MAINDEC: -Ø8-DIRXB-D-D

TITLE: -RX8/RXØ1 DATA RELIABILITY/EXERCISER PROGRAM

AUTHOR: -MIKE STURAK
-HANK POULTER
-DON RICE

DATE: -MAY ,1976

MAINTAINER: -DIAGNOSTIC ENGINEERING

1. ABSTRACT

THIS PROGRAM IS DESIGNED FOR THE COLLECTION OF STATISTICAL INFORMATION PERTAINING TO THE DATA RELIABILITY OF THE DISKETTE DRIVE(S) THAT ARE ASSOCIATED WITH THE RX01 DISKETTE MICROPROCESSOR CONTROLLER, AND RX8 INTERFACE.

THE CATEGORIES OF STATISTICAL INFORMATION ACCUMULATED ARE:

- (A) COMPLETED PASSES OF THE PROGRAM
- (B) PROGRAM RESTARTS (BOTH MANUAL AND PROGRAMMED AUTOMATIC)
- (C) INTERUM STATISTICAL REPORTS
- (D) RECOVERABLE AND NON-RECOVERABLE (PER DISKETTE) OF:
  - (1) WRITE ERROR
  - (2) READ ERROR
  - (3) CRC AND DATA ERROR
  - (4) NO CRC BUT DATA ERROR
  - (5) CRC BUT NO DATA ERROR
  - (6) SEEK ERROR
  - (7) PARITY ERROR
- (E) TOTAL WRITES/READS (PER DISKETTE)
- (F) TRACK ACCESS (ACTUATOR MOVEMENTS TO THAT TRACK)
- (G) SELF ACCESS (WITH NO ACTUATOR MOVEMENTS TO THAT TRACK)
- (H) ALL ERRORS (PER TRACK/PER DISKETTE) EXCLUDING "UNEXPECTED" CONTROL FAILURES WHICH RESTARTS THE PROGRAM:
  - (1) UNEXPECTED RX01 INTERRUPT REQUEST
  - (2) MISSING ERROR FLAG
  - (3) DEVICE TEST HUNG

REVISION D
THIS REVISION CONTAINS THE CODE FOR THE CONSOLE PACKAGE.
THE CODE FOR SELECTING THE DEVICE CODES FOR THE CONTROLLER
HAS BEEN CHANGED TO ALOW DEVICE CODE SELECTION VIA SWITCH REGISTER
SETTINGS.
INTERFACES FOR THE APT-8 SYSTEM HAVE BEEN PROVIDED ALLOWING
THIS DIAGNOSTIC TO RUN UNDER APT-8.
THE REAL TIME CLOCK ROUTINE AND ANY DECIMAL ROUTINES HAVE BEEN DELETED
TO CONSERVE SPACE.

2. REQUIREMENTS

2.1 EQUIPMENT

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

2.2 STORAGE

THIS PROGRAM OCCUPIES PROGRAM LOCATIONS 0 THRU 7577 AND MUST RESIDE WITHIN FIELD 0. IF THE CONSOLE PACKAGE IS ACTIVE THEN FIELD 1 LOCATIONS 200 TO 2000 ARE USED.

2.3 PRELIMINARY DIAGNOSTIC PROGRAMS

THIS PROGRAM ASSUMES THAT THE RX8/RX01 INTERFACE DIAGNOSTIC PROGRAM HAS SOME TIME PREVIOUSLY EXECUTED SUCCESSFULLY.

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 3 STARTING ADDRESS LOCATIONS:

200 * DATA RELIABILITY/EXERCISER *

STARTING THIS PROGRAM AT PROGRAM LOCATION 200, AND SUCCESSFULLY SUPPLYING THE NECESSARY TEST PARAMATERS REQUESTED, DIRECTS THIS PROGRAM TO BEGIN COLLECTING STATISTICAL INFORMATION PERTAINING TO THE DATA RELIABILITY OF THE RX01 SUBSYSTEM.THIS WILL BE THE START LOCATION OF THE CONSOLE PACKAGE.

201 * RESTART OF DATA RELIABILITY/EXERCISER *

STARTING THIS PROGRAM AT PROGRAM LOCATION 201 DIRECTS THE PROGRAM TO CONTINUE AMMENDING ALL ADDITIONAL STATISTICAL INFORMATION TO THE STATISTICAL INFORMATION ALREADY COLLECTED.

202 * REPORT OF ACCUMULATED STATISTICAL INFORMATION *

STARTING THIS PROGRAM AT PROGRAM LOCATION 202 DIRECTS THIS PROGRAM TO PRINT ON THE CONSOLE TELEPRINTER ALL THE STATISTICAL INFORMATION COLLECTED. THE CONSOLE PACKAGE CAN PRINT THE STATISTICAL INFORMATION COLLECTED BY TYPING CONTROL O.

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.
ON A ACTIVE CONSOLE PACKAGE THE SWITCH REGISTER QUESTION WILL BE PRINTED. RESPONDING TO THIS QUESTION WILL START THE PROGRAM.

4.3 PROGRAM ACTION

THE PROGRAM WILL PRINT ON THE TELEPRINTER THE PRESENT " MAINDEC " REVISION, AND, "REMOVE THE DIAGNOSTIC DISKETTE" IF THE CONSOLE PACKAGE IS ACTIVE. TO CONTINUE REMOVE THE DISKETTE AND REPLACE WITH A SCRATCH DISKETTE THEN TYPE CONTROL E.

* 200 *

THE PROGRAM HAS PRINTED THE RX8 INTERFACE IOT DEVICE CODE AND WILL NOW WAIT FOR INPUT FROM THE SWITCH REGISTER OR THE ANSWER TO THE SWITCH REGISTER QUESTION. EITHER SET THE SWITCH REGISTER TO THE PROPER DEVICE CODE OR TYPE IN THE PROPER DEVICE CODE, CONTINUING THE PROGRAM VIA THE CONT SWITCH IF CONSOLE DEACTIVE. THE PROGRAM WILL DEFAULT TO DEVICE CODE 75 IF THE SWITCH REGISTER IS SET TO ZERO.

EXAMPLE DEVICE CODE IS 76

SET SWITCH REGISTER TO 0760

IF THE DEVICE CODE IS SET TO A EXISTING CONTROLLER THEN THE SELECTED DEVICE CODE IS PRINTED. TO SELECT A DIFFERENT DEVICE CODE FROM THE ONE ALLREADY SELECTED AND VERIFIED BY THE MESSAGE RX8 DEVICE CODE IS 6XX0. THE PROGRAM MUST BE RELOADED.

201

THE PROGRAM HAS RECONFIRMED PREVIOUS DISKETTE DRIVE AND TEST PARAMATER SELECTIONS BY PRINTING APPROPRIATE MESSAGES ON THE TELEPRINTER, AND HAS RESUMED THE FUNCTIONS OF AMMENDING ALL ADDITIONAL STATISTICAL INFORMATION TO THE STATISTICAL INFORMATION ALREADY COLLECTED.

* 202 *

THE PROGRAM HAS BEGUN PRINTING ON THE CONSOLE TELEPRINTER ALL THE STATISTICAL INFORMATION COLLECTED.

4.4 TEST PARAMETER SELECTIONS

4.4.1 DISKETTE DRIVE

AFTER STARTING THIS PROGRAM AT STARTING ADDRESS 200, THE PROGRAM WILL PRINT: " SELECT DISKETTE DRIVES ", AND HALT OR PRINT THE SWITCH REGISTER QUESTION IF THE CONSOLE PACKAGE IS ACTIVE.

THE OPERATOR WILL THEN CONFIGURE ACCUMULATOR SWITCHES 0, AND 1 TO REPRESENT DRIVE SELECTION, AND THEN PRESS " CONT " INUE OR IF ON A ACTIVE CONSOLE PACKAGE ANSWERING THE SWITCH REGISTER QUESTION WILL CONTINUE THE DIAGNOSTIC.

ACCUMULATOR
SWITCHES

0 1

U U

ØØ - THE OPERATOR DIRECTS THE PROGRAM TO AUTOMATICALLY SELECT ALL DISKETTE DRIVES THAT ARE " READY " (POWER APPLIED, DISKETTE INSERTED, AND DOOR CLOSED)

1Ø - SELECT ONLY DISKETTE DRIVE Ø

Ø1 - SELECT ONLY DISKETTE DRIVE 1

11 - SELECT BOTH DRIVES Ø AND 1

THE PROGRAM WILL PRINT A DISKETTE DRIVE SELECTION COMFIRMATION MESSAGE IF THE PROGRAM WAS SUCCESSFUL AT ATTEMPTING TO SELECT AT LEAST ONE DRIVE AS DIRECTED BY THE OPERATORS UU SELECTION. THE DISKETTE DRIVES CONFIRMED AS SELECTABLE BY THE PROGRAM MAY DIFFER FROM THE OPERATORS UU SELECTION IF THE PROGRAM DETECTED A DRIVE(S) TO BE " NOT READY ".

IF, HOWEVER, ALL DRIVES WERE FOUND TO BE " NOT READY " THEN THE PROGRAM WILL PRINT THE MESSAGE: " DRIVES NOT OK-BUT MAINDEC WILL RESTART ", AND AUTOMATICALLY RESTART ITSELF AT AN ATTEMPT TO SUCCESSFULLY SELECT AT LEAST ONE DISKETTE DRIVE.

THE PROGRAM WOULD MAKE 4 SUCH ATTEMPTS AT RESTARTING ITSELF. IF, AFTER 4 ATTEMPTS AT DRIVE SELECTION, THE PROGRAM HAS BEEN UNSUCCESSFUL AT SELECTING AT LEAST ONE DISKETTE DRIVE, THE PROGRAM WILL PRINT THE FOLLOWING MESSAGE AND HALT: THE CONSOLE PACKAGE WILL RESTART.

"DRIVES NOT OK-BUT MAINDEC WILL HALT"

OBVIOUSLY, THIS PROGRAM IS UNABLE TO ACCUMMULATE STATISTICAL INFORMATION PERTAINING TO THE DATA RELIABILITY OF DISKETTE DRIVES IF ALL DRIVES APE "NOT READY" FOR TESTING.

////////////////////////////////

AFTER STARTING THIS PROGRAM AT ADDRESS 200, AND AFTER SUCCESSFULLY SELECTING A " DISKETTE DRIVE ", THE PROGRAM WILL PRINT THE FOLLOWING MESSAGE AND HALT IF ON CONSOLE PACKAGE WILL PRINT WAITING.

" SELECT PARAMATERS "

THE OPERATOR WILL THEN CONFIGURE ACCUMULATOR SWITCHES 0, 1, AND 2 TO REPRESENT A PATTERN SELECTION, SWITCHES 3, 4, AND 5 TO REPRESENT A TEST SELECTION, SWITCHES 6, 7, AND 8 TO REPRESENT AN ACTUATOR SEQUENCE SELECTION, SWITCH 9 TO REPRESENT 8/12 BIT MODE, SWITCH 10 TO REPRESENT DELETED DATA MODE.

THE OPERATOR WILL THEN PRESS " CONT "INUE OR ANSWER THE SWITCH REGISTER QUESTION IF ON CONSOLE PACKAGE.

A C C U M U L A T O R
S W I T C H E S

0	1	2		3	4	5		6	7	8		9	10	11
P	P	P		T	T	T		S	S	S		M	D	-

THE PROGRAM WILL PRINT A TEST PARAMATER SELECTION CONFIRMATION MESSAGE AND BEGIN ACCUMULATING STATISTICAL INFORMATION PERTAINING TO THE DATA RELIABILITY OF THE RX01 SUBSYSTEM.

THE SW= QUESTION WILL BE PRINTED NEXT IF THE CONSOLE PACKAGE IS ACTIVE. ENTER THE RUNNING SWITCHES BEFORE THE PROGRAM BEGINS EXECUTION. SET THE SWITCH REGISTER TO THE DESIRED SETTINGS FOUND BELOW. IF THE CONSOLE PACKAGE IS NOT ACTIVE THEN PROGRAM EXECUTION WILL BEGIN AFTER THE CONFIRMATION MESSAGE IS PRINTED.

5. OPERATING PROCEDURE

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

```
0 = 1 - HALT AT DETECTION OF AN ERROR 4000
1 = 1 - HALT AT THE END OF A TEST PASS 2000
2 = 1 - (LONG) DATA COMPARISON ERROR PRINTOUT 1000
3 = 1 - INHIBIT ERROR PRINTOUTS 400
4 = 1 - INHIBIT ERROR RECOVERY ATTEMPTS 200
5 = 1 - INHIBIT RINGING OF [BELL] AT ERROR 100
6 = 1 - INHIBIT THE ISSUING OF [INIT] AT ERROR 40
```

DISPLAY WITHIN THE MQ (IF THE PDP HAS AN MQ) THE FOLLOWING RUNTIME DATA:

```
10 = X
11 = Y

YX - 00 - TARGET TRACK (BITS 0-7) / SECTOR (BITS 8-11)
     01 - TEST PARAMATER SELECTION
     10 - STATUS FROM XDR AT END OF FUNCTION
     11 - COMMAND WORD TO RX01 CONTROL
```

THIS PROGRAM MAY, AT THE OPERATORS DISCRETION AND AT ANY TIME DURING THE OPERATION OF THIS PROGRAM, BE STOPPED AND STARTED OR RESTARTED WITHOUT CONSEQUENCE.

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.

THE FOLLOWING CHART REPRESENTS AN OVERVIEW OF WHICH ERRORS MAY BE DETECTED IN WHICH TEST:

	ERRORS:				
TEST:	WRITE	READ	DATA	SEEK	PARITY
0	X	X	X		
1	X	X		A	A
2	X	X	X		
3		X	X	L	L
4		X			
5	X	X	X	L	L
6	X	X	X		
7		X	X		

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 FOLLOWING INFORMATION IS PRINTED FOR ALL ERRORS DETECTED. THE HEADER LINE IS ONLY PRINTED FOR THE FIRST ERROR DETECTED WITHIN EACH TEST PASS.

```
      CMND    XDR    CODE    RSTA    START      TARGET      TEST   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
            TEST    - TEST PARAMETERS SELECTED
            PASS    - PASS # AT ERROR (TO 16777215 DECIMAL)
```

7.1.1.1 KEY INITIALIZE ERROR

CMND	XDR	CODE	RSTA	START	TARGET	TEST(X) PASS
KEY	0100	0120	0200	KEY	[HOME]	KEY

STARTING THE PROGRAM HAD PRODUCED A CONSOLE [KEY] INITIALIZE, AND

THE RX01 CONTROL WAS UNABLE TO FIND THE [HOME] POSITION ON DRIVE 0.

CMND - CONSOLE [KEY] INITIALIZE
XDR - DELETED DATA MARK HAPPENED TO BE PRESENT
CODE - A PREAMBLE COULD NOT BE FOUND
RSTA - DISKETTE DRIVE IS READY
START - ACTUATOR POSITION UNKNOWN
TARGET - [HOME] TRACK 1, SECTOR 1

7.1.1.2 SEEK ERROR

CMND	XDR	CODE	RSTA	START	TARGET	TEST(X) 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 WAS ISSUED [INIT]
XDR - 0
CODE - A PREAMBLE COULD NOT BE FOUND
RSTA - DRIVE READY
START - HOME POSITION
TARGET - HOME POSITION

7.1.1.3 WRITE-CRC AND DATA ERROR

CMND	XDR	CODE	RSTA	START	TARGET	TEST(X) 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

7.1.1.4 READ-CRC AND DATA ERROR

```
CMND    XDR     CODE    RSTA    START   TARGET  TEST(X) 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.

7.1.1.5 WRITE-CRC BUT NO DATA ERROR

```
CMND    XDR     CODE    RSTA    START   TARGET  TEST(X) PASS
0026    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 EXPENSION 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.

7.1.2 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.

7.1.3 FATAL ERROR RECOVERY

IF THE PROGRAM DETECTS ANY OF THE SUCCEDING FATAL ERROR CONDITIONS, THE PROGRAMS RECOVERY WILL BE THAT OF AN AUTOMATIC RESTART.

THE PROGRAM WILL AUTOMATICALLY DUMP ALL STATISTICAL INFORMATION ACCUMULATED ISSUE AN [INIT] AND EFFECTIVELY RESTART ITSELF FROM RESTART ADDRESS 201.

(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 SHORTING AIDS

THIS PROGRAM, APART FROM THE COLLECTION OF STATISTICAL INFORMATION, IS DESIGNED AS A FIELD ENGINEERING TOOL.

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 OUTER-MOST 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,   1        /INITIAL TRACK TO TEST
    ID,   114      /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 STANDARD.

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.

8.2 COMPATABILITY VERIFICATION

A. SELECT A TEST THAT WILL WRITE-READ-AND VERIFY THE DATA THEREBY INSURING THE QUALITY OF DATA PRIOR TO THE DISKETTE SWAP.

   SELECT TEST 0 OR TEST 2.

   ANY SEQUENCE WILL ACHIEVE THE FIRST OBJECTIVE.

B. CONFIGURE OPERATIONAL CONSOLE SWITCH 1 = 1 (TO HALT THE PDP AT THE COMPLETION OF 1 PASS). THIS IS TO INSURE THE DATA PATTERN IS NOT FRESHENED (APPLICABLE TO RANDOM DATA SELECTION).

C. PHYSICALLY SWAP THE DISKETTE MEDIA RESIDING WITHIN DISKETTE DRIVE 0 WITH THE MEDIA WITHIN DISKETTE DRIVE 1.

D. SELECT A TEST THAT WILL READ-AND VERIFY THE DATA (THIS IS THE COMPATABILITY TEST).

   SELECT TEST 7 IF TEST 0 WAS SELECTED AT (A), OR
   SELECT TEST 3 IF TEST 2 WAS SELECTED AT (A).

   THE PATTERN SELECTION MUST BE EQUIVALENT TO THE PATTERN SELECTED AT (A), THE SEQUENCE MAY NOT.

9. PARAMETER DESCRIPTION

9.1 PATTERN (PPP) DESCRIPTIONS

9.1.1 RANDOM (PPP=0)

A FRESH RANDOM PATTERN WILL BE GENERATED AT THE END OF EACH PASS.

9.1.2 PATTERN 1 - ALL 1'S

9.1.3 PATTERN 2 - 00110011

9.1.4 PATTERN 3 - 11001100

9.1.5 PATTERN 4 - 10101010

9.1.6 PATTERN 5 - 01010101

9.1.7 PATTERN 6 -

9.1.8 PATTERN 7 - ALL 0'S

9.2 TEST (TTT) DESCRIPTIONS

ALL TESTS EXERCISE ONLY THAT SURFACE [WINDOW] OF THE DISKETTE SPECIFIED BY THE CONTENTS OF THE FIELD ENGINEERING MAINTENANCE PROGRAM LOCATIONS (REFER TO PARAGRAPH 8) " OD ", " ID ", " FIRST ", AND " LAST ", WITH A DATA PATTERN SPECIFIED BY THE PATTERN (PPP) SELECTION, (PARAGRAPH 9.1) AND WITH AN ACTUATOR MOVEMENT SPECIFIED BY THE SEQUENCE (SSS) SELECTION PARAGRAPH 9.3).

9.2.1 ACCEPTANCE TEST (TTT=0)

THIS TEST HAS BEEN LABLED THE ACCEPTANCE TEST BECAUSE IT EXERCISES ALL THE DESIGN FEATURES OF THE RX8/RX01 SUBSYSTEM EXPEDIENTLY.

FIRSTLY, WITH DATA SPECIFIED BY THE PATTERN SELECTION (PARAGRAPH 9.1), AND WITH AN INCREMENTAL ACTUATOR MOVEMENT SEQUENCE, THIS TEST WILL WRITE-READ-AND PROGRAM VERIFY EACH SECTOR FROM " FIRST " TO " LAST " OF EACH TRACK FROM " OD " TO " ID ".

SECONDLY, WITH AN ACTUATOR MOVEMENT SPECIFIED BY THE SEQUENCE SELECTION (PARAGRAPH 9.3), THIS TEST WILL REREAD THE TRACKS AND SECTORS PREVIOUSLY WRITTEN. THE DEFAULT PATTERN SELECTION IS RANDOM AND THE DEFAULT ACTUATOR MOVEMENT SEQUENCE SELECTION IS RANDOM.

TO EXPEDIENTLY TEST ALL THE DESIGN FEATURES OF THE RX8/RX01 SUBSYSTEM (8/12 BIT MODE, AND DELETED DATA), THIS TEST WILL ALTERNATELY EXERCISE EACH FEATURE, REGULATED BY THE VALUE OF THE " TARGET " TRACK POSITION. IF THE VALUE OF THE TARGET TRACK IS " X " THEN THE DESIGN FEATURE UNDER TEST IS " Y ".

X	Y
--0	12-BIT MODE
--1	12-BIT MODE WITH DELETED DATA
--2	8-BIT MODE
--3	8-BIT MODE WITH DELETED DATA
--4	
--5	
--6	(ETC.)
--7	

9.2.2 TEST 1 - WRITE/READ
////////////////////////

9.2.3 TEST 2 - WRITE/READ/PROGRAM VERIFY DATA
//

9.2.4 TEST 3 - READ/PROGRAM VERIFY DATA
//////////////////////////////////////

TEST 3 IS THE COMPATABILITY COUNTER PART TO TEST 2.

9.2.5 TEST 4 - READ ONLY
///////////////////////

9.2.6 TEST 5 - WRITE ONLY
////////////////////////

THE AFFORE MENTIONED TESTS WILL PERFORM THE DESCRIBED FUNCTIONS USING 8-
OR 12-BIT MODE, (PARAGRAPH 9.4), WITH OR WITHOUT DELETED DATA, (PARAGRAPH 9.5).

9.2.7 TEST 6 - WRITE/READ/PROGRAM VERIFY DATA
////////////,//////////////////////////////

FIRSTLY, WITH AN INCREMENTAL ACTUATOR MOVEMENT SEQUENCE,
THIS TEST WILL WRITE, READ, AND PROGRAM VERIFY DATA IN 8 OR 12 BIT
MODE AS SPECIFIED BY THE " M " SELECTION, (PARAGRAPH 9.4), WITH OR WITHOUT
ELETED DATA AS SPECIFIED BY THE " D " SELECTION, (PARAGRAPH 9.5).

SECONDLY, WITH AN ACTUATOR MOVEMENT SPECIFIED BY THE SEQUENCE
SELECTION, (PARAGRAPH 9.3), THIS PROGRAM WILL REREAD THE TRACKS AND
SECTORS PREVIOUSLY WRITTEN.

9.2.8 TEST 7 - READ-PROGRAM VERIFY
//////////////////////////////////

TEST 7 IS THE " COMPATABILITY COUNTERPART " OF TEST 0.

9.3 SEQUENCE (SSS) DESCRIPTION
//////////////////////////////

THE SEQUENCE GENERATOR SELECTS A TARGET TRACK WITHIN THE WINDOW
SPECIFIED BY THE OUTSIDE DIAMETER (OD) AND INSIDE DIAMETER (ID) PARAMETERS.

9.3.1 RANDOM (SSS=0)

THE SEQUENCE GENERATOR WILL RANDOMLY SELECT A TARGET TRACK
BETWEEN OD AND ID.

9.3.2 SEQUENCE 1 - INCREMENTAL
////////////////////////////

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK COMMENCING WITH "OD", IN INCREMENTS OF 1 TO "ID".

9.3.3 SEQUENCE 2 - DECREMENTAL
////////////////////////////

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK COMMENCING WITH "ID" IN DECREMENTS OF 1 TO "OD".

9.3.4 SEQUENCE 3 - INCREMENTAL/DECREMENTAL
//

FIRST REFER TO PARAGRAPH 9.2.2, THEN REFER TO PARAGRAPH 9.2.3.

9.3.5 SEQUENCE 4 - BOUNCE ID TO OD
//////////////////////////////////

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT TO THE VALUE OF "ID" OR "OD" AND BOUNCE TO "ID" TO "OD".

9.3.6 SEQUENCE 5 - DECREMENTAL/INCREMENTAL BOUNCE.
//

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT TO THE VALUE OF "ID" OR "OD" AND BOUNCE TO "ID" THEN TO "OD". THEN THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT TO THE VALUE OF "ID-1" OR "OD+1" AND BOUNCE, ETC.

9.3.7 SEQUENCE 6 - STROBE
/////////////////////////

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT TO THE VALUE OF "ID" OR "OD", AND BOUNCE TO "ID" THEN TO "OD". THEN THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT TO "ID-1" OR "OD" AND STROBE ETC.

9.3.8 SEQUENCE 7 -
////////////////////

9.4 8/12 BIT MODE DESCRIPTION (M)
////////////////////////////////////

THE PATTERN GENERATOR WILL ASSEMBLE A PATTERN OF 64 TWELVE BIT WORDS

(IF M = 0), OR 128 EIGHT BIT BYTES (IF M = 1).

9.5 DELETED DATA DESCRIPTION (D)
////////////////////////////////

THE SELECTEDTEST WILL WRITE WITH DELETED DATA, OR READ EXPECTING

DELETED DATA (IF D=1).

10. CONSOLE PACKEGE

TABLE OF CONTENTS

10.1. ABSTRA

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.

10.2. REQUIREMENTS

10.2.1 STORAGE

THIS PACKAGE CAN RESIDE IN ANY PART OF CORE.

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.

10.4. STANDARD OPERATION PROCEDURE

10.4.1 INITIALIZATION

FOR A ACTIVE CONSOLE PACKAGE

1.) LOAD ADDRESS 0021

2.) SET SR0=0 INDICATOR FOR USING THE PSEUDO SWITCH REGISTER

3.) LOAD ADDRESS 0022

4.) SET SR3=1 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 TO INDICATE A HARDWARE SWITCH REGISTER

3.) LOAD ADDRESS 0022

4.) SET SR3=0 TO INDICATE A DEACTIVE CONSOLE PACKAGE

5.) LOAD STARTING ADDRESS OF PROGRAM AND BEGIN

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 C
THIS WILL START THE LOADER THAT IS IN LOCATION 7600.

CONTROL R
THIS WILL RESTART THE PROGRAM AND REASK THE SWITCH REGISTER QUESTION AND THE REMAINNING SET UP QUESTIONS.

CONTROL E
THIS WILL CONTINUE THE PROGRAM FROM A ERROR IF ALLOWED BY THE DIAGNOSTIC OR FROM A WAITING STATEMENT.

CONTROL O
THIS CONTROL CHARACTER WILL TYPE OUT THE STATISTICAL REPORT

CONTROL S
THIS WILL INHIBIT PRINTING AND NOT DISPLAY THIS WILL NOT EFFECT THE PROGRAM BUT NO PRINTOUT WILL BE SEEN. TO GET PRINTS OUT TYPE CONTROL Q

CONTROL Q
THIS IS TO CONTINUE A PROGRAM AFTEP A CONTROL S IS TYPED.THIS IS A NONPRINTING CHARACTER.

10.4.3 WAITING MESSAGE

THE WAITING MESSAGE IS USED TO ALLOW THE OPERATOR TIME
TO MAKE A DECISION AS TO WHAT CONTROL CHARACTER
TO TYPE. THIS MESSAGE MAY APPEAR AT THE END
OF PASS MESSAGE IF THE HALT ON ERROR BIT IS SET.THE CONTROL
CHARACTERS MAY NOW BE USED TO PERFORM THE NEEDED FUNCTION.

THE WAITING MESSAGE MAY BE PRINTED AFTER A ERROR MESSAGE
IF THE HALT ON ERROR BIT IS SET.HERE AGAIN THE CONTROL
CHARACTERS MAY BE USED.
THE WAITING MESSAGE MAY BE PRINTED IF OPERATOR INTERVENTION
IS REQUIRED..

10.4.4 SWITCH REGISTER MESSAGE

THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER
BEFORE PROGRAM EXECUTION TAKES PLACE.THE SWITCH REGISTER
IS SETUP WHEN THE FOURTH CHARACTER IS ENTERED OR A CARRIAGE
RETURN IS TYPED.

```
**********************************************************
SR=0000 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 A -)

* INDICATES THAT NO ERRORS WERE DETECTED IN THE PASS
- INDICATES THAT A ERROR WAS DETECTED IN THE PASS

****

10.5. ERRORS

UPON DETECTION OF A ERROR THE DIAGNOSTIC WILL DO ONE OF
THE FOLLOWING OPERATIONS:
1.) PRINT OUT THE STANDARD CONSOLE PACKAGE ERROR MESSAGE
(SEE SECTION 5.2 FOR FORMAT.). THE PROGRAM WILL THEN CHECK THE
SWITCH SETTING AND IF HALT ON ERROR IS SET ,THE MESSAGE
WAITING WILL BE PRINTED. THE OPERATOR MUST ENTER
A CONTROL CHARACTER TO CONTINUE ON . IF THE HALT ON ERROR
BIT IS NOT SET THEN THE PROGRAM WILL CONTINUE ON
AFTER THE ERROR MESSAGE IS PRINTED.
2.) PRINT THE ERROR MESSAGE FOR THE PARTICULAR ERROR CONDITION
AND NOT THE STANDARD ERROR MESSAGE.A CHECK OF THE SWITCH
REGISTER WILL BE MADE TO DETERMIND IF THE PROGRAM SHOULD
CONTINUE RUNNING AFTER THE ERROR MESSAGE OR PRINT WAITING.
REFERE 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 0021

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
0	4000	USE PSEUDO SWITCHES	USE HARDWARE SWITCHES
1	2000	NO OPTION 1	HAS OPTION 1
2	1000	NO OPTION 2	HAS OPTION 2
3	400	NO 8A SIMULATOR	HAS 8A SIMULATOR
4	200	NO OPTION SIMULATOR	HAS OPTION SIMULATOR
5	100	NOT ON 8A XOR	ON 8A XOR
6	40	NOT PDP8-E TYPE CPU	PDP8-E TYPE CPU
7-11		8A MEMORY SIZE EX. 1K=00 2K=01 7K=06 32K=31	

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 YET DEFINED	
3	400	DEACTIVE CONSOLE PACKAGE	ACTIVE CONSOLE PACKAGE

10.6.2 ERROR RELATED SWITCHES

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

BIT	OCTAL VALUE	FUNCTION WHEN 0	FUNCTION WHEN 1
0	4000	CONTINUE AFTER ERROR	STOP ON ERROR
1	2000	CONTINUE AFTER TEST	STOP AT END OF TEST
2	1000	SHORT ERROR PRINT	LONG DATA COMPARISON ERROR PRINT OUT
3	400	PRINT ERRORS	NO ERROR PRINT OUTS
4	200	MAKE ERROR RECOVERY	NO ERROR RECOVERY ATTEMPTS
5	100	RING BELL AT ERROR	NO BELL RINGING ON ERRORS
6	40	ISSUE [INIT] AT ERROR	DO NOT ISSUS [INIT] AT ERROR

10-11 DISPLAY IN MQ IF PRESENT

00=TARGET TRACK BITS0-7 SECTOR BITS 8-11

01=TEST PARAMETER SECTION

10=STATUS OF XDR AT END OF FUNCTION

11=COMMANDWORD TO RX01 CONTROL

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. DIALOG FOR CONSOLE PACKAGE

THE DIALOG FOR THIS DIAGNOSTIC IS:

```
R DIRXB (CR)

MAINDEC-08-DIRXB-B                      /THE -B IS THE REVISION LEVEL

REMOVE THE DIAGNOSTIC DISKETTE          /TO CONTINUE WITH THE DIAGNOSTIC
                                        /TYPE CONTROL E

/PAUSE FOR ABOUT 5 SECONDS//


RX8 DEVICE CODE IS
SR=0750                                 /DEVICE CODE IS SET TO 75

6750                    /THIS VERFIES THAT THERE IS A
                                        /RX8 WITH DEVICE CODE 75

SELECT DISKETTE DRIVES


SR=0750 0000                            /TEST BOTH DRIVES

DRIVES SELECTED 0,1                     /TELL WHICH DRIVES WERE READY

SELECT TEST PARAMATERS:

SR=0000 0000

SR=0000 6000                            /SET SWITCH SETTINGS TO STOP ON ERROR
                                        /AND AT END OF PASS
TEST PARAMATERS: 0                      /THE DIAGNOSTIC IS NOW RUNNING
```

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. SINGLE OR MULTIPLE DRIVE TESTING.

3. DRIVE OR DRIVES TO BE TESTED.

4. DIAGNOSTIC RUNNING UNDER THE APT-8 SYSTEM.

ADDRESS 20 (PSEUDO SWITCH REGISTER)

ADDRESS 20 IS USED TO INDICATE THE DEVICE CODE OF THE RX01 UNDER TEST. ENTER THE DEVICE CODE IN BIT POSITIONS 3-8.

EXAMPLE: 0750
DEVICE CODE 75 IS INDICATED BY THE PREVIOUS STATEMENT.

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 (HARWARE IDENTIFIER 2)

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.

IF SINGLE DRIVE TESTING BIT 5 MUST BE A ONE WITH BIT 11 INDICATING WHICH DRIVE TO DO. IF BIT 11 IS A ONE, DRIVE ONE WILL BE EXERCISED. IF BIT 11 IS A ZERO, DRIVE ZERO WILL BE EXERCISED. IF BOTH DRIVES ARE TO BE EXERCISED, BIT 5 SHOULD BE SET TO A ZERO AND BIT 11 SET TO A ONE. THIS WILL EXERCISE BOTH DRIVES. IF BIT 11 IS SET TO A ZERO, THE PROGRAM WILL AUTOMATICALLY DETERMINE THE NUMBER OF DRIVES TO BE DONE. IT IS RECOMMENDED THAT THE FORMER METHOD BE USED. THIS WILL ELIMINATE ANY POSSIBILITY THAT ONE OF THE DRIVES MAY NOT BE FUNCTIONING.

11.3 APT-8 INTERFACES.

11.3.1 TIMING

APT-8 IS NOTIFIED OF PROGRAM RUN BETWEEN .2 SECONDS AND 2.Ø 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 RERUN 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 DATA RELIABILITY/EXERCISER -DIRXB-D
                /CONSOL &RC-V1R3-  CONSOL PACKAGE



                /SET UP A LAS TO BE EQUALL TO THE CALL C8CKSW

                /PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE CONSOL
                /EVERY FIVE SECONDS OR LESS



                /SETUP CNTVAL FOR A RANGE OF 1 TO 4 MINUTES FOR C8PASS TO PRINT PASS
                /SETUP OF CNTVAL WILL BE FOUND IN C8PASS


                /SET UP XDOSW AS THE VALUE NEEDED FOR A RETURN FOR CONTROL R
                /RETURN TO ASK THE SWITCH REGISTER QUESTION,
        0001            FIELD 1



        6661            PSKF=   6661
        6662            PCLF=   6662
        6663            PSKE=   6663
        6664            PSTB=   6664
        6665            PSIE=   6665
        6004            GTF=    6004
        7501            MQA=    7501
        6007            CAF=    6007
        7421            MQL=    7421


        0200            *200
                /*********************************************************************
                /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

0200  0000  XC8PAS, 0
0201  4777'          JMS     C8CK22          /CHECK LOCATION22
0202  5210          JMP     DOPACK          /IS CLASSIC
0203  4272          JMS     XC8SW           /CHECK SR SETTING
0204  0376          AND     (400            /FOR HALT ON END OF C8PASS
0205  7640          SZA CLA                 /1= HALT 0 CONTINUE
0206  5236          JMP     C8EXT1          /COMMON EXIT
```



```
0207  5235  C8BY1,  JMP     C8BY1           /CONTINUE ON RUNNING PROGRAM
0210  4240  DOPACK, JMS     CKCOUT          /CLASS CHECK C8PASS COUNT
0211  5235          JMP     C8BY1           /C8PASS COUNT NOT DONE REDO PROGRAM
0212  2257          ISZ     PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
0213  4775'         JMS     XC8CRL          /CRLF
0214  4322          JMS     XC8PNT                  /C8PRNT BUFFER
0215  0263          MESPAS                  /
0216  6201          CDF 0
0217  1660          TAD I   XPASSES         /GET NUMBER
0220  6211          CDF 10
0221  4774'         JMS     XC8OCT                  /PRINT OCTAL ONLY,
0222  6201          CDF 0
0223  1655          TAD I   XMX             /GET THE CHAR IN FLD 0
0224  6211          CDF 10
0225  3240          DCA     CKCOUT
0226  4322          JMS     XC8PNT
0227  0240          CKCOUT
0230  4775'         JMS     XC8CRL                  /DO A CARRIAGE RETURN
0231  4272          JMS     XC8SW                   /CHECK A HALT AT END OF C8PASS
0232  0376          AND     (400            /MASK BIT
0233  7640          SZA CLA                 /HALT =1 NO SKIP CONTINUE =0
0234  4773'         JMS     XC8INQ                  /STOP PROGRAM EXECUTION-LOOK FOR INPUT
0235  2200  C8BY1,  ISZ     XC8PAS          /BUMP RETURN
0236  6203  C8EXT1, CDF CIF 00
0237  5600          JMP I   XC8PAS
0240  0000  CKCOUT, 0
0241  1261          TAD     DOSET           /CHECK IF SET UP NEEDED
0242  7640          SZA CLA                 /0=SET UP C8PASS COUNT VALUE
                                              /1=C8PASS COUNT VALUE OK
0243  5250          JMP     NOSET           /C8PASS COUNT VALUE ON
0244  1262          TAD     CNTVAL          /GET COUNT VALUE FOR THIS PROG
0245  7040          CMA                     /SET TO NEGATIVE
0246  3256          DCA     DOCNT           /STORE IN HERE
0247  2261          ISZ     DOSET           /INDICATE VALUE SET UP
0250  2256  NOSET,  ISZ     DOCNT           /COUNT THE NUMBER OF PASSES
0251  5235          JMP     C8BY1           /EXIT FOR ANOTHER PASS
0252  3261          DCA     DOSET           /SET TO C8PRNT C8PASS
0253  2240          ISZ     CKCOUT          /BUMP RETURN FOR
0254  5640          JMP I   CKCOUT          /C8PASS C8TYPE OUT
0255  2134  XMX,    MX
0256  0000  DOCNT,  0
0257  0000  PASCNT, 0                       /
0260  6350  XPASSES,         PASSES          /PRINT THE NUMBER IN FLD 0
0261  0000  DOSET,  0
0262  0000  CNTVAL, 0
0263  0411  MESPAS, TEXT    "DIRXB-D PASS "
0264  2230
0265  0255
0266  0440
0267  2001
0270  2323
0271  4000
                /*********************************************************************

                /C8CKSW
```

```
                    /ROUTINE THAT WILL CHECK WHERE TO READ THE
                    /C8 SWITCHES FROM IE. FROM PANEL OR PSEUDO C8SWIT REGISTER
                    /       C8CKSW= JMS XC8SW
                    /EX     C8CKSW          /READ THE C8SWIT REGISTER
                                            /RETURN WITH THE CONTENTS OF SWITCH REGISTER

                    /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING


0272  0000          XC8SW,  0
0273  7200                  CLA                     /CLEAR AC
0274  4772'                 JMS     XC8CKP          /CHECK FOR CONTROL CHARACTER!
0275  7000                  NOP
0276  6201                  CDF 00
0277  1771                  TAD I   (21
0300  6211                  CDF 10
0301  7710                  SPA CLA                 /CHECK IF FROM PANEL 4000
0302  7614                  7614                    /DO LAS AND SKIPGET FROM PANEL WITH LAS
0303  5305                  JMP     C8GET1          /GET LOC 20 FLD 0
0304  5310                  JMP     C8EXT2          /LEAVE BY A COMMON ROUTINE
0305  6201          C8GET1, CDF 00
0306  1770                  TAD I   (20
0307  6211                  CDF 10
0310  5672          C8EXT2, JMP I   XC8SW


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

                    /C8TTYI
                    /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE CONSOL
                    /       JMS     XC8TTY= JMS XC8TTY
                    /EX,    JMS     XC8TTY          /READ CHAR FROM THE CONSOL DEVICE
                    /                       /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR

                    /
                    /
0311  0000          XC8TTY, 0
0312  6031                  KSF                     /LOOK FOR KEYBOARD FLAG
0313  5312                  JMP     .-1
0314  6036                  KPB                     /GET CHAR
0315  0367                  AND     (177            /MASK FOR 7 BITS
0316  1366                  TAD     (200            /ADD THE EIGTH BIT
0317  3765'                 DCA     C8CHAR          /STORE IT
0320  1765'                 TAD     C8CHAR
0321  5711                  JMP I   XC8TTY          /EXIT
                    /****************************************************************

                    /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.

                    /       JMS     XC8PNT= JMS XC8PNT
```



```
                    /EX,    JMS     XC8PNT                  /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
                    /       MES877          /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




0322  0000          XC8PNT, 0
0323  7300                  CLA CLL
0324  1722                  TAD I   XC8PNT          /GET C8PRNT BUFFERS STARTING LOCATION
0325  3355                  DCA     PTSTOR          /STORE IN PTSTOR
0326  2322                  ISZ     XC8PNT          /BUMP RETURN
0327  1755          C8D01,  TAD I   PTSTOR          /GET DATA WORD
0330  0364                  AND     (7700           /MASK FOR LEFT BYTE
0331  7450                  SNA                     /CHECK IF 00 TERMINATE
0332  5722                  JMP I   XC8PNT          /EXIT
0333  7500                  SMA                     /IS AC MINUS
0334  7020                  CML                     /MAKE CHAR A 300 AFTER ROTATE
0335  7001                  IAC                     /MAKE CHAR A 200 AFTER ROTATE
0336  7012                  RTR
0337  7012                  RTR
0340  7012                  RTR                     /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
0341  4763'                 JMS     XC8TYP                  /C8PRNT IT ON CONSOLE
0342  1755                  TAD I   PTSTOR          /GET DATA WORD
0343  0362                  AND     (0077           /MASK FOR RIGHT BYTE
0344  7450                  SNA                     /CHECK IF 00 TERMINATOR
0345  5722                  JMP I   XC8PNT          //EXIT
0346  1361                  TAD     (3740           /ADD FUDGE FACTOR TO DETERMINE IF 200
0347  7500                  SMA                     /OR 300 IS TO BE ADD TO CHAR
0350  1360                  TAD     (100            /ADD 100
0351  1337                  TAD     (240            /ADD 200
0352  4763'                 JMS     XC8TYP                  /C8TYPE ONLY BITS 4-11
0353  2355                  ISZ     PTSTOR          /BUMP POINTER FOR NEXT WORD
0354  5327                  JMP     C8D01           /DO AGAIN
0355  0000          PTSTOR, 0                       /STOR FOR C8PRNT BUFFER
0356  0000          [illegible], 0                  /[illegible]
0357  0240
0360  0100
0361  3740
0362  0077
0363  1112
0364  7700
0365  1110
0366  0200
0367  0177
0370  0020
0371  0021
0372  1054
0373  0635
0374  1013
0375  1036
0376  0400
0377  1151
```

```
                0400    PAGE
  215                   /*****************************************************************
  216
  217                   /C8CNTR
  218                   /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
  219                   /IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-O-L-S
  220                   /       JMS     XC8CNT= JMS XC8CNT
  221
  222                   /EX,    JMS     XC8CNT                  /CHECK FOR CONTROL CHARACTER
  223                   /       JMP     ANYTHING        /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
  224                   /       JMP     ANYTHING        /LOC, IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
  225                   /
  226
  227                   /RETURN IS TO CALL PLUS ONE IF CONTINUE
  228                   /RETURN IS TO CALL PLUS TWO IF INMODE NOT SET AND NOT CONTROL CHAR
  229                   /
  230
  231   0400  0000      XC8CNT, 0
  232   0401  3777'             DCA     ACSAV           /SAVE THE AC
  233   0402  4776'             JMS     C8CK22          /CHECK LOC 22
  234   0403  5206              JMP     .+3             /ON ACTIVE CONSOLE
  235   0404  1777'             TAD     ACSAV           /GET AC FOR RETURN
  236   0405  5600              JMP I   XC8CNT          /EXIT NOT ON ACTIVE CONSOLE
  237   0406  6004              GTF
  238   0407  3775'             DCA     FLSAVE
  239   0410  7501              MQA
  240   0411  3774'             DCA     MQSAVE          /SAVE THE MQ
  241   0412  3255              DCA     INDEXA          /SET DISPLACEMENT INTO TABLE B
  242   0413  1257              TAD     XTABLA          /GET ADDRS OF TABLE A
  243   0414  3256              DCA     GETDAT          /CONTAINS POINTER TO CONTROL CHAR
  244   0415  1656      REDOA,  TAD I   GETDAT          /GET CONTROL CHAR FROM TABLE
  245   0416  7450              SNA                     /CHECK FOR A 0 END OF TABLE
  246   0417  5226              JMP     DONEA           /END OF TABLE NO CONTROL CHAR
  247   0420  1773'             TAD     C8CHAR          /COMPARE CHAR TO CONTROL CHAR
  248   0421  7650              SNA CLA                 /0 IF MATCH
  249   0422  5243              JMP     GOITA           /MATCH
  250   0423  2255              ISZ     INDEXA          /NO MATCH NOT END OF TABLE REDO
  251   0424  2256              ISZ     GETDAT          /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
  252   0425  5215              JMP     REDOA           /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR,
  253   0426  1772'     DONEA,  TAD     INMODE          /CHECK IF PROGRAM EXPECTS CHAR
  254   0427  7640              SZA CLA                 /1=CHAR EXPECTED  0= NO CHAR EXPECTED
  255   0430  5240              JMP     EXITA           /CHAR EXPECTED
  256   0431  1773'             TAD     C8CHAR          /GET CHAR - NOT CONTROL + NOT EXPECTED
  257   0432  4771'             JMS     XC8TYP                  /C8PRNT CHAR
  258   0433  1370              TAD     (277            /GET CODE FOR "?"
  259   0434  4771'             JMS     XC8TYP
  260   0435  4767'             JMS     XC8CRL
  261   0436  2200              ISZ     XC8CNT                  /UPDATE POINTER FOR +2 RETURN!
  262   0437  5600              JMP I   XC8CNT                  /EXIT AND CONTINUE PROGRAM
  263   0440  2200      EXITA,  ISZ     XC8CNT          /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
  264   0441  1773'             TAD     C8CHAR          /PUT CHAR IN AC.
  265   0442  5600              JMP I   XC8CNT          /EXIT
  266   0443  1773'     GOITA,  TAD     C8CHAR          /GET THE CONTENTS OF CHAR
  267   0444  1366              TAD     (100            /ADD 100 TO FORM A GOOD ASCII CHARACTER
  268   0445  3773'             DCA     C8CHAR          /RESTORE COFFECT CHAR
```



```
  269   0446  1260              TAD     XTABLB          /GET START OF TABLE B
  270   0447  1255              TAD     INDEXA          /GET NOW FAR INTO TABLE
  271   0450  3254              DCA     GOTOA           /STORE IT
  272   0451  1654              TAD I   GOTOA           /GET THE ROUTINE STARTTING ADDRESS
  273   0452  3254              DCA     GOTOA           /STORE IT IN HERE
  274   0453  5654              JMP I   GOTOA           /GOTO CONTROL CHAR ROUTINE
  275   0454  0000      GOTOA,  0000                    /ADD OF CNTRL ROUTINE TO EXECUTE
  276   0455  0000      INDEXA, 0000                    /DISPLACEMENT INTO CNTRL TABLE
  277   0456  0000      GETDAT, 0000                    /LOCATION OF ADDRS OF CONTROL CHAR,
  278   0457  0461      XTABLA, TABLA                   /ADDRS OF TABLEA
  279   0460  0471      XTABLB, TABLB                   /ADDRS OF TABLEB
  280   0461  7575      TABLA,  7575                    /CNTRL C BACK TO MONITOR 203
  281   0462  7557              7557                    /CNTRL Q START DISPLAYING CHAR, AGAIN 221
  282   0463  7556              7556                    /CNTRL R BACK TO BEGINNING OF PROGRAM 222
  283   0464  7555              7555                    /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
  284   0465  7573              7573                    /CNTRL E CONTINUE WITH PROGRAM 205
  285   0466  7574              7574                    /CONTROL D CHANGE SWITCH REGISTER ON FLY
  286   0467  7561              7561                    /CONTROL O FOR PRINTING STSTICIS LOC 202
  287   0470  0000              0000
  288   0471  1006      TABLB,  CNTRLC
  289   0472  0500              CNTRLQ
  290   0473  0504              CNTRLR
  291   0474  0514              CNTRLS
  292   0475  0532              CNTRLE
  293   0476  0600              CNTRLD
  294   0477  0535              CNTRLO
  295
  296                   /
  297                   /START SENDING CHAR, TO THE DISPLAY
  298                   /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
  299                   /THE CALL FOR CONTROL S,
  300                   /
  301   0500  3330      CNTRLQ, DCA     C8SETS          /CLEAR SOFT FLAG FOR CNTRL S
  302   0501  3772'             DCA     INMODE          /CLEAR SOFTWARE FLAG!
  303   0502  4765'             JMS     C8GET           /GET THE REGISTERS
  304   0503  5731              JMP I   C8RETR          /GO TO CALL SAVED BY CNTRL S
  305
  306                   /
  307                   /
  308                   /GO TO THE QUESTION C8SWIT
  309                   /
  310                   /
  311   0504  4764'     CNTRLR, JMS     UPAROW          /C8PRNT A " AND THE CHAR
  312   0505  3330              DCA     C8SETS          /CLEAR SOFT FLAG FOR CNTRL S
  313   0506  3772'             DCA     INMODE
  314   0507  4767'             JMS     XC8CRL
  315   0510  3763'     C8BY4,  DCA     C8SWST          /CLEAR REENTRY FLAG
  316   0511  6203              CDF CIF 00
  317   0512  5713              JMP I   XDOSW           /GO TO ADDRS OF C8SWIT
  318   0513  0200      XDOSW,  C8STRT                  /DOSW IS LABEL FOR C8SWIT QUESTION
  319                   /
  320                   /
  321                   /STOP SENDING CHAR, TO DISPLAY UNTIL A ^Q IS RECEIVED
  322                   /
  323                   /
```

```
0514  1330  CNTRLS, TAD   C8SETS          /IF1 DO NOT STORE IN C8RETR
0515  7640          SZA CLA
0516  5323          JMP   C8DO7           /DONT SET UP C8RETR
0517  7001          IAC
0520  1200          TAD   XC8CNT          /GET RETURN FOR THIS CALL
0521  3331          DCA   C8RETR          /STORE IT HERE FOR USE BE CNTROL Q
0522  2330          ISZ   C8SETS          /UPDATE REENTRY FLAG!
0523  4762' C8DO7,  JMS   XC8TTY                  /LOOK FOR CONTROL CHAR,
0524  4765'         JMS   C8GET           /REPLACE AC, MQ, AND LINK,
0525  4200          JMS   XC8CNT                  /CHECK FOR CONTROL CHAR,
0526  7200          CLA
0527  5314          JMP   CNTRLS
0530  0000  C8SETS, 0
0531  0000  C8RETR, 0
              /
              /
              /
              /CONTROL E
              /CONTINUE RUNNING FROM A INQUIRE OR ERROR
              /
              /
0532  4764' CNTRLE, JMS   UPAROW          /PRINT THE CONTROL CHAR
0533  4765'         JMS   C8GET           /GET THE REGISTERS
0534  5600          JMP I XC8CNT          /RETURN TO CALL PLUS ONE
              /
              /
              /CONTROL O TO RETURN TO FLD 0 LOC 202 FOR STATISTICAL INFO
0535  4764' CNTRLO, JMS   UPAROW
0536  6203          CDF CIF 0                     /SET UP TO FLD 0
0537  5761          JMP I (202                    /START OF STATISTIC PROG
0561  0202
0562  0311
0563  0746
0564  0615
0565  0624
0566  0100
0567  1036
0570  0277
0571  1112
0572  1111
0573  1110
0574  1142
0575  1143
0576  1151
0577  1141
      0600          PAGE
              /
              /
              /
              /CONTROL D
              /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
              /THE PROGRAM RUNNING,
0600  4215  CNTRLD, JMS   UPAROW
```



```
0601  1213          TAD   C8SETD          /CHECK IF THE RETURN ADDRS IS SAFE
0602  7640          SZA CLA
0603  5207          JMP   C8DO11          /DO NOT CHANGE THE RETURN ADDRS
0604  1777'         TAD   XC8CNT          /GET THE RETURN ADDRS AND SAVE IT
0605  3214          DCA   C8RETD          /SAVE THE RETURN HERE
0606  2213          ISZ   C8SETD          /INDICATE RETURN SAVED DONT DISTROY
0607  4252  C8DO11, JMS   XC8PSW                 /GO CHANGE THE SWITCH REGISTER
0610  3213          DCA   C8SETD          /CLEAR THE FLAG
0611  4224          JMS   C8GET           /REPLACE AC, MQ, AND LINK,
0612  5614          JMP I C8RETD          /RETURN TO THE PROGRAM
              /
0613  0000  C8SETD, 0
0614  0000  C8RETD, 0
              /


0615  0000  UPAROW, 0                     /C8PRNT THE "=" AND THE CHAR C8TYPED IN
0616  1376          TAD   (336            /CODE FOR =
0617  4775'         JMS   XC8TYP
0620  1774'         TAD   C8CHAR          /C8TYPE THE CHAR
0621  4775'         JMS   XC8TYP
0622  4773'         JMS   XC8CRLF
0623  5615          JMP I UPAROW          /EXIT

0624  0000  C8GET,  0
0625  7200          CLA
0626  1772'         TAD   MQSAVE
0627  7421          MQL                   /RESTORE MQ
0630  1771'         TAD   FLSAVE
0631  7004          RAL                   /RESTORE THE LINK
0632  7200          CLA
0633  1770'         TAD   ACSAV           /RESTORE THE AC
0634  5624          JMP I C8GET           /GET THE REGISTERS


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

              /C8INQU
              /C8INQU ROUTINE WILL PRINT A ASTERISK
              /AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
              /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
              /IF NO CONTROL CHAR ENTERED THEN ASTERISK IS REPRINTED
              /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN
              //

              /       JMS   XC8INQ= JMS XC8INQ

              /EX     JMS   XC8INQ                  /C8 WILL PRINT A * AND WAIT FOR INPUT
              /       DO ANYTHING           /RETURN IS CALL PLUS ONE AC =0 CONTINUE

0635  0000  XC8INQ, 0
0636  4767'         JMS   C8CK22          /CHECK FOR LOC 22 FLD 0
0637  7410          SKP
0640  5635          JMP I XC8INQ          /NOT CONSOLE LEAVE
```

```
0641  4773'          JMS     XC8CRLF
0642  4766'          JMS     XC8PNT
0643  1144           WATMES                  /INQUIR WAITTING
0644  4773'          JMS     XC8CRL
0645  4765'          JMS     XC8TTY          /SAVE CHARACTER!
0646  4224           JMS     C8GET           /REPLACE AC, MQ, AND LINK.
0647  4777'          JMS     XC8CNT          /CHECK FOR CONTROL CHARACTER!
0650  5635           JMP I   XC8INQ          /EXIT AND CONTINUE
0651  5236           JMP     XC8INQ+1        /REASK
                /
                /*****************************************************************
                /C8SWIT
                /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
                /SW QUESTION, IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTIONBUT
                /RETURN TO CALL PLUS ONE AC=0,
                /C8SWIT WILL SET UP THE PSEUDO C8SWIT
                /REGISTER WITH THE NEW DATA ENTERED
                /THE TAG  C8DOR AT THE START OF THE CALL IS FOR THE RETURN OF CONTROL R
                /CHAR, THIS MAY BE CHANGED IF THIS IS NOT WHERE A GOOD RESTART
                /OF PROGRAM IS.
                /
                /       JMS     XC8PSW= JMS XC8PSW

                /EX,    C8DOR,  JMS     XC8PSW          /SET UP PSEUDO C8SWIT REGISTER IF
                                                /ON THE CONSOL PACKAGE, RETURN IS CALL PLUS ONE AC = 0


0652  0000    XC8PSW, 0
0653  4767'          JMS     C8CK22
0654  7410           SKP
0655  5652           JMP I   XC8PSW          /RETURN WITHOUT ASKING PSEUDO SWITCH
0656  1346           TAD     C8SWST
0657  7640           SZA CLA                 /SPECIAL D EXIT?
0660  5764'          JMP     C8BY4           /YES, PRINT SR=,
0661  2346           ISZ     C8SWST          /NO, SET FLAG!
0662  4773'   REDO1,  JMS     XC8CRLF
0663  4766'          JMS     XC8PNT                  /C8PRNT SR=XXX
0664  1004           MESA
0665  6201           CDF 00
0666  1763           TAD I   (20
0667  6211           CDF 10
0670  4762'          JMS     XC8OCT                  /CONVERT IT TO ASCII
0671  1361           TAD     (40             /GET SPACE
0672  4775'          JMS     XC8TYP
0673  2760'          ISZ     INMODE          /SET FLAG FOR CHAR EXECTED
0674  4757'          JMS     XC8ECH                  /LOOK FOR INPUT
0675  4322           JMS     TSTCHA          /NOT CONTROL TEST IT IS LEGAL
0676  1774'          TAD     C8CHAR          /STORE NEW CHAR IN SW REG
0677  6201           CDF 00
0700  3763           DCA I   (20
0701  6211           CDF 10
0702  1356           TAD     (-3             /GET A MINUS 3
0703  3347           DCA     TMPCNT          /STORE IN TEMP COUNT
```



```
0704  4757'   GETCH1, JMS     XC8ECH                  /GET NEXT CHAR
0705  4322           JMS     TSTCHA          /CHECK IF CR + GOOD CHAR
0706  6201           CDF 00
0707  1763           TAD I   (20
0710  6211           CDF 10
0711  7106           RTL CLL                 /ROTATE IT LEFT 3 PLACES
0712  7004           RAL
0713  1774'          TAD     C8CHAR          /GET CHAR + ADD IT TO PREVIOUS CONTENTS
0714  6201           CDF 00
0715  3763           DCA I   (20
0716  6211           CDF 10
0717  2347           ISZ     TMPCNT          /BUMP COUNT
0720  5304           JMP     GETCH1          /JMP BACK + GET NEXT CHAR
0721  5343           JMP     ENDIT           /END 4 CHAR C8TYPED IN
0722  0000    TSTCHA, 0
0723  7041           CIA                     /CMPL CHAR IN AC
0724  1355           TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
0725  7650           SNA CLA                 /SKIP IN NOT CR,
0726  5343           JMP     ENDIT           /WAS CARRIAGE RETURN
0727  1774'          TAD     C8CHAR          /NOT CR, GET CHAR
0730  1354           TAD     (-260           /CHECK IF IT IS IN RANGE
0731  7710           SPA CLA                 /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
0732  5753'          JMP     C8ERR1          /C8ERR - CHAR TOO SMALL
0733  1774'          TAD     C8CHAR          /GET CHAR
0734  1352           TAD     (-270           /GET A -270 + CHECK IF IT IS LARGER THEN 7
0735  7700           SMA CLA                 /SKIP IF LESS THEN 7
0736  5753'          JMP     C8ERR1          /C8ERR ON CHAR NOT IN RANGE
0737  1774'          TAD     C8CHAR          /GET CHAR
0740  0351           AND     (7              /MASK FOR RIGHT BYTE
0741  3774'          DCA     C8CHAR          /STORE IN CHAR
                                             /GET CHAR IN AC
0742  5722           JMP I   TSTCHA          /EXIT
0743  4773'   ENDIT,  JMS     XC8CRL                  /DO A CR LF
0744  3346           DCA     C8SWST          /CLEAR REENTRY FLAG!
0745  5652           JMP I   XC8PSW          /EXIT ROUTINE
                /
0746  0000    C8SWST, 0
0747  0000    TMPCNT, 0

0751  0007
0752  7510
0753  1000
0754  7520
0755  0215
0756  7775
0757  1076
0760  1111
0761  0040
0762  1013
0763  0020
0764  0510
0765  0311
0766  0322
0767  1151
0770  1141
```

```
0771  1143
0772  1142
0773  1036
0774  1110
0775  1112
0776  0336
0777  0400
      1000            PAGE

1000  1377  C8ERR1, TAD     (277            /PRINT A ?
1001  4312          JMS     XC8TYPE
1002  4236          JMS     XC8CRLF
1003  5776'         JMP     REDO1
1004  2322  MESA,   TEXT    "SR="
1005  7500
                    /
                    /
                    /RETURN TO MONITOR
1006  3337  CNTRLC, DCA     TTYLPT          /CLEAR EXIT FLAG,
1007  4775'         JMS     UPAROW          /C8PRNT A" AND LETTER IN CHAR
1010  6203          CDF CIF                 /GO TO 0 FLD
1011  6007          CAF                     /CLEAR THE WORLD
1012  5774          JMP I   (7600           /GO TO DIAGNOSTIC MONITOR
                    /
                    /

                    /*********************************************************************
                    /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
                    /       JMS     XC8OCT= JMS XC8OCT
                    /
                    /EX,    JMS     XC8OCT          /AC CONTAINS NUMBER TO BE CHANGE
                    /

1013  0000  XC8OCT, 0
1014  7106          CLL RTL
1015  7006          RTL                     /POSITION THE FIRST CHAR FOR PRINTING
1016  3234          DCA     C8TMP1          /SAVE CORRECT POSITIONED WORD HERE
1017  1373          TAD     (-4
1020  3235          DCA     C8CKP           /STORE COUNTER IN HERE
1021  1234  C8DO4,  TAD     C8TMP1          /GET FIRST NUMBER
1022  0372          AND     (0007           /MASK
1023  1371          TAD     (260            /ADD THE PRINT CONSTANT
1024  4312          JMS     XC8TYP                  /TYPE THE NUMBER
1025  1234          TAD     C8TMP1          /
1026  7006          RTL
1027  7004          RAL                     /PUT NEXT NUMBER IN POSITION
1030  3234          DCA     C8TMP1          /STORE IT
1031  2235          ISZ     C8CKP           /DONE YET WITH FOUR NUMBERS
1032  5221          JMP     C8DO4           /NOT YET DO MORE
1033  5613          JMP I   XC8OCT          /DONE WITH FOUR
1034  0000  C8TMP1, 0
1035  0000  C8CKP,  0
```



```
                    /*********************************************************************

                    /C8CRLF
                    /C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
                    /
                    /       JMS     XC8CRL= JMS XC8CRL
                    /
                    /EX,    JMS     XC8CRL          /C8PRNT A CR AND LF WITH FILL
                    /                               /RETURN TO CALL PLUS ONE AC =0

1036  0000  XC8CRL, 0
1037  7300          CLA CLL
1040  1370          TAD     (215            /GET CODE FOR CR
1041  4312          JMS     XC8TYP
1042  1252          TAD     C8FILLER
1043  7040          CMA
1044  3253          DCA     FILCNT          /STORE FILLER IN HERE
1045  1367          TAD     (212            /GET CODE FOR LF
1046  4312  C8DO2,  JMS     XC8TYP
1047  2253          ISZ     FILCNT          /CHECK ON FILLER CHAR
1050  5246          JMP     C8DO2           /TYPE A NON PRINTING CHAR
1051  5636          JMP I   XC8CRL          /EXIT
1052  0004  C8FILLER,      0004            /FILLER SET FOR 4 CHAR
1053  0000  FILCNT, 0                       /COUNTER FOR FILL


                    //*************************************************************
                    /C8CKPA
                    /THIS ROUTINE WILL CHECK IF A CONTROL CHARACTER WAS INPUTED
                    /FROM THE CONSOLE TERMINAL, IF THE FLAG IS SET AND THE CONSOLE
                    /PACKAGE IS ACTIVE A CHECK IS MADE TO DETERMINE IF IT IS A CONTROL
                    /CHARACTER, IF SO THEN ITS FUNCTION IS PERFORMED, IF NOT OR A
                    /CONTROL E-D-L-O IT WILL DO ITS FUNCTION AND RETURN TO THE CALL
                    /+2, A NON-CONTROL CHARACTER WILL BE PRINTED WITH A ? AND
                    /RETURN TO CALL +2, IF NO FLAG IS SET OR IF NOT THE CONSOLE
                    /PACKAGE THE RETURN WILL BE TO THE CALL +1,
                    /       JMS     XC8CKP= JMS XC8CKP

                    /EX,    JMS     XC8CKP          /CHECK IF CONSOL DEVICE KEYBOARD SET
                    /       NOP             /RETURN
                    /       NOP             /RETURN

1054  0000  XC8CKP, 0
1055  3341          DCA     ACSAV           /SAVE AC, MQ, AND LINK!
1056  6004          GTF                     /GET THE FLAGS
1057  3343          DCA     FLSAVE
1060  7501          MQA
1061  3342          DCA     MQSAVE          /SAVE MQ,
1062  6031          KSF                     /CHECK THE CONSOL FLAG
1063  5274          JMP     C8BY3           /NO FLAG UP!
1064  4351          JMS     C8CK22          /CHECK LOC 22
1065  7410          SKP
1066  5274          JMP     C8BY3           /NO!
```

```
1067  4766'          JMS     XC8TTY          /SAVE CHARACTER!
1070  4765'          JMS     C8GET           /REPLACE AC, MQ, AND LINK!
1071  4764'          JMS     XC8CNT                  /CHECK IF IT WAS A CONTROL CHAR
1072  7000           NOP
1073  2254           ISZ     XC8CKP                  /UPDATE FOR RETURN +2.
1074  4765'  C8BY3,  JMS     C8GET                   /REPLACE FLAGS.
1075  5654           JMP I   XC8CKP          /EXIT
                     /
                     /
                     //*********************************************************************

                     /C8ECHO
                     /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD,  STORE IT IN LOCATION CHAR
                     /CHECK IF IT WAS A C8CNTR CHARACTER - SET INMODE - C8PRNT CHARACTER
                     /       JMS     XC8ECH= JMS XC8ECH
                     /EX.    JMS     XC8ECH          /LOOK FOR CONSOL CHAR C8PRNT IT
                                             /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN


                     /
1076  0000   XC8ECH, 0
1077  4766'          JMS     XC8TTY                  /WAIT FOR CHAR FROM KEYBOARD
1100  4765'          JMS     C8GET                   /GET THE REGISTERS
1101  2311           ISZ     INMODE          /SET INMODE IDENTIFING THIS AS A EXPECTED CHAR
1102  4764'          JMS     XC8CNT                  /GO CHECK IF IT IS A CONTROL CHAR
1103  5676           JMP I   XC8ECH          /WAS A CONTROL CHAR - CONTINUE RUNNING
1104  4312           JMS     XC8TYP                  /NOT A CONTROL CHAR C8PRNT IT
1105  3311           DCA     INMODE          /CLEAR FLAG THAT CHAR EXPECTED
1106  1310           TAD     C8CHAR          /GET CHAR IN AC
1107  5676           JMP I   XC8ECH          /EXIT
1110  0000   C8CHAR, 0
1111  0000   INMODE, 0

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

                     /C8TYPE
                     /THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
                     /
                     /       JMS     XC8TYP= JMS XC8TYP

                     /EX.    JMS     XC8TYP          /C8PRNT THE CHAR IN THE AC.
                     /                       /RETURN CALL PLUS ONE AC =0000
                                             /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT


1112  0000   XC8TYP, 0
1113  3336           DCA     PNTBUF          /STORE CHAR
1114  1337           TAD     TTYLPT          /CHECK 0=TTY 7777=LPT
1115  7640           SZA CLA
1116  5325           JMP     XDOLPT          /DO OUT PUT ON LPT
1117  1336           TAD     PNTBUF
1120  6046           TLS
1121  6041           TSF
1122  5321           JMP     .-1
1123  6042           TCF
```



```
1124  5334           JMP     C8BY5           /EXIT
1125  1336   XDOLPT, TAD     PNTBUF          /GET CHAR
1126  6666           PSTB    PCLF            /C8PRNT IT
1127  4254           JMS     XC8CKP          /CHECK FOR CONTROL C.
1130  7000           NOP
1131  6661           PSKF
1132  5327           JMP     .-3             /WAIT UNTIL DONE
1133  6662           PCLF
1134  7200   C8BY5,  CLA
1135  5712           JMP I   XC8TYP          /EXIT
1136  0000   PNTBUF, 0
1137  0000   TTYLPT, 0


1140  7777   PCSAVE, 7777
1141  7777   ACSAV,  7777
1142  7777   MQSAVE, 7777
1143  7777   FLSAVE, 7777
1144  2701   WATMES, TEXT    "WAITING "
      1145  1124
      1146  1116
      1147  0740
      1150  0000

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

                     /C8CK22 WILL CHECK LOCATION 22 FLD 0

1151  0000           C8CK22, 0
1152  6201           CDF 00
1153  7200           CLA
1154  1763           TAD I   (22
1155  6211           CDF 10
1156  7650           SNA CLA
1157  2351           ISZ     C8CK22          /RETURN FORACTIVE CONSOL IS +1
1160  5751           JMP I   C8CK22


1163  0022
1164  0400
1165  0624
1166  0311
1167  0212
1170  0215
1171  0260
1172  0007
1173  7774
1174  7600
1175  0615
1176  0662
1177  0277
      1200   PAGE
                     /
                     /***************************************
```

```
                                /THIS IS THE FIELD 0 CALL FOR CHECKING THE CONTROL CHAR
                                
1200  0000                      XXC8CNTR,       0
1201  4777'                     JMS     XC8CNTR         /GO TO CONTROL CHAR ROUTINE
1202  7000                      NOP
1203  6203                      CDF CIF 00
1204  5600                      JMP I   XXC8CNTR        /RETURN TO FIELD 0


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

1205  0000                      XXC8INQ,        0
1206  4776'                     JMS     XC8INQU         /PRINT WAITING
1207  6203                      CDF CIF 00
1210  5605                      JMP I   XXC8INQ         /EXIT TO FLD 0

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

1211  0000                      XXC8PSW,        0
1212  4775'                     JMS     XC8PSW          /FIELD 0 CALL FOR SWIT REG QUESTION
1213  6203                      CDF CIF 00
1214  5611                      JMP I   XXC8PSW         /EXIT TO FIELD 0


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

1215  0000                      XXC8SW, 0
1216  4774'                     JMS     XC8SW           /FIELD 0 CALL FOR THIS CHECK OF SW SETTING
1217  6203                      CDF CIF 00
1220  5615                      JMP I   XXC8SW          /EXIT TO FIELD 0


                                /LOOK IS A CHECK OF TTY AND CONTROL CHAR

1221  0000                      XC8LOOK,        0
1222  4773'                     JMS     XC8TTY          /GET THE CHAR
1223  4777'                     JMS     XC8CNTR         /GET THE CONTROL CHAR FUNCTION
1224  7410                      SKP                     /IS A CONTINUE
1225  5230                      JMP     REASK1
1226  6203                      EXTLOOK,        CDF CIF 00
1227  5621                      JMP I   XC8LOOK
1230  4776'   REASK1,           JMS     XC8INQU
1231  5226                      JMP     EXTLOOK


1373  0311
```



```
1374  0272
1375  0652
1376  0635
1377  0400
      0000    FIELD 0
```

```
0000
0100

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  01111111  11111111  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  10011111  11111111

1200  11111111  11111111  11111111  11000000  00000000  00000000  00000000  00000000
1300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00011111

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
```

```
                        / RX8 DATA RELIABILITY/EXERCISER * MAINDEC-08-DIRXB-D
                        /
                        /THIS TABLE OF PROCESSOR HLT 'S IS DESIGNED TO PROVIDE TO THE OPERATOR IMPORTANT
                        /INFORMATION CONCERNING THAT HALT AND THE TYPE OF RECOVERY AVAILABLE
                        /
                        /THE CONTENTS OF THE AC AT THE TIME OF THE HALT REPRESENTS THE PSEUDO ADDRESS
                        /OF THE 7402 (HLT).
                        /
                        /ALL OCTAL TO DECIMAL CONVERSION ROUTINES HAVE BEEN REMOVED
                        /TO CONSERVE CORE, THE REAL TIME CLOCK HAS ALSO BEEN REMOVED
                        /AGAIN TO SAVE CORE.
                        /
                        /
                        /
1400  0243              HLT1    /               OK      WAITING FOR OPERATOR TO SELECT DRIVES
                        /
                        /
                        /
1401  0412              HLT2    /               OK      WAITING FOR OPERATOR TO SELECT TESTS
                        /
                        /
                        /
1402  2102              HLT6    /               OK      PROCESSOR HALTED AT ERROR
                        /
                        /
                        /
1403  2131              HLT10   /               OK      PROCESSOR HALTED AT END OF TEST
                        /
                        /
                        /
1404  4220              HLT16   /               OK      PROCESSOR HALTED AT ERROR (AC SW 0 = 1)
                        /
                        /
                        /
1405  0204              HLT20   /               OK      PROCESSOR HALTED AT END OF
                        /                               STATISTICAL INFORMATION DUMP (SA WAS 202)
                        /
                        /
                        /
1406  1474              HLT7    /               OK      PROCESSOR HALTED AT ERROR (AC SW 0 = 1)
                        /
                        /
                        /
1407  2261              HLT8    /               FATAL   AUTOMATIC PROGRAM RESTARTS EXCEEDED 4
                        /
                        /PATTERN OVERVIEW - AC SWITCHES 0-1-2
                        /
                        /       0 - RANDOM DATA         4 - 10101010
                        /       1 - ALL 1'S             5 - 01010101
                        /       2 - 00110011            6 -
                        /       3 - 11001100            7 - ALL 0'S
                        /
                        /TEST OVERVIEW - AC SWITCHES 3-4-5
                        /
                        /       0 - THE ACCEPTANCE TEST         4 -READ (CRC CHECK)
```



```
                        /       1 - WRITE-READ                  5 - WRITE ONLY
                        /           (CRC CHECK)
                        /       2 - WRITE-READ-READ             6 - NOT THE ACCEPTANCE TEST
                        /           CHECK (PROGRAM                  (BUT SIMILAR)
                        /           VERIFY)
                        /       3 - THE COUNTER PART OF         7 - THE COUNTERPART OF TEST 0
                        /           (TEST 2, READ-PROGRAM VERIFY)     (READ-PROGRAM VERIFY)
                        /
                        /SEQUENCE OVERVIEW - AC SWITCHES 6-7-8
                        /
                        /TRACK ACCESS SEQUENCE IS SELECTED VIA AC SWITCHES 6,7,8 AT L/S 200
                        /
                        / 0 - RANDOM
                        / 1 - INCREMENTAL OD TO ID
                        / 2 - DECREMENTAL ID TO OD
                        / 3 - COMBINATION OF SEQ 0, AND SEQ 1 (INC/DEC)
                        / 4 - BOUNCE ID TO OD ONLY
                        / 5 - BOUNCE: (ID, OD ; ID-1, OD+1 ; ...ETC TO 47, 45)
                        / 6 - STROBE: (ID, OD ; ID-1, OD ; ...ETC TO 1, 0)
                        / 7 -
                        /PDP-8/E AUGMENTED INTRUCTIONS
                        /
                        /BSW DEFINED AT A LATER POINT ON PAGE 0
        6001    ION=6001
        6002    IOF=6002
        4407    LAS=CKSWIT              /CALL WILL CHECK THE HARDWARE SW OR LOC 20 DEPENDING
                                /ON THE STAET OF THE SWITCH REGISTER BIT IN LOCATION
                                /21
        7501    MQA=7501                        / "OR" (MQ) WITH (AC)
        7421    MQL=7421                        /MQ=AC (THEN CLEAR AC)
                /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
                /ITERRUPT SERVICE POINTERS
                /
        0000            *0
0000    0304            304                             /REVISION D

        0001            *1
0001    5402            JMP I .+1
0002    3400            PI
0003    0000    XA10,           0
                /
```

```
                        /PROGRAM LOCATIONS XXX AND YYY ARE TEMPORARY STORAGE REGISTERS FOR DATA
                        /OR FOR ADDRESSES OF DATA WHICH ARE CALLED WITHIN SUBROUTINES WHICH
                        /DO NOT CALL SUBROUTINES WHICH CALL THESE STORAGE REGISTERS
                        /
                        /XXX AND YYY ARE CALLED WITHIN THE FOLLOWING SUBROUTINES
                        /
                        /       XXX                     YYY
                        /
                        /RDORWR (2)
                        /DD/RX-ERROR (2)
                        /LOCK (2)                       (2)
                        /HUNGUP (4)
                        /S202                           (4)
                        /
0004  0000              XXX,            0
0005  0000              YYY,            0
                        /
                        /***************************
                        /CONSOLE
                        /***************************
        4406    C8LOOK= JMS I   .               /LOOK FOR TTY INPUT AND CONTROL CHAR
0006    1221            XC8LOOK
                        
        4407    CKSWIT= JMS I   .                       /REPLACES LAS
0007    0744            XCKSWIT
                        
                        /
        0010    *10
                        /
                        /
                        /AUTO-INDEX REGISTER DEFINITIONS
                        /
0010  0000              A10,    0
0011  0000              A11,    0
0012  0000              A12,    0
0013  0000              A13,    0
0014  0400              K0400,  0400
0015  0200              K0200,  0200
                        
        0020            *20
                        /
                        /THE FOLLOWING PROGRAM LOCATIONS (20, 21, AND 22) ARE RESERVED FOR ACT8/A
                        /
0020  0750              0750            /PSEUDO SWITCH REGISTER  SET TO DEVICE CODE 75
0021  4000              4000            /PSEUDO SWITCH REGISTER=0000
                                        /USE HARDWARE SWITCH REGISTER=4000
0022  0000              0000            /400 FOR CONSOL PACKAGE ACTIVE
                                        /0000 FOR NONACTIVE CONSOLE PACKAGE
                        
0023  0000              0000                            /RESERVED FOR FUTURE USE.
                        /***************
                        /CONSOLE
                        /***************
                        
        4424            CHECKC8=JMS I   .       /CHECK IF ON CONSOLE
```



```
0024  5420              XCHECK
                        
                        
        4425            C8PASS=JMS I    .
0025    0200            XC8PASS
                        
        4426            C8SWIT= JMS I   .                       /ASK THE SWITCH REG QUESTION
0026    1211            XXC8PSW
                        
        4427            AERROR=JMS I .
0027    3351            XAERRO
                        
        4430            C8INQU= JMS I .
0030    1205            XXC8INQ                                 /PRINT THE WAITING MES
        4431            C8CNTL=JMS I .
0031    1200            XXC8CNTR
                        
                        
                        
                        /
                        /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 WILL VERIFY THAT THESE PARAMATERS ARE WITHIN THE PERSCRIBED
                        /LIMITS, IF THE PROGRAM VERIFICATION DETECTS AN IRREGULARITY - THEN THE
                        /PARAMATER OUT OF BOUNDS WILL BE SET TO ITS PROPER VALUE AUTOMATICALLY
                        /
                        /THE PROGRAM WILL PRINT A CONFIRMATION MESSAGE IF THESE PARAMATERS ARE NON STANDARD
                        /
0032  0001              OD,     1                       /OUTSIDE DIAMETER (MIN VALUE 0)
0033  0114              ID,     114                     /INSIDE DIAMETER (MAX VALUE 114)
0034  0001              FIRST,  1                       /FIRST SECTOR TO ACCESS (MIN VAL 1)
0035  0032              LAST,   32                      /LAST SECTOR TO ACCESS (MAX VAL 32)
                        /
                        /PDP-8/E AUGMENTED INSTRUCTIONS
                        /
        4436    BSW=JMS I .
0036    5144            XBSW    /PROGRAMMED BYTE SWAP
                        /
                        /DISKETTE IOT SUBROUTINES
                        /
        4437    LCD=JMS I .
0037    4226            XLCD
        4440    LCDA=JMS I .
0040    4233            XLCDA
        4441    LCDB=JMS I .
0041    4260            XLCDB
        4442    XDRIN=JMS I .
0042    0522            XXDRIN
```

```
1035          4443    XDROUT=JMS I .
1036    0043  0525            XXDROUT
1037          4444    STR=JMS I .
1038    0044  0531            XSTR
1039          4445    SER=JMS I .
1040    0045  0536            XSER
1041          4446    SDN=JMS I .
1042    0046  0543            XSDN
1043          4447    INTR=JMS I .
1044    0047  4415            XINTR
1045          4450    INIT=JMS I .
1046    0050  4423            XINIT
1047                  /OPERATING SYSTEM SUBROUTINES
1048                  /
1049          4451    DELUNIT=JMS I .
1050    0051  2275            XDELUNIT        /DELETE FROM (UNITS) UNITX
1051          4452    DONE=JMS I .
1052    0052  4707            XDONE           /               FORM: "DONE; NO; YES"
1053          4453    GETASECTOR=JMS I .
1054    0053  3007            XGETASECTOR
1055          4454    GETATRACK=JMS I .
1056    0054  2425            XGETATRACK      /GET A TRACK FOR IOT LCD-B (TRACK #)
1057          4455    GETUNIT=JMS I .
1058    0055  2200            XGETUNIT        /SELECT A DISKETTE DRIVE
1059          4456    HLT=HALT
1060          4456    HALT=JMS I .
1061    0056  5126            XHALT
1062          4457    INITSECTORS=JMS I .
1063    0057  3000            XINITSECTORS
1064          4460    INITTRACKS=JMS I .
1065    0060  2413            XINITTRACKS
1066                  /LOCK THE COUNTER THAT OVERFLOWED AT -1
1067                  /
1068                  /FORM: LOCK; LSB; MSB (OR IF NO MSB THEN K7777)
1069                  /
1070          4461    LOCK=JMS I .
1071    0061  2400            XLOCK
1072          4462    LOG=JMS I .
1073    0062  3502            XLOG            /LOG ALL ERRORS (IF ANY), FORM: "LOG; (X)ERRORS"
1074          4463    PRINT=JMS I .
1075    0063  3227            XPRINT          /PRINT A MESSAGE; FORM: "PRINT; MESSAGE"
1076          4464    PRINTDRIVESELECTED=JMS I .
1077    0064  2331            XDRIVESELECTED
1078          4465    READ=JMS I .
1079    0065  1400            XREAD
1080          4466    READCOMPARE=JMS I .
1081    0066  1352            XREADCOMPARE
1082          4467    SETUP=JMS I .
1083    0067  2135            XSETUP
1084          4470    SPECIALTYPE=JMS I .
1085    0070  4517            XSPECIALTYPE
1086          4471    STOP=JMS I .
1087    0071  2104            XSTOP           /STOP TEST AT COMPLETION IF AC SW 1 = 1
1088          4472    TAB=JMS I .
1089    0072  3200            XTAB            /               FORM: " TAB; N "
```



```
1090          4473    TY4OCT=JMS I .
1091    0073  2676            XTY4OCT         /TYPE (4) OCTAL ; FORM: " TY4OCT; OCTAL "
1092          4474    TYPEIT=JMS I .
1093    0074  3272            XTYPEIT                         /TYPE (1) 8 BIT ASCII; (AC) AT ENTRY = ASCII
1094                  /*****************************************************************
1095                  /THESE ROUTINES HAVE BEEN REMOVED. ONLY OCTAL VALUES WILL BE PRINTED.
1096                  /
1097                  /TYSW9=JMS I .
1098                  /       XTYSW9          /TYPE OCTAL (SW9 = 0) OR DECIMAL VALUES
1099                  /TY4DEC=JMS I .
1100                  /       XTY4DEC         /TYPE (4) DECIMAL; FORM: (AC=DECIMAL); TY4DEC
1101                  /TY8DEC=JMS I .
1102                  /       XOCTDEC         /TYPE (8) DECIMAL; FORM: "TY8DEC; LSB; MSB"
1103                  /TY8DEX=JMS I .
1104                  /       XTY8DEX         /TYPE (8) DECIMAL < 4096 MAGNITUDE; FORM: "TY8DEX; LSB"
1105                  /*****************************************************************
1106                  /
1107                  /
1108          4475    TY8OCT=JMS I    .
1109    0075  4751            XTY8OCT                         /TYPES 8 OCTAL DIGIT FROM DOUBLE
1110                                                          /PRECISION LOG.
1111          4476    DRVSEL=JMS I    .
1112    0076  4723            XDRVSL                  /DRIVE SELECT ROUTINE FOR APT-8
1113          4477    APT8=JMS I      .
1114    0077  0343            XAPT8                           /WILL TEST FOR APT SYSTEM
1115          4500    CHEK22=JMS I    .
1116    0100  4714            CHK22
1117          4501    WRITE=JMS I .
1118    0101  1200            XWRITE
1119          4502    WAIT=JMS I .
1120    0102  2352            XWAIT
1121                  /OPERATING SYSTEM ALLOCATED STORAGE REFERENCES
1122                  /
1123                  /A MAX OF 4 AUTOMATIC RESTARTS PERMITTED PRIOR TO U-HALT
1124                  /
1125    0103  0000    ARESTARTS,      0               /MAXIMUM OF 4 AUTO RESTARTS PRIOR TO PDP HALT
1126    0104  0000    BUSY,           0               / = 1 - PROCESSING AN RX01 PROGRAM INTERRUPT
1127    0105  0000    COMMAND,        0               /DISKETTE COMMAND ; (AC) AT LCD
1128    0106  0000    COMPRERROR,     0               /PROGRAM DATA COMPARE ERRORS
1129    0107  7777    EPASS,          7777            / (7777) IS 1ST ERROR THIS PASS
1130    0110  7777    FIRSTERROR,     7777            / (7777) IF 1ST ERROR EVER FOR PROGRAM
1131    0111  7740    HANGER,         -40             /COUNTER TO DETECT DEVICE TEST HUNG
1132    0112  0000    IDUMP,          0               / # OF AUTOMATIC INTERUM STATISTICAL REPORTS
1133    0113  7777    K7777,          -1              / CONSTANT
1134    0114  7772    KM6,            -6              / CONSTANT
1135    0115  7770    KM10,           -10             / CONSTANT
1136    0116  7740    KM40,           -40             / CONSTANT
1137    0117  7704    KM74,           -74             / CONSTANT
1138    0120  0012    K12,            12              / CONSTANT
1139    0121  0016    K16,            16              / CONSTANT
1140    0122  0074    K74,            74              / CONSTANT
1141    0123  0750    K0750,  0750
1142    0124  7777    XCNT,   -1
1143    0125  0377    K377,           377             / CONSTANT
1144    0126  7377    K7377,  7377
```

```
1145  0127  7000  K7000,  7000
1146  0130  6520  K6520,  6520                    /USED FOR ERROR REPORTER FOR APT.
1147  0131  0007  K0007,  0007
1148  0132  0000  PASSINPROGRESS, 0               / = 1 IF A TEST PASS IS IN PROGRESS
1149  0133  0000  RDC,            0               / = 0 IF A RDC TEST, = 1 IF READ, 4000 IF WRITE
1150  0134  7765  KRETRY,         -13             / 1 ORIGINAL TRY + 10 RETRYS
1151  0135  7746  SECTORS,        -32             /NEGATIVE # OF SECTORS PER TRACK (1-32 OCTAL)
1152  0136  0000  SSTART,         0               /SECTOR LAST ACCESSED ( 0 = "HOME" )
1153  0137  0000  STARGET,        0               /TARGET SECTOR OF (UNITX)
1154  0140  0000  START,          0               /TRACK LAST ACCESSED
1155  0141  0000  ASTATUS,        0               /DISKETTE STATUS " A " AT INTERRUPT (ERROR OR DONE)
1156  0142  0000  BSTATUS,        0               /RX01 DEFINITIVE ERROR CODE REGISTER
1157  0143  0000  CSTATUS,        0               /STATUS FROM A "READ STATUS" COMMAND
1158  0144  0000  TARGET,         0               /TARGET TRACK OF (UNITX)
1159  0145  0000  TESTP,          0               /TEST PARAMATERS (SELECTED FROM AC SWITCHES)
1160  0146  0000  IF,             0               /INTERLEAVE FACTOR (1, 2, 3)
1161  0147  0000  BSWAC,  0
1162  0150  0000  BSWLINK,        0
1163              /
1164              /THE FOLLOWING K0007 RETRY COUNTERS MUST REMAIN IN THE ORDER DEFINED
1165              /
1166              /BECAUSE REFERENCES TO THESE LOCATIONS ARE FROM SUBROUTINE XLOG
1167              /
1168  0151  7765  R1RETRY,         -13     /WERRORS        /WRITE ERROR RECOVERY
1169  0152  7765  R2RETRY,         -13     /RERRORS        /READ ERROR RECOVERY
1170  0153  0000  DWSLOG,         0                       /DATA ERROR WITH CRC STATUS ERROR
1171  0154  0000  DNSLOG,         0       /DNSERRORS      /DATA ERROR BUT NO CRC STATUS ERROR
1172  0155  0000  SNDLOG,         0       /SNDERRORS      /CRC STATUS ERROR BUT NO DATA ERROR
1173  0156  7765  SRETRY,         -13     /SERRORS        /SEEK ERROR RECOVERY
1174  0157  7765  PRETRY,         -13     /PERRORS        /PARITY ERROR RECOVERY
1175              /
1176              / (TRACKS) ARE SET TO THE NEGATIVE DIFFERENCE BETWEEN (OD), AND (ID)
1177              / IN THE SUBOROUTNE "INITTRACKS "
1178              /
1179  0160  7663  TRACKS,          -115            / -# OF TRACKS PER DISKETTE (-115 TO -1 DYNAMIC DECREMENT)
1180  0161  0115  TTRACKS,         115             / # OF TRACKS PER DISKETTE (115 TO 1 STATIC)
1181              /*****************************************************************
1182              /
1183              /THE REAL TIME CLOCK NO LONGER AVAILABLE.
1184              /THIS WAS DONE TO CONSERVE SPACE AND RUN TIME.
1185              /XSUBCPS,        -21             / THE CLOCK IS SET AT ONE TICK =10 MILL SECONDS
1186              /       ********** THE RTC IS TO BE SET TO -21 FOR A 10 MSEC CLOCK
1187              /
1188              /SUBCPS,         -21
1189              /CPS,    -6
1190              /
1191  0162  0000  XTARGET,         0               / ; (AC) = TRACK+SECTOR AT IOT LCD=B ; DESTINATION
1192              /SECOND,                 -74             / 60 SECONDS PER MINUTE
1193              /MINUTE,                 -74             / 60 MINUTES PER HOUR
1194              /HOUR,           0
1195              /                0               / HOURS TO 16777215
1196              /TICK,           0               / = 1 MEANS CLOCK IS TICKING
1197              /THE ABOVE CONSTANTS REMOVED. REAL TIME CLOCK NO LONGER AVAILABLE.
1198              /
1199              /TIME AT DETECTION OF AN ERROR
```



```
1200              /
1201              /ESECOND,        0               /
1202              /EMINUTE,        0               /
1203              /EHOUR,          0
1204              /                0               /
1205              /
1206              /*****************************************************************
1207  0163  0000  ECOMMAND,        0               / COMMAND IN ERROR
1208  0164  0000  H1,              0               / STALL FOR DEVICE TEST HUNG
1209  0165  0000  GOBIT,           0               / = 1 MEANS PROGRAM EXPECT INTERRUPT REQUEST FROM RX01
1210              /
1211              / (SUMCHECK) IS A NUMBER GENERATED WITHIN SUBROUTINE * GETWORD *
1212              /EQUIVALENT TO SUMCHECK OF 62/126  [ 12/8 BIT MODE] DATA WORDS
1213              /
1214  0166  0000  SUMCHECK,        0
1215              /
1216  0167  0000  LSB,             0               /
1217  0170  0000  MSB,             0               /
1218  0171  0000  TTYBUSY,         0               / = 0 MEANS NOT BUSY, = 1 BUSY = 4000 MEANS <CTRL>S
1219  0172  0000  STESTP,          0               /DYNAMIC SUBTEST DIRECTIVE
1220              /
1221              / (USTART) = 4000 MEANS [KEY], = 0 MEANS STARTING UNIT WAS 0
1222              / = 1 MEANS STARTING UNIT WAS 1
1223              /
1224  0173  4000  USTART,          4000
1225  0174  0000  GOOD,            0               / EXPECTED DATA PATTERN
1226  0175  0000  SUNITS, 0                /SAVE UNITS FOR S202 STATICAL REPORT
1227  0176  5304  XXKCC,  XKCC
1228        0200        *200
1229                  /********
1230                  /CONSOLE
1231                  /********
1232  0200  5207  C8STRT, JMP BEGIN                      /STARTING ADDRESS 200
1233  0201  5206          JMP BEGIN-1             /RESTART 201
1234              /
1235  0202  3171          DCA TTYBUSY
1236  0203  4777'         JMS S202
1237  0204  4456  HLT20,  HLT
1238  0205  5203          JMP .-2
1239              /PRIME THE AUTOMATIC INTERUM STATISTICAL REPORT (IDUMP), AND
1240              /PRIME THE RETURN ADDRESS OF THE STATISTICAL (DUMP) SUBROUTINE
1241              /
1242              /WHEN (S202) NOT = 0, THEN THE STATISTICAL REPORT WAS MANUALLY INITIATED
1243              /BY THE OPERATOR IN CHARGE
1244              /
1245              /WHEN (S202) = 0, THEN THE STATISTICAL REPORT IS AN INTERUM DUMP
1246              /AUTOMATICALLY PRINTED BECAUSE A/OR ALL DISKETTE UNITS(S) HAVE
1247              /FOR SOME REASON BEEN DESELECTED FROM TESTING.
1248              /
1249  0206  1376          TAD (XNONE)             /LS 201 (SAME AS AUTORESTART)
1250  0207  4477  BEGIN,  APT8                    /TEST FOR APT-8
1251  0210  3777'         DCA S202
1252  0211  3775'         DCA XLOCK
1253  0212  3171          DCA TTYBUSY
1254  0213  3104          DCA BUSY
```

```
1255    0214  3165            DCA GOBIT
1256    0215  1116            TAD KM40
1257    0216  3111            DCA HANGER
1258    0217  3136            DCA SSTART
1259    0220  3144            DCA TARGET
1260    0221  7240            STA
1261    0222  3110            DCA FIRSTERROR
1262    0223  7240            STA
1263    0224  3107            DCA EPASS
1264
1265                          /**************
1266                          /CONSOLE
1267                          /**************
1268    0225  4774'           JMS PNTID               /PRINT THE ID AND REMOVE MESS
1269                                                  /BEFORE  PRINTING DO A CAF
1270                                                  /WAIT FOR CONTROL E TO CONTINUE
1271                          /***************
1272    0226  4502            WAIT                            /WAIT FOR SDN FLAG, TIME OUT IF YOU
1273                                                          /DON'T GET IT.
1274
1275    0227  4446    SDNFIRST,       SDN
1276    0230  4445            SER
1277    0231  7410            SKP
1278    0232  4773'           JMS FORCE
1279                  /IF (S202 NOT = 0, THEN L/S 201, IF (S202) = 0, THEN L/S 200
1280                  /
1281                  /PROGRAM NOTE:
1282                  /
1283                  /THE LABLE "XLS" MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN THE ERROR SERVICE
1284                  /
1285    0233  1777'   XLS,    TAD S202
1286    0234  7640            SZA CLA
1287    0235  5247            JMP AUTORESTART
1288    0236  3103    S200,   DCA ARESTARTS
1289    0237  3112            DCA IDUMP
1290    0240  4500            CHEK22                          /SEE IF ON APT
1291    0241  4476            DRVSEL                          /ON APT
1292                          /**************
1293                          /CONSOL
1294                          /**************
1295    0242  4772'           JMS C8CKSELECT          /SELECT DISKETTE AND WAIT FOR SW  QUESTION
1296                          /***************
1297    0243  4456    HLT1,   HLT                     /SELECTION IS VIA ACCUMULATOR SWITCHES
1298    0244  4407            LAS                     /FOR DRIVE SELECTION (BIT 00 = DRIVE 0)
1299    0245  0371            AND (SW0+SW1)           /BITS 0-1 (MAXIMUM 2 DISKETTE DRIVES)
1300                  /THE OPERATOR FAILED TO SELECT AT LEAST (1) DISKETTE DRIVE, OR
1301                  /MISTAKENLY SELECTED A DISKETTE DRIVE WITH NO POWER APPLIED, OR
1302                  /SELECTED A DISKETTE DRIVE NOT UP TO SPEED
1303                  /
1304                  /THEREFORE THE PROGRAM WILL AUTOMATICALLY ATTEMPT TO SELECT ALL
1305                  /DISKETTE DRIVES WHICH HAVE BEEN " POWERED UP ".
1306                  /
1307                  /THE PROGRAM WILL ISSUE THE COMMAND "READ STATUS REGISTER"
1308                  /SELECTING EACH DISKETTE UNIT
1309                  /
```



```
1310                  /THE PROGRAM WILL DO THIS BY SEQUENCING FROM DRIVE 0 THRU (MAX)
1311                  /SAMPLING THE STATUS REGISTER FOR THE CONDITION "SEL DRV RDY"
1312                  /
1313                  /IF THE CONDITION "SEL DRV RDY" IS NOT FOUND, THAT (UNIT) IS NOT
1314                  /SELECTABLE AND DELETED FROM THE MAXIMUM SYSTEM CONFIGURATION (UNITS).
1315                  /
1316    0246  7450            SNA
1317                  /
1318                  /REFRESH PROGRAM LOCATIONS WUNITS, UNITS, AND BUSY FOR AN AUTORESTART (AND LS 201)
1319                  /
1320    0247  1371    AUTORESTART, TAD (6000)         /MAXIMUM SYSTEM CONFIGURATION 2 DISKETTE DRIVES
1321    0250  3770'           DCA UNITS
1322    0251  3767'           DCA WUNITS              /REFRESH FOR FIRST ENTRY INTO " XGETUNIT "
1323    0252  3104            DCA BUSY
1324    0253  7330            STL CLA RAR
1325    0254  3766'           DCA UNITZ       / TO SET INTO USTART WITHIN XGETUNIT
1326    0255  1116            TAD KM40
1327    0256  3111            DCA HANGER
1328    0257  4455    AUTO,   GETUNIT
1329    0260  1134            TAD KRETRY
1330    0261  3157            DCA PRETRY
1331    0262  1120    AUTOL,  TAD K12
1332    0263  4440            LCDA
1333                  /
1334                  /RETURN TO HERE FROM AN RX01 INTERRUPT
1335                  /
1336                  /THE LABLE "JMPAUTOOK" MUST RESIDE HERE BECAUSE OF REFERENCES AT "PI"
1337                  /
1338    0264  5277    JMPAUTOOK, JMP AUTOOK
1339    0265  5267            JMP AUTOERROR
1340    0266  5765'           JMP XPI
1341                  /
1342                  /RETURN IS HERE TO AUTOERROR IF A PARITY ERROR ON THE COMMAND WORD
1343                  /
1344    0267  2157    AUTOERROR, ISZ  PRETRY
1345    0270  7410            SKP
1346    0271  5277            JMP AUTOOKNOTOK
1347    0272  4407            LAS
1348    0273  0015            AND K0200
1349    0274  7650            SNA CLA
1350    0275  5262            JMP AUTOL
1351    0276  3157            DCA PRETRY
1352                  /
1353                  /RETURN IS HERE TO AUTOOK IF NO ERROR OCCURED
1354                  /
1355                  /THEREFORE LOG A SOFT PARITY ERROR
1356                  /
1357                  / (OR TO LOG A HARD P ERROR)
1358                  /
1359    0277  4462    AUTOOK, LOG
1360    0300  7315            PERRORS                 /LOG H OR S PARITY ERROR
1361    0301  1141            TAD ASTATUS
1362    0302  0015            AND K0200                       /DRIVE SELECT READY ?
1363    0303  7650            SNA CLA
1364    0304  4451            DELUNIT                         / NO
```

```
                        /
                        /PROGRAMMING NOTE:
                        /
                        /THE LABEL " XAUTO " MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN
                        /SUBROUTINES " XGETUNIT" AND " XDELUNIT "
                        /
0305  4452    XAUTO,    DONE
0306  5257              JMP AUTO
0307  4464              PRINTDRIVESELECTED
                        /
                        /IF ENTRY TO HERE WAS FROM OF AN AUTOMATIC DUMP ERROR LOGS
                        /BECAUSE FOR SOME REASON ANY OR ALL THE UNITS BECAME DESELECTED
                        /THEN THE TESTING WITH THE (TESTP) PREVIOUSLY SELECTED AT S/A 200
                        /AUTOMATICALLY CONTINUES
                        /
                        / (AN AUTORESTART IS EQUIVALENT TO A L/S 201)
                        /
                        /THE LOGS ARE REFRESHED ONLY AT L/S 200, AND
                        /AT AN AUTORESTART, AND
                        /AT A LOG-OVERFLOW
                        /
                        /IF THE DRIVES SELECTED FOR THE RESTART ARE NOT THE ORIGINAL SELECTIONS
                        /
0310  1775'              TAD XLOCK
0311  7640              SZA CLA
0312  5320              JMP XLOGREFRESH
0313  1175              TAD SUNITS
0314  7041              CIA
0315  1770'             TAD UNITS
0316  7650              SNA CLA
0317  5764'             JMP XS201
                        / " DCA XLOCK " PREVENTS ILLEGAL LOG-REFRESH AT RESTART 201
                        /
0320  3775'   XLOGREFRESH, DCA XLOCK
0321  4463              PRINT
0322  5577              MREFRESH
0323  4463              PRINT
0324  5624              MPASSES
0325  4475              TYBOCT
0326  6350              PASSES
                        /CLEAR ALL LOGS
                        /
0327  1363    LOGREFRESH, TAD (LOGS-1)
0330  3010              DCA A10                     / C L E A R
0331  3410              DCA I A10
0332  1010              TAD A10                     /   A L L
0333  1362              TAD (-XLOGS)
0334  7640              SZA CLA                     / L O G S
0335  5331              JMP .-4
0336  1777'             TAD S202
0337  1361              TAD (-XNONE)
0340  7640              SZA CLA
0341  5760'             JMP NOTEST
0342  5764'             JMP XS201
                        /
```



```
                        /ROUTINE TO DETERMINE IF ON APT-8. IF APT-8 IS SELECTED
                        /THEN CONSOLE AND TEST PARAMETER SELECTION FUNCTIONS ARE NOP.
                        /IF NOT ROUTINE IS NOP.
                        /
0343  0000    XAPT8,    0
0344  7300              CLA CLL
0345  4500              CHEK22
0346  7410              SKP                         /ON APT-8
0347  5743              JMP I   XAPT8
0350  1022              TAD     22
0351  0126              AND     K7377               /NOP CONSOLE PACKAGE
0352  3022              DCA     22                  /RESTORE 22
0353  5757'             JMP     DEVCDE              /GET DEVICE CODE IN ADDRESS 20,
0354  5743              JMP I   XAPT8               /AND EXIT
                                                    /USE RELIABILITY FUNCTION.
0357  5345
0360  0405
0361  5533
0362  0330
0363  6347
0364  0400
0365  0676
0366  2272
0367  2271
0370  2270
0371  6000
0372  0734
0373  3605
0374  0722
0375  2400
0376  2245
0377  4434
      0400              PAGE
                        /THIS ROUTINE HAS BEEN MOVED FROM LOC 405 TO 400
                        /SAVE  ONE LOC BY MOVE
                        /
0400  2777'   XS201,   ISZ RESTARTS
0401  5220              JMP XS20X
0402  4461              LOCK
0403  6352              RESTARTS
0404  0113              K7777
                        /*****************
                        /*******************
                        / " SELECT OPERATING PARAMATERS " VIA AC SWITCHES
                        /
                        /               PPP. TTT. SSS. 8/12 DD (10)
                        /
0405  4463    NOTEST, PRINT
0406  5563              MSTEST
                        /*****************
                        /CONSOLE
                        /*****************
0407  4424              CHECKC8
0410  4426              C8SWIT                  /ASK THE SWITCH REGISTER QUESTION
0411  7410              SKP                     /SKIP OVER HLT IN CODE AFTER RETURNING
```

```
1474                    /*********************************
1475    0412  4456      HLT2,   HLT
1476    0413  4407              LAS
1477    0414  3145              DCA TESTP
1478    0415  4424              CHECKC8
1479    0416  4426              C8SWIT
1480    0417  7200              CLA             /STOP IF ON CLASSIC TO SET UP THE RUNNING SWITCHES
1481
1482                    /
1483    0420  7200      XS20X,CLA
1484                    /
1485                    /PRIME (SUNITS) = (UNITS) IF EVER A " JMS 6202 "
1486                    /
1487    0421  1776'             TAD UNITS
1488    0422  3175              DCA SUNITS
1489                    /
1490                    / 0 < (FIRST) <= 32
1491                    /
1492    0423  1034              TAD FIRST
1493    0424  7740              SMA SZA CLA
1494    0425  5230              JMP .+3
1495    0426  7301              CLL CLA IAC
1496    0427  3034              DCA FIRST
1497    0430  1034              TAD FIRST
1498    0431  1375              TAD (-32)
1499    0432  7740              SMA SZA CLA
1500    0433  5226              JMP .-5
1501                    / 0 < (LAST) => (FIRST)
1502                    /
1503    0434  1035              TAD LAST
1504    0435  7740              SMA SZA CLA
1505    0436  5241              JMP .+3
1506    0437  1374              TAD (32)
1507    0440  3035              DCA LAST
1508    0441  1035              TAD LAST
1509    0442  7041              CIA
1510    0443  1034              TAD FIRST
1511    0444  7740              SMA SZA CLA
1512    0445  5237              JMP .-6
1513                    / 0 <= ID <= 114
1514                    /
1515    0446  1033              TAD ID
1516    0447  7700              SMA CLA
1517    0450  5253              JMP .+3
1518    0451  1373              TAD (114)
1519    0452  3033              DCA ID
1520    0453  1033              TAD ID
1521    0454  1372              TAD (-114)
1522    0455  7740              SMA SZA CLA
1523    0456  5251              JMP .-5
1524                    / 0 <= OD <= ID
1525                    /
1526    0457  1032              TAD OD
1527    0460  7700              SMA CLA
1528    0461  5264              JMP .+3
```



```
1529    0462  7301              CLL CLA IAC
1530    0463  3032              DCA OD
1531    0464  1033              TAD ID
1532    0465  7041              CIA
1533    0466  1032              TAD OD
1534    0467  7740              SMA SZA CLA
1535    0470  5262              JMP .-6
1536                    /PRINT THE (TESTP) SELECTIONS AND CHECK FOR NON STANDARD OD, ID, FIRST, AND LAST
1537                    /
1538    0471  4771'             JMS CHECK
1539
1540                    /BITS 0-3 OF TESTP CONTAIN THE TEST PARAMATER FOR EXECUTION
1541                    /
1542    0472  1370              TAD (700)
1543    0473  0145              AND TESTP
1544    0474  7112              CLL RTR
1545    0475  7012              RTR
1546    0476  7012              RTR
1547    0477  1367              TAD (TESTS)
1548    0500  3311              DCA XTESTS
1549                    / SET INTO STESTP FROM TESTP THE 8/12 BIT MODE AND DD BITS
1550                    /
1551    0501  7321              CLL CLA CML IAC
1552    0502  7006              RTL                     / 6
1553    0503  0145              AND TESTP
1554    0504  7110              CLL RAR
1555    0505  3172              DCA STESTP                      / SUBTEST DIRECTIVE
1556                    /
1557    0506  1711              TAD I XTESTS
1558    0507  3311              DCA XTESTS
1559    0510  5711              JMP I XTESTS
1560    0511  0631      XTESTS, THETEST
1561                    /
1562                    /TEST SELECTIONS
1563                    /
1564                    /
1565                    /       TEST   0 - THE ACCEPTANCE TEST
1566                    /       TEST 001 - WRITE - READ (CRC CHECK)
1567                    /       TEST 010 - WRITE - READ - READ CHECK (PROGRAM VERIFY)
1568                    /       TEST 011 - READ - PROGRAM VERIFY (COUNTER PART TO TEST 2)
1569                    /       TEST 100 - READ (CRC CHECK)
1570                    /       TEST   5 - WRITE ONLY
1571                    /       TEST 110 - NOT THE ACCEPTANCE TEST (BUT SIMILAR)
1572                    /       TEST 111 - READ - PROGRAM VERIFY (COUNTER PART TO TEST 0)
1573                    /
1574                    /
1575    0512  0631      TESTS,  THETEST
1576    0513  0610              TEST1
1577    0514  0606              TEST2
1578    0515  0602              TEST3
1579          0602      TEST7=TEST3
1580                    /
1581    0516  0600              TEST4
1582    0517  0612              TEST5
1583    0520  0631              THETEST
```

```
1584    0521  0602          TEST7
1585                  /
1586                  /TRANSFER DATA REGISTER (FROM) THE RX01 CONTROL
1587                  /
1588    0522  0522    XXDRIN, .
1589    0523  6752    K67X2A, 6752
1590    0524  5722          JMP I XXDRIN
1591                  /TRANSFER DATA REGISTER (TO) THE RX01 CONTROL
1592                  /
1593    0525  0525    XXDROUT, .
1594    0526  6752    K67X2B, 6752
1595    0527  7200          CLA
1596    0530  5725          JMP I XXDROUT
1597                  /SKIP ON TRANSFER REQUEST
1598                  /
1599    0531  0531    XSTR,   .
1600    0532  6753    K67X3,  6753                        /STR, SKIP ON TRANSFER
1601                                                      /REQUEST FLAG,
1602    0533  5731          JMP I   XSTR                 /DID NOT GET SKIP,
1603    0534  2331          ISZ     XSTR                 /UPDATE RETURN,
1604    0535  5731          JMP I   XSTR                 /EXIT.
1605                  /SKIP ON RX01 ERROR FLAG
1606                  /
1607    0536  0536    XSER,   .
1608    0537  6754    K67X4,  6754                        /SKIP ON ERROR FLAG,
1609    0540  5736          JMP I   XSER                 /DID NOT GET SKIP,
1610    0541  2336          ISZ     XSER
1611    0542  5736          JMP I   XSER
1612                  /SKIP ON RX01 DONE FLAG
1613                  /
1614    0543  0543    XSDN;   .
1615    0544  6705    K67X5,  6705                        /SKIP ON DONE FLAG,
1616    0545  5743          JMP I   XSDN                          /DID NOT GET SKIP,
1617    0546  2343          ISZ     XSDN
1618    0547  5743          JMP I   XSDN
1619                  /IF THE PROGRAMMED INSTRUCTION IMMEDIATELY BEFORE " READ "
1620                  /IS A " WRITE " , THEN THIS IS A WRITE DATA ERROR, IF NOT,
1621                  /THEN THIS IS A READ DATA ERROR
1622                  /
1623                  /FORM: JMS RDORWR; (READ RETURN); (WRITE RETURN)
1624                  /
1625    0550  0550    RDORWR, .
1626    0551  7344          CLL STA RAL
1627    0552  1766'         TAD XREAD
1628    0553  3004          DCA XXX
1629    0554  1404          TAD I XXX
1630    0555  1365          TAD (-WRITE)
1631    0556  7650          SNA CLA
1632    0557  2350          ISZ RDORWR
1633    0560  5750          JMP I RDORWR
1634                  /***********
1635                  /CONSOLE
1636                  /***********
1637                  /THIS ROUTINE IS USED FOR THE C8PASS RETURN TO REENTER THE PROGRAM
1638
```



```
1639    0561  6001    C8RET1, ION
1640    0562  5764'         JMP     PASSRETURN
1641    0564  2123
1642    0565  3277
1643    0566  1400
1644    0567  0512
1645    0570  0700
1646    0571  3111
1647    0572  7664
1648    0573  0114
1649    0574  0032
1650    0575  7746
1651    0576  2270
1652    0577  6352
              0600          PAGE
1653    0600  1377    TEST4,  TAD (READ)
1654    0601  7410          SKP
1655    0602  1376    TEST3,  TAD (READCOMPARE)
1656    0603  3223          DCA DOB
1657    0604  1127          TAD K7000
1658    0605  5215          JMP DCADOA
1659    0606  1376    TEST2,  TAD (READCOMPARE)
1660    0607  7410          SKP
1661    0610  1377    TEST1,  TAD (READ)
1662    0611  7410          SKP
1663    0612  1127    TEST5,  TAD K7000
1664    0613  3223          DCA DOB
1665    0614  1375          TAD (WRITE)
1666    0615  3222    DCADOA, DCA DOA
1667                  /
1668                  / TESTS 1, 2, 3, 4, 5, OR 7
1669                  /
1670    0616  4460    TEST,   INITTRACKS
1671    0617  4455          GETUNIT
1672    0620  4454    TESTL,  GETATRACK
1673                  /
1674                  /IF THIS IS TEST # 7 THEN " JMS ACCEPT " BECAUSE THIS IS THE READ-PROGRAM VERIFY
1675                  /COUNTERPART TO THE ACCEPTANCE TEST # 0
1676                  /
1677    0621  4261          JMS ACCEPT
1678    0622  4501    DOA,    WRITE
1679    0623  4465    DOB,    READ
1680    0624  2160          ISZ TRACKS
1681    0625  5220          JMP TESTL
1682    0626  4471          STOP
1683    0627  5216          JMP TEST
1684    0630  5216          JMP TEST
1685                  /
1686                  /THIS IS THE ACCEPTANCE TEST (DEFAULT TEST SELECTION = 0)
1687                  /
1688                  /THIS TEST WILL SEQUENCE THROUGH ALL 8/12 BIT MODE AND DELETED DATA SELECTIONS
1689                  /
1690                  / (STESTP) IS THE DYNAMIC SUBTEST DIRECTIVE
1691                  /
1692    0631  4460    THETEST, INITTRACKS
```

```
1693    0632  4455            GETUNIT
1694                    /
1695                    /FORCE THE ACTUATOR SEQUENCE = 0 (INCREMENTAL 0-114)
1696                    /
1697                    /PROGRAMMING NOTE:
1698                    /
1699                    /THE CODE FROM LABLE " THEL " TO LABLE " XTHEL " IS EQUIVALENT TO " GETATRACK "
1700                    /
1701    0633  1374    THEL,   TAD (XTHEL)
1702    0634  3773'           DCA XGETATRACK
1703    0635  1144            TAD TARGET
1704    0636  3140            DCA START
1705    0637  5772'           JMP SEQINC
1706    0640  4261    XTHEL,  JMS ACCEPT
1707    0641  4501            WRITE
1708    0642  4466            READCOMPARE
1709    0643  2160            ISZ TRACKS
1710    0644  5233            JMP THEL
1711    0645  4452            DONE
1712    0646  5231            JMP THETEST
1713                    /ACTUATOR MOVEMENT [NOW] IS THAT SELECTED AT START (BITS 6,7,8 OR TEST P)
1714                    /
1715    0647  4460    XXTHEL, INITTRACKS
1716    0650  4455            GETUNIT
1717    0651  4454    XYTHEL, GETATRACK
1718    0652  4261            JMS ACCEPT
1719    0653  4466            READCOMPARE
1720    0654  2160            ISZ TRACKS
1721    0655  5251            JMP XYTHEL
1722    0656  4471            STOP
1723    0657  5247            JMP XXTHEL
1724    0660  5231            JMP THETEST
1725                    /IF THIS IS THE ACCEPTANCE TEST # 0 THEN:
1726                    /
1727                    /IF THE TARGET TRACK = X, THE SUBTEST DIRECTIVE (STESTP) WILL = Y
1728                    /
1729                    /       TARGET  /       SUBTEST
1730                    /       TRACK   /       DIRECTIVE
1731                    /
1732                    /         X     /         Y
1733                    /.....................................................................
1734                    /         0     /         0                   / 12 BIT MODE
1735                    /         1     /         1                   / 12 BIT MODE WITH DELETED DATA
1736                    /         2     /         2                   /  8 BIT MODE
1737                    /         3     /         3                   /  8 BIT MODE WITH DELETED DATA
1738                    /         4     /         0                   /       .
1739                    /         5     /         1                   /       .
1740                    /         6     /         2                   /       .
1741                    /         7     /         3                   /       .
1742                    /
1743                    /         .     /         .                   /       .
1744                    /
1745                    /       114     /         0                   /       .
1746                    /
1747                    /
```



```
1748                    / " ACCEPT " IS A SUBROUTINE WHICH RESETS (STESTP) THEREBY REGULATING THE EXECUTION
1749                    /OF 8/12 BIT MODE AND DELETED DATA
1750                    /
1751    0661  0661    ACCEPT, .
1752    0662  1145            TAD TESTP
1753    0663  0371            AND (700)
1754    0664  7450            SNA
1755    0665  5271            JMP T0T7
1756    0666  1370            TAD (-700)
1757    0667  7640            SZA CLA
1758    0670  5661            JMP I ACCEPT
1759    0671  7321    T0T7,   CLL CML CLA IAC
1760    0672  7004            RAL
1761    0673  0144            AND TARGET
1762    0674  3172            DCA STESTP
1763    0675  5661            JMP I ACCEPT
1764                    /WAIT FOR A PROGRAM INTERRUPT REQUEST
1765                    /
1766                    /
1767                    /       BUT WHILE WAITING, DISPLAY IN THE MQ THE CODED INFORMATION
1768                    /AS INDICATED BY ACCUMULATOR SWITCHES 9, 10, AND 11 AT RUN-TIME
1769                    /
1770                    /               0 = TARGET TRACK AND SECTOR
1771                    /               1 = TEST PARAMATERS (SELECTED FROM SA 200)
1772                    /               2 = " A " STATUS
1773                    /               3 = " COMMAND " WORD TO RX01
1774                    /
1775    0676  6001    XPI,    ION
1776    0677  1116            TAD KM40
1777    0700  3111            DCA HANGER
1778    0701  4407            LAS
1779    0702  0367            AND (SW10+SW11)
1780    0703  1366            TAD (TAD I DISPLAY)
1781    0704  3305            DCA .+1
1782    0705  1716            TAD I DISPLAY
1783    0706  7421            MQL
1784    0707  2164            ISZ H1
1785    0710  5301            JMP XPI+3
1786    0711  2111            ISZ HANGER
1787    0712  5301            JMP XPI+3
1788    0713  7200            CLA
1789    0714  1365            TAD (XPI)
1790    0715  5764'           JMP HUNGUP
1791    0716  0162    DISPLAY, XTARGET
1792    0717  0145            TESTP
1793    0720  0141            ASTATUS
1794    0721  0105            COMMAND
1795                    /***************
1796                    /CONSOLE
1797                    /********************
1798
1799                                                    /CALLED FROM LOCATION 225
1800    0722  0000    PNTID,  0                         /PRINT ID AND REMOVE, WAIT FOR CONTROL E
1801    0723  6007            CAF                       /IF NO CLEAR BY FRONT PANEL THEN DO IT HERE
1802    0724  4463            PRINT
```

```
1803    0725  6336          MIDENTIFICATION /PRINT THE ID
1804    0726  4463          PRINT
1805    0727  5452          REMOVE          /PRINT REMOVE DIAG DISK
1806    0730  4424          CHECKC8                 /IS IT A ACTIVE CONSOLE PACKAGE
1807    0731  4406          C8LOOK                  /YES LOOK FOR CONTROL CHARACTERS
1808    0732  6001          ION
1809    0733  5722          JMP I   PNTID           /EXIT PNTID
1810
1811
1812                                                /CALL MADE FROM LOCATION 240
1813    0734  0000    C8CKSELECTION,  0             /MAKE DRIVE SELECTION VIA SWIT QUESTION
1814    0735  4463          PRINT
1815    0736  5547          MSDRIVES                /PRINT DRIVES SELECTED
1816    0737  4424          CHECKC8
1817    0740  4426          C8SWIT                  /ASK THE SWIT REG QUESTION FOR SETT
1818    0741  2334          ISZ     C8CKSEL         /BUMP RETURN IF ON CONSOLE
1819    0742  6001          ION
1820    0743  5734          JMP I   C8CKSEL         /EXIT C8CKSEFECTION OF DRIVES
1821
1822
1823                                                /THIS CALL IS USED IN PLACE OF A LAS
1824
1825    0744  0000    XCKSWIT,        0             /CHECK SWIT REG ROUTINE
1826    0745  7200          CLA
1827    0746  4500          CHEK22
1828    0747  5744          JMP I   XCKSWIT         /ON APT IGNORE SWITCH REGISTER,
1829    0750  1022          TAD     22              /TO USE HARD OF SOFTWARE SWITCH REG
1830    0751  0363          AND     (400            /MASK FOR BIT
1831    0752  7650          SNA CLA
1832    0753  7614          7614                    /LAS AND SKIP WAS HARDWARE SWITCH REG
1833                                                /THIS IS A NOP IF ON APT-8,
1834    0754  1020          TAD     20              /WAS SOFT PSEUDO SWITCH REGISTER
1835    0755  5744          JMP I   XCKSWIT
1836
1837    0763  0400
1838    0764  5200
1839    0765  0676
1840    0766  1716
1841    0767  0003
1842    0770  7100
1843    0771  0700
1844    0772  2470
1845    0773  2425
1846    0774  0640
1847    0775  4501
1848    0776  4466
1849    0777  4465
              1000    PAGE
1850                  /END OF PASS ROUTINE
1851
1852    1000  4424    PASMES, CHECKC8                 /CHECK IF ON ACTIVE CONSOLE
1853    1001  4425          C8PASS                    /IS ACTIVE
1854    1002  5777'         JMP     C8RET1            /GO TO ANOTHER ROUTINE TO RETURN TO LOC2114
1855
1856
```



```
1857
1858                        /*************************************************************
1859    1003  4463    RETUR2, PRINT
1860    1004  5611          MCRLF
1861    1005  5776'         JMP     RETUR1                  /CRLF ROUTINE FOR END OF PAS,
1862                  NRETUR1,/ PATTERN SAVE
1863                  /
1864                  /SAVE THE RANDOM * R * REGISTERS FOR A RANDOM PATTERN SELECTION (IF EVER)
1865                  /
1866                  /PREVENTING DIFFERENT RANDOM PATTERN FROM BEING GENERATED FOR EACH SECTOR
1867                  /THEREBY ENABLING A * COMPATABILITY * TEST TO BE EXECUTED WITH RANDOM DATA
1868                  /
1869    1006  1006    PATSAVE, .
1870    1007  1775'         TAD R1
1871    1010  3214          DCA PATR1
1872    1011  1774'         TAD R2
1873    1012  3215          DCA PATR2
1874    1013  5606          JMP I PATSAVE
1875    1014  1234    PATR1,  1234
1876    1015  0765    PATR2,  0765
1877                  /
1878                  /PATTERN SETUP
1879                  /
1880                  /SETUP FOR THE APPROPRIATE PATTERN AS SELECTED BY THE OPERATOR AT L/S 200
1881                  /
1882    1016  1016    PATSETUP, .
1883    1017  1373          TAD (7000)
1884    1020  0145          AND TESTP
1885    1021  7106          CLL RTL
1886    1022  7006          RTL
1887    1023  1372          TAD (TAD PATTERNS)
1888    1024  3225          DCA .+1
1889    1025  1312          TAD PATTERNS
1890    1026  3302          DCA XPATTERNS
1891    1027  3166          DCA SUMCHECK
1892    1030  7301          CLL CLA IAC
1893    1031  7004          RAL
1894    1032  0172          AND STESTP                      / 8/12 BIT MODE INTERROGATION
1895    1033  7640          SZA CLA
1896    1034  1371          TAD (-100)
1897    1035  1371          TAD (-100)
1898    1036  3011          DCA A11
1899    1037  1011          TAD A11
1900    1040  3012          DCA A12
1901    1041  1214          TAD PATR1
1902    1042  3775'         DCA R1
1903    1043  1215          TAD PATR2
1904    1044  3774'         DCA R2
1905    1045  5616          JMP I PATSETUP
1906                  /
1907                  / GET WORD
1908                  /
1909                  /GET A 12 BIT WORD OR AN 8 BIT BYTE FOR FILLING THE SECTOR BUFFER, OR
1910                  /
1911                  /TO COMPARE TO THE DATA EMPTIED FROM THE SECTOR BUFFER
```

```
1912                    /
1913                    / IF (A12) - (A11) = 0, THEN EXIT WITH (AC) = " TARGET " TRACK
1914                    /
1915                    / IF (A12) - (A11) = 1, THEN EXIT WITH (AC) = "STARGET " SECTOR
1916                    /
1917                    / IF (A11) = 7776, THEN EXIT WITH THE (AC) = " SUMCHECK "
1918                    /
1919                    / IF (A11) = 7777, THEN EXIT WITH THE (AC) = " -(2 X SUMCHECK)
1920                    /
1921    1046  1046      GETWORD, .
1922    1047  1012              TAD A12
1923    1050  7041              CIA
1924    1051  1011              TAD A11
1925    1052  7440              SZA
1926    1053  5256              JMP .+3
1927    1054  1144              TAD TARGET
1928    1055  5303              JMP DCAGOOD                     / " TARGET "
1929    1056  7110              CLL RAR
1930    1057  7640              SZA CLA
1931    1060  5263              JMP .+3
1932    1061  1137              TAD STARGET
1933    1062  5303              JMP DCAGOOD             / " STARGET "
1934    1063  1011              TAD A11
1935    1064  7001              IAC
1936    1065  7440              SZA
1937    1066  5274              JMP .+6
1938    1067  1166              TAD SUMCHECK
1939    1070  7141              CLL CIA
1940    1071  7004              RAL
1941    1072  3174              DCA GOOD
1942    1073  5307              JMP ISZA11      / " -(2 TIMES SUMCHECK) "
1943    1074  7001              IAC
1944    1075  7640              SZA CLA
1945    1076  5302              JMP     XPATTERNS
1946    1077  1166              TAD     SUMCHECK
1947    1100  3174              DCA     GOOD
1948    1101  5307              JMP     ISZA11
1949    1102  4770'   XPATTERNS, JMS RANGEN
1950    1103  3174    DCAGOOD, DCA GOOD
1951    1104  1166              TAD SUMCHECK
1952    1105  1174              TAD GOOD
1953    1106  3166              DCA SUMCHECK
1954    1107  2011    ISZA11, ISZ A11
1955    1110  7000              NOP
1956    1111  5646              JMP I GETWORD           / EXIT SUBROUTINE
1957                    /THE FOLLOWING ARE THE ALLOCATED PATTERN POINTERS
1958                    /
1959    1112  4770'   PATTERNS,       JMS RANGEN
1960    1113  7240                    STA                     / 1
1961    1114  1322                    TAD PAT2
1962    1115  1323                    TAD PAT3
1963    1116  1324                    TAD PAT4
1964    1117  1325                    TAD PAT5
1965    1120  1326                    TAD PAT6
1966    1121  7200                    CLA
```



```
1967                    /
1968                    /       12 BIT MODE     8 BIT MODE
1969                    /
1970    1122  1463      PAT2,   1463            / 63            / 0011  00110011
1971    1123  6314      PAT3,   6314            / 314           / 1100  11001100
1972    1124  5252      PAT4,   5252            / 252           / 1010  10101010
1973    1125  2525      PAT5,   2525            / 125           / 0101  01010101
1974    1126  1126      PAT6,   .
1975                    /
1976                    /
1977                    /
1978                    /THE TEST PARAMATERS ARE RESIDUAL FROM THE PREVIOUS TEST SELECTIONS
1979                    /
1980    1127  4767'   ERROR3, JMS KEYSWITCH
1981    1130  5766'           JMP TAB60
1982    1131  4473            TY4OCT
1983    1132  0145            TESTP
1984                    /IF THIS IS TEST 0 "ACCEPTANCE TEST" ALSO PRINT (X) THE SUBTEST DIRECTIVE
1985                    /
1986                    / X = 0 - 12 BIT MODE
1987                    / X = 1 - 12 BIT MODE WITH DELETED DATA
1988                    / X = 2 -  8 BIT MODE
1989                    / X = 3 -  8 BIT MODE WITH DELETED DATA
1990                    /
1991    1133  1145              TAD TESTP
1992    1134  0365              AND (700)
1993    1135  7640              SZA CLA
1994    1136  5766'             JMP TAB60
1995    1137  1172              TAD STESTP
1996    1140  1364              TAD (5060)
1997    1141  3345              DCA MDIRECTIVE
1998    1142  4463              PRINT
1999    1143  1145              MDIRECTIVE
2000    1144  5766'             JMP TAB60
2001    1145  5040    MDIRECTIVE, TEXT "( )"
        1146  5100
2002                    /IF (XSDN) = THE RETURN ADDRESS TO " SDNSECOND " THEN THE DEVICE TEST IS
2003                    /HUNG FROM THE [KEY] INITIALIZE, THE STARTING TRACK IS [KEY], AND THE
2004                    /TARGET TRACK IS [HOME]
2005                    /
2006    1147  1147      INITSWITCH, .
2007    1150  1763'             TAD     XWAIT
2008    1151  1362              TAD (-SDNSECOND)
2009    1152  7640              SZA CLA
2010    1153  2347              ISZ INITSWITCH
2011    1154  5747              JMP I INITSWITCH
2012
2013    1162  3352
2014    1163  2352
2015    1164  5060
2016    1165  0700
2017    1166  2525
2018    1167  5327
2019    1170  3333
2020    1171  7700
```

```
2021    1172  1312
2022    1173  7000
2023    1174  3350
2024    1175  3347
2025    1176  2000
2026    1177  0561
              1200          PAGE
2027                  /WRITE ONLY
2028                  /
2029                  /WRITE ALL SELECTED SECTORS OF THAT TRACK
2030                  /
2031    1200  1200    XWRITE, .
2032    1201  7330            STL CLA RAR
2033    1202  3133            DCA RDC
2034    1203  4457            INITSECTORS     /THIS IS A WRITE (RDC = 4000)
2035    1204  4453    WRITEL, GETASECTOR
2036    1205  7410            SKP
2037                  /ENTRY TO HERE FROM READ SUBROUTINE IF A HARD READ AFTER WRITE ERROR HAS OCCURED
2038                  /
2039    1206  1377    REWRITE, TAD (JMP WHICHREAD)
2040    1207  3274            DCA JMPWHICHREAD
2041                  /THE PROGRAM WILL ISSUE AN INIT FOR ALL SEEK ERRORS
2042                  /
2043                  /NOTE:
2044                  /
2045                  /THE FUNCTION OF THE INIT IS TO SEEK TRACK 1 / SECTOR 1, AND TRANSFER INTO
2046                  /THE SECTOR BUFFER THE CONTENTS OF SECTOR 1, THEREFORE TO RECOVER FROM A
2047                  /SEEK ERROR, THE PROGRAM MUST RE-FILL THE SECTOR BUFFER THEN RE-SEEK
2048                  /
2049    1210  1134            TAD KRETRY
2050    1211  3156            DCA SRETRY
2051    1212  1134    WRESEEK, TAD KRETRY
2052    1213  3157            DCA PRETRY                      /PARITY RETRY COUNTER
2053                  /FILL RX01 SECTOR BUFFER
2054                  /
2055    1214  4776'   REFILL, JMS PATSETUP
2056    1215  4440            LCDA
2057    1216  5236            JMP FILLOK
2058    1217  5226            JMP FILLERROR
2059                  /RETURN TO HERE IS FROM SUBROUTINE XLCDA
2060                  /
2061    1220  4775'   FILL,   JMS GETWORD
2062    1221  4444            STR
2063    1222  5221            JMP .-1
2064    1223  1174            TAD GOOD
2065    1224  4443            XDROUT
2066    1225  5220            JMP FILL
2067                  /AC SW (4) = 1 ; INHIBIT INTERFACE PARITY RECOVERY
2068                  /
2069    1226  2157    FILLERROR, ISZ PRETRY
2070    1227  7410            SKP
2071    1230  5236            JMP FILLOKNOTOK
2072    1231  4407            LAS
2073    1232  0015            AND K0200
2074    1233  7650            SNA CLA
```



```
2075    1234  5214            JMP REFILL
2076    1235  3157            DCA PRETRY
2077                  / 1.
2078                  / 5.
2079                  / 2.  IF (RETRY) < -12 ; AN ERROR HAS JUST BEEN RECOVERED FROM
2080                  / 3.  IF (RETRY) = -12 ; THERE IS NO ERROR TO LOG
2081                  /
2082    1236  4462    FILLOK, LOG
2083    1237  7315            PERRORS         /LOG H / S INTERFACE PARITY ERRORS (IF ANY)
2084                  /THE SECTOR BUFFER HAS SUCCESSFULLY BEEN FILLED AND CONTAINS THE
2085                  /PATTERN SELECTED - ALL SOFT PARITY ERRORS HAVE BEEN LOGGED
2086                  /
2087    1240  1134            TAD KRETRY
2088    1241  3157            DCA PRETRY
2089    1242  7301            CLL CLA IAC             /  1
2090    1243  0172            AND STESTP              /TESTP FOR DELETED DATA SELECTION
2091    1244  7004            RAL
2092    1245  7001            IAC
2093    1246  7006            RTL                     / 4 IF WRITE OR 14 IF WRITE DELETED DATA
2094    1247  4441            LCDB
2095    1250  5262            JMP WRITEOK
2096                  /RETURN TO HERE IS FROM A PI (IF AN RX01 ERROR FLAG)
2097                  /
2098                  /AC SW (4) = 1 ; INHIBIT WRITE RETRY
2099                  /
2100    1251  2156    WRITERROR, ISZ SRETRY
2101    1252  7410            SKP
2102    1253  5272            JMP WNOTOK      /LOG HARD SEEK ERROR
2103    1254  4407            LAS
2104    1255  0015            AND K0200
2105    1256  7650            SNA CLA
2106    1257  5212            JMP WRESEEK
2107    1260  3156            DCA SRETRY
2108    1261  5272            JMP WNOTOK
2109                  /
2110                  / 1.  IF (RETRY) = 0 ; A NON RECOVERABLE ERROR EXISTS
2111                  / 2.  IF (RETRY) < -12 ; AN ERROR HAS JUST BEEN RECOVERED FROM
2112                  / 3.  IF (RETRY) = -12 ; THERE IS NO ERROR TO LOG
2113                  / 5.  IF THE AC SWITCH IS TO INHIBIT RETRY ; A HARD ERROR IS LOGGED
2114                  /
2115                  /NOTE: THE ONLY ERROR EXPECTED HERE EVER IS A "SEEK" ERROR
2116                  /
2117                  /RETURN TO HERE IS FROM A PI (IF ONLY AN RX01 DONE FLAG)
2118                  /
2119    1262  1144    WRITEOK, TAD TARGET
2120    1263  3140            DCA START
2121    1264  1137            TAD STARGET
2122    1265  3136            DCA SSTART
2123                  /LOG TOTAL WRITES (NO HARD SEEK ERROR) PER DRIVE
2124                  /
2125    1266  1774'           TAD UNITZ
2126    1267  7104            CLL RAL
2127    1270  1373            TAD (WRITES)
2128    1271  4772'           JMS LOGCOMMON
2129    1272  4462    WNOTOK, LOG
```

```
2130    1273  7313            SERRORS
2131    1274  5300    JMPWHICHREAD, JMP WHICHREAD     /CONTAINS 0 OR MODIFIED TO JMP WHICHREAD
2132                    /
2133    1275  2135            ISZ SECTORS
2134    1276  5204            JMP WRITEL
2135    1277  5600            JMP I XWRITE
2136                    /IF THIS IS A WRITE AFTER READ, "JMP READRETRY", BUT
2137                    /
2138                    /IF A HARD SEEK ERROR, "JMP NUREAD"
2139                    /
2140    1300  1156    WHICHREAD, TAD SRETRY
2141    1301  7650            SNA CLA
2142    1302  5342            JMP NUREAD              /HARD SEEK ERROR
2143    1303  5771'           JMP READRETRY           /SOFT
2144                    /
2145                    /CONTROLLER FAILURES
2146                    /
2147    1304  1370    SDNUNEXPECTED, TAD (MSDNUNEXPECTED)
2148    1305  7410            SKP
2149    1306  1367    NOSER,  TAD (MNOSER)
2150    1307  3316            DCA XMESSAGE
2151    1310  4407            LAS
2152    1311  0014            AND K0400
2153    1312  7640            SZA CLA
2154    1313  5317            JMP QUIET
2155    1314  4766'           JMS FORCE
2156    1315  4463            PRINT
2157    1316  0000    XMESSAGE, 0
2158    1317  4407    QUIET,  LAS
2159    1320  7710            SPA CLA
2160    1321  4456            HLT
2161    1322  5765'           JMP RS
2162                    /LOG ANY RECOVERABLE SEEK ERRORS WHICH MAY HAVE OCCURED
2163                    /PRIOR TO THIS DNS, OR SND
2164                    /
2165    1323  4462    DNS,    LOG
2166    1324  7313            SERRORS
2167    1325  1134            TAD KRETRY
2168    1326  3156            DCA SRETRY
2169                    /LOG TOTAL READS (NO SEEK ERRORS) PER DRIVE
2170                    /
2171    1327  1774'           TAD UNITZ
2172    1330  7104            CLL RAL
2173    1331  1364            TAD (READS)
2174    1332  4772'           JMS LOGCOMMON
2175    1333  2152            ISZ R2RETRY
2176    1334  7410            SKP
2177    1335  5345            JMP UREAD
2178                    /AC SW (4) = 1 ; INHIBIT READ RETRY
2179                    /
2180    1336  4407            LAS
2181    1337  0015            AND K0200
2182    1340  7650            SNA CLA
2183    1341  5763'           JMP REREAD
2184                    /A HARD FILL BUFFER PARITY ERROR OR A HARD PARITY ERROR ON THE COMMAND/
```



```
2185                    /SECTOR/TRACK WORDS, OR
2186                    /A HARD SEEK ERROR WHICH HAS BEEN LOGGED WITHIN THE WRITE SUBROUTINE, OR
2187                    /A HARD CRC ERROR WHICH OCCURED WHILE WITHIN THE READ SUBROUTINE
2188                    /
2189    1342  3151    NUREAD, DCA R1RETRY
2190    1343  3152            DCA R2RETRY
2191    1344  5762'           JMP RNOTOK
2192                    /IF THIS IS A READ AFTER WRITE THEN RE-WRITE THE SECTOR IN ERROR
2193                    /
2194                    /BECAUSE THIS IS A HARD PROGRAM COMPARE DATA ERROR
2195                    /
2196    1345  4761'    UREAD,  JMS RDORWR
2197    1346  5342            JMP NUREAD
2198    1347  2151            ISZ R1RETRY
2199    1350  5206            JMP REWRITE
2200    1351  5762'           JMP RNOTOK
2201                    /READ VERIFY
2202                    /
2203    1352  1352    XREADCOMPARE, .
2204    1353  1352            TAD XREADCOMPARE
2205    1354  3760'           DCA XREAD
2206    1355  5757'           JMP XRDC
2207    1357  1402
2208    1360  1400
2209    1361  0550
2210    1362  1522
2211    1363  1414
2212    1364  6357
2213    1365  2237
2214    1366  3605
2215    1367  6315
2216    1370  2532
2217    1371  1407
2218    1372  4400
2219    1373  6353
2220    1374  2272
2221    1375  1046
2222    1376  1016
2223    1377  5300
              1400              PAGE
2224                    /READ AND READ AFTER WRITE SUBROUTINE
2225                    /
2226                    /IF THIS IS A READ AFTER WRITE, THEN 1 PROGRAM LOCATION PRECEEDING
2227                    /THE PROGRAM LOCATION CONTAINING THE "READ" WILL CONTAIN "WRITE"
2228                    /
2229                    /READ ALL SELECTED SECTORS OF THAT TRACK
2230                    /
2231                    /
2232                    / (RDC) = 0 IF RDC, = 1 IF READ, 4000 IF WRITE
2233                    /
2234                    /
2235    1400  1400    XREAD,  .
2236    1401  7301            CLL CLA IAC
2237    1402  3133    XRDC,   DCA RDC
2238    1403  4457            INITSECTORS
```

```
2239    1404  1134    READL,  TAD KRETRY
2240    1405  3151            DCA R1RETRY
2241    1406  4453            GETASECTOR
2242                  /ENTRY TO HERE FROM WRITE SUBROUTINE IF A HARD WRITE AFTER READ ERROR HAS OCCURED
2243                  /
2244    1407  1134    READRETRY, TAD KRETRY
2245    1410  3152            DCA R2RETRY
2246                  /REFRESH PROGRAM LOCATION SNDLOG BECAUSE THE CONTENTS MIGHT BE RESIDUAL
2247                  /IF A PREVIOUS SND (STATUS NO DATA) ERROR EVER OCCURED
2248                  /
2249    1411  3155            DCA SNDLOG
2250    1412  3153            DCA DWSLOG
2251    1413  3154            DCA DNSLOG
2252    1414  1134    REREAD, TAD KRETRY
2253    1415  3156             DCA SRETRY
2254    1416  1134    RESEEK, TAD KRETRY
2255    1417  3157            DCA PRETRY
2256    1420  7321            CLA CLL CML IAC
2257    1421  7006            RTL
2258    1422  4441            LCDB
2259    1423  5276            JMP READOK
2260                  /RETURN TO HERE IS FROM A PI (IF AN RX01 ERROR FLAG)
2261                  /
2262                  /AN ERROR HAS BEEN DETECTED
2263                  /
2264                  /IF NOT A CRC ERROR THEN ASSUME A SEEK ERROR
2265                  /
2266    1424  7301    READERROR, CLL CLA IAC
2267    1425  0141            AND ASTATUS             /CRC MASK
2268    1426  7640            SZA CLA
2269    1427  5243            JMP CRCERROR
2270    1430  2156            ISZ SRETRY
2271    1431  7410            SKP
2272    1432  5240            JMP USEEK
2273    1433  4407            LAS
2274    1434  0015            AND K0200
2275    1435  7650            SNA CLA
2276    1436  5216            JMP RESEEK
2277    1437  3156            DCA SRETRY
2278                  /
2279    1440  4462    USEEK,  LOG
2280    1441  7313            SERRORS
2281    1442  5364            JMP RLOGGED             /LOG HARD SEEK ERRORS
2282                  /PROGRAMMING NOTE:
2283                  /
2284                  /ANY RECOVERABLE SEEK ERRORS ARE LOGGED AT PROGRAM LOCATION " DNS "
2285                  /
2286                  /AN ERROR HAS OCCURED
2287                  /
2288          1323    SND=DNS
2289          1323    DWS=SND
2290                  /
2291                  /THE SECTOR BUFFER CONTAINS THE DATA READ
2292                  /
2293                  /ANY PARITY ERRORS WOULD HAVE PREVIOUSLY BEEN DETECTED AND LOGGED
```



```
2294                  /
2295                  /THIS ERROR IS NOT A SEEK ERROR, THEREFORE IT IS ASSUMED TO BE A
2296                  /
2297                  /                       CRC ERROR
2298                  /
2299                  /COMPARE THE DATA WITHIN THE SECTOR BUFFER TO DETECT CRC STATUS
2300                  /WITHOUT DATA ERRORS (SND)
2301                  /
2302                  /IF AT THE END OF THE COMPARE, STATUS NO DATA ERRORS HAVE BEEN DETECTED
2303                  /THEN PRINT AN APPROPRIATE MESSAGE
2304                  /
2305    1443  1133    CRCERROR, TAD RDC
2306    1444  7640            SZA CLA
2307    1445  5272            JMP XCRCERROR
2308    1446  4777'           JMS COMPARE
2309    1447  1106            TAD COMPRERROR
2310    1450  7450            SNA
2311    1451  1776'           TAD INSUMCHECK
2312    1452  7640            SZA CLA
2313    1453  5775'           JMP DWS
2314    1454  2155            ISZ SNDLOG
2315                  /
2316                  /IF AC SW (3) = 1 THEN DO NOT PRINT THE ERROR INFORMATION
2317                  /
2318    1455  4407            LAS
2319    1456  0014            AND K0400
2320    1457  7640            SZA CLA
2321    1460  5272            JMP XCRCERROR
2322    1461  4774'           JMS RDORWR
2323    1462  5266            JMP .+4
2324    1463  4463            PRINT
2325    1464  5741            MWRITE
2326    1465  5270            JMP .+3
2327    1466  4463            PRINT
2328    1467  5745            MREAD
2329    1470  4463            PRINT
2330    1471  6005            MSNDERROR
2331    1472  4407    XCRCERROR, LAS
2332    1473  7710            SPA CLA
2333    1474  4456    HLT7,   HLT
2334    1475  5775'           JMP SND
2335                  /
2336                  /IF THIS IS A READ COMPARE TEST
2337                  /
2338                  /THEN " JMS COMPARE ", BUT...
2339                  /
2340                  /IF A STATUS ERROR WITH NO DATA ERROR HAS PREVIOUSLY BEEN DETECTED
2341                  /
2342                  /THEN DO NOT RE- " JMS COMPARE ", AND
2343                  /
2344                  /DO NOT RESET PROGRAM LOCATION " START " WITH " TARGET "
2345                  /
2346                  /PROGRAMMING NOTE:
2347                  /
2348                  /ANY RECOVERABLE SEEK ERRORS WHICH OCCURED PRIOR TO CRC OR DATA ERRORS
```

```
2349                    /
2350                    /ARE LOGGED AT PROGRAM LOCATION " DNS "
2351                    /
2352    1476  1155      READOK, TAD SNDLOG
2353    1477  1133              TAD RDC
2354    1500  7640              SZA CLA
2355    1501  5310              JMP ROK
2356    1502  4777'             JMS COMPARE
2357                    /
2358    1503  1106              TAD COMPRERROR
2359    1504  7450              SNA
2360    1505  1776'             TAD INSUMCHECK
2361    1506  7640              SZA CLA
2362    1507  5775'             JMP DNS
2363    1510  1144      ROK,    TAD TARGET
2364    1511  3140              DCA START
2365    1512  1137              TAD STARGET
2366    1513  3136              DCA SSTART
2367                    /LOG TOTAL READS (NO HARD SEEK ERRORS) PER DRIVE
2368                    /
2369    1514  1773'             TAD UNITZ
2370    1515  7104              CLL RAL
2371    1516  1372              TAD (READS)
2372    1517  4771'             JMS LOGCOMMON
2373                    /LOG ANY RECOVERABLE SEEK ERRORS
2374                    /
2375                    /NOTE: NO DATA OR CRC ERRORS HAVE OCCURED
2376                    /
2377    1520  4462              LOG
2378    1521  7313              SERRORS
2379                    /LOG A WRITE ERROR IF THIS IS A READ AFTER A WRITE, OTHERWISE
2380                    /
2381                    /LOG A READ ERROR
2382                    /
2383    1522  4774'     RNOTOK, JMS RDORWR
2384    1523  5337              JMP WHATYPEREAD
2385                    /THIS IS A READ AFTER A WRITE
2386                    /
2387                    /IF (R2RETRY) = -12 AND (R1RETRY) = -12, THEN NO ERRORS TO LOG
2388                    /
2389                    /IF 0 < (R2RETRY) <= -11 AND (R1RETRY) = -12, THEN RECOVERABLE READ
2390                    /(IF PREVIOUSLY THERE WERE NO SEEK ERRORS)
2391                    /
2392                    /IF (R2RETRY) = -12 AND 0 < (R1RETRY) <= -11, THEN RECOVERABLE WRITE
2393                    /
2394                    /IF (R2RETRY) = 0 AND (R1RETRY) = 0 THEN UNRECOVERABLE WRITE
2395                    /
2396                    /
2397                    /
2398                    /NOTATION:              R1RETRY - REWRITE LOG
2399                    /                       R2RETRY - REREAD LOG
2400                    /
2401                    /
2402                    /
2403    1524  1134              TAD KRETRY
```



```
2404    1525  7041              CIA
2405    1526  1152              TAD R2RETRY
2406    1527  7450              SNA
2407    1530  5334              JMP .+4                         / (R2RETRY) = (RETRY)
2408                    /
2409                    / (R2RETRY) NOT = (RETRY)
2410                    /
2411    1531  1134              TAD KRETRY
2412    1532  7640              SZA CLA
2413    1533  5362              JMP LOGRERRORS                  /LOG A SOFT READ AFTER WRITE ERROR
2414    1534  4462              LOG
2415    1535  7301              WERRORS
2416    1536  5364              JMP RLOGGED     /LOG A WRITE ERROR (IF ANY)
2417                    /THIS IS A READ ONLY (NOT A READ AFTER WRITE)
2418                    /
2419                    /IF A COMPARE ERROR EXISTS THEN THIS IS A DATA ERROR
2420                    /
2421                    /AND IF THE CONTENTS OF BSTATUS = 0 THEN THIS IS A DATA NO STATUS ERROR
2422                    /
2423                    /OTHERWISE THIS IS JUST A READ ERROR
2424                    /
2425                    /BUT, IF THIS IS A RDC TEST, AND
2426                    /
2427                    /IF THE CONTENTS OF DNSLOG > 0 THEN LOG; DNSERRORS, AND
2428                    /
2429                    /IF THE CONTENTS OF DWSLOG > 0 THEN LOG; DATAERRORS
2430                    /
2431                    /THE DNS, AND DWS LOGS BECOME UNRECOVERABLE WHEN (R2RETRY) = 0
2432                    /
2433                    /READ ERRORS = X, OF WHICH THERE WERE X DNS ERRORS, AND X DWS ERRORS
2434                    /
2435    1537  1133      WHATYPEREAD, TAD RDC
2436    1540  7640              SZA CLA
2437    1541  5362              JMP LOGRERRORS
2438    1542  1154              TAD DNSLOG
2439    1543  7650              SNA CLA
2440    1544  5770'             JMP WHAT2
2441    1545  1152              TAD R2RETRY
2442    1546  3154              DCA DNSLOG
2443    1547  4462              LOG
2444    1550  7307              DNSERRORS
2445    1551  5770'             JMP WHAT2
2446    1552  1155      WHAT3,  TAD SNDLOG
2447    1553  7650              SNA CLA
2448    1554  5361              JMP .+5
2449    1555  1152              TAD R2RETRY
2450    1556  3155              DCA SNDLOG
2451    1557  4462              LOG
2452    1560  7311              SNDERRORS
2453                    /       TAD SUMLOG; SNA CLA; JMP .+5
2454                    /       TAD R2RETRY; DCA SUMLOG; LOG; SUMERRORS
2455    1561  5364              JMP RLOGGED
2456                    /
2457    1562  4462      LOGRERRORS, LOG
2458    1563  7303              RERRORS /HARD OR SOFT READ ONLY, OR SOFT READ AFTER WRITE
```

```
2459    1564  2135    RLOGGED, ISZ SECTORS
2460    1565  5204            JMP READL
2461    1566  5600            JMP I XREAD
2462    1570  3071
2463    1571  4400
2464    1572  6357
2465    1573  2272
2466    1574  0550
2467    1575  1323
2468    1576  1763
2469    1577  1601
              1600            PAGE
2470    1600  5601    JMPICOMPARE, JMP I COMPARE
2471                    /
2472                    /THE FOLLOWING INFORMATION IS ALWAYS PRINTED IF A PROGRAM COMPARE DATA ERROR
2473                    /
2474                    /                       DATA ERROR
2475                    /                       WORD GOOD BAD
2476                    /
2477                    /WHERE " WORD " IS THE WORD NUMBER (0-127),
2478                    /AND " GOOD " IS THE DATA WORD WRITTEN,
2479                    /AND " BAD " IS THE DATA WORD READ (IN ERROR)
2480                    /
2481                    /WORDS 0 AND 1 ARE HEADER WORDS (8 BIT BYTES)
2482                    /
2483                    / WORD 0 - TRACK # (BITS 5-11)
2484                    / WORD 1 - SECTOR (BITS 7-11)
2485                    /
2486                    /
2487                    /AC SW (4) = 1 ; INHIBIT READ DATA ERROR TYPEOUT
2488                    /
2489                    /
2490    1601  1601    COMPARE, .
2491                    /
2492                    /EMPTY BUFFER
2493                    /
2494                    /SAVE THE PREVIOUS READ'S A-STATUS REGISTER
2495                    /
2496    1602  7301              CLL CLA IAC
2497    1603  0141              AND ASTATUS
2498    1604  3362              DCA XASTATUS    / = 1 IF CRC ERROR
2499    1605  1134              TAD KRETRY
2500    1606  3157              DCA PRETRY
2501    1607  4777'   EMPTYL, JMS PATSETUP
2502    1610  7301              CLL CLA IAC
2503    1611  7004              RAL
2504    1612  4440              LCDA
2505    1613  5776'             JMP EMPTYOK
2506    1614  5775'             JMP EMPTYERROR
2507                    /RETURN TO HERE FROM SUBROUTINE XLCDA
2508                    /
2509    1615  3106              DCA COMPRERROR
2510    1616  3363              DCA INSUMCHECK
2511                    /AC SW (3) = 1 ; INHIBIT FURTHER READ DATA ERROR TYPEOUTS
2512                    /
```



```
2513                    /...BUT STAY IN THIS LOOP UNTIL THE RX01 SECTOR BUFFER IS EMPTIED
2514                    /
2515    1617  4774'   EMPTY,  JMS GETWORD
2516    1620  4444              STR
2517    1621  5220              JMP .-1
2518                    /
2519                    /DISABLE THE RX01 INTERRUPT
2520                    /
2521    1622  4447              INTR
2522                    /
2523                    /TRANSFER DATA FROM THE SECTOR BUFFER INTO THE ACCUMULATOR
2524                    /
2525    1623  4442              XDRIN                   / "ACTUAL"  (BAD)  DATA
2526    1624  3003              DCA XA10
2527                    /
2528                    /ASSUME A 12 BIT SUMCHECK EVEN IF 8 BIT MODE FOR NOW
2529                    /
2530                    /NOTE: THE CONTENTS OF PROGRAM LOCATION " INSUMCHECK " SHOULD = 0
2531                    / (AFTER ALL WORDS HAVE COME IN)
2532                    /
2533    1625  1003              TAD XA10
2534    1626  1363              TAD INSUMCHECK
2535    1627  3363              DCA INSUMCHECK
2536    1630  7301              CLL CLA IAC             / 2  (8/12 BIT MODE MASK)
2537    1631  7004              RAL
2538    1632  0172              AND STESTP
2539    1633  7112              CLL RTR
2540    1634  1174              TAD GOOD
2541    1635  7430              SZL                     / 0 = 12 BIT, 1 = 8 BIT
2542    1636  0125              AND K377
2543    1637  7041              CIA
2544    1640  1003              TAD XA10
2545    1641  7650              SNA CLA
2546    1642  5773'             JMP ENDCOMPARE
2547                    /
2548                    /A PROGRAM COMPARE DATA ERROR HAS BEEN DETECTED
2549                    /
2550                    /NOTATION:
2551                    /
2552                    /THE CONTENTS OF PROGRAM LOCATION XASTATUS REFLECTS THE STATUS OF THE
2553                    /RX01 AT THE COMPLETITION OF THE PREVIOUS " READ SECTOR "
2554                    /
2555                    /IF A CRC ERROR EXISTS THEN THIS IS A DATA ERROR WITH STATUS ERROR
2556                    /
2557                    /IF A CRC ERROR DOESN'T EXIST THEN THIS IS A DATA ERROR WITH NO ERROR STATUS
2558                    /
2559    1643  1362              TAD XASTATUS            / A-STATUS OF PREVIOUS READ
2560    1644  7450              SNA
2561    1645  2154              ISZ DNSLOG              /NO CRC STATUS
2562    1646  7640              SZA CLA
2563    1647  2153              ISZ DWSLOG              /CRC STATUS
2564                    /
2565                    /AC SW (3) TO INHIBIT ERROR PRINTOUT
2566                    /
2567                    /IF THIS IS A READ ONLY TEST (NOT READ COMPARE) OR IF AC SW 3 = 1
```

```
                        /THEN DO NOT PRINT ERROR INFORMATION
                        /
                        /BUT,
                        /
                        /IF THIS IS A READ COMPARE TEST AND AC SW 3 = 0
                        /THEN PRINT ERROR INFORMATION
                        /
1650  4407                      LAS
1651  0014                      AND K0400
1652  1133                      TAD RDC
1653  7640                      SZA CLA
1654  5360                      JMP ISZCOMPRERROR
                        /IF THIS IS THE FIRST COMPARE ERROR THEN PRINT HEADER INFORMATION
                        /
1655  1106                      TAD COMPRERROR
1656  7640                      SZA CLA
1657  5320                      JMP CNOTFIRST
                        /
                        /IF A DATA NO CRC STATUS ERROR (DNS) THEN PRINT ENTIRE ERROR INFORMATION
                        /
1660  1154                      TAD DNSLOG
1661  7640                      SZA CLA
1662  4772'                     JMS FORCE
                        /IF THE PROGRAMMED INSTRUCTION IMMEDIATELY BEFORE " READ "
                        /IS A " WRITE " , THEN THIS IS A WRITE DATA ERROR, IF NOT,
                        /THEN THIS IS A READ DATA ERROR
                        /


                        /PROGRAMMING NOTE:
                        /
                        /THE LABLE " XCOMPARE " MUST RESIDE HERE BECAUSE OF REFERENCES MADE WITHIN " XERROR "
                        /
1663  4771'     XCOMPARE, JMS RDORWR
1664  5270              JMP .+4
1665  4463              PRINT
1666  5741              MWRITE
1667  5272              JMP .+3
1670  4463              PRINT
1671  5745              MREAD
                        /NOTATION:
                        /
                        /THE CONTENTS OF PROGRAM LOCATION XASTATUS REFLECTS THE STATUS OF THE
                        /RX01 AT THE COMPLETITION OF THE PREVIOUS " READ SECTOR "
                        /
                        /IF A CRC ERROR EXISTS THEN THIS IS A DATA ERROR WITH STATUS ERROR
                        /
                        /IF A CRC ERROR DOESN'T EXIST THEN THIS IS A DATA ERROR WITH NO ERROR STATUS
                        /
1672  1362              TAD XASTATUS
1673  7640              SZA CLA
1674  5300              JMP DWESERROR
1675  4463              PRINT
1676  5751              MDNSERROR
1677  5302              JMP .+3
1700  4463    DWESERROR, PRINT
```



```
1701  5757              MDWESERROR
1702  4463              PRINT
1703  5763              MDATAERROR
                        /PRINT " WORD " IF 12-BIT MODE, OR PRINT " BYTE " IF 8-BIT MODE
                        /
1704  1370              TAD (MWORD)
1705  3315              DCA XFLENGTH
                        / TEST 8/12-BIT MODE SELECTION
                        /
1706  7304              CLL CLA RAL
1707  0172              AND STESTP
1710  7650              SNA CLA
1711  5314              JMP .+3
1712  1367              TAD (MBYTE)
1713  3315              DCA XFLENGTH
1714  4463              PRINT
1715  5772    XFLENGTH, MWORD
1716  4463              PRINT
1717  6000              MGB
                        / AC 2 = 0 - PRINT ONLY FIRST 3 COMPARE ERRORS
                        / AC 2 = 1 - PRINT ALL COMPARE ERRORS
                        /
1720  4407    CNOTFIRST, LAS
1721  0366              AND (SW2)
1722  7640              SZA CLA
1723  5330              JMP .+5
1724  7346              CLL STA RTL
1725  1106              TAD COMPRERROR
1726  7700              SMA CLA
1727  5360              JMP ISZCOMPRERROR
1730  4463              PRINT
1731  5611              MCRLF
1732  1012              TAD A12
1733  7041              CIA
1734  1011              TAD A11
1735  3004              DCA     XXX                     /TEMP STORAGE FOR VALUE
1736  4473              TY4OCT
1737  0004              XXX
1740  4472              TAB
1741  0005              5
                        /IF 8-BIT MODE THEN MASK THE 12-BIT "GOOD" WORDS K377
                        /
1742  7301              CLL CLA IAC
1743  7004              RAL
1744  0172              AND STESTP
1745  7112              CLL RTR
1746  1174              TAD GOOD
1747  7430              SZL
1750  0125              AND K377
1751  3167              DCA LSB
1752  4473              TY4OCT
1753  0167              LSB
1754  4472              TAB
1755  0012              12
1756  4473              TY4OCT
```

```
2678    1757  0003            XA10
2679    1760  2106      ISZCOMPRERROR, ISZ COMPRERROR
2680    1761  5773'             JMP ENDCOMPARE
2681                      /
2682                      /THE CONTENTS OF THE XASTATUS PROGRAM LOCATION REFLECTS THE STATUS AT THE
2683                      /COMPLETITION OF THE PREVIOUS READ FUNCTION
2684                      /
2685                      /THE PREVIOUS STATUS IS SAVED BECAUSE A SUCCEEDING ERROR
2686                      / (PARITY ERROR ON THE COMMAND WORD) MAY OCCUR
2687                      /
2688    1762  0000      XASTATUS, 0
2689                      /
2690                      /THE CONTENTS OF " INSUMCHECK " IS THE SUMCHECK DERIVED FROM THE SUM OF ALL
2691                      /DATA WORDS COMING IN (THE SUM OF ALL " BAD " ), AND
2692                      /SHOULD BE EQUIVALENT TO 0 AT THE END OF THE EMPTY BUFFER
2693                      /
2694    1763  0000      INSUMCHECK, 0
2695                      /**************
2696                      /CONSOLE
2697                      /******************
2698                      /
2699    1766  1000
2700    1767  5775
2701    1770  5772
2702    1771  0550
2703    1772  3605
2704    1773  2007
2705    1774  1046
2706    1775  2012
2707    1776  2023
2708    1777  1016
              2000      PAGE
2709                      /
2710    2000  4463      RETUR1, PRINT
2711    2001  5624              MPASSES                 /PROGRAM NAME
2712    2002  4475              TY8OCT
2713    2003  6350              PASSES                  /NUMBER OF PASSES
2714    2004  4463              PRINT                   /CALL IS MADE FROM LOCATION 755
2715                                                    /IS USED FOR END OF PASS
2716    2005  2134              MX                      /PRINT A * OR - IF NOT ON ACTIVE CONSOLE
2717    2006  5323              JMP     PASSRETURN      /RETURN TO PROGRAM AT LOCATION 2114
2718                                                    /* IS FOR ERROR FREE PASS
2719                                                    / - IS FOR ERROR ON PASS
2720
2721                      /**************
2722                      /
2723                      /RE-ENABLE THE RX01 INTERRUPT
2724                      /
2725    2007  7301      ENDCOMPARE, CLL CLA IAC
2726    2010  4447              INTR
2727    2011  5777'             JMP EMPTY
2728                      /THIS INTERFACE PARITY ERROR MUST BE ON THE COMMAND WORD TO "EMPTY BUFFER"
2729                      /
2730                      /NOTE: IT CAN'T BE ANY OTHER ERROR
2731                      /
```



```
2732    2012  2157      EMPTYERROR, ISZ PRETRY
2733    2013  7410              SKP
2734    2014  5271              JMP XEMPTYOKNOTOK
2735    2015  4407              LAS
2736    2016  0015              AND K0200
2737    2017  7650              SNA CLA
2738    2020  5776'             JMP EMPTYL
2739    2021  3157              DCA PRETRY
2740    2022  5271              JMP XEMPTYOKNOTOK
2741                      / 1.  IF (RETRY) = 0 ; A NON RECOVERABLE ERROR EXISTS
2742                      / 5.  IF THE AC SWITCH IS TO INHIBIT RETRY ; A HARD ERROR IS LOGGED
2743                      / 2.  IF (RETRY) < -12 ; AN ERROR HAS JUST BEEN RECOVERED FROM
2744                      / 3.  IF (RETRY) = -12 ; THERE IS NO ERROR TO LOG
2745                      /
2746                      /IF AC SW (3) = 0
2747                      /
2748                      /PRINT A VALUE SYMBOLIC OF THE TOTAL # OF COMPARE ERRORS DETECTED
2749                      /
2750                      /IF 8-BIT MODE THEN THE "SUMCHECK" WILL OVERFLOW INTO BITS 0 TO 3
2751                      /
2752                      /THEREFORE MASK THE CONTENTS OF " INSUMCHECK "
2753                      /
2754                      /THE RESULT OF THE SUBTRACTION SHOULD = 0
2755                      /
2756                      /NO MASK IS NEEDED FOR 12-BIT MODE
2757                      /
2758    2023  7301      EMPTYOK, CLL CLA IAC
2759    2024  7004              RAL
2760    2025  0172              AND STE5TP
2761    2026  7112              CLL RTR
2762    2027  1775'             TAD INSUMCHECK
2763    2030  7430              SZL
2764    2031  0125              AND K377
2765    2032  3775'             DCA INSUMCHECK
2766    2033  4407              LAS
2767    2034  0014              AND K0400
2768    2035  7640              SZA CLA
2769    2036  5271              JMP XEMPTYOK
2770                      /IF A SUMCHECK ERROR EXISTS WITHOUT A "COMPRERROR" THEN "FORCE" A TYPEOUT
2771                      /
2772    2037  1106              TAD COMPRERROR
2773    2040  7640              SZA CLA
2774    2041  5246              JMP .+5
2775    2042  1775'             TAD INSUMCHECK
2776    2043  7650              SNA CLA
2777    2044  5271              JMP XEMPTYOK
2778    2045  4774'             JMS FORCE
2779    2046  4463              PRINT
2780    2047  6020              MSUMCHECK
2781    2050  1775'             TAD INSUMCHECK
2782    2051  7640              SZA CLA
2783    2052  5256              JMP .+4
2784    2053  4463              PRINT
2785    2054  6030              MOK
2786    2055  5261              JMP .+4
```

```
2787    2056  4473          TY4OCT
2788    2057  1763          INSUMCHECK
2789    2060  5264          JMP .+4
2790    2061  1106          TAD COMPRERROR
2791    2062  7650          SNA CLA
2792    2063  5271          JMP XEMPTYOK
2793    2064  4463          PRINT
2794    2065  6032          MDESUMMARY
2795    2066  4473          TY4OCT                    /ONLY OCTAL VALUES WILL BE PRINTED
2796                                                  /REPLACES TY8DEX.
2797    2067  0106          COMPRERROR
2798    2070  5271          JMP XEMPTYOK
2799    2071  4462    XEMPTYOK, LOG
2800    2072  7315          PERRORS         /LOG HARD AND SOFT PARITY ERRORS (IF ANY)
2801                  /AC SW 0 = 1 ; HALT ON ERROR
2802                  /
2803    2073  1106          TAD COMPRERROR
2804    2074  7450          SNA
2805    2075  1775'         TAD INSUMCHECK
2806    2076  7650          SNA CLA
2807    2077  5773'         JMP JMPICOMPARE
2808    2100  4407          LAS
2809    2101  7710          SPA CLA
2810    2102  4456    HLT6, HLT
2811    2103  5773'         JMP     JMPICOMPARE
2812                  /STOP THE PRESENT TEST AT COMPLETION IF AC SW 1 = 1
2813                  /
2814                  /...AND PRINT THE MESSAGE "END OF TEST # RUNTIME"
2815                  /
2816    2104  2104    XSTOP,  .
2817    2105  4452          DONE
2818    2106  5704          JMP I XSTOP
2819    2107  2304          ISZ XSTOP
2820                  /RESET (EPASS) = 7777 MEANS NEW PASS
2821                  /
2822    2110  7240          STA
2823    2111  3107          DCA EPASS
2824    2112  1132          TAD PASSINPROGRESS
2825    2113  7700          SMA CLA
2826    2114  1372          TAD (7500)
2827    2115  1371          TAD (5500)
2828    2116  3334          DCA MX
2829    2117  3132          DCA PASSINPROGRESS
2830    2120  1370          TAD (PASSES)
2831    2121  4767'         JMS LOGCOMMON
2832                  /*******
2833                  /CONSOLE
2834                  /********
2835
2836    2122  5766'         JMP     PASMES          /GO TO LOCATION 753 TO DETERMIND
2837                                                  /WHAT TO PRINT FOR A PASS
2838    2123  4407    PASSRETURN, LAS
2839    2124  0365          AND (SW1)
2840    2125  7650          SNA CLA
2841    2126  5332          JMP HLT10+1
```



```
2842    2127  4463          PRINT
2843    2130  5615          MEOT
2844                  /RESET THE CONSTANTS OF " PATR1 " AND " PATR2 " TO GENERATE A NEW RANDOM
2845                  /PATTERN (IF THE PATTERN SELECTION IS 0 THAT IS)
2846                  /
2847    2131  4456    HLT10, HLT
2848    2132  4764'   C8PASRETURN, JMS PATSAVE
2849    2133  5704          JMP I XSTOP
2850                  /PRINT A " * " IF AN ERROR [FREE] PASS
2851                  /PRINT A " - " IF AN ERROR [THIS] PASS
2852                  /
2853    2134  5200    MX,     TEXT "*"
2854                  /
2855                  /
2856                  /
2857    2135  2135    XSETUP, .
2858    2136  1171          TAD TTYBUSY
2859    2137  7640          SZA CLA
2860    2140  5336          JMP .-2
2861    2141  1363          TAD (ANDRETURN)
2862    2142  3762'         DCA XPRINT
2863    2143  1735          TAD I XSETUP
2864    2144  3357          DCA XANDRETURN
2865    2145  2335          ISZ XSETUP
2866    2146  5735          JMP I XSETUP
2867                  /
2868                  /AND RETURN TO HERE WAITING FOR ENTIRE NUMERICAL OUTPUT
2869                  /
2870    2147  1171    ANDRETURN, TAD TTYBUSY
2871    2150  7640          SZA CLA
2872    2151  5347          JMP .-2
2873                  /
2874                  /THEN EXIT FROM HERE FOR MAIN LINE CODE
2875                  /
2876    2152  1757    THENEXIT, TAD I XANDRETURN
2877    2153  3357          DCA XANDRETURN
2878    2154  3171          DCA TTYBUSY
2879    2155  6001          ION
2880    2156  5757          JMP I XANDRETURN
2881    2157  2157    XANDRETURN, .
2882    2162  3227
2883    2163  2147
2884    2164  1006
2885    2165  2000
2886    2166  1000
2887    2167  4400
2888    2170  6350
2889    2171  5500
2890    2172  7500
2891    2173  1600
2892    2174  3605
2893    2175  1763
2894    2176  1607
2895    2177  1617
              2200          PAGE
```

```
2896                    /SEQUENCE TO THE NEXT AVAILABLE DISKETTE
2897                    /
2898    2200  2200      XGETUNIT,       .
2899    2201  1272              TAD UNITZ
2900    2202  3173              DCA USTART      / STARTING UNIT
2901    2203  3272              DCA UNITZ       /CLEAR FOR A NEW DISKETTE
2902    2204  1271              TAD WUNITS      /WORKING UNIT COUNTER
2903    2205  7450              SNA
2904    2206  1270              TAD UNITS       /EXAUSTED ALL DISKETTES ; RESET
2905    2207  3271              DCA WUNITS
2906    2210  3267              DCA POLL        /CLEAR POLLER
2907    2211  7120              STL             /START
2908    2212  1267      NEXT,   TAD POLL
2909    2213  7010              RAR             /NEXT
2910    2214  3267              DCA POLL
2911    2215  1267              TAD POLL
2912    2216  7430              SZL             /DISKETTE
2913    2217  5240              JMP JMS202      /NO UNITS AVAILABLE ; CATASTROPHIC
2914    2220  0271              AND WUNITS
2915    2221  7450              SNA
2916    2222  2272              ISZ UNITZ       /ACTIVE DISKETTE
2917    2223  7450              SNA
2918    2224  5212              JMP NEXT        /TRY AGAIN
2919                    /A DISKETTE IS AVAILABLE AND SELECTED FOR OPERATIONS
2920    2225  3273              DCA UNITX       /A CODED VERSION OF UNIT
2921    2226  1273              TAD UNITX
2922    2227  7040              CMA             /...DELETE FROM
2923    2230  0271              AND WUNITS      /...AVAILABLE UNIT LIST (WUNITS)
2924    2231  3271              DCA WUNITS      /...AND CREATE NEW LIST
2925    2232  1272              TAD UNITZ
2926    2233  7106              CLL RTL
2927    2234  7006              RTL             /BIT 7 OF COMMAND REGISTER
2928    2235  3274              DCA UNIT        /FOR COMMAND REGISTER LOAD LATER
2929    2236  5600              JMP I XGETUNIT
2930                    /
2931                    /
2932                    /ENTRY TO THIS POINT MAY BE FROM SUBROUTINE XDELETE, IF SO-
2933                    /NO DRIVES REMANE SELECTABLE THEREFORE, IF ENTRY INTO XGETUNIT WAS
2934                    /FROM SA-200, OR SA-201 (INITIALIZATION OF THE PROGRAM), THEN DO NOT
2935                    /DUMP THE LOGS-BUT DO JMP AUTORESTART
2936                    /
2937                    /A MAXIMUM OF 4 AUTO RESTARTS ARE PERMITTED PRIOR TO AN UNRECOVERABLE
2938                    /PROCESSOR HLT INSTRUCTION FORCING THE OPERATOR TO MANUALY RESTART
2939                    /
2940                    /1 OR ALL SELECTED DISKETTE DRIVES MAY HAVE FOR SOME REASON BECOME DESELECTED,
2941                    /THEREFORE THE PROGRAM WILL TRY TO RESTART USING THE TEST PARAMATERS
2942                    /PREVIOUSLY SELECTED AT SA-200
2943                    /
2944                    /IN SUMMARY, RESTART IF ANY ONE OF THE FOLLOWING:
2945                    /
2946                    /       (1)     HARD PARITY ERROR
2947                    /       (2)     A SELECTED DRIVE BECAME DESELECTED
2948                    /       (3)     UNEXPECTED RX01 INTERRUPT REQUEST
2949                    /       (4)     MISSING ERROR FLAG
2950                    /       (5)     LOG-COUNTER OVERFLOW
```



```
2951                    /       (6)     DEVICE TEST HUNG
2952                    /
2953    2237  3275      RS,     DCA XDELUNIT
2954                    /
2955                    /IF ENTRY TO HERE WAS FROM THE AUTOMATIC UNIT SCAN
2956                    /THEN DO NOT PRINT THE STATISTICAL REPORT
2957                    /
2958    2240  1377      JMS202, TAD (-XAUTO)
2959    2241  1275              TAD XDELUNIT
2960    2242  7650              SNA CLA
2961    2243  5246              JMP .+3
2962    2244  4776'             JMS S202
2963                    /
2964                    /THE LABLE "XNONE" MUST RESIDE BECAUSE OF REFERENCES MADE FROM "XAUTO"
2965                    /
2966    2245  5250      XNONE,  JMP .+3
2967                    /
2968    2246  4463              PRINT
2969    2247  5504              MNOTREADY
2970    2250  4463              PRINT
2971    2251  6336              MIDENTIFICATION
2972    2252  7340              CLL STA
2973    2253  7006              RTL
2974    2254  1103              TAD ARESTARTS
2975    2255  7750              SPA SNA CLA
2976    2256  5262              JMP .+4
2977    2257  4463              PRINT
2978    2260  5525              MNOGONOMORE
2979    2261  4456      HLTS,   HLT
2980    2262  4463              PRINT
2981    2263  5516              MRS
2982    2264  2103              ISZ ARESTARTS
2983    2265  4450              INIT
2984    2266  5775'             JMP AUTORESTART
2985    2267  0000      POLL,   0               /DISKETTE POLL
2986    2270  6000      UNITS,  6000            /AVAILABLE UNIT LIST (MAX SYS CONFIGURATION)
2987    2271  0000      WUNITS, 0               /CODED WORKING UNIT LIST (UNITS YET TO BE EXERCISED)
2988                    /
2989                    /UNITZ ; UNIT 1 LOOKS LIKE 0001
2990                    /UNITX ; UNIT 1 LOOKS LIKE 2000
2991                    /UNIT  ; UNIT 1 LOOKS LIKE 0020 (RX01 COMMAND WORD BIT 7)
2992                    /
2993    2272  0000      UNITZ,  0               /ACTIVE DISKETTE
2994    2273  0000      UNITX,  0               /ACTIVE DISKETTE IN CODED FORM
2995    2274  0000      UNIT,   0               /A CODED VERSION OF UNIT Z (FOR COMMAND REGISTER LOAD)
2996                    /
2997                    /DELETE (UNITX) FROM (UNITS)
2998                    /
2999                    /...AND PRINT A MESSAGE TO THE OPERATOR INFORMING HIM OF THE MOST RECENT
3000                    /DISKETTE DELETION...IF THE ENTRY INTO " XDELUNIT " WAS NOT FROM THE " AUTO "
3001                    /DISKETTE SCAN (DISKETTE INITIALIZE AT BEGINNNING OF PROGRAM)
3002                    /
3003                    /...AND SET (SECTORS), AND (TRACKS) = 7777
3004                    /
3005    2275  2275      XDELUNIT, .
```

```
3006    2276  1273            TAD UNITX
3007    2277  7040            CMA
3008    2300  0270            AND UNITS
3009    2301  3270            DCA UNITS
3010                  /
3011                  /THIS UNIT IS DELETED ; INFORM THE OPERATOR, BUT
3012                  /IF THIS UNIT HAS BEEN DELETED BECAUSE IS IS NOT SELECTABLE
3013                  /(DOOR CLOSED WITH DISKETTE INSERTED) AND THIS CONDITION WAS
3014                  /DETECTED BY THE PROGRAM WHILE SCANNING THE BUS FOR ALL SELECTABLE
3015                  /DISKETTE DRIVES TO PERFORM APPLICABLE TESTING, THEN DO NOT INFORM
3016                  /THE OPERATOR BECAUSE THIS IS/MAY BE A LEGAL CONDITION
3017                  /
3018    2302  1377            TAD (-XAUTO)
3019    2303  1275            TAD XDELUNIT    /RETURN ADDRESS
3020    2304  7650            SNA CLA
3021    2305  5325            JMP NOINFORM    /ENTRY WAS FROM THE AUTO DISKETTE SCAN
3022                  /
3023    2306  4463            PRINT
3024    2307  6042            MUNIT
3025    2310  4473            TY4OCT                          /ONLY OCTAL VALUES WILL BE PRINTED
3026                                                          /REPLACES TY8DEX.
3027    2311  2272            UNITZ
3028    2312  4463            PRINT
3029    2313  6054            MDELETE
3030    2314  1270            TAD UNITS
3031    2315  7650            SNA CLA
3032    2316  5240            JMP JMS202
3033                  /ALSO PRINT THE DRIVES REMAINING SELECTED (IF ANY)
3034                  /
3035    2317  4776'           JMS S202
3036    2320  4464            PRINTDRIVESELECTED
3037                  /AND SET (SECTORS) AND (TRACKS) = 7777 TO ABORT TEST ON THIS DRIVE
3038                  /
3039    2321  7240            STA
3040    2322  3135            DCA SECTORS
3041    2323  7240            STA
3042    2324  3160            DCA TRACKS
3043                  /IF ALL THE UNITS HAVE BEEN DESELECTED THEN DO NOT PRINT THE INTERUM REPORT
3044                  /HERE.  AN INTERUM REPORT WILL BE PRINTED WITHIN THE SUBROUTINE "XGETUNIT"
3045                  /
3046    2325  1270    NOINFORM, TAD UNITS
3047    2326  7650            SNA CLA
3048    2327  5240            JMP JMS202
3049    2330  5675            JMP I XDELUNIT
3050                  /
3051                  /PRINT ON THE TELEPRINTER THE "DRIVES SELECTED" VIA 200, OR 201
3052                  /
3053    2331  2331    XDRIVESELECTED, .
3054    2332  4463            PRINT
3055    2333  5470            MDISKETTE
3056                  /IF THERE NO UNITS SELECTABLE,THEN PRINT (NONE)
3057                  /
3058    2334  1270            TAD UNITS
3059    2335  7640            SZA CLA
3060    2336  5344            JMP MOREDRIVESELECTED
```



```
3061    2337  4463            PRINT
3062    2340  5446            MNONE
3063    2341  5731            JMP I XDRIVESELECTED
3064    2342  4463    XMOREDRIVESELECTED, PRINT
3065    2343  5502            MCOMMA
3066    2344  4455    MOREDRIVESELECTED, GETUNIT
3067    2345  4473            TY4OCT                          /ONLY OCTAL VALUES WILL BE PRINTED
3068                                                          /REPLACES TY8DEX.
3069    2346  2272            UNITZ
3070    2347  4452            DONE
3071    2350  5342            JMP XMOREDRIVESELECTED
3072    2351  5731            JMP I XDRIVESELECTED
3073                  /ROUTINE TO WAIT FOR SKIP ON AN IOT, IF SKIP DOES NOT OCCUR
3074                  /THE ROUTINE WILL PRINT PC POINT IN ERROR AND GO BACK ABOUT ITS
3075                  /BUSINESS.
3076                  /
3077    2352  0000    XWAIT,  0
3078    2353  1752            TAD I   XWAIT                   /GET IOT TO EXECUTE
3079    2354  3357            DCA     IOTWAT
3080    2355  1116            TAD     KM40                    /WILL LOOP FOR ABOUT 180 MSEC.
3081    2356  3111            DCA     HANGER
3082    2357  4456    IOTWAT, HLT                             /REPLACED WITH IOT TO EXECUTE.
3083    2360  7410            SKP                             /DID NOT GET A SKIP YET.
3084    2361  5370            JMP     WATEX                   /GOT THE SKIP,UPDATE RETURN.
3085    2362  2164            ISZ     H1
3086    2363  5357            JMP     IOTWAT                  /DID NOT TIME OUT.
3087    2364  2111            ISZ     HANGER
3088    2365  5357            JMP     IOTWAT
3089    2366  1352            TAD     XWAIT                   /GET ERROR PC
3090    2367  5774'           JMP     HUNGUP
3091    2370  2352    WATEX,  ISZ     XWAIT
3092    2371  5752            JMP I   XWAIT
3093                  /*****************
3094                  /*****************
3095    2374  5200
3096    2375  0247
3097    2376  4434
3098    2377  7473
              2400            PAGE
3099                  /TEMPORARILY LOCK THE COUNTERS AT -1 FOR AN INTERUM DUMP
3100                  /
3101                  /THE ADDRESS PARAMATERS ARE PASSED VIA " I LOCK"
3102                  /
3103                  /FORM: LOCK; LSB; MSB (OR K7777 IF NO MSB)
3104                  /
3105    2400  2400    XLOCK,  .
3106    2401  1600            TAD I XLOCK
3107    2402  2200            ISZ XLOCK
3108    2403  3004            DCA XXX
3109    2404  7240            STA
3110    2405  3404            DCA I XXX
3111    2406  1600            TAD I XLOCK
3112    2407  3005            DCA YYY
3113    2410  7240            STA
3114    2411  3405            DCA I YYY
```

```
3115    2412  5777'           JMP RS
3116                  /INITIALIZE THE NUMBER OF TRACKS ACCESSED VIA THE DIFFERENCE BETWEEN
3117                  /THE CONTENTS OF PROGRAM LOCATIONS " OD " AND " ID ".
3118                  /
3119    2413  2413    XINITTRACKS, .
3120    2414  2132            ISZ PASSINPROGRESS
3121    2415  1033            TAD ID
3122    2416  7040            CMA
3123    2417  1032            TAD OD
3124    2420  3160            DCA TRACKS
3125    2421  1160            TAD TRACKS
3126    2422  7041            CIA
3127    2423  3161            DCA TTRACKS
3128    2424  5613            JMP I XINITTRACKS
3129                  / OD (OUTSIDE DIAMETER) ACTUATOR POSITION INITIALIZED TO (0)
3130                  /
3131                  / ID (INSIDE DIAMETER) ACTUATOR POSITION INITIALIZED TO 114 (76 DECIMAL)
3132                  /
3133                  / " XGETATRACK " WILL GET A TRACK VALUE BETWEEN THE LIMITS OF THE CONTENTS OF
3134                  /PROGRAM LOCATION OD (MIN 0), AND THE CONTENTS OF ID (MAX 114).
3135                  /
3136                  /GET A DISKETTE TRACK TO BE (AC) WITHIN IOT LCD-B
3137                  /
3138                  / IF THIS IS THE " FIRSTMOVE ", (START) IS NOT APPLICABLE HERE, BUT
3139                  / WILL BECOME APPLICABLE WITHIN SUBROUINE " XGETASECTOR ".
3140                  /
3141    2425  2425    XGETATRACK,     .
3142    2426  1144            TAD TARGET      /PRESENT ACTUATOR POSITION (FROM PREVIOUS LCD-B)
3143    2427  3140            DCA START       /BECOMES  STARTING ACTUATOR POSITION
3144    2430  1376            TAD (70)
3145    2431  0145            AND TESTP
3146    2432  7110            CLL RAR
3147    2433  7012            RTR
3148    2434  1375            TAD (TAD SEQ)
3149    2435  3236            DCA .+1
3150    2436  1242            TAD SEQ
3151    2437  3241            DCA .+2
3152    2440  5641    RESEQUENCE, JMP I .+1
3153    2441  2452            SEQRANDOM
3154                  /TRACK ACCESS SEQUENCE IS SELECTED VIA AC SWITCHES 6,7,8 AT L/S 200
3155                  /
3156                  / 0 = RANDOM
3157                  / 1 = INCREMENTAL OD TO ID
3158                  / 2 = DECREMENTAL ID TO OD
3159                  / 3 = COMBINATION OF SEQ 0, AND SEQ 1 (INC/DEC)
3160                  / 4 = BOUNCE ID TO OD ONLY
3161                  / 5 = BOUNCE: (ID, OD ; ID-1, OD+1 ; ...ETC TO 47, 45)
3162                  / 6 = STROBE: (ID, OD ; ID-1, OD ; ...ETC TO 1, 0)
3163                  / 7 =
3164                  /
3165    2442  2452    SEQ,    SEQRANDOM
3166    2443  2470            SEQINC
3167    2444  2501            SEQDEC
3168    2445  2632            SEQID
3169    2446  2654            SEQABOUNCE
```



```
3170    2447  2545            SEQBBOUNCE
3171    2450  2600            SEQSTROBE
3172    2451  0405            NOTEST
3173                  /RANDOM ACTUATOR ACCESS
3174                  /
3175    2452  1266    SEQRANDOM, TAD SEQR1
3176    2453  3774'           DCA R1
3177    2454  1267            TAD SEQR2
3178    2455  3773'           DCA R2
3179    2456  4772'           JMS RANGEN
3180    2457  0371            AND (177)
3181    2460  3144            DCA TARGET
3182    2461  1774'           TAD R1
3183    2462  3266            DCA SEQR1
3184    2463  1773'           TAD R2
3185    2464  3267            DCA SEQR2
3186    2465  5312            JMP XSEQ
3187    2466  1234    SEQR1,  1234
3188    2467  0765    SEQR2,  0765
3189                  /
3190                  /INCREMENTAL ACTUATOR ACCESS (OD INCREMENTALLY TO ID)
3191                  /
3192    2470  1161    SEQINC, TAD TTRACKS
3193    2471  1160            TAD TRACKS
3194    2472  7640            SZA CLA
3195    2473  5276            JMP .+3
3196    2474  1032            TAD OD
3197    2475  5311            JMP DCATARGET
3198    2476  1144            TAD TARGET
3199    2477  7001            IAC
3200    2500  5311            JMP DCATARGET
3201                  /DECREMENTAL ACTUATOR ACCESS (ID TO OD)
3202                  /
3203    2501  1161    SEQDEC, TAD TTRACKS
3204    2502  1160            TAD TRACKS
3205    2503  7640            SZA CLA
3206    2504  5307            JMP .+3
3207    2505  1033            TAD ID
3208    2506  5311            JMP DCATARGET
3209    2507  1144            TAD TARGET
3210    2510  1113            TAD K7777
3211    2511  3144    DCATARGET, DCA TARGET
3212                  /
3213                  /PREVIOUSLY AT L/S THE FOLLOWING CONDITION WAS TRUE
3214                  /
3215                  /               0 <= (OD) <= (ID) <= 32
3216                  /
3217                  /THEREFORE TEST FOR THE CONDITION
3218                  /
3219                  /               (TARGET) <= (ID)
3220                  /
3221    2512  1033    XSEQ,   TAD ID
3222    2513  7041            CIA
3223    2514  1144            TAD TARGET
3224    2515  7740            SMA SZA CLA
```

```
3225    2516  5240            JMP RESEQUENCE
3226                  /AND TEST FOR THE CONDITION
3227                  /
3228                  /               (OD) <= (TARGET)
3229                  /
3230    2517  1144            TAD TARGET
3231    2520  7041            CIA
3232    2521  1032            TAD OD
3233    2522  7740            SMA SZA CLA
3234    2523  5240            JMP RESEQUENCE
3235                  /
3236                  / (TARGET) >= (OD)
3237                  /
3238                  / 2ND TEST ; (TARGET) MUST NOT = THE  "VIRGIN " TRACK # 46 (38 DECIMAL)
3239                  /
3240                  / ; RESET TO 0
3241                  /
3242                  /       TAD (-46); TAD TARGET; SNA CLA; DCA TARGET
3243                  /
3244    2524  5625            JMP I XGETATRACK
3245    2525  4472    TAB60,  TAB
3246    2526  0002            2
3247    2527  4475            TY8OCT
3248    2530  6350            PASSES
3249                  /       PASSES+1                        /NOT USED
3250
3251    2531  5770'           JMP NOTICK
3252                  /
3253    2532  3725    MSDNUNEXPECTED, TEXT "_UNEXPECTED RX01 IRQ"
        2533  1605
        2534  3020
        2535  0503
        2536  2405
        2537  0440
        2540  2230
        2541  6061
        2542  4011
        2543  2221
        2544  0000
3254                  /BOUNCE ; ID TO OD
3255                  /
3256                  /THEREFORE 76 (NOT 77) TRACKS ARE TESTED
3257                  /
3258    2545  1161    SEQBBOUNCE,TAD TTRACKS
3259    2546  1160            TAD TRACKS
3260    2547  7640            SZA CLA
3261    2550  5355            JMP Q40D
3262                  /FIRST ENTRY INTO SEQUENCE # 4
3263                  /
3264                  /IF (TRACKS) = [ (ID)-(OD) ] IS A NEGATIVE ODD THEN INCREMENT (TRACKS)
3265                  /
3266    2551  7201            CLA IAC
3267    2552  0160            AND TRACKS
3268    2553  7640            SZA CLA
3269    2554  2160            ISZ TRACKS
```



```
3270                  /IF (TRACKS) = -ODD ; BOUNCE TO OUTSIDE DIAMETER, BUT
3271                  /
3272                  /IF (TRACKS) = -EVEN ; BOUNCE TO INSIDE DIAMETER
3273                  /
3274    2555  7201    Q40D,   CLA IAC
3275    2556  0160            AND TRACKS
3276    2557  7650            SNA CLA
3277    2560  5767'           JMP Q46ID
3278    2561  7240            STA
3279    2562  1161            TAD TTRACKS
3280    2563  1160            TAD TRACKS
3281    2564  7110            CLL RAR
3282    2565  5766'           JMP Q46OD
3283                  /
3284    2566  2627
3285    2567  2621
3286    2570  4526
3287    2571  0177
3288    2572  3333
3289    2573  3350
3290    2574  3347
3291    2575  1242
3292    2576  0070
3293    2577  2237
        2600    PAGE
3294                  /
3295                  // (TRACKS) = -EVEN ; THEREFORE THE BOUNCE IS TO THE INSIDE DIAMETER
3296                  //
3297                  /Q4ID,  TAD TTRACKS; TAD TRACKS; CLL RAR; CIA; TAD ID; DCA TARGET; JMP XSEQ
3298                  /STROBE ID, OD ; ID=1, OD ; ID=2, OD ; ...ETC...
3299                  /
3300    2600  1161    SEQSTROBE, TAD TTRACKS
3301    2601  1160            TAD TRACKS
3302    2602  7640            SZA CLA
3303    2603  5214            JMP Q6OD
3304                  /FIRST ENTRY INTO SEQUENCE # 6
3305                  /
3306    2604  1160            TAD TRACKS
3307    2605  7101            CLL IAC
3308    2606  7004            RAL
3309    2607  3160            DCA TRACKS
3310    2610  1160            TAD TRACKS
3311    2611  7041            CIA
3312    2612  3161            DCA TTRACKS
3313    2613  5221            JMP Q46ID
3314                  /
3315                  / IF (TARGET) = (0D), THEN STROBE TO INSIDE DIAMETER
3316                  /
3317    2614  1144    Q6OD,   TAD TARGET
3318    2615  7041            CIA
3319    2616  1032            TAD OD
3320    2617  7640            SZA CLA
3321    2620  5227            JMP Q46OD
3322                  /
3323                  /
```

```
3324                    /
3325    2621  1161      Q46ID,  TAD TTRACKS
3326    2622  1160              TAD TRACKS
3327    2623  7110              CLL RAR
3328    2624  7041              CIA
3329    2625  1033              TAD ID
3330    2626  7410              SKP
3331    2627  1032      Q46OD,  TAD OD
3332    2630  3144              DCA TARGET
3333    2631  5777'             JMP XSEQ
3334                    / ****** THE RTC IS REQUESTING SERVICE ******
3335                    /
3336                    / OD+1 INCREMENTALLY TO ID; ID-1 DECREMENTALLY TO OD
3337                    /
3338    2632  1161      SEQID,  TAD TTRACKS
3339    2633  1160              TAD TRACKS
3340    2634  7640              SZA CLA
3341    2635  5245              JMP XSEQ2
3342    2636  1160              TAD TRACKS
3343    2637  7104              CLL RAL
3344    2640  1376              TAD (2)
3345    2641  3160              DCA TRACKS      / (TRACKS X 2)-2 = 152(MAX VAL)
3346    2642  1160              TAD TRACKS
3347    2643  7041              CIA
3348    2644  3161              DCA TTRACKS
3349                    /INCREMENT IF (TRACKS) < [ (ID)-(OD) ]
3350                    /DECREMENT IF (TRACKS) => [ (ID)-(OD) ]
3351    2645  1032      XSEQ2,  TAD OD
3352    2646  7041              CIA
3353    2647  1033              TAD ID
3354    2650  1160              TAD TRACKS
3355    2651  7700              SMA CLA
3356    2652  5775'             JMP SEQDEC      / ID TO OD
3357    2653  5774'             JMP SEQINC      / OD TO ID
3358                    /
3359                    /BOUNCE; ID,OD ONLY
3360                    /
3361    2654  1161      SEQABOUNCE, TAD TTRACKS
3362    2655  1160              TAD TRACKS
3363    2656  7640              SZA CLA
3364    2657  5265              JMP XSEQ3
3365    2660  7344              CLL STA RAL
3366    2661  3160              DCA TRACKS
3367    2662  1160              TAD TRACKS
3368    2663  7041              CIA
3369    2664  3161              DCA TTRACKS
3370    2665  1144      XSEQ3,  TAD TARGET
3371    2666  7041              CIA
3372    2667  1032              TAD OD
3373    2670  7650              SNA CLA
3374    2671  1033              TAD ID
3375    2672  7450              SNA
3376    2673  1032              TAD OD
3377    2674  3144              DCA TARGET
3378    2675  5777'             JMP XSEQ
```



```
3379                    /*********
3380                    /
3381                    /TYPE 4 OCTAL
3382                    /
3383    2676  2676      XTY4OCT, .
3384    2677  7410              SKP
3385    2700  3171              DCA     TTYBUSY                 /INITIALIZE TTYBUSY INDICAOR.
3386    2701  4467              SETUP
3387    2702  2676              XTY4OCT
3388    2703  1676              TAD I XTY4OCT
3389    2704  2276              ISZ XTY4OCT
3390    2705  3360              DCA XOCTAL      /FOR " OCTAL " ADDRESS
3391    2706  1760              TAD I XOCTAL
3392    2707  3360              DCA XOCTAL      /OCTAL
3393    2710  7346              CLL STA RTL     / -3
3394    2711  1113              TAD K7777       / -1
3395    2712  3361              DCA DIGITS
3396    2713  7346      SHIFT,  CLL STA RTL     / -3
3397    2714  3363              DCA SHIFTS
3398    2715  1360              TAD XOCTAL
3399    2716  7100      XSHIFT, CLL
3400    2717  7510              SPA
3401    2720  7020              CML
3402    2721  7004              RAL
3403    2722  2363              ISZ SHIFTS
3404    2723  5316              JMP XSHIFT
3405    2724  3360              DCA XOCTAL      /NEW
3406    2725  1360              TAD XOCTAL
3407    2726  0131              AND K0007                       /OCTAL MASK
3408    2727  7450              SNA
3409    2730  5340      JMPDIG, JMP     ISZDIG                  /DO NOT PRINT LEADING ZEROS.
3410    2731  3362              DCA     XXDMP                   /STORE NUMBER TO BE PRINTED
3411    2732  1127              TAD     K7000
3412    2733  3330              DCA     .-3                     /NOP JMP ISZDIG. LEADING ZEROS WILL NOT BE PRINTED
3413    2734  1362              TAD     XXDMP                   /RETURN VALUE TO BE PRINTED.
3414    2735  1373              TAD (260)                       /FOR ASCII COMPONENT
3415    2736  4474              TYPEIT
3416    2737  2364              ISZ     CCNT                    /INDICATES A CHARACTER HAS BEEN PRINTED
3417    2740  2361      ISZDIG, ISZ DIGITS                      /INDEX DIGIT COUNT
3418    2741  5313              JMP SHIFT
3419    2742  2124              ISZ     XCNT                    /TY8OCT?
3420    2743  5300              JMP     XTY4OCT+2               /YES
3421    2744  1364              TAD     CCNT
3422    2745  7650              SNA CLA                         /PRINT ONLY A ZERO??
3423    2746  5355              JMP     ZERO                    /YES
3424    2747  7340              CLL CLA CMA
3425    2750  3124              DCA     XCNT                    /INIT COUNTER
3426    2751  3364              DCA     CCNT
3427    2752  1372              TAD     (JMP    ISZDIG)         /ESTABLISH FIRST TIME SWITCH.
3428    2753  3330              DCA     JMPDIG
3429    2754  5771'             JMP      THENEXIT
3430    2755  1373      ZERO,   TAD     (260)
3431    2756  4474              TYPEIT
3432    2757  5347              JMP     .-10
3433    2760  0000      XOCTAL, 0               / " OCTAL " FOR TYPEOUT
```

```
3434    2761  7775    DIGITS, -3
3435    2762  0000    XXDMP,  0
3436    2763  7775    SHIFTS, -3
3437    2764  0000    CCNT,   0
3438                  /*********
3439    2771  2152
3440    2772  5340
3441    2773  0260
3442    2774  2470
3443    2775  2501
3444    2776  0002
3445    2777  2512
              3000    PAGE
3446                  /
3447                  /INITIALIZE THE NUMBER OF SECTORS AVAILABLE TO ACCESS (PER TRACK) VIA THE
3448                  /DIFFERENCE BETWEEN THE CONTENTS OF PROGRAM LOCATIONS " FIRST " AND " LAST ".
3449                  /
3450    3000  3000    XINITSECTORS, .
3451    3001  1035            TAD LAST
3452    3002  7040            CMA
3453    3003  1034            TAD FIRST
3454    3004  3135            DCA SECTORS
3455    3005  3270            DCA XSTARGET
3456    3006  5600            JMP I XINITSECTORS
3457                  /
3458                  /GET A SECTOR
3459                  /
3460                  /SECTOR ACCESS 1-32 (OCTAL)
3461                  /
3462    3007  3007    XGETASECTOR, .
3463                  /
3464                  /SET (SSTART)
3465                  /
3466    3010  7301    XXGETASECTOR, CLL CLA IAC
3467    3011  3146            DCA IF
3468    3012  1133            TAD RDC                 / (RDC) = 0 IF READ VERIFY, 4000 IF WRITE, 1 IF READ
3469    3013  7450            SNA
3470    3014  2146            ISZ IF                  / + 1 READ AND PROGRAM VERIFY
3471    3015  7710            SPA CLA
3472    3016  2146            ISZ IF                  / +1 WRITE
3473    3017  7301            CLL CLA IAC
3474    3020  7004            RAL
3475    3021  0172            AND STESTP
3476    3022  7650            SNA CLA
3477    3023  5226            JMP .+3
3478    3024  2146            ISZ IF                  / +1 FOR 8 BIT MODE
3479    3025  2146            ISZ IF                  / +1 FOR 8 BIT MODE
3480                  /
3481                  /THE INTERLEAVE FACTOR (IF) IS:
3482                  /
3483                  / 1 +1 IF READ (CRC CHECK)
3484                  / 2 +1 IF WRITE
3485                  / 3 +1 IF WRITE 8-BIT MODE
3486                  / 2 +1 IF READ AND PROGRAM VERIFY
3487                  / 4 +1 IF READ AND PROGRAM VERIFY 8-BIT MODE
```



```
3488                  / 2 +1 IF READ 8-BIT MODE
3489                  /
3490    3026  1270    NEXTSECTOR, TAD XSTARGET
3491    3027  7440            SZA
3492    3030  1146            TAD IF                  / 1,2, OR 3, OR 4
3493    3031  7001            IAC                     / +1
3494    3032  3270            DCA XSTARGET
3495    3033  1270            TAD XSTARGET
3496    3034  1377            TAD (-33)
3497    3035  7510            SPA
3498    3036  5244            JMP OKSTARGET           / < 33
3499    3037  7640            SZA CLA                 /SKIP IF = 33
3500    3040  7240            STA                     / > 33
3501    3041  1376            TAD (-31)
3502    3042  1270            TAD XSTARGET
3503    3043  3270            DCA XSTARGET
3504    3044  7200    OKSTARGET, CLA
3505    3045  1270            TAD XSTARGET
3506    3046  3137            DCA STARGET             / "TARGET SECTOR"
3507                  /
3508                  /PREVIOUSLY AT L/S THE FOLLOWING CONDITION WAS TRUE
3509                  /
3510                  /               0 < (FIRST) <= (LAST)
3511                  /
3512                  /THEREFORE TEST FOR THE CONDITION
3513                  /
3514                  /               (STARGET) <= (LAST)
3515                  /
3516    3047  1035            TAD LAST
3517    3050  7041            CIA
3518    3051  1137            TAD STARGET
3519    3052  7740            SMA SZA CLA
3520    3053  5226            JMP NEXTSECTOR
3521                  /
3522                  /
3523                  /AND FOR THE CONDITION
3524                  /
3525                  /               (FIRST) <= (STARGET)
3526                  /
3527    3054  1137    PAGE1,  TAD STARGET
3528    3055  7041            CIA
3529    3056  1034            TAD FIRST
3530    3057  7740            SMA SZA CLA
3531    3060  5226            JMP NEXTSECTOR
3532                  /FORMAT (XTARGET) BITS 0-6 TRACK ; AND BITS 7-11 SECTOR
3533                  /
3534    3061  1144            TAD TARGET
3535    3062  7104            CLL RAL
3536    3063  7006            RTL
3537    3064  7006            RTL
3538    3065  1137            TAD STARGET
3539    3066  3162            DCA XTARGET
3540    3067  5607            JMP I XGETASECTOR
3541                  /
3542    3070  0000    XSTARGET, 0             / 1 TO 32
```

```
                        /
3071  1153    WHAT2,    TAD DWSLOG
3072  7650              SNA CLA
3073  5775'             JMP WHAT3
3074  1152              TAD R2RETRY
3075  3153              DCA DWSLOG
3076  4162              LOG
3077  7305              DATAERRORS
3100  5775'             JMP WHAT3
                        /
3101  2516    MMUNRECOVERABLE,TEXT "UNRECOVERABLE "
3102  2205
3103  0317
3104  2605
3105  2201
3106  0214
3107  0540
3110  0000
                        /THIS SUBROUTINE IS ENTERED FROM ALL 3 STARTING ADDRESSES
                        /
                        /THIS SUBROUTINE CHECKS FOR OD, ID, FIRST, AND LAST TO BE STANDARD
                        /
                        /AND REPORTS A NON-STANDARD MESSAGE IF OTHERWISE
                        /
                        /THE STANDARD SELECTIONS ARE: OD = 1, ID = 114, FIRST = 1, LAST = 32
                        /
3111  3111    CHECK,    .
3112  4463              PRINT
3113  6124              MTESTP
3114  4473              TY40CT
3115  0145              TESTP
3116  4463              PRINT
3117  5611              MCRLF
3120  7240              STA
3121  1032              TAD OD
3122  7640              SZA CLA
3123  5340              JMP NSTANDARD
3124  1033              TAD ID
3125  1374              TAD (-114)
3126  7640              SZA CLA
3127  5340              JMP NSTANDARD
3130  7240              STA
3131  1034              TAD FIRST
3132  7640              SZA CLA
3133  5340              JMP NSTANDARD
3134  1035              TAD LAST
3135  1373              TAD (-32)
3136  7650              SNA CLA
3137  5711              JMP I CHECK
3140  4463    NSTANDARD, PRINT
3141  5717              MOD
3142  4473              TY40CT
3143  0032              OD
3144  4463              PRINT
3145  5723              MID
```



```
3146  4473              TY40CT
3147  0033              ID
3150  4463              PRINT
3151  5727              MFIRST
3152  4473              TY40CT
3153  0034              FIRST
3154  4463              PRINT
3155  5734              MLAST
3156  4473              TY40CT
3157  0035              LAST
3160  5711              JMP I CHECK

                        /*******
                        /CONSOLE
                        /*********

                        /THIS ROUTINE IS FOR XKCC LOCATION 5511 IT WILL STORE THE CORRECTED
                        /8 BIT CHARACTER FROM THE TTY IN LOC CHAR IN FLD 1 FOR THE C8CNTR ROUTINE


3161  0000    C8TST2, 0
3162  1372              TAD     (200            /ADDD THE 8 TH BIT
3163  6211              CDF 10
3164  3770              DCA I   XC8CHAR         /STORE IT IN CHAR FLD 1
3165  1770              TAD I   XC8CHAR         /GET THE CHAR
3166  6201              CDF 0                   /RETURN TO CORRECT FIELD
3167  5761              JMP I   C8TST2          /EXIT C8TST2
3170  1110    XC8CHAR,  C8CHAR
                        /
3172  0200
3173  7746
3174  7664
3175  1552
3176  7747
3177  7745
      3200    PAGE
                        /
                        /SUBROUTINE ; TAB
                        /ENTRY ; TAB; +N
                        /COMMENT ; PRINT " N " SPACES WHERE N IS VIA INDEXED XTAB
                        /
3200  3200    XTAB,     .
3201  4467              SETUP
3202  3200              XTAB
3203  3226              DCA XXTAB       /FOR COUNT
3204  7200    XTABL,    CLA
3205  1226              TAD XXTAB
3206  1600              TAD I XTAB      /FOR " N "
3207  3226              DCA XXTAB
3210  1305              TAD CHARLINE    / # OF CHARACTERS ALREADY TYPED ON THIS LINE
3211  1377              TAD (110)       / 72 CHARACTER LINE STANDARD
3212  7041              CIA
3213  1226              TAD XXTAB
3214  7550              SPA SNA
3215  5204              JMP XTABL
```

```
3645  3216  7041          CIA
3646  3217  3226          DCA XXTAB
3647  3220  2200          ISZ XTAB
3648  3221  1376          TAD (240)
3649  3222  4474          TYPEIT
3650  3223  2226          ISZ XXTAB
3651  3224  5221          JMP .-3
3652  3225  5775'         JMP THENEXIT
3653  3226  0000  XXTAB,  0
3654                      /
3655                      /SUBROUTINE ; PRINT
3656                      /ENTRY ;
3657                      /COMMENT ; PRINT A " MESSAGE ",  AND A <CR><LF> AT EACH _
3658                      /
3659                      /  CALL SYNTAX FOR PRINT
3660                      /
3661                      /  1.  PRINT; MTEXT
3662                      /
3663  3227  3227  XPRINT, .
3664  3230  4500          CHEK22                  /TEST FOR APT-8
3665  3231  5322          JMP     PNTEXT                          /ON APT. NOP PRINT
3666  3232  1171          TAD TTYBUSY
3667  3233  7640          SZA CLA
3668  3234  5232          JMP .-2
3669
3670  3235  1627          TAD I XPRINT    / " TEXT"
3671  3236  2227          ISZ XPRINT
3672  3237  3247          DCA MESSAGE     /ADDRESS
3673  3240  1647  NUWORD, TAD I MESSAGE
3674  3241  4250          OUTPUT          /LEFT BYTE
3675  3242  1647          TAD I MESSAGE
3676  3243  2247          ISZ MESSAGE
3677  3244  4436          BSW
3678  3245  4250          OUTPUT          /RIGHT BYTE
3679  3246  5240          JMP NUWORD
3680  3247  0000  MESSAGE,0
3681        4250  OUTPUT=JMS .
3682  3250  3250  XOUTPUT,.
3683  3251  0374          AND (-100)      /MASK MS BITS 0-5
3684  3252  7440          SZA
3685  3253  5256          JMP .+3
3686  3254  3171          DCA TTYBUSY
3687  3255  5773'         JMP PIEXIT
3688  3256  1372          TAD (4100)
3689  3257  7450          SNA
3690  3260  5267          JMP NULINE      /  _
3691  3261  1371          TAD (-4100+2)   /CODE 200
3692  3262  7500          SMA
3693  3263  7001          IAC             /CODE 300
3694  3264  4436          BSW
3695  3265  4474          TYPEIT
3696  3266  5650          JMP I XOUTPUT
3697  3267  1250  NULINE, TAD XOUTPUT
3698  3270  3272          DCA XTYPEIT
3699  3271  5276          JMP XNULINE
```



```
3700  3272  3272  XTYPEIT,.
3701  3273  4306          JMS TY1ASC
3702  3274  2305          ISZ CHARLINE
3703  3275  5672          JMP I XTYPEIT
3704  3276  1370  XNULINE,TAD (215)       / <CR>
3705  3277  4306          JMS TY1ASC
3706  3300  1367          TAD (212)       / <LF>
3707  3301  4306          JMS TY1ASC
3708  3302  1366          TAD (-110)
3709  3303  3305          DCA CHARLINE    / 72 CHARACTER LINE (NEGATIVE NOTATION)
3710  3304  5672          JMP I XTYPEIT
3711  3305  7670  CHARLINE,      -110     / # CHARACTERS PER LINE ARE COUNTED HERE
3712                      /
3713                      /
3714  3306  3306  TY1ASC, .
3715  3307  3013          DCA A13
3716  3310  4500          CHEK22
3717  3311  5322          JMP     PNTEXT                  /ON APT. EXIT AND CONTINUE.
3718  3312  1013          TAD A13
3719  3313  6046          TLS
3720  3314  7200          CLA
3721  3315  1171          TAD TTYBUSY
3722  3316  7640          SZA CLA
3723  3317  5773'         JMP PIEXIT
3724  3320  2171          ISZ TTYBUSY
3725  3321  7410          SKP
3726  3322  2227  PNTEXT, ISZ     XPRINT                  /UPDATE FOR RETURN
3727  3323  6001          ION
3728  3324  5627          JMP I XPRINT
3729                      /IF THE CONTENTS OF A13 = 207 [BELL] THEN EXIT VIA A JMP I XTYPEIT
3730                      /SO NOT TO INC CHARLINE FOR THE NONPRINTING BELL CHARACTER
3731                      /
3732  3325  6042  XTCF,   TCF
3733  3326  1013          TAD A13
3734  3327  1365          TAD (-207)
3735  3330  7650          SNA CLA
3736  3331  5672          JMP I XTYPEIT
3737  3332  5706          JMP I TY1ASC
3738                      /
3739                      /RANDOM NUMBER GENERATOR
3740                      / (EXIT IS WITH THE RANDOM # IN THE ACCUMULATOR)
3741  3333  3333  RANGEN, .
3742  3334  7301          CLL CLA IAC
3743  3335  1347          TAD R1
3744  3336  1350          TAD R2
3745  3337  7106          CLL RTL
3746  3340  3347          DCA R1
3747  3341  1350          TAD R2
3748  3342  7012          RTR
3749  3343  1347          TAD R1
3750  3344  3350          DCA R2
3751  3345  1350          TAD R2
3752  3346  5733          JMP I RANGEN
3753  3347  1234  R1,     1234
3754  3350  0765  R2,     0765
```

```
                        /
                        /ERROR REPORTER FOR APT. INDICATES THE PC AT THE TIME OF THE ERROR.
                        /
3351  0000              XAERRO, 0
3352  3004                      DCA     XXX                     /SAVE ERROR PC
3353  4500                      CHEK22
3354  7410                      SKP
3355  5751                      JMP I   XAERRO
3356  6002                      IOF
3357  1004                      TAD     XXX                     /GET BACK ERROR PC
3360  6201                      CDF     00
3361  6272                      CIF     70
3362  5530                      JMP I   K6520
3363  5363                      JMP     .                               /SOMETHING WENT WRONG ON
                                                                  /ON REPORTING ERROR TO APT
                        /
3365  7571
3366  7670
3367  0212
3370  0215
3371  3702
3372  4100
3373  3473
3374  7700
3375  2152
3376  0240
3377  0110
      3400              PAGE
                        /ENTRY TO THIS POINT WAS CAUSED BY A PROGRAM INTERRUPT REQUEST
                        /
3400  3300              PI,     DCA XAC
3401  7010                      RAR
3402  3301                      DCA XLINK       /SAVE (AC) AND (LINK)
3403  6031                      KSF
3404  7410                      SKP
3405  5576                      JMP I   XXKCC   /IGNORE KEYBOARD IRQ
3406  6041                      TSF
3407  5215                      JMP PICLSK
                        /IF THIS TELEPRINTER FLAG IS EXPECTED (TTYBUSY) = 1
                        /THEN "JMP XTCF"
                        /IF NOT THEN "JMP PIEXIT"
                        /
3410  1171                      TAD TTYBUSY
3411  7740                      SMA SZA CLA
3412  5777'                     JMP XTCF
3413  6042                      TCF
3414  5273                      JMP PIEXIT
                        /IF (BUSY) = 1, THEN AN RX01 PI IS ALREADY BEING PROCESSED
                        /
                        /IF (GOBIT) = 0, THEN THIS DISKETTE IRQ IS UNEXPECTED
                        /
                        /DISABLE RX01 INTERRUPT
                        /
                        /READ RX01 STATUS REGISTER
                        /
```



```
3415  1104              PICLSK, TAD BUSY
3416  7640                      SZA CLA
3417  5273                      JMP PIEXIT
3420  2104                      ISZ BUSY
                        /REFRESH PROGRAM LOCATION " FORCE " BECAUSE THIS IS [NOT] A FORCED TYPEOUT
                        /
                        /IT MAY HOWEVER BE AN RX-ERROR TYPEOUT
                        /
3421  3776'                     DCA FORCE
                        /
3422  6001                      ION
                        /
                        /SPECIAL PROGRAMMING NOTE:
                        /
                        /THE FOLLOWING INSTRUCTION IMMEDIATELY AFTER THE PREVIOUS " ION "
                        /MUST BE THE IOT TO SKIP ON THE RX DONE FLAG (67X5)
                        /AND NOT THE PSEUDO INSTRUCTION " SDN " WHICH "JMS XSDN"
                        /BECAUSE THE PROGRAM WILL [HANG]
                        /
3423  6755              K67X5B, 6755
3424  5266                      JMP UNKNOWN
3425  1165                      TAD GOBIT
3426  7650                      SNA CLA
3427  5775'                     JMP SDNUNEXPECTED
3430  4447                      INTR                    /CLEAR RX01 INTERRUPT ENABLE
                        /
3431  4442                      XDRIN
3432  0125                      AND K377
3433  3141                      DCA ASTATUS
                        /IF THE RETURN IS TO "AUTOOK" THEN THIS PI IS FROM THE AUTOSCAN AFTER
                        /[KEY] INIT - THEREFORE DELETED DATA MAY BE SET (OK FOR NOW)
                        /
3434  1774'                     TAD RETURN
3435  1373                      TAD (-JMPAUTOOK)
3436  7650                      SNA CLA
3437  5256                      JMP DDIGNORE
                        /
                        /THE COMMANDS FILL BUFFER AND EMPTY BUFFER SHOULD NOT ATTRACT DELETED DATA
                        /
3440  1121                      TAD K16
3441  0105                      AND COMMAND
3442  7440                      SZA                     /SKIP IF FILL BUFFER (0)
3443  7112                      CLL RTR
3444  7640                      SZA CLA                 /SKIP IF EMPTY BUFFER (2)
3445  7301                      CLL CLA IAC             /  1
3446  0172                      AND STESTP
3447  7010                      RAR                     /PUT TO LINK
3450  1372                      TAD (100)
3451  0141                      AND ASTATUS             / A STATUS D.D. MASK
                        /
                        /IF (L) = 0 AND (AC) = 0, O.K. - NO D.D. MARK
                        /
                        /IF (L) = 0 AND (AC) > 0  (=100), UNEXPECTED D.D.
                        /
                        /IF (L) = 1 AND (AC) = 0, D.D. MARK EXPECTED DIDN'T OCCUR
```

```
                        /
                        /IF (L) = 1 AND (AC) > 0  (=100), O.K. - D.D. MARK OCCURED
                        /
3452  7430              SZL
3453  7640              SZA CLA                 / (L) = 1
3454  7440              SZA                     / (L) = 0, OR (L) = 1 AND (AC) > 0
3455  5771'             JMP DDERROR             / (L) = 0 AND (AC) > 0  (=100)  , OR (L) = 1 AND (AC) = 0
3456  4445    DDIGNORE, SER
3457  5261              JMP VERIFY              /RX01 OK - RETURN TO INLINE CODE
3460  5770'             JMP RXERROR
                        /
                        /VERIFY THAT THE CONTENTS OF THE A-STATUS REGISTER = 0
                        /
                        /WHEN NO RX01 ERROR FLAG EXISTS
                        /
                        /NOTE:
                        /
                        /THE A-STATUS MAY = 200 (IF ENTRY TO HERE IS FROM THE AUTO SCAN AT "AUTO"
                        /
                        /MASK OUT BITS 4 (DRIVE READY); AND 5 (DELETED DATA), AND 9 (INIT DONE)
                        /
3461  1141    VERIFY, TAD ASTATUS
3462  0367              AND (73)
3463  7640              SZA CLA
3464  5766'             JMP NOSER
3465  5765'             JMP OKRETURN
                        /
                        /AN UNKNOWN PROGRAM INTERRUPT OCCURED
                        /
3466  1364    UNKNOWN, TAD    (UNKNOWN                        /ERROR PC.
3467  4427              AERROR                  /REPORT ERROR TO APT IF REQUIRED.
3470  4463              PRINT
3471  6327              MUNKNOWN
3472  3104              DCA BUSY
3473  1301    PIEXIT, TAD XLINK
3474  7104              CLL RAL
3475  1300              TAD XAC
3476  6001              ION
3477  5400              JMP I 0
3500  0000    XAC,    0
3501  0000    XLINK,  0
                        / " LOG ERRORS " (IF ANY)
                        /
                        /FORM: LOG; XERROR
                        /
                        /WHERE XERROR=
                        /
                        /WERRORS                        (R1RETRY)
                        /RERRORS                        (R2RETRY)
                        /DATAERRORS
                        /DNSERRORS
                        /SNDERRORS
                        /SERRORS                        (SRETRY)
                        /PERRORS                        (PRETRY)
                        /
```



```
                        /IF (RETRY) = 0         ; LOG "UNRECOVERABLE" (HARD) ERROR
                        /IF (RETRY) < -12       ; LOG "RECOVERABLE" (SOFT) ERROR
                        /IF (RETRY) = -12       ; NO ERROR TO LOG
                        /
                        /
                        /PROGRAMMING NOTE: ANY "XERROR" IS RESTRICTED TO A MAGNITUDE OF 4095 DECIMAL
                        /
                        /
3502  3502    XLOG,   .
3503  1702              TAD I XLOG              /ADDRESS OF LOG
3504  1363              TAD (-WERRORS)          /
3505  7110              CLL RAR                 /RIGHT JUSTIFIED 1 PLACE
3506  1362              TAD (R1RETRY)           /
3507  3327              DCA LSBX1               /CONTAINS ADDRESS OF X-RETRY COUNTER
3510  1727              TAD I LSBX1             /AC CONTAINS CONTENTS OF THAT X-RETRY COUNTER
3511  7450              SNA
3512  5320              JMP UNRECOVERABLE       /UNRECOVERABLE ERROR EXISTS
3513  7041              CIA
3514  1134              TAD KRETRY
3515  7450              SNA
3516  5354              JMP LOGGED              /NO ERROR EXISTS OR PREVIOUSLY EXISTED
                        /       DCA TTRETRY     / # OF RETRY RECOVERED AT
3517  7610              CLA SKP
3520  1121    UNRECOVERABLE, TAD K16          / UNRECOVERABLE OFFSET
3521  1702              TAD I XLOG              / TO OBTAIN " XERROR "
3522  1761'             TAD UNITZ               /UNIT OFFSET
3523  3327              DCA LSBX1               /TO WORK FOR INDEX
3524  2727              ISZ I LSBX1
3525  5331              JMP .+4
3526  4461              LOCK
3527  0000    LSBX1,  0
3530  0113              K7777
                        /
                        /AN ERROR HAS OCCURED THIS PASS
                        /
3531  7330              STL CLA RAR
3532  3132              DCA PASSINPROGRESS
3533  1302              TAD     XLOG                    /POINTS TO TYPE OF ERROR.
3534  4427              AERROR
                        /LOG TRACK ACCESS FREQUENCY ERROR (ANY ERROR) PER DRIVE PER TRACK
                        /
                        //IF A "PARITY ERROR" DO NOT LOG TAPE
                        //
                        /       TAD I XLOG; TAD (-PERRORS); SNA CLA; JMP LOGGED
                        /LOG TRACK ACCESS FREQUENCY ERROR (ANY ERROR) PER DRIVE PER TRACK
                        /
                        /       TAD UNITZ
                        /       CMA
                        /       DCA LSBX2
                        /       TAD (TAPE1-TAPE0)       /FOR DISKETTE UNIT OFFSET
                        /       ISZ LSBX2
                        /       JMP .-2
3535  1761'             TAD UNITZ               / 0 OR 1
3536  7640              SZA CLA
3537  1360              TAD (TAPE1-TAPE0)
```

```
3974    3540  1360            TAD (TAFE1-TAFE0)
3975    3541  1144            TAD TARGET
3976    3542  1357            TAD (TAFE0-TAFE1+TAFE)
3977    3543  3347            DCA LSBX2
3978    3544  2747            ISZ I LSBX2
3979    3545  5351            JMP HARDP
3980    3546  4461            LOCK
3981    3547  0000    LSBX2,  0
3982    3550  0113            K7777
3983                    /
3984                    /IF THIS IS A HARD PARITY ERROR THEN RESTART THE PROGRAM
3985                    /
3986                    /HARDP, TAD I XLOG; TAD (-PERRORS); SZA CLA; JMP LOGGED
3987    3551  1157    HARDP,  TAD PRETRY
3988    3552  7650            SNA CLA
3989    3553  5756'           JMP RS
3990    3554  2302    LOGGED, ISZ XLOG
3991    3555  5702            JMP I XLOG
3992    3556  2237
3993    3557  6732
3994    3560  0115
3995    3561  2272
3996    3562  0151
3997    3563  0477
3998    3564  3466
3999    3565  3602
4000    3566  1306
4001    3567  0073
4002    3570  3642
4003    3571  3616
4004    3572  0100
4005    3573  7514
4006    3574  3600
4007    3575  1304
4008    3576  3605
4009    3577  3325
              3600              PAGE
4010                    /THE CONTENTS OF RETURN ARE SETUP WITHIN THE SUBROUTINES "LCD-A" AND "LCD-B"
4011                    /
4012                    /TO REPRESENT THE RETURN ADDRESS OF THE INLINE TESTING
4013                    /
4014                    /
4015    3600  0000    RETURN, 0
4016                    /
4017    3601  2200    ERETURN, ISZ RETURN                     /INCREMENT FOR ERROR RETURN ADDRESS
4018                    /
4019                    /ENTRY TO HERE FROM PI SERVICE
4020                    /
4021                    /NO RX01 ERROR FLAG EXISTS
4022                    /
4023    3602  3104    OKRETURN, DCA BUSY
4024    3603  4777'           JMS     XTICK                   /NOTIFY APT IF NEED BE,
4025    3604  5600            JMP I RETURN
4026                    /ENTRY TO HERE MAY HAVE BEEN FROM:
4027                    /
```



```
4028                    / (1)   XLS     - LOAD ADDRESSES 200, OR 201
4029                    /
4030                    / (2)   NOSER   - UNEXPECTED DONE FLAG / NO ERROR FLAG
4031                    /               - THEN RS (RESTART)
4032                    /
4033                    / (3)   COMPARE - DATA NO STATUS ERROR
4034                    /
4035                    / (4)   EMPTYOK - SUMCHECK ERROR W/O DATA COMPARE ERROR OR CRC ERROR
4036                    /
4037                    / (5)   INIT
4038                    /
4039                    / (6)   HUNGUP  - DEVICE TEST IS HUNG AT PC:
4040                    /
4041    3605  0000    FORCE,  0
4042    3606  2104            ISZ BUSY
4043    3607  5242            JMP RXERROR
4044    3610  7240    XFORCE, STA
4045    3611  1104            TAD BUSY
4046    3612  3104            DCA BUSY
4047    3613  5605            JMP I FORCE
4048    3614  6272    DTYPE,  MEDDDIDNOT
4049    3615  6303            MUDDDID
4050                    /
4051                    /A DISKETTE DELETED DATA MALFUNCTION HAS BEEN DETECTED
4052                    /
4053                    /*************************************************************************
4054                    /
4055                    / IF (AC) = 0 - EXPECTED D.D. DIDN'T OCCUR
4056                    /
4057                    / IF (AC) = 100 - UNEXPEDTED D.D. OCCURED
4058                    /
4059    3616  7640    DDERROR, SZA CLA
4060    3617  7001            IAC
4061    3620  3776'           DCA DMTYPE
4062    3621  1776'           TAD DMTYPE
4063    3622  7640            SZA CLA
4064    3623  1375            TAD (UDCODES-DCODES)
4065    3624  1774'           TAD UNITZ
4066    3625  1373            TAD (DCODES)
4067    3626  3232            DCA DDCODE
4068    3627  2632            ISZ I DDCODE
4069    3630  5234            JMP .+4
4070    3631  4461            LOCK
4071    3632  0000    DDCODE, 0
4072    3633  0113            K7777
4073    3634  1776'           TAD DMTYPE
4074    3635  1372            TAD (DTYPE)
4075    3636  3004            DCA XXX
4076                    /PROGRAMMING NOTE: "SER" TO CLEAR ACCOMPANYING ERROR FLAG (IF ANY)
4077                    /
4078    3637  4445            SER
4079    3640  7000            NOP
4080    3641  1404            TAD I XXX
4081                    /
4082                    /A DISKETTE ERROR HAS BEEN DETECTED
```

```
                        /
                        / (DMTYPE) NOT = 0 IF A D.D. ERROR EXISTS
                        / (DMTYPE) = 0 IF NO D.D. ERROR EXISTS
                        /
4087    3642  3776'     RXERROR, DCA DMTYPE
4088    3643  1105              TAD COMMAND
4089    3644  3163              DCA ECOMMAND
                        /FORMAT ERRORS (STATUS B WORD):
                        /
                        / 40, 50, (60), 70, 100, 110, 120, 130, (140), 150, 160, 170, (200), (210)
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF A PARITY ERROR OCCURS WHILE ATTEMPTING TO READ THE B-CODES, OR WHILE
                        /ATTEMPTING TO READ THE STATUS (COMMANDS #7, #5), THEN THE ORIGINAL ERROR
                        /WHICH BROUGHT THE PROGRAM TO THIS ERROR SERVICE ROUTINE WILL BE LOST
                        /
                        /SPECIAL PROGRAMMING NOTE:
                        /
                        /IF THIS IS A FORCED TYPEOUT FROM HUNGUP BECAUSE THE DEVICE TEST IS HUNG
                        /THEN THIS PROGRAM DOES NOT EVEN READ THE B- AND C- STATUS
                        /BECAUSE THE PROGRAM COULD GET HUNG WITHIN AN INFINITE LOOP
                        /BECAUSE A " JMS FORCE " IS ISSUED WITHIN HUNGUP WHICH WAS ENTERED IF
                        /THE IOT'S SDN OR SER OR STR FAILED TO SKIP WITHIN AN ALLOTED PERIOD OF TIME
                        /
                        /ALSO, AN ERROR MESSAGE IS FORCED EVEN IF SW 3 = 1
                        /
4110    3645  1205      SAVEBSTATUS, TAD FORCE
4111    3646  1371              TAD (-XHUNG)
4112    3647  7650              SNA CLA
4113    3650  5352              JMP ERROR
4114                    /...ALSO, IF ENTRY TO HERE IS FROM (3) / COMPARE / THEN DON'T READ THE
4115                    / B-, OR C- STATUS BECAUSE THE FUNCTION EMPTY BUFFER HAS NOT YET COMPLETED
4116                    /
4117    3651  1205              TAD FORCE
4118    3652  1370              TAD (-XCOMPARE)
4119    3653  7650              SNA CLA
4120    3654  5352              JMP ERROR
4121    3655  1121              TAD K16
4122    3656  4437              LCD
4123    3657  4502              WAIT
4124    3660  4446              SDN
4125    3661  4445              SER
4126    3662  7000              NOP
4127    3663  4442              XDRIN
4128    3664  0125              AND K377
4129    3665  3142              DCA BSTATUS
4130    3666  1767'     SAVECSTATUS, TAD UNIT
4131    3667  1120              TAD K12
4132    3670  4437              LCD
4133    3671  4502              WAIT
4134    3672  4446              SDN
4135    3673  4445              SER
4136    3674  7000              NOP
4137    3675  4442              XDRIN
```



```
4138    3676  0125              AND K377
4139    3677  3143              DCA CSTATUS
                        /LOG A AND B STATUS REGISTERS PER UNIT
                        /
                        /       DCODES, EXPECTED D.D. DIDN'T OCCUR
                        /               UNEXPEDTED D.D. OCCURED
                        /       ACODES, A0
                        /               ACRC
                        /               APAR
                        /       BCODES, B0
                        /               B10
                        /               B20
                        /               B30
                        /               B40
                        /               B50
                        /               B60
                        /               B70
                        /               B100
                        /               B110
                        /               B120
                        /               B130
                        /               B140
                        /               B150
                        /               B160
                        /               B170
                        /               B200
                        /    DCODES+25, B210
                        /
                        /THE BSTATUS SHOULD NEVER BE ANY OF THE FOLLOWING CODES
                        /
                        /               220
                        /               230
                        /               240
                        /               250
                        /               260
                        /               270
                        /               300
                        /               310
                        /               320
                        /               330
                        /               340
                        /               350
                        /               360
                        /       DCODES+43, 370
                        /
4183    3700  7321      LOGCODES, CLL CML CLA IAC       / 3
4184    3701  7004              RAL
4185    3702  0141              AND ASTATUS
4186    3703  7440              SZA
4187    3704  5311              JMP ANOT0
4188                    /
4189                    /IF ANY D.D. ERRORS HAVE BEEN PREVIOUSLY LOGGED
4190                    /
4191                    /THEN DON'T GOTO "ANOT0"
4192                    /
```

```
 4193    3705  1776'           TAD DMTYPE
 4194    3706  7640            SZA CLA
 4195    3707  5326            JMP LOGBSTATUS
 4196    3710  5316            JMP A0                  /A STATUS AT ERROR = 0
 4197    3711  7040    ANOT0,  CMA
 4198    3712  3324            DCA ACODE
 4199    3713  1375            TAD (ACRC-ACODES)
 4200    3714  2324            ISZ ACODE
 4201    3715  5313            JMP .-2
 4202    3716  1774'   A0,     TAD UNITZ
 4203    3717  1366            TAD (ACODES)
 4204    3720  3324            DCA ACODE
 4205    3721  2724            ISZ I ACODE
 4206    3722  5326            JMP LOGBSTATUS
 4207    3723  4461            LOCK
 4208    3724  0000    ACODE,  0
 4209    3725  0113            K7777
 4210                    /
 4211                    /LOG B CODES
 4212                    /
 4213    3726  1142    LOGBSTATUS, TAD BSTATUS
 4214    3727  7110            CLL RAR
 4215    3730  7012            RTR
 4216    3731  7040            CMA
 4217    3732  3344            DCA BCODE
 4218    3733  1375            TAD (B10-BCODES)
 4219    3734  2344            ISZ BCODE
 4220    3735  5333            JMP .-2
 4221    3736  1774'           TAD UNITZ
 4222    3737  1365            TAD (BCODES-B10+BCODES)
 4223    3740  3344            DCA BCODE
 4224    3741  2744            ISZ I BCODE
 4225    3742  5346            JMP .+4
 4226    3743  4461            LOCK
 4227    3744  0000    BCODE,  0
 4228    3745  0113            K7777
 4229                    /
 4230                    /PRINT AN ERROR MESSAGE IF AC SW 3 = 0
 4231                    /
 4232    3746  4407    LASSW3, LAS
 4233    3747  0014            AND K0400
 4234    3750  7640            SZA CLA
 4235    3751  5764'           JMP NOPRINT
 4236                    /
 4237                    /SAVE THE TIME AT THE DETECTION OF THE ERROR
 4238                    /
 4239    3752  5763'   ERROR,  JMP ERROR2
 4240                    /
 4241    3763  4000
 4242    3764  4535
 4243    3765  7347
 4244    3766  7341
 4245    3767  2274
 4246    3770  6115
 4247    3771  2502
```



```
 4248    3772  3614
 4249    3773  7335
 4250    3774  2272
 4251    3775  0002
 4252    3776  4533
 4253    3777  5400
               4000              PAGE
 4254    4000  1777'   ERROR2, TAD     FORCE                   /GET ERROR PC.
 4255    4001  7440            SZA                             /IGNORE FIRST TIME ERROR FOR APT.
 4256    4002  4427            AERROR                          /REPORT IT TO APT IF NEED BE.
 4257    4003  1110            TAD FIRSTERROR
 4258    4004  7650            SNA CLA
 4259    4005  5211            JMP NOHEADER
 4260                    /THE FOLLOWING INFORMATION IS PRINTED FOR ALL ERRORS DETECTED
 4261                    /
 4262                    /THE ERROR HEADER TEXT IS INHIBITED IF THE ERROR IS NOT THE FIRST ERROR EVER
 4263                    /
 4264                    /       CMND  XDR    CODE   RST    U:?  START  TARGET   PARAMATERS PASS
 4265                    /
 4266    4006  4463            PRINT
 4267    4007  5652            MEHEADER
 4268    4010  5225            JMP ONECRLF
 4269                    /IF THIS IS -NOT- A FORCED TYPEOUT, AND IF THERE ARE NO DATA COMPARE
 4270                    /ERRORS (COMPRERROR=0), THEN PRINT ONLY 1-CRLF
 4271                    /BECAUSE
 4272                    /
 4273                    /THIS ERROR MUST BE AN ERROR AT THE END OF THE EMPTY BUFFER DONE FLAG
 4274                    /WHICH WOULD BE ASSOCIATED TO ANY PREVIOUS FORCED TYPEOUT OF DATA ERRORS
 4275                    /
 4276    4011  1777'   NOHEADER, TAD FORCE
 4277    4012  7650            SNA CLA
 4278    4013  5223            JMP TWOCRLF
 4279    4014  1106            TAD COMPRERROR
 4280    4015  7640            SZA CLA
 4281    4016  5225            JMP ONECRLF
 4282                    /IF THIS IS A FORCED TYPEOUT FROM " XXINIT " THEN PRINT ONLY 1 CRLF
 4283                    /
 4284    4017  1777'           TAD FORCE
 4285    4020  1376            TAD (-XXINIT)
 4286    4021  7650            SNA CLA
 4287    4022  5225            JMP ONECRLF
 4288    4023  4463    TWOCRLF, PRINT
 4289    4024  5611            MCRLF
 4290    4025  4463    ONECRLF, PRINT
 4291    4026  5611            MCRLF
 4292    4027  4775'           JMS INITSWITCH
 4293    4030  5235            JMP .+5
 4294                    /IF AN ERROR FROM THE RECAL, THEN PRINT (INIT) FOR THE COMMAND
 4295                    /
 4296    4031  1777'           TAD FORCE
 4297    4032  1376            TAD (-XXINIT)
 4298    4033  7640            SZA CLA
 4299    4034  5240            JMP .+4
 4300    4035  4463            PRINT
 4301    4036  5712            MINIT
```

```
4302  4037  5244          JMP TAB5
4303  4040  4774'         JMS KEYSWITCH
4304  4041  5244          JMP .+3
4305  4042  4473          TY4OCT
4306  4043  0163          ECOMMAND
4307  4044  4472  TAB5,   TAB
4308  4045  0005          5
4309                      /IF THE DEVICE TEST IS HUNG,
4310                      /THEN THE A= B= AND C= STATUS ARE NOT APPLICABLE
4311                      /
4312  4046  1777'         TAD FORCE
4313  4047  1373          TAD (-XHUNG)
4314  4050  7650          SNA CLA
4315  4051  5263          JMP DASHALL
4316  4052  4473          TY4OCT
4317  4053  0141          ASTATUS
4318  4054  4472          TAB
4319  4055  0013          13
4320                      /IF THIS IS A FORCED TYPEOUT FROM "COMPARE" THEN THE B=, AND C= STATUS
4321                      /ARE RESIDUAL FROM A PREVIOUS COMMAND IN ERROR AND ARE N/A HERE
4322                      /BECAUSE A DATA NO STATUS ERROR HAS BEEN DETECTED PRIOR TO THE COMPLETETION
4323                      /OF THE FUNCTION "EMPTY BUFFER"
4324                      /
4325  4056  1777'         TAD FORCE
4326  4057  1372          TAD (-XCOMPARE)
4327  4060  7640          SZA CLA
4328  4061  5276          JMP TYBSTATUS
4329  4062  5267          JMP DASHBC
4330  4063  4463  DASHALL, PRINT
4331  4064  6234          MDASH
4332  4065  4472          TAB
4333  4066  0013          13
4334  4067  4463  DASHBC,  PRINT
4335  4070  6234          MDASH
4336  4071  4472          TAB
4337  4072  0021          21
4338  4073  4463          PRINT
4339  4074  6234          MDASH
4340  4075  5304          JMP TAB27
4341  4076  4473  TYBSTATUS, TY4OCT
4342  4077  0142          BSTATUS
4343  4100  4472          TAB
4344  4101  0021          21
4345  4102  4473          TY4OCT
4346  4103  0143          CSTATUS
4347  4104  4472  TAB27,   TAB
4348  4105  0027          27
4349  4106  4775'         JMS INITSWITCH
4350  4107  5315          JMP .+6
4351  4110  4774'         JMS KEYSWITCH
4352  4111  5326          JMP TAB41
4353                      /IF (SSTART) = 0 THEN PRINT "HOME" BECAUSE A RECAL HAS TAKEN PLACE
4354                      /THEREFORE THE ACTUATOR IS AT (SHOULD BE) TRACK 1 (HOME)
4355                      /
4356  4112  1136          TAD SSTART
```



```
4357  4113  7640          SZA CLA
4358  4114  5320          JMP .+4
4359  4115  4463          PRINT
4360  4116  5706           MHOME
4361  4117  5326          JMP TAB41
4362  4120  4473          TY4OCT
4363  4121  0140          START
4364  4122  4472          TAB
4365  4123  0034          34
4366  4124  4473          TY4OCT
4367  4125  0136          SSTART
4368  4126  4472  TAB41,   TAB
4369  4127  0041          41
4370  4130  4775'         JMS INITSWITCH
4371  4131  5346          JMP PHOME
4372                      /IF (FORCE) = THE ADDRESS "XXINIT" THEN ALSO PRINT (HOME) BECAUSE AN ERROR
4373                      /HAS OCCURED FROM THE RECAL WHEN THE TARGET WAS (HOME)
4374                      /
4375  4132  1777'         TAD FORCE
4376  4133  1376          TAD (-XXINIT)
4377  4134  7650          SNA CLA
4378  4135  5342          JMP .+5
4379                      /IF (XSDN) = THE RETURN ADDRESS TO " SDNFIRST " THEN THE DEVICE TEST IS
4380                      /HUNG, THE STARTING TRACK IS (KEY) AND THE TARGET TRACK IS (HOME)
4381                      /
4382  4136  1771'         TAD     XWAIT
4383  4137  1370          TAD (-SDNFIRST)
4384  4140  7650          SNA CLA
4385  4141  5346          JMP .+5
4386                      /IF (FORCE ) = THE RETURN ADDRESS TO " XLS " THEN THE TARGET TRACK
4387                      /IS (HOME) FROM A (KEY) INITIALIZE
4388                      /
4389  4142  1777'         TAD FORCE
4390  4143  1367          TAD (-XLS)
4391  4144  7640          SZA CLA
4392  4145  5351          JMP .+4
4393  4146  4463  PHOME,   PRINT
4394  4147  5706          MHOME
4395  4150  5357          JMP TAB53
4396  4151  4473          TY4OCT
4397  4152  0144          TARGET
4398  4153  4472          TAB
4399  4154  0046          46
4400  4155  4473          TY4OCT
4401  4156  0137          STARGET
4402  4157  4472  TAB53,   TAB
4403  4160  0053          53
4404                      /IF THIS IS A FORCED TYPEOUT FROM "XLS" THEN THE TEST PARAMATERS HAVEN'T
4405                      /BEEN SELECTED FOR THIS SA200 YET AND THEST TEST PARAMATERS ARE RESIDUAL
4406                      /FROM THE PREVIOUS PASS (IF ANY) THEREFORE THE PROGRAM PRINTS (KEY)
4407                      /
4408                      /ONLY PRINT: " TEST PASS TIME " IF THIS ERROR IS THE FIRST ERROR THIS PASS
4409                      /
4410                      / (EPASS) = 7777 MEANS FIRST ERROR THIS PASS
4411                      /
```

```
4412    4161  2107            ISZ EPASS
4413    4162  5766'           JMP NOTICK
4414    4163  5765'           JMP ERROR3
4415    4165  1127
4416    4166  4526
4417    4167  7545
4418    4170  7551
4419    4171  2352
4420    4172  6115
4421    4173  2502
4422    4174  5327
4423    4175  1147
4424    4176  3346
4425    4177  3605
              4200            PAGE
4426                  /PROGRAM NOTE:
4427                  /
4428                  /ENTRY TO THIS FAR IS IF [NOT] A FORCED TYPEOUT
4429                  /
4430                  /RECAL IF DEFINITIVE ERROR CODE IS A SEEK ERROR
4431                  /
4432                  / (NOT CODES 140, 200, OR 210)
4433                  /
4434                  /AC SW 6 = 1 TO INHIBIT [INIT] AT ERROR
4435                  /
4436    4200  4407    RECALIF, LAS
4437    4201  0377            AND (SW6)
4438    4202  7640            SZA CLA
4439    4203  5216            JMP LASSW0
4440    4204  1142            TAD BSTATUS
4441    4205  1376            TAD (-140)
4442    4206  7450            SNA
4443    4207  5216            JMP LASSW0
4444    4210  1116            TAD KM40
4445    4211  7450            SNA
4446    4212  5216            JMP LASSW0
4447    4213  1115            TAD KM10
4448    4214  7640            SZA CLA
4449    4215  4450            INIT
4450    4216  4407    LASSW0, LAS
4451    4217  7710            SPA CLA
4452    4220  4456            HLT16, HLT      /AC SW 0 = 1 (HALT ON ERROR)
4453                  /IF THE DRIVE IS NOT READY THEN THIS IS A CONTROLLER FAILURE
4454                  /
4455                  /BECAUSE THIS DRIVE WAS READY AT ONE TIME
4456                  /
4457                  /THEREFORE RESTART THE PROGRAM
4458                  /
4459    4221  1143            TAD CSTATUS
4460    4222  0375            AND (200)
4461    4223  7650            SNA CLA
4462    4224  5774'           JMP RS
4463    4225  5773'           JMP ERETURN
4464    4226  4226    XLCD,   .
4465    4227  3105            DCA COMMAND
```



```
4466    4230  1105            TAD COMMAND
4467    4231  6751    K67X1, 6751
4468    4232  5626            JMP I XLCD
4469                  /LOAD THE COMMAND FOR: FILL BUFFER, AND EMPTY BUFFER
4470                  /WITH THE RX01 INTERRUPT ENABLED
4471                  /
4472                  /FORM: (AC) IS  COMMAND; LCDA; NORMAL RETURN; ERROR RETURN
4473                  /
4474                  /PROGRAMMING NOTE:
4475                  /
4476                  /THE UNIT BIT IS NOT REQUIRED FOR FILLING OR EMPTYING THE BUFFER
4477                  /
4478                  /IT IS REQUIRED BY THE PROGRAM FOR AN ERROR TYPEOUT (IF ANY)
4479                  /
4480    4233  4233    XLCDA,  .
4481    4234  4247            JMS GETLCD
4482    4235  1105            TAD COMMAND
4483    4236  4437            LCD
4484    4237  1233            TAD XLCDA
4485    4240  3772'           DCA RETURN
4486    4241  2233            ISZ XLCDA
4487    4242  2233            ISZ XLCDA
4488    4243  7201            CLA IAC
4489    4244  4447            INTR
4490    4245  6001            ION
4491    4246  5633            JMP I XLCDA
4492                  /
4493                  /
4494                  /
4495    4247  4247    GETLCD, .
4496    4250  1771'           TAD UNIT                        / 0 OR 20
4497    4251  3105            DCA COMMAND                     /TEMPORARY STORAGE
4498                  /
4499                  /WHEN THE CONTENTS OF " GOBIT " ARE = 0 ; NO PROGRAM IRQ IS EXPECTED FROM THE DISK
4500                  /
4501    4252  7301            CLL CLA IAC                     / 2
4502    4253  7004            RAL
4503    4254  0172            AND STESTP                      /TESTP FOR 8/12 BIT MODE SELECTION
4504    4255  7640            SZA CLA
4505    4256  1370            TAD (100)                       / 100 FOR 8 BIT MODE SELECTION
4506    4257  5647            JMP I GETLCD
4507                  /
4508                  /
4509                  /
4510                  /LOAD THE COMMAND AND THE TRACK AND SECTOR ADDRESSES AND GO WITH INTERRUPT ENABLE !
4511                  /
4512                  /FORM: (AC) IS COMMAND; LCDB; NORMAL RETURN; ERROR
4513                  /
4514    4260  4260    XLCDB,  .
4515    4261  4247            JMS GETLCD
4516    4262  1105    LCDBL,  TAD COMMAND
4517    4263  4437            LCD
4518                  /
4519                  /LOAD THE TRACK AND SECTOR ADDRESSES FOR THE COMMANDS:
4520                  /
```

```
4521                    /WRITE, OR WRITE DELETED DATA, OR READ SECTOR
4522                    /
4523    4264  1367              TAD (LCDBRETURN)
4524    4265  3772'             DCA RETURN
4525    4266  1127              TAD K7000
4526    4267  3304              DCA XLCDBRETURN
4527    4270  7201              CLA IAC
4528    4271  4447              INTR                    /ENABLE RX01 INTERRUPT
4529    4272  4444              STR
4530    4273  5272              JMP .-1                 /SKIP ON TRANSFER REQUEST FLAG
4531    4274  1137              TAD STARGET
4532    4275  4443              XDROUT          / SECTOR
4533    4276  4444              STR
4534    4277  5276              JMP .-1                 /SKIP ON TRANSFER REQUEST FLAG
4535    4300  1144              TAD TARGET
4536    4301  4443              XDROUT          / TRACK
4537    4302  5766'             JMP XPI
4538                    /
4539                    /RETURN TO HERE IF ANY ERROR OCCURS (OF IF "DONE" FLAG OCCURS)
4540                    /
4541                    /IF A PARITY ERROR OCCURS THEN RETRY TO LOAD THE COMMAND
4542                    /
4543                    /IF NOT A PARITY ERROR THEN THIS MUST BE THAT "DONE" FLAG I MENTIONED
4544                    /
4545    4303  5322      LCDBRETURN, JMP OTHERRORS               / "JMP OTHERRORS" IF RETURN IS OK
4546    4304  7000      XLCDBRETURN, NOP
4547    4305  7301              CLL CLA IAC
4548    4306  7004              RAL
4549    4307  0141              AND ASTATUS
4550    4310  7650              SNA CLA
4551    4311  5322              JMP OTHERRORS
4552                    /PARITY ERROR = RETRY
4553                    /
4554    4312  2157              ISZ PRETRY
4555    4313  7410              SKP
4556    4314  5322              JMP OTHERRORS   / HARD PARITY ERROR
4557    4315  4407              LAS
4558    4316  0015              AND K0200
4559    4317  7650              SNA CLA
4560    4320  5262              JMP LCDBL
4561    4321  3157              DCA PRETRY
4562                    /
4563                    /THESE ARE ALL OTHER ERRORS WHICH MAY OCCUR
4564                    /
4565    4322  4462      OTHERRORS,      LOG
4566    4323  7315              PERRORS         /LOG HARD/SOFT P ERRORS (IF ANY)
4567    4324  1365              TAD (JMP OTHERRORS)
4568    4325  3304              DCA XLCDBRETURN
4569    4326  1367              TAD (LCDBRETURN)
4570    4327  7041              CIA
4571    4330  1772'             TAD RETURN
4572    4331  1260              TAD XLCDB
4573    4332  3260              DCA XLCDB
4574                    /
4575                    /LOG TRACK ACCESS FREQUENCY (TAF) OR
```



```
4576                    /
4577                    /LOG " SAME " TRACK ACCESS FREQUENCY
4578                    /
4579                    /IF (SSTART) NOT = 0 WHICH INDICATES A " HOME " ACTUATOR POSITION
4580                    /
4581                    /CAUSED BY AN INITIALIZE (MANUAL AT L/S OR A PROGRAM AUTOMATIC INIT)
4582                    /
4583                    /LOG  " SAME " TRACK ACCESS LOG IF (TARGET) = (START)
4584                    /
4585    4333  1144              TAD TARGET
4586    4334  7041              CIA
4587    4335  1140              TAD START
4588    4336  7640              SZA CLA
4589    4337  5343              JMP LOGTAF
4590    4340  1136              TAD SSTART
4591    4341  7640              SZA CLA
4592    4342  5347              JMP LOGSAME
4593    4343  1144      LOGTAF, TAD TARGET
4594    4344  7104              CLL RAL
4595    4345  1364              TAD (TAF)
4596    4346  5352              JMP XLOGCOMMON
4597    4347  1144      LOGSAME,TAD TARGET
4598    4350  7104              CLL RAL
4599    4351  1363              TAD (SAME)
4600    4352  4762'     XLOGCOMMON, JMS LOGCOMMON
4601    4353  5660              JMP I XLCDB
4602    4362  4400
4603    4363  6615
4604    4364  6363
4605    4365  5322
4606    4366  0676
4607    4367  4303
4608    4370  0100
4609    4371  2274
4610    4372  3600
4611    4373  3601
4612    4374  2237
4613    4375  0200
4614    4376  7640
4615    4377  0040
              4400              PAGE
4616                    /LOGCOMMON IS A DOUBLE PRECISION LOGGER
4617                    /
4618    4400  4400      LOGCOMMON, .
4619    4401  3212              DCA LOGLSB
4620    4402  2612              ISZ I LOGLSB
4621    4403  5600              JMP I LOGCOMMON
4622    4404  7301              CLL CLA IAC
4623    4405  1212              TAD LOGLSB
4624    4406  3213              DCA LOGMSB
4625    4407  2613              ISZ I LOGMSB
4626    4410  5600              JMP I LOGCOMMON
4627    4411  4461              LOCK
4628    4412  0000      LOGLSB, 0
4629    4413  0000      LOGMSB, 0
```

```
4630    4414  5600            JMP I LOGCOMMON
4631                  /
4632                  /ENABLE / DISABLE RX01 INTERRUPT ENABLE
4633                  /
4634                  /   AC = 1 AT ENTRY TO ENABLE INTERRUPT
4635                  /
4636                  /FORM: (AC = 0, 0R 1); INTR
4637                  /
4638                  / (GOBIT) = 0, NO RX01 PI IS EXPECTED
4639                  /
4640                  / (GOBIT) = 1, AN RX01 PI IS EXPECTED
4641                  /
4642    4415  4415    XINTR,  .
4643    4416  3165            DCA GOBIT
4644    4417  1165            TAD GOBIT
4645    4420  6756    K67X6,  6756
4646    4421  7200            CLA
4647    4422  5615            JMP I XINTR
4648                  /
4649                  /INITIALIZE (POWER CLEAR) THE RX01 SUBSYSTEM
4650                  /
4651    4423  4423    XINIT,  .
4652    4424  6757    K67X7,  6757
4653                  /THE LABLE " SDNSECOND " MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN ERROR
4654                  /
4655    4425  4502            WAIT
4656    4426  4446    SDNSECOND, SDN
4657    4427  4445            SER
4658    4430  5232            JMP XXINIT
4659                  /IF AN ERROR HAS OCCURED FROM THE [INIT] THEN [HOME] WAS THE TARGET
4660                  /
4661                  /THE LABLE "XXINIT" MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN RX-ERROR
4662                  /
4663    4431  4777*           JMS FORCE
4664                  /
4665    4432  3136    XXINIT, DCA SSTART
4666    4433  5623            JMP I XINIT
4667                  /STARTING ADDRESS 202
4668                  /
4669                  /THIS IS AN IMAGE DUMP OF ALL STATISTICAL INFORMATION ACCUMULATED BY ALL LOGS
4670                  /
4671                  /THE FOLLOWING INFORMATION IS PRINTED ON THE TELEPRINTER
4672                  /
4673                  /
4674                  /               MAINDEC-8/E-
4675                  /
4676                  /               STATISTICAL REPORT
4677                  /
4678                  /               <IF A LOG-OVERFLOW THIS LINE IS TYPED>
4679                  /
4680                  /               <IF AN AUTOMATIC DUMP THIS LINE IS PRINTED>
4681                  /
4682                  /               <IF A PASS INCOMPLETE THIS LINE IS TYPED>
4683                  /
4684                  /               DRIVES SELECTED:
```



```
4685                  /
4686                  /               TEST PARAMATER SELECTIONS:
4687                  /
4688                  /               OD  ID  FIRST  LAST <VALUES PRINTED IF NON STANDARD>
4689                  /
4690                  /               RUN-TIME HOURS:MINUTES:SECONDS ( X COMPLETED PASSES)
4691                  /               X RESTARTS (OF WHICH X WERE AUTOMATIC RESTARTS)
4692                  /               X INTERUM STATISTICAL REPORTS
4693                  /
4694                  /               RECOVERABLE:
4695                  /
4696                  /                  WRITE ERRORS
4697                  /                  READ ERRORS
4698                  /                  DATA ERRORS
4699                  /                  DNS ERRORS
4700                  /                  SND ERRORS
4701                  /                  SEEK ERRORS
4702                  /                  PARITY ERRORS
4703                  /
4704                  /               NONRECOVERABLE:
4705                  /
4706                  /                  WRITE ERRORS
4707                  /                  READ ERRORS
4708                  /                  DATA ERRORS
4709                  /                  DATA NO STATUS ERRORS
4710                  /                  CRC STATUS NO DATA ERRORS
4711                  /                  SEEK ERRORS
4712                  /                  PARITY ERRORS
4713                  /
4714                  /               SECTOR WRITES / READS
4715                  /
4716                  /               TOTAL A, B, D CODES
4717                  /
4718                  /               TRACK  ACCESS  SELF  ALL-ERRORS (TOT PER DISK)
4719                  /               MAINDEC-08-
4720                  /
4721                  /               STATISTICAL REPORT
4722                  /
4723                  /               <IF A LOG-OVERFLOW THIS LINE IS TYPED>
4724                  /
4725                  /               <IF AN AUTOMATIC DUMP THIS LINE IS PRINTED>
4726                  /
4727                  /               <IF A PASS INCOMPLETE THIS LINE IS TYPED>
4728                  /
4729                  /               DRIVES SELECTED:
4730                  /
4731                  /               TEST PARAMATER SELECTIONS:
4732                  /
4733                  /               OD  ID  FIRST  LAST <VALUES PRINTED IF NON STANDARD>
4734                  /
4735                  /               RUN-TIME HOURS:MINUTES:SECONDS ( X COMPLETED PASSES)
4736                  /               X RESTARTS (OF WHICH X WERE AUTOMATIC RESTARTS)
4737                  /               X INTERUM STATISTICAL REPORTS
4738                  /
4739                  /
```

```
4740                    /
4741                    /
4742                    /PROGRAMMING NOTE:
4743                    /
4744                    /THIS SUBROUTINE MUST NOT USE TEMPORARY STORAGE LOCATIONS XXX OR YYY
4745                    /BECAUSE THEY ARE REFERENCED WITHIN SUBROUTINE " XLOCK "
4746                    /WHICH CALLS THIS SUBROUTINE
4747                    /
4748                    /
4749                    /
4750                    /THESE LOGS ARE DUMPED AT EACH START 202 OR
4751                    /
4752                    /
4753                    /AT A DISKETTE UNIT DELETION (IF THAT DELETION WAS NOT FROM THE
4754                    /PROGRAM AUTOMATIC DISKETTE SCAN AT THE PROGRAMS START), OR
4755                    /
4756                    /AT A STATISTICAL LOG COUNTER MAGNITUDE OVERFLOW
4757                    /
4758                    /
4759                    /
4760    4434  4434      S202,   .
4761    4435  4463              PRINT
4762    4436  6336              MIDENTIFICATION
4763    4437  4463              PRINT
4764    4440  6066              MDUMP
4765    4441  1776'             TAD XLOCK
4766    4442  7650              SNA CLA
4767    4443  5246              JMP .+3
4768    4444  4463              PRINT
4769    4445  6077              MLOGOVERFLOW
4770                    /IF THE RETURN ADDRESS VIA S202 IS TO PROGRAM LOCATION HLT20
4771                    /THEN THIS DUMP WAS MANUALLY INITIALIZED AND IS NOT AN INTERUM DUMP
4772                    /
4773    4446  1234              TAD S202
4774    4447  1375              TAD (-HLT20)
4775    4450  7650              SNA CLA
4776    4451  5255              JMP .+4
4777    4452  2112              ISZ IDUMP
4778    4453  4463              PRINT
4779    4454  6104              MINTERUM
4780    4455  1132              TAD PASSINPROGRESS
4781    4456  7650              SNA CLA
4782    4457  5262              JMP .+3
4783    4460  4463              PRINT
4784    4461  6115              MINCOMPLETE
4785    4462  1175              TAD SUNITS
4786    4463  3774'             DCA UNITS
4787    4464  3773'             DCA WUNITS
4788    4465  4464              PRINTDRIVESELECTED
4789    4466  1774'             TAD UNITS
4790    4467  7650              SNA CLA
4791    4470  5316              JMP S202RETURN
4792    4471  4772'             JMS CHECK
4793                    /
4794                    /       TAD RESTARTS; SNA CLA; JMP .+7
```



```
4795    4472  4463              PRINT
4796    4473  5611              MCRLF
4797    4474  6032              MDESUMMARY
4798    4475  4473              TY4OCT                          /ONLY OCTAL VALUES WILL BE PRINTED
4799                                                          /REPLACES TY8DEX.
4800    4476  6352              RESTARTS
4801    4477  4463              PRINT
4802    4500  6145              MRESTARTS
4803                    /       TAD ARESTARTS; SNA CLA; JMP .+7
4804    4501  4463              PRINT
4805    4502  6152              MLEFTPAREN
4806    4503  4473              TY4OCT                          /ONLY OCTAL VALUES WILL BE PRINTED
4807                                                          /REPLACES TY8DEX.
4808    4504  0103              ARESTARTS
4809    4505  4463               PRINT
4810    4506  6155              MARESTARTS
4811                    /       TAD IDUMP; SNA CLA; JMP .+7
4812    4507  4463              PRINT
4813    4510  5611              MCRLF
4814    4511  4473              TY4OCT                          /ONLY OCTAL VALUES WILL BE PRINTED
4815                                                          /REPLACES TY8DEX.
4816    4512  0112              IDUMP
4817    4513  4463              PRINT
4818    4514  6163              MIDUMP
4819                    /       PRINT; MTREVOLUTION; TY8DEC; TOTALR; TOTALR+1
4820                    /
4821    4515  5771'             JMP XS202
4822                    /
4823    4516  5634      S202RETURN, JMP I S202
4824                    /
4825                    /
4826                    /
4827    4517  4517      XSPECIALTYPEIT, .
4828    4520  4467              SETUP
4829    4521  4517              XSPECIALTYPEIT
4830    4522  1717              TAD I XSPECIALTYPEIT
4831    4523  2317              ISZ XSPECIALTYPEIT
4832    4524  4474              TYPEIT
4833    4525  5770'             JMP THENEXIT
4834                    /
4835                    /
4836                    /
4837                    /
4838                    /CLEAR " EPASS " TO PREVENT PREVIOUS " ISZ EPASS " FROM EVER OVERFLOWING
4839                    /
4840    4526  3107      NOTICK, DCA EPASS
4841    4527  1333              TAD DMTYPE
4842    4530  7650              SNA CLA
4843    4531  5334              JMP .+3
4844    4532  4463              PRINT
4845    4533  0000              DMTYPE, 0
4846    4534  3110              DCA FIRSTERROR
4847                    /
4848                    /AC SW 5 = 1 TO INHIBIT THE RINGING OF THE BELL AT ERROR
4849                    /
```

```
4850  4535  4407  NOPRINT, LAS
4851  4536  0367           AND (SW5)
4852  4537  7640           SZA CLA
4853  4540  5343           JMP .+3
4854  4541  4470           SPECIALTYPEIT
4855  4542  0207           207
4856                 /IF ENTRY WAS FROM A "JMS FORCE" THEN EXIT BY A "JMP I FORCE"
4857                 /
4858  4543  1777'          TAD FORCE
4859  4544  7640           SZA CLA
4860  4545  5766'          JMP XFORCE
4861  4546  5765'          JMP RECALIF
4862                       /*************************************************
4863                       /COMSOLE
4864                       /*************************************************
4865  4547  4424  C8TEST, CHECKC8                        /ACTIVE CONSOLE??
4866  4550  4431           C8CNTL                  /ROUTINE TO EXECUTE IF CONSOLE ACTIVE
4867  4551  7000           NOP
4868  4552  7200           CLA
4869  4553  3171           DCA     TTYBUSY         /CLEAR THE FLAG
4870  4554  5764'          JMP     PIEXIT          /LEAVE
4871
4872                       /*************************************************
4873                 /
4874                 /ROUTINE TO ALLOW FOR THE PRINTING OF 8 OCTAL DIGITS.
4875                 /
4876  4555  0000  PNTNOP, 0
4877  4556  1127           TAD     K7000
4878  4557  3761           DCA I   XISZDIG
4879  4560  5755           JMP I   PNTNOP
4880                 /
4881  4561  2731  XISZDIG,         ISZDIG-7
4882  4564  3473
4883  4565  4200
4884  4566  3610
4885  4567  0100
4886  4570  2152
4887  4571  4600
4888  4572  3111
4889  4573  2271
4890  4574  2270
4891  4575  7574
4892  4576  2400
4893  4577  3605
      4600           PAGE
4894                 /
4895                 /               RECOVERABLE:
4896                 /
4897                 /                  WRITE ERRORS
4898                 /                  READ ERRORS
4899                 /                  DATA ERRORS
4900                 /                  DNS ERRORS
4901                 /                  SND ERRORS
4902                 /                  SEEK ERRORS
4903                 /                  PARITY ERRORS
```



```
4904                 /
4905                 /               NONRECOVERABLE:
4906                 /
4907                 /                  WRITE ERRORS
4908                 /                  READ ERRORS
4909                 /                  DATA ERRORS
4910                 /                  DATA NO STATUS ERRORS
4911                 /                  CRC STATUS NO DATA ERRORS
4912                 /                  SEEK ERRORS
4913                 /                  PARITY ERRORS
4914                 /
4915                 /               SECTOR WRITES / READS
4916                 /
4917  4600  4463  XS202,  PRINT
4918  4601  5611           MCRLF
4919                 / (14 DECIMAL CATAGORIES OF ERROR INFORMATION)
4920                 /
4921  4602  1377  XL0,     TAD (-16)
4922  4603  3012           DCA A12
4923  4604  4455           GETUNIT
4924  4605  1776'          TAD UNITZ
4925  4606  1375           TAD (WERRORS-2)
4926  4607  3010           DCA A10
4927                 /PROGRAMMING NOTE:
4928                 /
4929                 /"TYPEIT" INSTEAD OF "TY8DEX" BECAUSE "TY8DEX" USES "LSB"
4930                 /
4931  4610  4463           PRINT
4932  4611  6042           MUNIT
4933  4612  1776'          TAD UNITZ
4934  4613  1374           TAD (260)
4935  4614  3216           DCA .+2
4936  4615  4470           SPECIALTYPEIT
4937  4616  0260           260
4938  4617  4463           PRINT
4939  4620  5612           MCRLFS
4940  4621  2010  XL,      ISZ A10
4941  4622  1410           TAD I A10
4942  4623  7450           SNA
4943  4624  5254           JMP X1DUMP
4944  4625  3004           DCA     XXX                     /TEMP STORAGE ONLY
4945  4626  4473           TY4OCT
4946  4627  0004           XXX
4947  4630  4472           TAB
4948  4631  0005           5
4949  4632  1131           TAD K0007
4950  4633  1012           TAD A12
4951  4634  7710           SPA CLA
4952  4635  5241           JMP .+4
4953  4636  4463           PRINT
4954  4637  3101           MMUNRECOVERABLE
4955  4640  7410           SKP
4956  4641  1131           TAD K0007
4957  4642  1131           TAD K0007
4958  4643  1012           TAD A12
```

```
4959    4644  1373          TAD (TAD ERRORMESSAGES)
4960    4645  3246          DCA .+1
4961    4646  1300          TAD ERRORMESSAGES
4962    4647  3251          DCA .+2
4963    4650  4463          PRINT
4964    4651  0000          0
4965    4652  4463          PRINT
4966    4653  6265          MMERRORS
4967    4654  2012  X1DUMP, ISZ A12
4968    4655  5221          JMP XL
4969    4656  1776'         TAD UNITZ
4970    4657  7104          CLL RAL
4971    4660  1372          TAD (WRITES)
4972    4661  3270          DCA W0
4973    4662  1371          TAD (READS-WRITES)
4974    4663  1270          TAD W0
4975    4664  3274          DCA R0
4976    4665  4463          PRINT
4977    4666  6215          MWRSRDS
4978    4667  4475          TY8OCT                          /PRINT OCTAL ONLY
4979                                                        /REPLACES TY8DEC
4980    4670  6353  W0,     WRITES
4981
4982    4671  4463          PRINT
4983    4672  6232          MSLASH
4984                                                        /REPLACES TY8DEC
4985    4673  4475          TY8OCT                          /PRINT OCTAL ONLY
4986                                                        /REPLACES TY8DEC
4987    4674  6357  R0,     READS
4988    4675  4452          DONE
4989    4676  5202          JMP XL0
4990    4677  5770'         JMP X3DUMP
4991    4700  6235  ERRORMESSAGES, MMWRITE
4992    4701  6240          MMREAD
4993    4702  6243          MMDATA
4994    4703  6246          MMDNS
4995    4704  6005          MSNDERROR
4996    4705  6256          MMSEEK
4997    4706  6261          MMPARITY
4998                /
4999                /IF (WUNITS) = 0 ; ALL SELECTED DISKETTE DRIVES HAVE SEQUENCED
5000                /
5001    4707  4707  XDONE,  .
5002    4710  1767'         TAD WUNITS
5003    4711  7650          SNA CLA
5004    4712  2307          ISZ XDONE       / DONE ; (WUNITS) = 0
5005    4713  5707          JMP I XDONE
5006                /
5007                /LOG A AND B STATUS REGISTERS PER UNIT
5008                /
5009                /       DCODES, EXPECTED D.D. DIDN'T OCCUR
5010                /               UNEXPEDTED D.D. OCCURED
5011                /       ACODES, A0
5012                /               ACRC
5013                /               APAR
```



```
5014                /       BCODES, B0
5015                /               B10
5016                /               B20
5017                /               B30
5018                /               B40
5019                /               B50
5020                /               B60
5021                /               B70
5022                /               B100
5023                /               B110
5024                /               B120
5025                /               B130
5026                /               B140
5027                /               B150
5028                /               B160
5029                /               B170
5030                /       DCODES+25, B200
5031                /
5032                /THE BSTATUS SHOULD NEVER BE ANY OF THE FOLLOWING CODES
5033                /
5034                /               210
5035                /               220
5036                /               230
5037                /               240
5038                /               250
5039                /               260
5040                /               270
5041                /               300
5042                /               310
5043                /               320
5044                /               330
5045                /               340
5046                /               350
5047                /               360
5048                /       DCODES+44, 370
5049                /
5050                /ROUTINE TO DETERMINE IF ON APT
5051                /
5052    4714  0000  CHK22,  0
5053    4715  1022          TAD     22
5054    4716  0322          AND     K4000
5055    4717  7650          SNA CLA
5056    4720  2314          ISZ     CHK22
5057    4721  5714          JMP I   CHK22
5058    4722  4000  K4000,  4000
5059                /
5060                /ROUTINE TO DTERMINE IF SINGLE DRIVE OR MULTIPLE DRIVE TESTING.
5061                /IF SINGLE DRIVE TESTING , IT WILL DETERMINE WHICH DRIVE TO DO.
5062                /
5063    4723  0000  XDRVSL, 0
5064    4724  1022          TAD     22
5065    4725  0347          AND     K0003
5066    4726  3004          DCA     XXX                     /DRIVE ISOLATED.
5067    4727  1022          TAD     22
5068    4730  0350          AND     K0100
```

```
5069    4731  7750          SNA CLA CLL                     /SINGLE DRIVE TESTING
5070    4732  5766'         JMP     AUTORESTART             /NO, DO MAX IN SYSTEM.
5071    4733  1004          TAD     XXX
5072    4734  7010          RAR
5073    4735  7430          SZL                             /DRIVE 1 TO BE DONE
5074    4736  7130          STL RAR                         /NO, SET UP FOR DRIVE 0
5075    4737  7010          RAR
5076    4740  3004          DCA     XXX
5077    4741  7121          CLL CLL CML IAC         /+3 COSTANT
5078    4742  7004          RAL
5079    4743  1323          TAD     XDRVSL                  /UPDATE FOR RETURN
5080    4744  3323          DCA     XDRVSL
5081    4745  1004          TAD     XXX                     /RETURN WILL VALUE IN AC
5082    4746  5723          JMP I   XDRVSL
5083                  /
5084    4747  0003    K0003,  0003
5085    4750  0100    K0100,  0100
5086                  /
5087                  /ROUTINE TO TYPE 8 OCTAL DIGITS,
5088                  /FORMAT TY8OCT; MSB(STARTING ADDRESS OF DOUBLE LOG TO BE PRINTED).
5089                  /
5090    4751  0000    XTY8OCT,        0
5091    4752  1751            TAD I   XTY8OCT                 /GET STARTING ADDRESS
5092    4753  3363            DCA     .+10
5093    4754  1751            TAD I   XTY8OCT
5094    4755  7001            IAC                             /SECOND ADDRESS
5095    4756  3362            DCA     .+4
5096    4757  7344            CLL CLA CMA RAL                 /-2
5097    4760  3124            DCA     XCNT
5098    4761  4473            TY4OCT
5099    4762  7000            NOP                             /REPLACED WITH POINTER TO BE
5100    4763  7000            NOP                             /PRINTED
5101    4764  2351            ISZ     XTY8OCT                 /UPDATE RETURN
5102    4765  5751            JMP I   XTY8OCT                 /EXIT
5103                  /
5104                  /
5105    4766  0247
5106    4767  2271
5107    4770  5000
5108    4771  0004
5109    4772  6353
5110    4773  1300
5111    4774  0260
5112    4775  7277
5113    4776  2272
5114    4777  7762
              5030            PAGE
5115                  /               TOTAL A, B, D CODES
5116                  /
5117                  /               TRACK  ACCESS  SELF  ALL-ERRORS (TOT PER DISK)
5118                  /
5119    5000  4463    X3DUMP, PRINT
5120    5001  6174            MDUMPHEADER
5121    5002  1377            TAD (TAF-1)
5122    5003  3010            DCA A10
```



```
5123    5004  1010            TAD A10
5124    5005  3011            DCA A11
5125    5006  1376            TAD (-115)
5126    5007  3367            DCA YDUMP               / 0-114 TRACKS
5127    5010  1410    XDUMP,  TAD I A10
5128    5011  7450            SNA
5129    5012  1410            TAD I A10
5130    5013  7650            SNA CLA
5131    5014  5317            JMP XDUMPX
5132    5015  4463            PRINT
5133    5016  5611            MCRLF
5134    5017  1375            TAD (115)
5135    5020  1367            TAD YDUMP
5136    5021  3167            DCA LSB
5137    5022  4473            TY4OCT
5138    5023  0167            LSB
5139    5024  4472            TAB
5140    5025  0006            6
5141    5026  1411            TAD I A11
5142    5027  3167            DCA LSB
5143    5030  1411            TAD I A11
5144    5031  3170            DCA MSB
5145    5032  4475            TY8OCT                          /PRINT OCTAL ONLY
5146                                                          /REPLACES TY8DEC
5147    5033  0167            LSB
5148    5034  1374            TAD (SAME-TAF-2)
5149    5035  1011            TAD A11
5150    5036  3010            DCA A10
5151    5037  1010            TAD A10
5152    5040  3012            DCA A12
5153    5041  1410            TAD I A10
5154    5042  7450            SNA
5155    5043  1410            TAD I A10
5156    5044  7650            SNA CLA
5157    5045  5256            JMP XXDUMPERRORS
5158    5046  4472            TAB
5159    5047  0017            17
5160    5050  1412            TAD I A12
5161    5051  3167            DCA LSB
5162    5052  1412            TAD I A12
5163    5053  3170            DCA MSB
5164    5054  4475            TY8OCT                          /PRINT OCTAL ONLY
5165                                                          /REPLACES TY8DEC
5166    5055  0167            LSB
5167    5056  1373    XXDUMPERRORS, TAD (TAFE0-116)
5168    5057  1367             TAD YDUMP
5169    5060  1375            TAD (115)
5170    5061  3003            DCA XA10
5171    5062  4455    XDUMPLOOP, GETUNIT
5172    5063  1772'           TAD UNITZ
5173    5064  7640            SZA CLA
5174    5065  1375            TAD (TAFE1-TAFE0)
5175    5066  1375            TAD (TAFE1-TAFE0)
5176    5067  1003            TAD XA10
5177    5070  3012            DCA A12
```

```
5178  5071  1012          TAD A12
5179  5072  3010          DCA A10
5180  5073  1410          TAD I A10
5181  5074  7650          SNA CLA
5182  5075  5312          JMP XNOERRORS
5183  5076  4472          TAB
5184  5077  0030          30
5185  5100  4473          TY4OCT                    /ONLY OCTAL VALUES WILL BE PRINTED
5186                                                /REPLACES TY8DEX.
5187  5101  2272          UNIT2
5188  5102  4463          PRINT
5189  5103  6234          MDASH
5190  5104  1412          TAD 1 A12
5191  5105  3004          DCA     XXX               /TEMP STORAGE ONLY
5192  5106  4473          TY4OCT
5193  5107  0004          XXX
5194  5110  4463          PRINT
5195  5111  5614          MSPACE
5196  5112  4452    XNOERRORS, DONE
5197  5113  5262          JMP XDUMPLOOP
5198  5114  1011          TAD A11
5199  5115  3010          DCA A10
5200  5116  5321          JMP .+3
5201  5117  1010    XDUMPX, TAD A10
5202  5120  3011          DCA A11
5203  5121  2367          ISZ YDUMP
5204  5122  5210          JMP XDUMP
5205  5123  4463          PRINT
5206  5124  5612          MCRLFS
5207  5125  5771'         JMP S202RETURN
5208  5126  5126    XHALT,  .
5209  5127  1171          TAD TTYBUSY
5210  5130  7640          SZA CLA
5211  5131  5327          JMP .-2
5212                /THE CONTENTS OF THE AC AT THE HLT CONTAIN THE CALLING ADDRESS
5213                /
5214  5132  4500          CHEK22                    /TEST FOR APT.
5215  5133  5726          JMP I   XHALT             /IGNORE HALT.
5216  5134  7240          STA
5217  5135  1326          TAD XHALT
5218                      /***************
5219                      /CONSOLE
5220                      /*******************
5221
5222  5136  4424          CHECKC8
5223  5137  4430          C8INQU                    /PRINT WAITING AND LOOK FOR CNTR CHAR
5224  5140  7410          SKP                       /SKIP IF THE CONSOLE IS ACTIVE
5225  5141  7402          7402
5226  5142  7200          CLA
5227  5143  5726          JMP I XHALT
5228                /
5229                /PROGRAMMED SUBROUTINE TO BYTE SWAP THE CONTENTS OF THE AC
5230                /
5231                /THIS SUBROUTINE MAY ONLY BE CALLED FROM WITHIN SUBROUTINE " XPRINT "
5232                /
```



```
5233                /OTHERWISW STRANGE AND UNFORGIVEABLE THINGS WILL OCCUR TO BLOW YOUR MIND
5234                /
5235  5144  5144    XBSW,   .
5236  5145  3147          DCA BSWAC
5237  5146  7010          RAR
5238  5147  3150          DCA BSWLINK
5239  5150  1114          TAD KM6
5240  5151  3366          DCA BSWRAL
5241  5152  1147          TAD BSWAC
5242  5153  7100          CLL
5243  5154  7510          SPA
5244  5155  7120          STL
5245  5156  7004          RAL
5246  5157  2366          ISZ BSWRAL
5247  5160  5353          JMP .-5
5248  5161  3147          DCA BSWAC
5249  5162  1150          TAD BSWLINK
5250  5163  7104          CLL RAL
5251  5164  1147          TAD BSWAC
5252  5165  5744          JMP I XBSW
5253  5166  7772    BSWRAL, -6
5254  5167  0000    YDUMP,  0
5255                /
5256                /
5257                /
5258                /
5259                /
5260  5171  4516
5261  5172  2272
5262  5173  6731
5263  5174  0230
5264  5175  0115
5265  5176  7663
5266  5177  6362
            5200    PAGE
5267                /
5268                /ENTRY TO HERE FROM SUBROUTINES XSER, OR XSDN, OR XPI
5269                /
5270  5200  2104    HUNGUP, ISZ BUSY
5271  5201  3303          DCA HUNGPC
5272  5202  1116          TAD KM40
5273  5203  3111          DCA HANGER
5274                /IF THE PROGRAM IS HUNG BECAUSE IOT SDN FAILED TO SKIP FROM [KEY] INIT
5275                /AT THE START OF THIS PROGRAM, THEN MAYBE THE STANDARD OPERATING DEVICE
5276                /CODE 670- SELECTED BY THIS PROGRAM IS NOT THE DEVICE CODE OF THE UNIT UNDER
5277                /TEST, THEREFORE THE PROGRAM WILL AUTOMATICALLY SELECT A DEVICE CODE
5278                /
5279                /THE DONE FLAG SHOULD BE SET BY NOW FROM [KEY] INITIALIZE
5280                /
5281  5204  1777'         TAD XWAIT                 /RETURN ADDRESS FROM SUBROUTINE XSDN
5282  5205  1376          TAD (-SDNFIRST)           /ADDRESS FROM FIRST "SDN" EVER
5283  5206  7640          SZA CLA
5284  5207  5272          JMP TCTRLS                /DEVICE CODE ALREADY SELECTED
5285                /
5286                /A DEVICE CODE HAS NOT YET BEEN SELECTED
```

```
                        /
                        /THE DONE FLAG SHOULD BE SET BY NOW
                        /
                        /THIS ROUTINE WILL ASK FOR DEVICE CODES IF NOT SELLECTED
                        /
                        /****************
                        /CODE CHANGE FOR GETTING DEVICE CODES
                        /
                        /
                        /ENTER THE DEVICE CODE IN THE SIX MIDDLE BITS OF THE SWITCH REG,
                        /
                        /
5299    5210  4463      DOACTIVE, PRINT
5300    5211  5534              MDEVICE                 /PRINT THE DEVICE CODE MESSAGE IS
5301    5212  4424              CHECKC8                 /ON ACTIVE CONSOLE
5302    5213  4426              C8SWIT                  /ON ACTIVE CONSOLE DEVICE
5303    5214  5217              JMP     CKDEVICE        /RETURN FROM SWITCH REG
5304    5215  4456              HLT
5305    5216  4407              LAS                             /GET DEVICE CODE,
5306    5217  0375    CKDEVICE,         AND     (0770           /MASK FOR THESE BITS ONLY
5307    5220  7450              SNA
5308    5221  1374              TAD     (750                    /75 DEVICE CODE
5309    5222  1373              TAD     (6005           /ADD THE IOT INSTRUCTION
5310    5223  3224              DCA     ACTIVE          /STORE IT
5311    5224  6755    ACTIVE, 6755
5312    5225  7410              SKP             /NOT A DEVICE WITH THIS DEVICE CODE
5313    5226  5230              JMP     SDNOK           /DEVICE IS THERE
5314    5227  5210              JMP     DOACTIVE                /REASK DEVICE
5315                    /
5316                    /THE PROGRAM FOUND AN ACTIVE DEVICE CODE AND WILL
5317                    /
5318                    /SET THAT DEVICE CODE INTO ALL APPLICABLE IOT PROGRAM LOCATIONS
5319                    /
5320    5230  1224      SDNOK, TAD ACTIVE
5321    5231  0372              AND (-7)
5322    5232  3010               DCA A10
5323    5233  1371              TAD (XDEVIC-1)
5324    5234  3011              DCA A11
5325    5235  1411              TAD I A11
5326    5236  7450              SNA
5327    5237  5245              JMP .+6
5328    5240  3004              DCA XXX
5329    5241  1010              TAD A10
5330    5242  3404              DCA I XXX
5331    5243  2010              ISZ A10
5332    5244  5235              JMP .-7
5333    5245  1663              TAD I XK67X2A
5334    5246  3770'             DCA K67X2B
5335    5247  1666              TAD I   K67X5A
5336    5250  3767'             DCA     K67X5B
5337    5251  1662              TAD I XK67X1
5338    5252  0115              AND KM10
5339    5253  3167              DCA LSB
5340    5254  4473              TY4OCT
5341    5255  0167              LSB
```



```
5342    5256  7301              CLL CLA IAC
5343    5257  1777'             TAD XWAIT
5344    5260  3004              DCA XXX
5345    5261  5404              JMP I XXX
5346                    /
5347                    /RX-DEVICE CODE TABLE
5348                    /
5349          5262      XDEVICE=.
5350    5262  4231      XK67X1, K67X1
5351    5263  0523      XK67X2A,K67X2A
5352    5264  0532              K67X3
5353    5265  0537              K67X4
5354    5266  0544      K67X5A, K67X5
5355    5267  4420              K67X6
5356    5270  4424              K67X7
5357    5271  0000              0
5358                    /IF THE PROGRAM IS HUNG BECAUSE THE OPERATOR TYPED A <CTRL>Q
5359                    /THEN THAT'S OK - NO SPECIAL REMINDER WILL BE PRINTED
5360                    /
5361    5272  1171      TCTRLS, TAD TTYBUSY
5362    5273  7710              SPA CLA
5363    5274  5766'             JMP PIEXIT      /OK
5364    5275  4765'     JMSFORCE, JMS FORCE
5365                    /
5366                    /THE LABLE "XHUNG" MUST RESIDE HERE BECAUSE OF REFERENCES MADE WITHIN "FORCE"
5367                    /
5368    5276  4463      XHUNG,  PRINT
5369    5277  5635              MHUNGPC
5370    5300  4473              TY4OCT
5371    5301  5303              HUNGPC
5372    5302  5764'             JMP RS
5373    5303  0000      HUNGPC, 0
5374                    /IF THE TELETYPE IS "BUSY" (TTYBUSY = X), AND IF A KEYBOARD FLAG,
5375                    /THEN STOP THE TELETYPE OUTPUTS IF THE KRB BUFFER STATUS IS A <CTRL>S
5376                    /RESUME TELETYPE OUTPUTS IF THE KRB BUFFER STATIC IS A <CTRL>Q
5377                    / (AND IF THE PROGRAM IS ALREADY STOPPED FROM A PREVIUOUS <CTRL>S )
5378                    /
5379    5304  6036      XKCC,KRB
5380    5305  0363              AND     (177
5381    5306  4762'             JMS     C8TST2                  /SET UP CHAR IN FLD 1 AND MAKE IT 8 BITS
5382    5307  0363              AND (177)
5383    5310  1361              TAD (-21)                       / <CTRL>Q
5384    5311  7440              SZA
5385    5312  5321              JMP NOTQ
5386                    /
5387                    /THE KRB BUFFER STATIC IS A <CTRL>Q
5388                    /THEREFORE, RESUME TTY OUTPUTS IF A PREVIOUS <CTRL>S HAD OCCURED
5389                    /
5390    5313  1171              TAD TTYBUSY
5391    5314  7700              SMA CLA
5392    5315  5766'             JMP PIEXIT                      /NO PREVIOUS <CTRL>S
5393    5316  7301              CLL CLA IAC
5394    5317  3171              DCA TTYBUSY
5395    5320  5760'             JMP XTCF                        /RESUME TELETYPE OUTPUTS
5396    5321  1357      NOTQ,   TAD (-2)
```

```
5397    5322  7640            SZA CLA
5398                          /***************
5399                          /CONSOLE
5400                          /**************
5401
5402    5323  5756'           JMP     C8TEST                  /TEST THE REST OF THE CHARACTERS
5403
5404                          /*****************
5405    5324  7330            STL CLA RAR
5406    5325  3171            DCA TTYBUSY
5407    5326  5766'           JMP PIEXIT
5408                  /IF (FORCE) = THE ADDRESS OF  "XLS" THEN THIS ERROR IS FROM (KEY)
5409                  /INITIALIZE - THE STARTING TRACK WAS X (KEY), AND THE TARGET WAS (HOME)
5410                  /
5411    5327  5327    KEYSWITCH, .
5412    5330  1765'           TAD FORCE
5413    5331  1355            TAD (-XLS)
5414    5332  7650            SNA CLA
5415    5333  5340            JMP .+5
5416                  /OR IF THIS FORCE WAS FROM "SDNFIRST" THEN THE DEVICE TEST IS HUNG
5417                  /AND THE START WAS (KEY) AND THE TARGET WAS (HOME)
5418                  /
5419    5334  1777'           TAD XWAIT
5420    5335  1376            TAD (-SDNFIRST)
5421    5336  7640            SZA CLA
5422    5337  5343            JMP .+4
5423    5340  4463            PRINT
5424    5341  5715            MKEY
5425    5342  7410            SKP
5426    5343  2327            ISZ KEYSWITCH
5427    5344  5727            JMP I KEYSWITCH
5428                  /ROUTINE TO GET DEVICE CODE TO BE USED WITH APT.
5429                  /
5430    5345  1127    DEVCDE, TAD     K7000
5431    5346  3753            DCA I   SWTNOP                  /NOP TEST PARAM.
5432    5347  1754'           TAD     XAPT8                   /GET RETURN ADDRESS
5433    5350  3777'           DCA     XWAIT                   /STORE FOR RETURN TO PROPER PLACE.
5434
5435    5351  1020            TAD     20                              /GET DEVICE CODE TO USE
5436    5352  5217            JMP     CKDEVICE                        /ESTABLISH DEVICE CODES.
5437    5353  0412    SWTNOP, HLT2
5438    5354  0343
5439    5355  7545
5440    5356  4547
5441    5357  7776
5442    5360  3325
5443    5361  7757
5444    5362  3161
5445    5363  0177
5446    5364  2237
5447    5365  3605
5448    5366  3473
5449    5367  3423
5450    5370  0526
5451    5371  5261
```



```
5452    5372  7771
5453    5373  6005
5454    5374  0750
5455    5375  0770
5456    5376  7551
5457    5377  2352
              5400    PAGE
5458                  /
5459                  /ROUTINE TO NOTIFY OF OF RUNNING IF NEED BE DONE
5460                  /
5461    5400  0000    XTICK,  0
5462    5401  4500            CHEK22
5463    5402  7410            SKP                             /ON APT.
5464    5403  5600            JMP I   XTICK
5465    5404  2216            ISZ     CLKCNT
5466    5405  5600            JMP I   XTICK
5467    5406  1217            TAD     COUNT
5468    5407  3216            DCA     CLKCNT                  /INIT CLOCK COUNTER
5469    5410  6002            IOF
5470    5411  6201            CDF     00
5471    5412  6272            CIF     70
5472    5413  4615            JMS I   K6500                   /NOTIFY APT-8
5473    5414  5600            JMP I   XTICK                   /EXIT.
5474                  /
5475    5415  6500    K6500,  6500
5476    5416  7700    CLKCNT, -100
5477    5417  7700    COUNT,  -100
5478                  /
5479                  /
5480                          /***************
5481                          /CONSOLE
5482                          /*****************
5483
5484                          /ROUTINE FOR CHECKING THE STATUS OF THE CONSOLE PACKAGE
5485                          /IF ACTIVE DO CALL  PLUS ONE
5486                          /NOT ACTIVE DO CALL PLUS3
5487
5488    5420  0000    XCHECKC8,       0
5489    5421  7200            CLA
5490    5422  1022            TAD     22
5491    5423  0245            AND     XK400           /IS CONSOLE PACKAGE ACTIVE
5492    5424  7650            SNA CLA
5493    5425  5243            JMP     NOTCL8          /NOT ACTIVE
5494    5426  1620            TAD I   XCHECKC8                /GET CALL TO FIELD 1
5495    5427  3235            DCA     PACKDO          /STORE IT
5496    5430  1171            TAD     TTYBUSY
5497    5431  7640            SZA CLA                 /IS TTY STILL BUSY
5498    5432  5230            JMP     .-2             /LOOP UNTIL DONE
5499    5433  6002            IOF
5500    5434  6213            CDF CIF 10              /GO TO FLD 1
5501    5435  0000    PACKDO, 0000                    /CONSOLE CALL IN HERE
5502    5436  7000            NOP
5503    5437  6001            ION
5504    5440  2220    EXITCK, ISZ     XCHECKC8
5505    5441  7200            CLA
```

```
 5506    5442  5620          JMP I   XCHECKC8                 /EXIT XCHECKC8
 5507    5443  2220  NOTCL8, ISZ     XCHECKC8
 5508    5444  5240          JMP     EXITCK
 5509    5445  0400  XK400,  400
 5510                /
 5511                /
 5512    5446  5016  MNONE,                 TEXT    "(NONE)"
         5447  1716
         5450  0551
         5451  0000
 5513    5452  3722  REMOVE, TEXT    "_REMOVE DIAGNOSTIC DISKETTE"
         5453  0515
         5454  1726
         5455  0540
         5456  0411
         5457  0107
         5460  1617
         5461  2324
         5462  1103
         5463  4004
         5464  1123
         5465  1305
         5466  2424
         5467  0500
 5514    5470  3704  MDISKETTE,      TEXT "_DRIVES SELECTED: "
         5471  2211
         5472  2605
         5473  2340
         5474  2305
         5475  1405
         5476  0324
         5477  0504
         5500  7240
         5501  0000
 5515    5502  5440  MCOMMA,         TEXT ", "
         5503  0000
 5516    5504  3737  MNOTREADY,      TEXT "__DRIVES NOT OK-BUT"
         5505  0422
         5506  1126
         5507  0523
         5510  4016
         5511  1724
         5512  4017
         5513  1355
         5514  0225
         5515  2400
 5517    5516  4027  MRS,            TEXT " WILL RESTART"
         5517  1114
         5520  1440
         5521  2205
         5522  2324
         5523  0122
         5524  2400
 5518    5525  4027  MNOGONOMORE,    TEXT " WILL HALT__"
         5526  1114
```



```
         5527  1440
         5530  1001
         5531  1424
         5532  3737
         5533  0000
 5519    5534  3722  MDEVICE,        TEXT "_RX8 DEVICE CODE IS "
         5535  3070
         5536  4004
         5537  0526
         5540  1103
         5541  0540
         5542  0317
         5543  0405
         5544  4011
         5545  2340
         5546  0000
 5520    5547  3723  MSDRIVES,       TEXT "_SELECT DISKETTE DRIVES"
         5550  0514
         5551  0503
         5552  2440
         5553  0411
         5554  2313
         5555  0524
         5556  2405
         5557  4004
         5560  2211
         5561  2605
         5562  2300
 5521    5563  3723  MSTESTS,        TEXT "_SELECT TEST PARAMATERS"
         5564  0514
         5565  0503
         5566  2440
         5567  2405
         5570  2324
         5571  4020
         5572  0122
         5573  0115
         5574  0124
         5575  0522
         5576  2300
 5522    5577  3714  MREFRESH,       TEXT "_LOGS REFRESHED AT "
         5600  1707
         5601  2340
         5602  2205
         5603  0622
         5604  0523
         5605  1005
         5606  0440
         5607  0124
         5610  4000
 5523    5611  3700  MCRLF,          TEXT "_"
 5524    5612  3737  MCRLFS,         TEXT "__"
         5613  0000
 5525    5614  4000  MSPACE,         TEXT " "
 5526    5615  3705  MEOT,           TEXT "_END OF TEST "
```

```
                5616  1604
                5617  4017
                5620  0640
                5621  2405
                5622  2324
                5623  4000
5527            5624  0411    MPASSES,        TEXT "DIRXB-D PASS "
                5625  2230
                5626  0255
                5627  0440
                5630  2001
                5631  2323
                5632  4000
5528            5633  4016    MNO,            TEXT " NO"
                5634  1700
5529            5635  3704    MHUNGPC,        TEXT "_DEVICE TEST HUNG AT PC "
                5636  0526
                5637  1103
                5640  0540
                5641  2405
                5642  2324
                5643  4010
                5644  2516
                5645  0740
                5646  0124
                5647  4020
                5650  0340
                5651  0000
5530            5652  3737    MEHEADER,       TEXT "__CMND XDR   CODE  RSTA  START     TARGET    TEST PASS"
                5653  0315
                5654  1604
                5655  4030
                5656  0422
                5657  4040
                5660  4003
                5661  1704
                5662  0540
                5663  4022
                5664  2324
                5665  0140
                5666  4023
                5667  2401
                5670  2224
                5671  4040
                5672  4040
                5673  4024
                5674  0122
                5675  0705
                5676  2440
                5677  4040
                5700  4024
                5701  0523
                5702  2440
                5703  2001
                5704  2323
```



```
                5705  0000
5531            5706  3310    MHOME,          TEXT "[HOME]"
                5707  1715
                5710  0535
                5711  0000
5532            5712  1116    MINIT,          TEXT "INIT"
                5713  1124
                5714  0000
5533            5715  1305    MKEY,           TEXT "KEY"
                5716  3100
5534            5717  3737    MOD,            TEXT "__OD = "
                5720  1704
                5721  4075
                5722  4000
5535            5723  4011    MID,            TEXT " ID = "
                5724  0440
                5725  7540
                5726  0000
5536            5727  4006    MFIRST,         TEXT " FIRST = "
                5730  1122
                5731  2324
                5732  4075
                5733  4000
5537            5734  4014    MLAST,          TEXT " LAST = "
                5735  0123
                5736  2440
                5737  7540
                5740  0000
5538            5741  3727    MWRITE,         TEXT "_WRITE-"
                5742  2211
                5743  2405
                5744  5500
5539            5745  3722    MREAD,          TEXT "_READ-"
                5746  0501
                5747  0455
                5750  0000
5540            5751  1617    MDNSERROR,      TEXT "NO CRC BUT"
                5752  4003
                5753  2203
                5754  4002
                5755  2524
                5756  0000
5541            5757  0322    MDWESERROR,     TEXT "CRC AND"
                5760  0340
                5761  0116
                5762  0400
5542            5763  4004    MDATAERROR,     TEXT " DATA ERROR_"
                5764  0124
                5765  0140
                5766  0522
                5767  2217
                5770  2237
                5771  0000
5543            5772  2717    MWORD,          TEXT "WORD"
                5773  2204
```

```
                5774  0000
 5544           5775  0231    MBYTE,          TEXT "BYTE"
                5776  2405
                5777  0000
 5545           6000  4007    MGB,            TEXT " GOOD BAD"
                6001  1717
                6002  0440
                6003  0201
                6004  0400
 5546           6005  0322    MSNDERROR,      TEXT "CRC BUT NO DATA ERROR"
                6006  0340
                6007  0225
                6010  2440
                6011  1617
                6012  4004
                6013  0121
                6014  0140
                6015  0522
                6016  2217
                6017  2200
 5547           6020  3723    MSUMCHECK,      TEXT "_SUM-CHECK IS "
                6021  2515
                6022  5503
                6023  1405
                6024  0313
                6025  4011
                6026  2340
                6027  0000
 5548           6030  1713    MOK,            TEXT "OK"
                6031  0000
 5549           6032  3724    MDESUMMARY,     TEXT "_TOTAL BAD = "
                6033  1724
                6034  0114
                6035  4002
                6036  0104
                6037  4075
                6040  4000
 5550           6041  7200    MCOLON,         TEXT ":"
 5551           6042  3737    MUNIT,          TEXT "__DISKETTE DRIVE: "
                6043  0411
                6044  2313
                6045  0524
                6046  2405
                6047  4004
                6050  2211
                6051  2605
                6052  7240
                6053  0000
 5552           6054  4004    MDELETE,        TEXT " DROPPED FROM TEST"
                6055  2217
                6056  2020
                6057  0504
                6060  4006
                6061  2217
                6062  1540
```



```
                6063  2405
                6064  2324
                6065  0000
 5553           6066  3737    MDUMP,          TEXT "__STATISTICAL LOG"
                6067  2324
                6070  0124
                6071  1123
                6072  2411
                6073  0301
                6074  1440
                6075  1417
                6076  0700
 5554           6077  4017    MLOGOVERFLOW,   TEXT " OVERFLOW"
                6100  2605
                6101  2206
                6102  1417
                6103  2700
 5555           6104  4050    MINTERUM,       TEXT " (AUTOMATIC DUMP)"
                6105  0125
                6106  2417
                6107  1501
                6110  2411
                6111  0340
                6112  0425
                6113  1520
                6114  5100
 5556           6115  4020    MINCOMPLETE,    TEXT " PASS ABORTED"
                6116  0123
                6117  2340
                6120  0102
                6121  1722
                6122  2405
                6123  0400
 5557           6124  3737    MTESTP,         TEXT "__TEST PARAMATERS: "
                6125  2405
                6126  2324
                6127  4020
                6130  0122
                6131  0115
                6132  0124
                6133  0522
                6134  2372
                6135  4000
 5558           6136  3737    MRUNTIME,       TEXT "__RUN-TIME = "
                6137  2225
                6140  1655
                6141  2411
                6142  1505
                6143  4075
                6144  4000
 5559           6145  4022    MRESTARTS,      TEXT " RESTARTS"
                6146  0523
                6147  2401
                6150  2224
                6151  2300
```

```
5560    6152  4040    MLEFTPAREN,     TEXT "  ( "
        6153  5040
        6154  0000
5561    6155  4001    MARESTARTS,     TEXT " AUTOMATIC)"
        6156  2524
        6157  1715
        6160  0124
        6161  1103
        6162  5100
5562    6163  4011    MIDUMP,         TEXT " INTERUM REPORTS"
        6164  1624
        6165  0522
        6166  2515
        6167  4022
        6170  0520
        6171  1722
        6172  2423
        6173  0000
5563    6174  3737    MDUMPHEADER,    TEXT "__TRACK ACCESS   SELF     ERRORS"
        6175  2422
        6176  0103
        6177  1340
        6200  0103
        6201  0305
        6202  2323
        6203  4040
        6204  4023
        6205  0514
        6206  0640
        6207  4040
        6210  4040
        6211  0522
        6212  2217
        6213  2223
        6214  0000
5564    6215  2305    MWRSRDS,        TEXT "SECTOR WRITES / READS = "
        6216  0324
        6217  1722
        6220  4027
        6221  2211
        6222  2405
        6223  2340
        6224  5740
        6225  2205
        6226  0104
        6227  2340
        6230  7540
        6231  0000
5565    6232  4057    MSLASH,         TEXT " / "
        6233  4000
5566    6234  5500    MDASH,          TEXT "-"
5567    6235  2722    MMWRITE,        TEXT "WRITE"
        6236  1124
        6237  0500
5568    6240  2205    MMREAD,         TEXT "READ"
```



```
        6241  0104
        6242  0000
5569    6243  0401    MMDATA,         TEXT "DATA"
        6244  2401
        6245  0000
5570    6246  1617    MMDNS,          TEXT "NO CRC BUT DATA"
        6247  4003
        6250  2203
        6251  4002
        6252  2524
        6253  4004
        6254  0124
        6255  0100
5571    6256  2305    MMSEEK,         TEXT "SEEK"
        6257  0513
        6260  0000
5572    6261  2301    MMPARITY,       TEXT "PARITY"
        6262  2211
        6263  2431
        6264  0000
5573    6265  4005    MMERRORS,       TEXT " ERRORS_"
        6266  2222
        6267  1722
        6270  2337
        6271  0000
5574    6272  3715    MEDDDIDNOT,      TEXT "_MISSING DD MARK"
        6273  1123
        6274  2311
        6275  1607
        6276  4004
        6277  0440
        6300  1501
        6301  2213
        6302  0000
5575    6303  3725    MUDDDID,         TEXT "_UNEXPECTED DD MARK"
        6304  1605
        6305  3020
        6306  0503
        6307  2405
        6310  0440
        6311  0404
        6312  4015
        6313  0122
        6314  1300
5576    6315  3715    MNOSER,         TEXT "_MISSING ERROR FLAG"
        6316  1123
        6317  2311
        6320  1607
        6321  4005
        6322  2222
        6323  1722
        6324  4006
        6325  1401
        6326  0700
5577    6327  3737    MUNKNOWN,       TEXT "__UNKNOWN IRQ"
```

```
        6330  2516
        6331  1316
        6332  1727
        6333  1640
        6334  1122
        6335  2100
5578    6336  3715    MIDENTIFICATION,        TEXT    "_MAINDEC-08-DIRXB-D"
        6337  0111
        6340  1601
        6341  0503
        6342  5500
        6343  7055
        6344  0411
        6345  2230
        6346  0255
        6347  0400
5579                  /FOR THOSE OF YOU WHO LOVE TO CALCULATE
5580                  /
5581                  /
5582                  /               TOTAL BYTES = (128) X (ACCESS)
5583                  /
5584                  /
5585                  /               TOTAL BITS = (128) X (ACCESS) X (8)
5586                  /
5587                  /
5588                  /THIS LOG IS CLEARED EACH L-S 200 ... BE CAREFUL ...
5589                  /
5590                  /
5591          6350    LOGS=.
5592                  /
5593                  /TOTAL COMPLETED PASSES
5594                  /
5595          6350    PASSES=.
5596    6350  0000            0
5597    6351  0000            0
5598                  /
5599                  /TOTAL RESTARTS
5600                  /
5601          6352    RESTARTS=PASSES+2
5602                  /
5603                  /TOTAL WRITES
5604                  /
5605          6353    WRITES=RESTARTS+1
5606                  /
5607                  /TOTAL READS
5608                  /
5609          6357    READS=WRITES+4
5610                  /
5611                  /THE FOLLOWING LOGS ACCUMULATE STATISTICAL INFORMATION
5612                  /PERTAINING TO THE FOLLOWING FUNCTIONS:
5613                  /
5614                  /TRACK ACCESS FREQUENCY (TAF)
5615                  /
5616                  / (THE NUMBER OF TIMES A TRACK HAS BEEN ACCESSED)
5617                  /
```



```
5618                  /DOUBLE PRECISION LOG
5619                  /
5620          6363    TAF=READS+4
5621                  /
5622                  /SAME ACCESS
5623                  /
5624                  /THE NUMBER OF TIMES A TRACK HAS BEEN ACCESSED FROM THAT SAME TRACK
5625                  / (WITH NO LATERAL ACTUATOR MOVEMENT OCCURING)
5626                  /
5627                  /DOUBLE PRECISION LOG
5628                  /
5629          6615    SAME=TAF+232
5630                  /
5631                  /TRACK ACCESS FREQUENCY ERROR RATE (TAFE) PER DRIVE-PER TRACK
5632                  /
5633                  / (THE NUMBER OF TIMES A TRACK WAS ACCESSED AND SOME TYPE
5634                  /  OF ERROR RESULTED ; I.E. , WRITE, READ, PROGRAM VERIFY)
5635                  /
5636                  /SINGLE PRECISION LOG
5637                  /
5638          7047    TAFE=SAME+232
5639          7047    TAFE0=TAFE
5640          7164    TAFE1=TAFE0+115
5641                  /
5642                  /TOTAL WRITE ERRORS PER DISKETTE
5643                  /
5644          7301    WERRORS=TAFE1+115
5645                  /
5646                  /TOTAL READ ERRORS PER DISKETTE
5647                  /
5648          7303    RERRORS=WERRORS+2
5649                  /
5650                  /TOTAL PROGRAM READ COMPARE (DATA) ERRORS PER DISKETTE
5651                  /
5652          7305    DATAERRORS=RERRORS+2
5653                  /
5654                  /TOTAL DATA ERROR WITH NO CRC ERROR STATUS
5655                  /
5656          7307    DNSERRORS=DATAERRORS+2
5657                  /
5658                  /TOTAL DATA NO CRC STATUS ERROR
5659                  /
5660          7311    SNDERRORS=DNSERRORS+2
5661                  /
5662                  /TOTAL (SEEK) ERRORS PER DISKETTE
5663                  /
5664          7313    SERRORS=SNDERRORS+2
5665                  /
5666                  /TOTAL PARITY ERRORS PER DISKETTE
5667                  /
5668          7315    PERRORS=SERRORS+2
5669                  /
5670                  /THE NEXT 14 DECIMAL LOCATIONS ARE RESERVED FOR (PER DRIVE):
5671                  /
5672                  /UNRECOVERABLE WRITE ERRORS
```

```
5673                    /UNREVOVERABLE READ ERRORS
5674                    /UNRECOVERABLE PROGRAM READ COMPARE (DATA) ERRORS
5675                    /UNRECOVERABLE DATA NO ERROR STATUS ERRORS
5676                    /UNRECOVERABLE STATUS NO DATA ERRORS
5677                    /UNRECOVERABLE (SEEK) ERRORS
5678                    /UNRECOVERABLE PARITY ERRORS
5679                    /
5680                    /B-CODES LOG
5681                    /
5682            7335    DCODES=PERRORS+2+16
5683            7337    UDCODES=DCODES+2
5684            7341    ACODES=UDCODES+2
5685            7343    ACRC=ACODES+2
5686            7345    APAR=ACRC+2
5687            7347    A3=APAR+2
5688            7351    BCODES=A3+2
5689                    /
5690            7353    B10=BCODES+2
5691                    /
5692            7450    XLOGS=BCODES+40+40-1
5693                    /
5694                    /THE FOLLOWING IS THE WRITE BUFFER ALLOCATED STORAGE
5695                    /
5696            7451            *XLOGS+1
5697                    /
5698
5699
5700            0200            *200                    /START FOR SELF STARTING BINARY LOADER
5701
5702
5703                            $$$
```



```
0000  11111111  11111100  11111111  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  11111001  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11101111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111100  00011111  11111111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111000  00111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111101  11111111  11111111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111110  11111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11110011  11111111


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  00111111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11001111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111000  01111111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11110111  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11100000  00011111  11111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11110111  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11110000  00111111  11111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11001111  11111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


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

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11000000  00000000  00000000

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
A0        3716        C8GET   0624        DDIGNO  3456        GETWOR  1046
A10       0013        C8GET1  0305        DELUNI  4451        GOBIT   0165
A11       0011        C8INQU  4430        DEVCDE  5345        GOITA   0443
A12       0012        C8LOOK  4406        DIGITS  2761        GOOD    0174
A13       0013        C8PASP  2132        DISPLA  0716        GOTOA   0454
A3        7347        C8PASS  4425        DMTYPE  4533        GTF     6004
ACCEPT    0661        C8RET1  0561        DNS     1323        H1      0164
ACODE     3724        C8RETD  0614        DNSERR  7307        HALT    4456
ACODES    7341        C8RETR  0531        DNSLOG  0154        HANGER  0111
ACRC      7343        C8SETD  0613        DOA     0622        HARDP   3551
ACSAV     1141        C8SETS  0530        DOACTI  5210        HLT     4456
ACTIVE    5224        C8STRT  0200        DOB     0623        HLT1    0243
AERROR    4427        C8SWIT  4426        DOCNT   0256        HLT10   2131
ANDRET    2147        C8SWST  0746        DONE    4452        HLT16   4220
ANOT0     3711        C8TEST  4547        DONEA   0426        HLT2    0412
APAR      7345        C8TMP1  1034        DOPACK  0210        HLT20   0204
APT8      4477        C8TST2  3161        DOSET   0261        HLT6    2102
ARESTA    0103        CAF     6007        DRVSEL  4476        HLT7    1474
ASTATU    0141        CCNT    2764        DTYPE   3614        HLT8    2261
AUTO      0257        CHARLI  3305        DWESER  1700        HUNGPC  5303
AUTOER    0267        CHECK   3111        DWS     1323        HUNGUP  5200
AUTOL     0262        CHECKC  4424        DWSLOG  0153        ID      0033
AUTOOK    0277        CHEK22  4500        ECOMMA  0163        IDUMP   0112
AUTORE    0247        CHK22   4714        EMPTY   1617        IF      0146
B10       7353        CKCOUT  0240        EMPTYE  2012        INDEXA  0455
BCODE     3744        CKDEVI  5217        EMPTYL  1607        INIT    4450
BCODES    7351        CKSWIT  4407        EMPTYO  2023        INITSE  4457
BEGIN     0207        CLKCNT  5416        ENDCOM  2007        INITSW  1147
BSTATU    0142        CNOTFI  1720        ENDIT   0743        INITTR  4460
BSW       4436        CNTRLC  1006        EPASS   0107        INMODE  1111
BSWAC     0147        CNTRLD  0600        ERETUR  3601        INSUMC  1763
BSWLIN    0150        CNTRLE  0532        ERROR   3752        INTR    4447
BSWRAL    5166        CNTRLO  0535        ERROR2  4000        IOF     6002
BUSY      0104        CNTRLQ  0500        ERROR3  1127        ION     6001
C8BY1     0235        CNTRLR  0504        ERRORM  4700        IOTWAT  2357
C8BY3     1074        CNTRLS  0514        EXITA   0440        ISZA11  1107
C8BY4     0510        CNTVAL  0262        EXITCK  5440        ISZCOM  1760
C8BY5     1134        COMMAN  0105        EXTLOO  1226        ISZDIG  2740
C8CHAR    1110        COMPAR  1601        FILCNT  1053        JMPAUT  0264
C8CK22    1151        COMPRE  0106        FILL    1220        JMPDIG  2730
C8CKP     1035        COUNT   5417        FILLER  1226        JMPICO  1600
C8CKSE    0734        CRCERR  1443        FILLOK  1236        JMPWHI  1274
C8CNTL    4431        CSTATU  0143        FIRST   0034        JMS202  2240
C8DO1     0327        DASHAL  4063        FIRSTE  0110        JMSFOR  5275
C8DO11    0607        DASHBC  4067        FLSAVE  1143        K0003   4747
C8DO2     1046        DATAER  7305        FORCE   3605        K0007   0131
C8DO4     1021        DCADOA  0615        GETASE  4453        K0100   4750
C8DO7     0523        DCAGOO  1103        GETATR  4454        K0200   0015
C8ERR1    1000        DCATAR  2511        GETCH1  0704        K0400   0014
C8EXT1    0236        DCODES  7335        GETDAT  0456        K0750   0123
C8EXT2    0310        DDCODE  3632        GETLCD  4247        K12     0120
C8FILL    1052        DDERRO  3616        GETUNI  4455        K16     0121
```

K377	0125	MCOMMA	5502	MQL	7421	PAT2	1122
K4000	4722	MCRLF	5611	MQSAVE	1142	PAT3	1123
K6500	5415	MCRLFS	5612	MREAD	5745	PAT4	1124
K6520	0130	MDASH	6234	MPEFRE	5577	PAT5	1125
K67X1	4231	MDATAE	5763	MRESTA	6145	PAT6	1126
K67X2A	0523	MDELET	6054	MRS	5516	PATR1	1014
K67X2B	0526	MDESUM	6032	MRUNTI	6136	PATR2	1015
K67X3	0532	MDEVIC	5534	MSB	0170	PATSAV	1006
K67X4	0537	MDIREC	1145	MSDNUN	2532	PATSET	1016
K67X5	0544	MDISKE	5470	MSDRIV	5547	PATTER	1112
K67X5A	5266	MDNSER	5751	MSLASH	6232	PCLF	6662
K67X5B	3423	MDUMP	6066	MSNDER	6005	PCSAVE	1140
K67X6	4420	MDUMPH	6174	MSPACE	5614	PERROR	7315
K67X7	4424	MDWESE	5757	MSTEST	5563	PHOME	4146
K7000	0127	MEDDDI	6272	MSUMCH	6020	PI	3400
K7377	0126	MEHEAD	5652	MTESTP	6124	PICLSK	3415
K74	0122	MEOT	5615	MUDDDI	6303	PIEXIT	3473
K7777	0113	MESA	1004	MUNIT	6042	PNTBUF	1136
KEYSWI	5327	MESPAS	0263	MUNKNO	6327	PNTEXT	3322
KM10	0115	MESSAG	3247	MWORD	5772	PNTID	0722
KM40	0116	MFIRST	5727	MWRITE	5741	PNTNOP	4555
KM6	0114	MGB	6000	MWRSRD	6215	POLL	2267
KM74	0117	MHOME	5706	MX	2134	PRETRY	0157
KRETRY	0134	MHUNGP	5635	NEXT	2212	PRINT	4463
LAS	4407	MID	5723	NEXTSE	3026	PRINTD	4464
LASSW0	4216	MIDENT	6336	NOHEAD	4011	PSIE	6665
LASSW3	3746	MIDUMP	6163	NOINFO	2325	PSKE	6663
LAST	0035	MINCOM	6115	NOPRIN	4535	PSKF	6661
LCD	4437	MINIT	5712	NOSER	1306	PSTB	6664
LCDA	4440	MINTER	6104	NOSET	0250	PTSTOR	0355
LCDB	4441	MKEY	5715	NOTCLB	5443	Q46ID	2621
LCDBL	4262	MLAST	5734	NOTEST	0405	Q460D	2627
LCDBRE	4303	MLEFTP	6152	NOTICK	4526	Q40D	2555
LOCK	4461	MLOGOV	6077	NOTQ	5321	Q60D	2614
LOG	4462	MMDATA	6243	NRETUR	1006	QUIET	1317
LOGBST	3726	MMDNS	6246	NSTAND	3140	R0	4674
LOGCOD	3700	MMERRO	6265	NULINE	3267	R1	3347
LOGCOM	4400	MMPARI	6261	NUREAD	1342	R1RETR	0151
LOGGED	3554	MMREAD	6240	NUWORD	3240	R2	3350
LOGLSB	4412	MMSEEK	6256	OD	0032	R2RETR	0152
LOGMSB	4413	MMUNRE	3101	OKRETU	3602	RANGEN	3333
LOGREF	0327	MMWRIT	6235	OKSTAR	3044	RDC	0133
LOGRER	1562	MNO	5633	ONECRL	4025	RDORWR	0550
LOGS	6350	MNOGON	5525	OTHERR	4322	READ	4465
LOGSAM	4347	MNONE	5446	OUTPUT	4250	READCO	4466
LOGTAF	4343	MNOSER	6315	PACKDO	5435	READER	1424
LSB	0167	MNOTRE	5504	PAGE1	3054	READL	1404
LSBX1	3527	MOD	5717	PASCNT	0257	READOK	1476
LSBX2	3547	MOK	6030	PASMES	1000	READRE	1407
MAREST	6155	MOREDR	2344	PASSES	6350	READS	6357
MBYTE	5775	MPASSE	5624	PASSIN	0132	REASK1	1230
MCOLON	6041	MQA	7501	PASSRE	2123	RECALI	4200

REDO1	0662	START	0140	TTYBUS	0171	XC8INQ	0635
REDOA	0415	STESTP	0172	TTYLPT	1137	XC8LDO	1221
REFILL	1214	STOP	4471	TWOCRL	4023	XC8OCT	1013
REMOVE	5452	STOPNT	0356	TY1ASC	3306	XC8PAS	0200
REREAD	1414	STR	4444	TY4OCT	4473	XC8PNT	0322
RERROR	7303	SUMCHE	0166	TY8OCT	4475	XC8PSW	0652
RESEEK	1416	SUNITS	0175	TYBSTA	4076	XC8SW	0272
RESEQU	2440	SW0	4000	TYPEIT	4474	XC8TTY	0311
RESTAR	6352	SW1	2000	UDCODE	7337	XC8TYP	1112
RETUR1	2000	SW10	0002	UNIT	2274	XCHECK	5420
RETUR2	1003	SW11	0001	UNITS	2270	XCKSWI	0744
RETURN	3600	SW2	1000	UNITX	2273	XCNT	0124
REWRIT	1206	SW3	0400	UNITZ	2272	XCOMPA	1663
RLOGGE	1564	SW4	0200	UNKNOW	3466	XCRCER	1472
RNOTOK	1522	SW5	0100	UNRECO	3520	XDELUN	2275
ROK	1510	SW6	0040	UPAROW	0615	XDEVIC	5262
RS	2237	SW7	0020	UREAD	1345	XDOLPT	1125
RXERRO	3642	SW8	0010	USEEK	1440	XDONE	4707
S200	0236	SW9	0004	USTART	0173	XDOSW	0513
S202	4434	SWTNOP	5353	VERIFY	3461	XDRIN	4442
S202RE	4516	T0T7	0671	W0	4670	XDRIVE	2331
SAME	6615	TAB	4472	WAIT	4502	XDROUT	4443
SAVEBS	3645	TAB27	4104	WATEX	2370	XDRVSL	4723
SAVECS	3666	TAB41	4126	WATMES	1144	XDUMP	5010
SDN	4446	TAB5	4044	WERROR	7301	XDUMPL	5062
SDNFIR	0227	TAB53	4157	WHAT2	3071	XDUMPX	5117
SDNOK	5230	TAB60	2525	WHAT3	1552	XEMPTY	2071
SDNSEC	4426	TABLA	0461	WHATYP	1537	XFLENG	1715
SDNUNE	1304	TABLB	0471	WHICHR	1300	XFORCE	3610
SECTOR	0135	TAF	6363	WNOTOK	1272	XGETAS	3007
SEQ	2442	TAFE	7047	WRESEE	1212	XGETAT	2425
SEQABO	2654	TAFE0	7047	WRITE	4501	XGETUN	2200
SEQBBO	2545	TAFE1	7164	WRITEL	1204	XHALT	5126
SEQDEC	2501	TARGET	0144	WRITEO	1262	XHUNG	5276
SEQID	2632	TCTRLS	5272	WRITER	1251	XINIT	4423
SEQINC	2470	TEST	0616	WRITES	6353	XINITS	3000
SEQR1	2466	TEST1	0610	WUNITS	2271	XINITT	2413
SEQR2	2467	TEST2	0606	X1DUMP	4654	XINTR	4415
SEQRAN	2452	TEST3	0602	X3DUMP	5000	XISZDI	4561
SEQSTR	2600	TEST4	0600	XA10	0003	XK400	5445
SER	4445	TEST5	0612	XAC	3500	XK67X1	5262
SERROR	7313	TEST7	0602	XAERRO	3351	XK67X2	5263
SETUP	4467	TESTL	0620	XANDRE	2157	XKCC	5304
SHIFT	2713	TESTP	0145	XAPT8	0343	XL	4621
SHIFTS	2763	TESTS	0512	XASTAT	1762	XL0	4602
SND	1323	THEL	0633	XAUTO	0305	XLCD	4226
SNDERR	7311	THENEX	2152	XBSW	5144	XLCDA	4233
SNDLOG	0155	THETES	0631	XC8CHA	3170	XLCDB	4260
SPECIA	4470	TMPCNT	0747	XC8CKP	1054	XLCDBR	4304
SRETRY	0156	TRACKS	0160	XC8CNT	0400	XLINK	3501
SSTART	0136	TSTCHA	0722	XC8CRL	1036	XLOCK	2400
STARGE	0137	TTRACK	0161	XC8ECH	1076	XLOG	3502

```
XLOGCO  4352
XLOGRE  0320
XLOGS   7450
XLS     0233
XMESSA  1316
XMORED  2342
XMX     0255
XNOERR  5112
XNONE   2245
XNULIN  3276
XOCTAL  2760
XOUTPU  3250
XPASSE  0260
XPATTE  1102
XPI     0676
XPRINT  3227
XRDC    1402
XREAD   1400
XREADC  1352
XS201   0400
XS202   4600
XS20X   0420
XSDN    0543
XSEQ    2512
XSEQ2   2645
XSEQ3   2665
XSER    0536
XSETUP  2135
XSHIFT  2716
XSPECI  4517
XSTARG  3070
XSTOP   2104
XSTR    0531
XTAB    3200
XTABL   3204
XTABLA  0457
XTABLB  0460
XTARGE  0162
XTCF    3325
XTESTS  0511
XTHEL   0640
XTICK   5400
XTY40C  2676
XTY80C  4751
XTYPEI  3272
XWAIT   2352
XWRITE  1200
XXC8CN  1200
XXC8IN  1205
XXC8PS  1211
XXC8SW  1215
XXDMP   2762
XXDRIN  0522
XXDROU  0525
XXDUMP  5056
XXGETA  3010
XXINIT  4432
XXKCC   0176
XXTAB   3226
XXTHEL  0647
XXX     0004
XYTHEL  0651
YDUMP   5167
YYY     0005
ZERO    2755
```



```
ERRORS DETECTED: 0

LINKS GENERATED: 279

RUN-TIME:  31 SECONDS

4K CORE USED
```

```
DDERRO   3870    4059#
DDIGNO   3844    3871#
DELUNI   1049#   1364
DEVCDE   1432    5430#
DIGITS   3395    3417    3434#
DISPLA   1780    1782    1791#
DMTYPE   4061    4062    4073    4087    4193    4841    4845#
DNS      2165#   2288    2362
DNSEPR   2444    5656#   5660
DNSLOG   1171#   2251    2438    2442    2561    2588
DOA      1666    1678#
DOACTI   5299#   5314
DOB      1656    1664    1679#
DOCNT      88      90      96#
DONE     1051#   1371    1711    2817    3070    4988    5196
DONEA     246     253#
DOPACK     51      57#
DOSET      82      89      92      99#
DRVSEL   1111#   1291
DTYPE    4048#   4074
DWESER   2618    2622#
DWS      2289#   2313
DWSLOG   1170#   2250    2563    3544    3548
ECOMMA   1207#   4089    4306
EMPTY    2515#   2727
EMPTYE   2506    2732#
EMPTYL   2501#   2738
EMPTYO   2505    2758#
ENDCOM   2546    2600    2725#
ENDIT     501     506     520#
EPASS    1129#   1263    2823    4412    4840
EPETUR   4017#   4463
ERROR    4113    4120    4239#
ERROR2   4239    4254#
ERROR3   1980#   4414
ERRORM   4959    4961    4991#
EXITA     255     263#
EXITCK   5501#   5508
EXTLOO    803#    806
FILCNT    612     615     619#
FILL     2061#   2066
FILLER   2058    2069#
FILLOK   2057    2071    2082#
FIRST    1017#   1492    1496    1497    1510    3453    3529    3578    3596
FIRSTE   1130#   1261    4257    4846
FLSAVE    238     407     643     723#
FORCE    1278    2155    2590    2778    3817    4041#   4047    4110    4117    4254    4276    4284    4296    4312
         4325    4375    4389    4663    4858    5364    5412
GETASE   1053#   2035    2241
GETATR   1055#   1672    1717
GETCH1    488#    500
GETDAT    243     244     251     277#
GETLCD   4481    4495#   4506    4515
```



```
GETUNI   1057#   1328    1671    1693    1716    3066    4923    5171
GETWOR   1921#   1956    2061    2515
GOBIT    1209#   1255    3830    4643    4644
GOITA     249     266#
GOOD     1225#   1941    1947    1950    1952    2064    2540    2669
GOIOA     271     272     273     274     275#
GTF        28#     237     642
H1       1208#   1784    3085
HALT     1059    1060#
HANGER   1131#   1257    1327    1777    1786    3081    3087    5273
HARDP    3979    3987#
HLT      1059#   1237    1297    1475    2160    2333    2810    2847    2979    3082    4452    5304
HLT1      829    1297#
HLT10     841    2841    2847#
HLT16     845    4452#
HLT2      833    1475#   5437
HLT20     849    1237#   4774
HLT6      837    2810#
HLT7      854    2333#
HLT8      850    2979#
HUNGPC   5271    5371    5373#
HUNGUP   1790    3090    5270#
ID       1016#   1515    1519    1520    1531    3121    3207    3221    3329    3353    3374    3573    3592
IDUMP    1132#   1289    4777    4816
IF       1160#   3467    3470    3472    3478    3479    3492
INDEXA    241     250     270     276#
INIT     1045#   2983    4449
INITSE   1062#   2034    2238
INITSW   2006#   2010    2011    4292    4349    4370
INITTR   1064#   1670    1692    1715
INMODE    253     302     313     479     674     678     682#
INSUMC   2311    2360    2510    2534    2535    2694#   2762    2765    2775    2781    2788    2805
INTR     1043#   2521    2726    3833    4489    4528
IOF       894#   3763    5469    5499
ION       893#   1639    1775    1808    1819    2879    3727    3819    3901    4490    5503
IOIWAT   3079    3082#   3086    3088
ISZA11   1942    1948    1954#
ISZCOM   2579    2652    2679#
ISZDIG   3409    3417#   3427    4881
JMPAUT   1338#   3842
JMPDIG   3409#   3428
JMPICO   2470#   2807    2811
JMPWHI   2040    2131#
JMS202   2913    2958#   3032    3048
JMSFOR   5364#
K0003    5065    5084#
K0007    1147#   3407    4949    4956    4957
K0100    5068    5085#
K0200     962#   1348    1362    2073    2104    2181    2274    2736    4558
K0400     961#   2152    2319    2576    2767    4233
K0750    1141#
K12      1138#   1331    4131
K16      1139#   3848    3942    4121
```

```
XLCD     1020   4464#  4468
XLCDA    1030   4480#  4484   4486   4487   4491
XLCDB    1032   4514#  4572   4573   4601
XLCDBR   4526   4546#  4568
XLINK    3786   3898   3904#
XLOCK    1071   1252   1388   1398   3105#  3106   3107   3111   4765
XLOG     1073   3927#  3928   3943   3956   3990   3991
XLOGCO   4596   4600#
XLOGRE   1390   1398#
XLOGS    1411   5692#  5696
XLS      1285#  4390   5413
XMESSA   2150   2157#
XMORED   3064#  3071
XMX        68     95#
XNOERR   5182   5196#
XNONE    1249   1415   2966#
XNULIN   3699   3704#
XOCTAL   3390   3391   3392   3398   3405   3406   3433#
XOUTPU   3682#  3696   3697
XPASSE     64     98#
XPATTE   1890   1945   1949#
XPI      1340   1775#  1785   1787   1789   4537
XPRINT   1075   2862   3663#  3670   3671   3726   3728
XRDC     2206   2237#
XREAD    1079   1627   2205   2235#  2461
XREADC   1081   2203#  2204
XS201    1395   1418   1455#
XS202    4821   4917#
XS20X    1456   1483#
XSDN     1042   1614#  1616   1617   1618
XSEQ     3186   3221#  3333   3378
XSEQ2    3341   3351#
XSEQ3    3364   3370#
XSER     1040   1607#  1609   1610   1611
XSETUP   1083   2857#  2863   2865   2866
XSHIFT   3399#  3404
XSPECI   1085   4827#  4829   4830   4831
XSTARG   3455   3490   3494   3495   3502   3503   3505   3542#
XSTOP    1087   2816#  2818   2819   2849
XSTR     1038   1599#  1602   1603   1604
XTAB     1089   3631#  3633   3637   3647
XTABL    3635#  3644
XTABLA    242    278#
XTABLB    269    279#
XTARGE   1191#  1791   3539
XTCF     3732#  3798   5395
XTESTS   1548   1557   1558   1559   1560#
XTHEL    1701   1706#
XTICK    4024   5461#  5464   5466   5473
XTY40C   1091   3383#  3387   3388   3389   3420
XTY80C   1109   5090#  5091   5093   5101   5102
XTYPEI   1093   3698   3700#  3703   3710   3736
XWAIT    1120   2007   3077#  3078   3089   3091   3092   4382   5281   5343   5419   5433
```



```
XWRITE   1118   2031#  2135
XXC8CN    760#   764    995
XXC8IN    769#   772    993
XXC8FS    776#   779    987
XXC8SW    786#   789
XXDMP    3410   3413   3435#
XXDRIN   1034   1589#  1590
XXDROU   1036   1593#  1596
XXDUMP   5157   5167#
XXGETA   3466#
XXINIT   4285   4297   4376   4658   4665#
XXKCC    1227#  3789
XXTAB    3634   3636   3638   3642   3646   3650   3653#
XXTHEL   1715#  1723
XXX       939#  1628   1629   2658   2660   3108   3110   3759   3764   4075   4080   4944   4946   5066
         5071   5076   5081   5191   5193   5328   5330   5344   5345
XYTHEL   1717#  1721
YDUMP    5126   5135   5168   5203   5254#
YYY       940#  3112   3114
ZERO     3423   3430#
.L0357    192    198#  1432   1435#
.L0360    191    199#  1417   1436#
.L0361    189    200#  1415   1437#
.L0362    186    201#  1411   1438#
.L0363    184    193    202#  1407   1439#
.L0364    175    203#  1395   1418   1440#
.L0365    147    148    204#  1340   1441#
.L0366    146    205#  1325   1442#
.L0367    145    206#  1322   1443#
.L0370    126    207#  1321   1393   1444#
.L0371    119    208#  1299   1320   1445#
.L0372    116    209#  1295   1446#
.L0373     77    210#  1278   1447#
.L0374     66    211#  1268   1448#
.L0375     60     73    212#  1252   1388   1398   1449#
.L0376     53     75    213#  1249   1450#
.L0377     50    214#  1236   1251   1285   1414   1451#
.L0561    353    354#
.L0562    331    355#
.L0563    315    356#
.L0564    311    345    351    357#  1640   1641#
.L0565    303    332    346    358#  1630   1642#
.L0566    267    359#  1627   1643#
.L0567    260    314    360#  1547   1644#
.L0570    258    361#  1542   1645#
.L0571    257    259    362#  1538   1646#
.L0572    253    302    313    363#  1521   1647#
.L0573    247    256    264    266    268    364#  1518   1648#
.L0574    240    365#  1506   1649#
.L0575    238    366#  1498   1650#
.L0576    233    367#  1487   1651#
.L0577    232    235    368#  1455   1652#
.L0751    516    527#
```

```
.L0752    512    528#
.L0753    510    514    529#
.L0754    508    530#
.L0755    504    531#
.L0756    486    532#
.L0757    480    488    533#
.L0760    479    534#
.L0761    477    535#
.L0762    476    536#
.L0763    474    484    491    497    537#   1830   1837#
.L0764    468    538#   1790   1838#
.L0765    437    539#   1789   1839#
.L0766    434    471    540#   1780   1840#
.L0767    430    463    541#   1779   1841#
.L0770    410    542#   1756   1842#
.L0771    407    543#   1753   1843#
.L0772    405    544#   1705   1844#
.L0773    400    433    436    470    520    545#   1702   1845#
.L0774    398    482    495    507    511    515    517    546#   1701   1846#
.L0775    397    399    478    547#   1665   1847#
.L0776    396    548#   1655   1659   1848#
.L0777    381    439    549#   1653   1661   1849#
.L1162   2008   2013#
.L1163    733    741#   2007   2014#
.L1164    653    675    742#   1996   2015#
.L1165    652    656    673    743#   1992   2016#
.L1166    651    672    744#   1981   1994   2000   2017#
.L1167    613    745#   1980   2018#
.L1170    608    746#   1949   1959   2019#
.L1171    585    747#   1896   1897   2020#
.L1172    584    748#   1887   2021#
.L1173    581    749#   1883   2022#
.L1174    563    750#   1872   1904   2023#
.L1175    560    751#   1870   1902   2024#
.L1176    554    752#   1861   2025#
.L1177    551    753#   1854   2026#
.L1357   2206   2207#
.L1360   2205   2208#
.L1361   2196   2209#
.L1362   2191   2200   2210#
.L1363   2183   2211#
.L1364   2173   2212#
.L1365   2161   2213#
.L1366   2155   2214#
.L1367   2149   2215#
.L1370   2147   2216#
.L1371   2143   2217#
.L1372   2128   2174   2218#
.L1373    799    810#   2127   2219#
.L1374    787    811#   2125   2171   2220#
.L1375    777    812#   2061   2221#
.L1376    770    805    813#   2055   2222#
.L1377    761    800    814#   2039   2223#
```



```
.L1570   2440   2445   2462#
.L1571   2372   2463#
.L1572   2371   2464#
.L1573   2369   2465#
.L1574   2322   2383   2466#
.L1575   2313   2334   2362   2467#
.L1576   2311   2360   2468#
.L1577   2308   2356   2469#
.L1766   2646   2699#
.L1767   2636   2700#
.L1770   2628   2701#
.L1771   2600   2702#
.L1772   2590   2703#
.L1773   2546   2680   2704#
.L1774   2515   2705#
.L1775   2506   2706#
.L1776   2505   2707#
.L1777   2501   2708#
.L2162   2862   2882#
.L2163   2861   2883#
.L2164   2848   2884#
.L2165   2839   2885#
.L2166   2836   2886#
.L2167   2831   2887#
.L2170   2830   2888#
.L2171   2827   2889#
.L2172   2826   2890#
.L2173   2807   2811   2891#
.L2174   2778   2892#
.L2175   2762   2765   2775   2781   2805   2893#
.L2176   2738   2894#
.L2177   2727   2895#
.L2374   3090   3095#
.L2375   2984   3096#
.L2376   2962   3035   3097#
.L2377   2958   3018   3098#
.L2566   3282   3284#
.L2567   3277   3285#
.L2570   3251   3286#
.L2571   3180   3287#
.L2572   3179   3288#
.L2573   3178   3184   3289#
.L2574   3176   3182   3290#
.L2575   3148   3291#
.L2576   3144   3292#
.L2577   3115   3293#
.L2771   3429   3439#
.L2772   3423   3440#
.L2773   3414   3430   3441#
.L2774   3357   3442#
.L2775   3356   3443#
.L2776   3344   3444#
.L2777   3333   3378   3445#
```

```
.L3172    3612    3620#
.L3173    3582    3621#
.L3174    3574    3622#
.L3175    3546    3551    3623#
.L3176    3501    3624#
.L3177    3496    3625#
.L3365    3734    3771#
.L3366    3708    3772#
.L3367    3706    3773#
.L3370    3704    3774#
.L3371    3691    3775#
.L3372    3688    3776#
.L3373    3687    3723    3777#
.L3374    3683    3778#
.L3375    3652    3779#
.L3376    3648    3780#
.L3377    3640    3781#
.L3556    3989    3992#
.L3557    3976    3993#
.L3560    3973    3974    3994#
.L3561    3944    3971    3995#
.L3562    3931    3996#
.L3563    3929    3997#
.L3564    3893    3998#
.L3565    3889    3999#
.L3566    3888    4000#
.L3567    3886    4001#
.L3570    3873    4002#
.L3571    3870    4003#
.L3572    3856    4004#
.L3573    3842    4005#
.L3574    3841    4006#
.L3575    3832    4007#
.L3576    3817    4008#
.L3577    3798    4009#
.L3763    4239    4241#
.L3764    4235    4242#
.L3765    4222    4243#
.L3766    4203    4244#
.L3767    4130    4245#
.L3770    4118    4246#
.L3771    4111    4247#
.L3772    4074    4248#
.L3773    4066    4249#
.L3774    4065    4202    4221    4250#
.L3775    4064    4199    4218    4251#
.L3776    4061    4062    4073    4087    4193    4252#
.L3777    4024    4253#
.L4165    4414    4415#
.L4166    4413    4416#
.L4167    4390    4417#
.L4170    4383    4418#
.L4171    4382    4419#
```



```
.L4172    4326    4420#
.L4173    4313    4421#
.L4174    4303    4351    4422#
.L4175    4292    4349    4370    4423#
.L4176    4285    4297    4376    4424#
.L4177    4254    4276    4284    4296    4312    4325    4375    4389    4425#
.L4362    4600    4602#
.L4363    4599    4603#
.L4364    4595    4604#
.L4365    4567    4605#
.L4366    4537    4606#
.L4367    4523    4569    4607#
.L4370    4505    4608#
.L4371    4496    4609#
.L4372    4485    4524    4571    4610#
.L4373    4463    4611#
.L4374    4462    4612#
.L4375    4460    4613#
.L4376    4441    4614#
.L4377    4437    4615#
.L4564    4870    4882#
.L4565    4861    4883#
.L4566    4860    4884#
.L4567    4851    4885#
.L4570    4833    4886#
.L4571    4821    4887#
.L4572    4792    4888#
.L4573    4787    4889#
.L4574    4786    4789    4890#
.L4575    4774    4891#
.L4576    4765    4892#
.L4577    4663    4858    4893#
.L4766    5070    5105#
.L4767    5002    5106#
.L4770    4990    5107#
.L4771    4973    5108#
.L4772    4971    5109#
.L4773    4959    5110#
.L4774    4934    5111#
.L4775    4925    5112#
.L4776    4924    4933    4969    5113#
.L4777    4921    5114#
.L5171    5207    5260#
.L5172    5172    5261#
.L5173    5167    5262#
.L5174    5148    5263#
.L5175    5134    5169    5174    5175    5264#
.L5176    5125    5265#
.L5177    5121    5266#
.L5354    5432    5438#
.L5355    5413    5439#
.L5356    5402    5440#
.L5357    5396    5441#
```

```
.L5360   5395   5442#
.L5361   5383   5443#
.L5362   5381   5444#
.L5363   5380   5382   5445#
.L5364   5372   5446#
.L5365   5364   5412   5447#
.L5366   5363   5392   5407   5448#
.L5367   5336   5449#
.L5370   5334   5450#
.L5371   5323   5451#
.L5372   5321   5452#
.L5373   5309   5453#
.L5374   5308   5454#
.L5375   5306   5455#
.L5376   5282   5420   5456#
.L5377   5281   5343   5419   5433   5457#
.V0002   3344   3444#  4064   4199   4218   4251#
.V0003   1779   1841#
.V0004   4973   5108#
.V0007    516    527#   584    748#
.V0020    126    207#   474    484    491    497    537#
.V0021    119    208#
.V0022    733    741#
.V0032   1506   1649#
.V0040    477    535#  4437   4615#
.V0070   3144   3292#
.V0073   3886   4001#
.V0077    186    201#
.V0100    191    199#   267    359#  3856   4004#  4505   4608#  4851   4885#
.V0110   3640   3781#
.V0114   1518   1648#
.V0115   3973   3974   3994#  5134   5169   5174   5175   5264#
.V0151   3931   3996#
.V0177    145    206#  3180   3287#  5380   5382   5445#
.V0200    146    205#  3612   3620#  4460   4613#
.V0202    353    354#
.V0212    613    745#  3706   3773#
.V0215    504    531#   608    746#  3704   3774#
.V0230   5148   5263#
.V0240    192    198#  3648   3780#
.V0247   2984   3096#  5070   5105#
.V0260    585    747#  3414   3430   3441#  4934   5111#
.V0272    787    811#
.V0277    258    361#   551    753#
.V0311    331    355#   437    539#   651    672    744#   799    810#
.V0322    434    471    540#
.V0330   1411   1438#
.V0336    396    548#
.V0343   5432   5438#
.V0400     53     75    213#   381    439    549#   653    675    742#   761    800    814#  1395   1418
         1440#  1830   1837#
.V0405   1417   1436#
.V0477   3929   3997#
```



```
.V0510    468    538#
.V0512   1547   1644#
.V0526   5334   5450#
.V0550   2196   2209#  2322   2383   2466#  2600   2702#
.V0561   1854   2026#
.V0615    311    345    351    357#   560    751#
.V0624    303    332    346    358#   652    656    673    743#
.V0635     77    210#   770    805    813#
.V0640   1701   1846#
.V0652    777    812#
.V0662    554    752#
.V0676   1340   1441#  1789   1839#  4537   4606#
.V0700   1542   1645#  1753   1843#  1992   2016#
.V0722   1268   1448#
.V0734   1295   1446#
.V0746    315    356#
.V0750   5308   5454#
.V0770   5306   5455#
.V1000    510    514    529#   2646   2699#  2836   2886#
.V1006   2848   2884#
.V1013     66    211#   476    536#
.V1016   2055   2222#  2501   2708#
.V1036     60     73    212#   260    314    360#   400    433    436    470    520    545#
.V1046   2061   2221#  2515   2705#
.V1054    116    209#
.V1076    480    488    533#
.V1110    147    148    204#   247    256    264    266    268#   364#   398    402    495    507    511
          515    517    546#
.V1111    253    302    313    363#   479    534#
.V1112    184    193    202#   257    259    362#   397    399    478    547#
.V1127   4414   4415#
.V1141    232    235    368#   410    542#
.V1142    240    365#   405    544#
.V1143    238    366#   407    543#
.V1147   4292   4349   4370   4423#
.V1151     50    214#   233    367#   430    463    541#
.V1242   3148   3291#
.V1300   4959   5110#
.V1304   3832   4007#
.V1306   3888   4000#
.V1312   1887   2021#
.V1323   2313   2334   2362   2467#
.V1400   1627   1643#  2205   2208#
.V1402   2206   2207#
.V1407   2143   2217#
.V1414   2183   2211#
.V1522   2191   2200   2210#
.V1552   3546   3551   3623#
.V1600   2807   2811   2891#
.V1601   2308   2356   2469#
.V1607   2738   2894#
.V1617   2727   2895#
.V1716   1780   1840#
```

.V1763	2311	2360	2468#	2762	2765	2775	2781	2805	2893#					
.V2000	1861	2025#	2839	2885#										
.V2007	2546	2680	2704#											
.V2012	2506	2706#												
.V2023	2505	2707#												
.V2123	1640	1641#												
.V2147	2861	2883#												
.V2152	3429	3439#	3652	3779#	4833	4886#								
.V2237	2161	2213#	3115	3293#	3989	3992#	4462	4612#	5372	5446#				
.V2245	1249	1450#												
.V2270	1321	1393	1444#	1487	1651#	4786	4789	4890#						
.V2271	1322	1443#	4787	4889#	5002	5106#								
.V2272	1325	1442#	2125	2171	2220#	2369	2465#	3944	3971	3995#	4065	4202	4221	4250#
	4924	4933	4969	5113#	5172	5261#								
.V2274	4130	4245#	4496	4609#										
.V2352	2007	2014#	4382	4419#	5281	5343	5419	5433	5457#					
.V2400	1252	1388	1398	1449#	4765	4892#								
.V2425	1702	1845#												
.V2470	1705	1844#	3357	3442#										
.V2501	3356	3443#												
.V2502	4111	4247#	4313	4421#										
.V2512	3333	3378	3445#											
.V2525	1981	1994	2000	2017#										
.V2532	2147	2216#												
.V2621	3277	3285#												
.V2627	3282	3284#												
.V3071	2440	2445	2462#											
.V3111	1538	1646#	4792	4898#										
.V3161	5381	5444#												
.V3227	2062	2882#												
.V3277	1630	1642#												
.V3325	3798	4009#	5395	5442#										
.V3333	1949	1959	2019#	3179	3288#									
.V3346	4285	4297	4376	4424#										
.V3347	1870	1902	2024#	3176	3182	3290#								
.V3350	1872	1904	2023#	3178	3184	3289#								
.V3352	2008	2013#												
.V3423	5336	5449#												
.V3466	3893	3998#												
.V3473	3687	3723	3777#	4870	4882#	5363	5392	5407	5448#					
.V3600	3841	4006#	4485	4524	4571	4610#								
.V3601	4463	4511#												
.V3602	3889	3999#												
.V3605	1278	1447#	2155	2214#	2590	2703#	2778	2892#	3817	4008#	4254	4276	4284	4296
	4312	4325	4375	4389	4425#	4663	4858	4893#	5364	5412	5447#			
.V3610	4860	4884#												
.V3614	4074	4248#												
.V3616	3870	4003#												
.V3642	3873	4002#												
.V3702	3691	3775#												
.V3740	189	200#												
.V4000	4239	4241#												
.V4100	3688	3776#												

.V4200	4861	4883#								
.V4303	4523	4569	4607#							
.V4400	2128	2174	2218#	2372	2463#	2831	2887#	4600	4602#	
.V4434	1236	1251	1285	1414	1451#	2962	3035	3097#		
.V4465	1653	1661	1849#							
.V4466	1655	1659	1848#							
.V4501	1665	1847#								
.V4516	5207	5260#								
.V4526	3251	3286#	4413	4416#						
.V4533	4061	4062	4073	4087	4193	4252#				
.V4535	4235	4242#								
.V4547	5402	5440#								
.V4600	4821	4887#								
.V5000	4990	5107#								
.V5060	1996	2015#								
.V5200	1790	1838#	3090	3095#						
.V5261	5323	5451#								
.V5300	2039	2223#								
.V5322	4567	4605#								
.V5327	1980	2018#	4303	4351	4422#					
.V5340	3427	3440#								
.V5345	1432	1435#								
.V5400	4024	4253#								
.V5500	2827	2889#								
.V5533	1415	1437#								
.V5772	2628	2701#								
.V5775	2636	2700#								
.V6000	1299	1320	1445#							
.V6005	5309	5453#								
.V6115	4118	4246#	4326	4420#						
.V6315	2149	2215#								
.V6347	1407	1439#								
.V6350	2830	2888#								
.V6352	1455	1652#								
.V6353	2127	2219#	4971	5109#						
.V6357	2173	2212#	2371	2464#						
.V6362	5121	5266#								
.V6363	4595	4604#								
.V6615	4599	4603#								
.V6731	5167	5262#								
.V6732	3976	3993#								
.V7000	1883	2022#								
.V7100	1756	1842#								
.V7277	4925	5112#								
.V7335	4066	4249#								
.V7341	4203	4244#								
.V7347	4222	4243#								
.V7473	2958	3018	3098#							
.V7500	2826	2890#								
.V7510	512	529#								
.V7514	3842	4005#								
.V7520	508	530#								
.V7545	4390	4417#	5413	5439#						

```
.V7551    4383    4418#   5282    5420    5456#
.V7571    3734    3771#
.V7574    4774    4891#
.V7600     563     750#
.V7640    4441    4614#
.V7663    5125    5265#
.V7664    1521    1647#   3574    3622#
.V7670    3708    3772#
.V7700     175     203#   1896    1897    2020#   3683    3778#
.V7745    3496    3625#
.V7746    1498    1650#   3582    3621#
.V7747    3501    3624#
.V7757    5383    5443#
.V7762    4921    5114#
.V7771    5321    5452#
.V7774     581     749#
.V7775     486     532#
```