA      3269   3275#
DOB      3259   3267   3276#
DOCNT     426    429    436#
DONE      985#  3038   3279   3487   3497
DOPACK    385    391#
DOSET     420    427    432    438#
DRVZRO   3431   3436#
DTESTP   1065#  1191   1193   1199   1207   1483   4996   5706   5716
DTYPE    5386#  5395
DWESER   4170   4174#
DWS      3900#  3924
DWSLOG   1100#  3862   4120
E0        717   1558#
E0PRE     707   1350#
E1        718   1571#
E10       724   1628#
E100      774   2074   2081#
E11      1614#
E110      778   2122   2129#
E120      783   2193#
E121      784   2197#
E122      785   2201#

E123      786   2206#
E124      782   2155   2178#
E130      817   2426#
E131      818   2440#
```



```
E140      835   2582#
E1PRE     710   1409#
E2        719   1575#
E20      1656#
E21       728   1659#
E210      839   4746#
E211      847   3093#
E212      848   3103#
E22       729   1662#
E23       730   1674#
E24       731   1677#
E240      856   2741#
E241      858   2788#
E242      861   2800#
E245      857   2747#
E25       732   1680#
E26       733   1694#
E27       734   1700#
E270      865   2838#
E271      867   2844#
E272      868   2855#
E28       735   1706#
E2PRE     708   1353#
E3        720   1579#
E30       739   1756#
E3PRE     709   1368#  2689   2691
E40       746   1847#
E41       749   1850   1865#
E42       743   1825#
E4PRE     714   1426#
E50       754   1910#
E51       756   1917#
E52       758   1924#
E53       755   1914#
E54       757   1921#
E55       759   1928#
E56       753   1907#
E60       763   1945   1953#
E61       764   1986#
E62       765   1989#
E63       766   1992#
E70       770   2048#
E7000     798   3149#
E7001     799   3158#
E7002     800   3160   3170#
E7003     807   3191#
E7004     808   3200#
E7005     810   3240#
E7006     809   3202   3221#
EA120     787   2305   2310#
EA121     788   2314#
EA122     789   2345#
EA123     792   2363#
```

SEQ 0158

SEQ 0159

```
XDROUT    963#  2410   2728   2824   3676   4738   5810   5814
XEMPTY   4273   4279   4303   4311   4326   4333   4337#
XERROR    982  3336#  3341   3370   3420
XFLENG   4181   4187   4189#
XFORCE   5381#  5642
XGETAP    988  3502#  3516   3521   3567   3623
XGETAS    990  4770#  4870
XGETAT    992  3473   4484#  4566
XGETUN    994  4411#  4440
XHALT     997  4367#  4377   4380
XHUNG    3793#  5425   5524
XI       2218#  2223
XINIT     974  5939#  5956
XINITR    976  5960#  5962
XINITS    999  4758#  4764
XINITT   1001  4463#  4471
XINTR     972  5931#  5936
XK67X2   5018  5020   5039#
XK67X3   5022  5040#
XK67X4   5024  5041#
XK67X5   5026  5042#
XK67X6   5028  5030   5043#
XK67X7   5032  5044#
XKCC     1270#  5257
XLCD      956  5744#  5748
XLCDA     958  5754#  5767   5769   5770   5776
XLCDB     960  5782#  5875   5876   5877
XLCDBR   5804  5855#  5870
XLINK    5254  5351   5357#
XLOCKU   1003  3284#  3295
XMESSA   3770  3776   3779#
XMX       402   435#
XNOPRI   3351  3407#
XNULIN   5163  5168#
XOCTAL   4943  4944   4945   4951   4958   4959   4986#
XOK      1006  5698#  5700   5701
XOUTPU   5146#  5160   5161
XPAT6    3614#  3622
XPATTE   3550  3551#  3566
XPI      5828#  5838   5840   5842
XPRINT   1018  4349   5130#  5134   5135   5195   5197
XRDC     3833  3851#
XREAD    1020  3017   3832   3849#  4006   4015
XREADC   1022  3830#  3831
XRETUR   5343  5369#
XRSI     1024  3186#  3242
XRSTR    1026  3144#  3176
XSCOPE   1032  2227#  2239   2241   2246   2249   2257   2261
XSDN      970  5916#  5918   5919   5920

XSEL      954  5739#  5741
XSEQ     4552#  4631   4698
XSEQ2    4594  4604#
XSEQ3    4617  4623#
```



```
XSER      968  5909#  5911   5912   5913
XSETUP   1028  4346#  4350   4352   4353
XSHIFT   4952#  4957
XSPECI   1030  5209#  5211   5212   5213
XSSCOP   1034  2244#  2245
XSTARG   4763  4797   4801   4802   4809   4810   4812   4873#
XSTP      966  5903#  5905   5906   5907
XTAB     1036  5098#  5100   5104   5114
XTABL    5102#  5111
XTARGE   1110#  4845   5844
XTCF     1294  5200#  5266
XTHEL    3472  3483#
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,V7640	5675	5730#										
,V7664	1221	1308#										
,V7670	5172	5219#										
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,V7704	3532	3629#										
,V7710	2794	2870#										
,V7740	1175	1316#	2849	2866#	3797	3802#	5678	5729#	5829	5885#		
,V7745	4803	4931#										
,V7746	1253	1306#										
,V7747	4808	4930#										
,V7762	268	363#										
,V7766	244	365#										
,V7770	5681	5728#										
,V7771	1743	1765#										
,V7772	3319	3464#										
,V7773	3229	3301#										
,V7774	241	366#	547	588#								