MAINDEC: -08-DIRXB-D-D

TITLE: -RX8/RX01 DATA RELIABILITY/EXERCISER PROGRAM

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MAINTAINER: -DIAGNOSTIC ENGINEERING

1. ABSTRACT
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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
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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
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THIS PROGRAM ASSUMES THAT THE RX8/RX01 INTERFACE DIAGNOSTIC PROGRAM

HAS SOME TIME PREVIOUSLY EXECUTED SUCCESSFULLY.

3. LOADING PROCEDURE
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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
/////////////////////////

THIS PROGRAM HAS 3 STARTING ADDRESS LOCATIONS.

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 STAT-

ISTICAL INFORMATION ALREADY COLLECTED.

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 ANSWER TO THE SWITCH

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.

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 STAT-

ISTICAL INFORMATION COLLECTED.

4.4 TEST PARAMETER SELECTIONS
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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.

```
               0 1

               U U
```

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

10 - SELECT ONLY DISKETTE DRIVE 0

01 - SELECT ONLY DISKETTE DRIVE 1

11 - SELECT BOTH DRIVES 0 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 FESTART 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 SEL-

ECTING 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.

4.4.2 PATTERN, TEST AND SEQUENCE
//////////////////////////////////

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

" SELECT PARAMATERS "

THE OPERATOR WILL THEN CONFIGURE ACCUMULATOR SWITCHES 0, 1, AND 2 TO RE-
PRESENT A PATTERN SELECTION, SWITCHES 3, 4, AND 5 TO REPRESENT A TEST SE-
LECTION, 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 DYNAMIC ACTION OF THE PROGRAM BY APPROPRI-
ATELY 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 PRE-

VIOUSLY).

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

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

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

WORD#	GOOD	BAD

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.

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:

TEST:	WRITE	READ	DATA	SEEK	PARITY
			ERRORS:		
0	X	X	X		
1	X	X	X	A	A
2	X	X	X	A	
3	X	X	X	L	L
4	X	X	X		
5	X	X	X		
6	X	X	X	L	L
7	X	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 INITI2LIAE
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 EXAMPLES
/////////////////

7.1.1.1 KEY INITIALIZE ERROR

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

THE RX01 CONTROL HAD PRODUCED A CONSOLE [KEY] INITIALIZE, AND

STARTING THE PROGRAM HAD PRODUCED A CONSOLE [KEY] INITIALIZE ON DRIVE 0.

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

7.1.1.2 SEEK ERROR

CMND	XDR	CODE	RSTA	START	TARGET	TEST(X)
0014	0100	0120	0300	[HOME]	1	PASS
INIT	0	0120	0200	[HOME]	[HOME]	

```
COMD    - WRITE DELETED DATA
XDR     - 0
CODE    - DELETED DATA MARK
RSTA    - DRIVE READY + DELETED DATA
START   - HOME POSITION
TARGET  - TRACK 1, SECTOR 1
```

A SEEK ERROR OCCURED WHILE TRYING TO " WRITE DELETED DATA " (CMND #14)

ONTO TRACK 1 SECTOR 1.

THEN THE PROGRAM ISSUED AN INITIALIZE AT AN ATTEMPT TO RECOVER FROM

THE " SEEK " ERROR.

```
CMND    - CONSOLE [KEY] INITIALIZE
XDR     - 0
CODE    - A PREAMBLE COULD NOT BE FOUND
RSTA    - DISKETTE DRIVE IS READY
START   - ACTUATOR POSITION UNKNOWN
TARGET  - [HOME] TRACK 1, SECTOR 1
```

7.1.1.3 WRITE-CRC AND DATA ERROR

CMND	XDR	CODE	RSTA	START	TARGET	TEST(X)
0026	0001	3200	0201	100,30	100,1	PASS

WRITE-CRC AND DATA 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
```

WORD	GOOD	BAD
4	5435	5473
5	6617	5437
6	6303	4606

SUMCHECK IS 1253

TOTAL BAD=60

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

THE PROGRAM EXPANDS THE STANDARD ERROR FORMAT TO INCLUDE DATA COM-

PARISON 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 WOPDS/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.

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 (APPLI-
   CABLE 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
//////////////////////////////////////

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

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

TEST 3 IS THE COMPATABILITY COUNTER PART TO TEST 2.

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-1" OR "OD+1" AND BOUNCE, ETC.

THEN THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT

TO THE VALUE OF "ID" OR "OD" AND BOUNCE TO "ID" THEN TO "OD".

THE SEQUENCE GENERATOR WILL SELECT A TARGET TRACK EQUIVALENT

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. ABSTRACT

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

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

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

======================================

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 REMAINING 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 O

CONTROL Q

                    THIS IS TO CONTINUE A PROGRAM AFTER 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.

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 ATTEMPTS	NO ERROR RECOVERY
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   /DEVICE CODE IS SET TO 75
SR=0750

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

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

11.1 DESCRIPTION
      ----

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
2.0 SECONDS. THIS WILL ALLOW THE DIAGNOSTIC TO RUN
UNDER THE MUCH SLOWER MOS MEMORY WITHOUT CAUSING APT-8 TO GIVE
A TIMEOUT ERROR.

11.3.2   ERRORS

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

```
      1                    /RX8 DATA RELIABILITY/EXERCISER -DIRXB-D
      2                    /CONSOL SRC-V1R3-  CONSOL PACKAGE
      3
      4
      5
      6                    /SET UP A LAS TO BE EQUALL TO THE CALL CCKSW
      7
      8                    /PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE CONSOL
      9                    /EVERY FIVE SECONDS OR LESS
     10
     11
     12
     13                    /SETUP CNTVAL FOR A RANGE OF 1 TO 4 MINUTES FOR C8PASS TO PRINT PASS
     14                    /SETUP OF CNTVAL WILL BE FOUND IN C8PASS
     15
     16
     17                    /SET UP XDOSW AS THE VALUE NEEDED FOR A RETURN FOR CONTROL R
     18                    /RETURN TO ASK THE SWITCH REGISTER QUESTION,
     19         0001           FIELD 1
     20
     21
     22
     23         6661           PSKF=    6661
     24         6662           PCLF=    6662
     25         6663           PSKE=    6663
     26         6664           PSTB=    6664
     27         6665           PSIE=    6665
     28         6004           GTF=     6004
     29         7501           MQA=     7501
     30         6007           CAF=     6007
     31         7421           MQL=     7421
     32
     33
     34         0200               *200
     35                    /*********************************************************************
     36                    /C8PASS
     37                    /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
     38                    /THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
     39                    /THE PROGRAM TO COMPLEATE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
     40                    /RANGE
     41                    /      C8PASS=JMS    XC8PAS
     42                    /EX,           C8PASS
     43                    /              HLT                    /HALT IF NON CONSOL PACKAGE
     44                    /              JMP    START1          /CONTINUE RUNNING THIS PROGRAM
     45                    /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
     46                    /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
     47
     48
     49    0200  0000      XC8PAS,  0
     50    0201  4777'             JMS    C8CK22       /CHECK LOCATION22
     51    0202  5210             JMP    DOPACK       /IS CLASSIC
     52    0203  4272             JMS    XC8SW        /CHECK SR SETTING
     53    0204  0376             AND    (400         /FOR HALT ON END OF C8PASS
     54    0205  7640             SZA CLA             /1= HALT 0 CONTINUE
     55    0206  5236             JMP    C8EXT1       /COMMON EXIT
```

```
     56    0207  5235             JMP    C8BY1        /CONTINUE ON RUNNING PROGRAM
     57    0210  4240      DOPACK, JMS    CKCOUT       /CLASS CHECK C8PASS COUNT
     58    0211  5235             JMP    C8BY1        /C8PASS COUNT NOT DONE REDO PROGRAM
     59    0212  2257             ISZ    PASCNT       /C8PASS COUNT DONE SET C8PASS COUNT
     60    0213  4775'            JMS    XC8CRL       /CRLF
     61    0214  4322             JMS    XC8PNT              /C8PRNT BUFFER
     62    0215  0263             MESPAS                /
     63    0216  6201             CDF 0
     64    0217  1660             TAD I  XPASSES      /GET NUMBER
     65    0220  6211             CDF 10
     66    0221  4774'            JMS    XC8OCT              /PRINT OCTAL ONLY,
     67    0222  6201             CDF 0
     68    0223  1655             TAD I  XMX          /GET THE CHAR IN FLD 0
     69    0224  6211             CDF 10
     70    0225  3240             DCA    CKCOUT
     71    0226  4322             JMS    XC8PNT
     72    0227  0240             CKCOUT
     73    0230  4775'            JMS    XC8CRL              /DO A CARRIAGE RETURN
     74    0231  4272             JMS    XC8SW               /CHECK A HALT AT END OF C8PASS
     75    0232  0376             AND    (400         /MASK BIT
     76    0233  7640             SZA CLA             /HALT =1 NO SKIP CONTINUE =0
     77    0234  4773'            JMS    XC8INQ              /STOP PROGRAM EXECUTION-LOOK FOR INPUT
     78    0235  2200      C8BY1, ISZ    XC8PAS       /BUMP RETURN
     79    0236  6203      C8EXT1, CDF CIF 00
     80    0237  5600             JMP I  XC8PAS
     81    0240  0000      CKCOUT, 0
     82    0241  1261             TAD    DOSET        /CHECK IF SET UP NEEDED
     83    0242  7640             SZA CLA             /0=SET UP C8PASS COUNT VALUE
     84                                               /1=C8PASS COUNT VALUE OK
     85    0243  5250             JMP    NOSET        /C8PASS COUNT VALUE ON
     86    0244  1262             TAD    CNTVAL       /GET COUNT VALUE FOR THIS PROG
     87    0245  7040             CMA                 /SET TO NEGATIVE
     88    0246  3256             DCA    DOCNT        /STORE IN HERE
     89    0247  2261             ISZ    DOSET        /INDICATE VALUE SET UP
     90    0250  2256      NOSET, ISZ    DOCNT        /COUNT THE NUMBER OF PASSES
     91    0251  5235             JMP    C8BY1        /EXIT FOR ANOTHER PASS
     92    0252  3261             DCA    DOSET        /SET TO C8PRNT C8PASS
     93    0253  2240             ISZ    CKCOUT       /BUMP RETURN FOR
     94    0254  5640             JMP I  CKCOUT       /C8PASS C8TYPE OUT
     95    0255  2134      XMX,   MX
     96    0256  0000      DOCNT, 0
     97    0257  0000      PASCNT, 0                   /
     98    0260  6350      XPASSES,       PASSES       /PRINT THE NUMBER IN FLD 0
     99    0261  0000      DOSET, 0
    100    0262  0000      CNTVAL, 0
    101    0263  0411      MESPAS, TEXT    "DIRXB-D PASS "
          0264  2230
          0265  0255
          0266  0440
          0267  2001
          0270  2323
          0271  4000
    102                    /*********************************************************************
    103
    104                    /C8CKSW
```

```
105                       /ROUTINE THAT WILL CHECK WHERE TO READ THE
106                       /C8 SWITCHES FROM IE. FROM PANEL OR PSEUDO C8SWIT REGISTER
107                       /         C8CKSW= JMS XC8SW
108                       /EX       C8CKSW                    /READ THE C8SWIT REGISTER
109                                                           /RETURN WITH THE CONTENTS OF SWITCH REGISTER
110
111                       /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING
112
113
114     0272  0000        XC8SW,  0
115     0273  7200                CLA                         /CLEAR AC
116     0274  4772'               JMS       XC8CKP            /CHECK FOR CONTROL CHARACTER!
117     0275  7000                NOP
118     0276  6201                CDF 00
119     0277  1771                TAD I     (21
120     0300  6211                CDF 10
121     0301  7710                SPA CLA                     /CHECK IF FROM PANEL 4000
122     0302  7614                7614                        /DO LAS AND SKIPGET FROM PANEL WITH LAS
123     0303  5305                JMP       C8GET1            /GET LOC 20 FLD 0
124     0304  5310                JMP       C8EXT2            /LEAVE BY A COMMON ROUTINE
125     0305  6201        C8GET1, CDF 00
126     0306  1770                TAD I     (20
127     0307  6211                CDF 10
128     0310  5672        C8EXT2, JMP I     XC8SW
129
130
131                       /******************************************************************
132
133                       /C8TTYI
134                       /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE CONSOL
135                       /         JMS       XC8TTY= JMS XC8TTY
136                       /EX.      JMS       XC8TTY            /READ CHAR FROM THE CONSOL DEVICE
137                       /                                    /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
138
139                       /
140                       /
141     0311  0000        XC8TTY, 0
142     0312  6031                KSF                         /LOOK FOR KEYBOARD FLAG
143     0313  5312                JMP       .-1
144     0314  6036                KPB                         /GET CHAR
145     0315  0367                AND       (177              /MASK FOR 7 BITS
146     0316  1366                TAD       (200              /ADD THE EIGTH BIT
147     0317  3765'               DCA       C8CHAR            /STORE IT
148     0320  1765'               TAD       C8CHAR
149     0321  5711                JMP I     XC8TTY            /EXIT
150                       /******************************************************************
151
152                       /C8PRNT
153
154                       /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
155                       /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL,  C8 PRINTING OF THE BUFFER
156                       /WILL STOP WHEN A 00 CHAR IS DETECTED. CHARACTERS ARE PACKED 2 PER WORD.
157
158                       /         JMS       XC8PNT= JMS XC8PNT
159
```

```
160
161                       /EX.      JMS       XC8PNT                    /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
162                       /         MES877                              /LOCATION OF C8PRNT BUFFER
163                       /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
164                       /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0
165
166
167
168
169     0322  0000        XC8PNT, 0
170     0323  7300                CLA CLL
171     0324  1722                TAD I     XC8PNT            /GET C8PRNT BUFFERS STARTING LOCATION
172     0325  3355                DCA       PTSTOR            /STORE IN PTSTOR
173     0326  2322                ISZ       XC8PNT            /BUMP RETURN
174     0327  1755        C8DO1,  TAD I     PTSTOR            /GET DATA WORD
175     0330  0364                AND       (7700             /MASK FOR LEFT BYTE
176     0331  7450                SNA                         /CHECK IF 00 TERMINATE
177     0332  5722                JMP I     XC8PNT            /EXIT
178     0333  7500                SMA                         /IS AC MINUS
179     0334  7020                CML                         /MAKE CHAR A 300 AFTER ROTATE
180     0335  7001                IAC                         /MAKE CHAR A 200 AFTER ROTATE
181     0336  7012                RTR
182     0337  7012                RTR
183     0340  7012                RTR                         /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
184     0341  4763'               JMS       XC8TYP            /C8PRNT IT ON CONSOLE
185     0342  1755                TAD I     PTSTOR            /GET DATA WORD
186     0343  0362                AND       (0077             /MASK FOR RIGHT BYTE
187     0344  7450                SNA                         /CHECK IF 00 TERMINATOR
188     0345  5722                JMP I     XC8PNT            //EXIT
189     0346  1361                TAD       (3740             /ADD FUDGE FACTOR TO DETERMINE IF 200
190     0347  7500                SMA                         /OR 300 IS TO BE ADD TO CHAR
191     0350  1350                TAD       (100              /ADD 100
192     0351  1337                TAD       (240              /ADD 200
193     0352  4763'               JMS       XC8TYP            /RETURN ONLY BITS 4-11
194     0353  2355                ISZ       PTSTOR            /BUMP POINTER FOR NEXT WORD
195     0354  5327                JMP       C8DO1             /DO AGAIN
196     0355  0000        PTSTOR, 0                           /STOR FOR C8PRNT BUFFER
197     0356  0000        STOCHR, 0                           /STOR COPTER STORAGE FOR C8PRNT
198     0357  0240
199     0360  0153
200     0361  3500
201     0362  0077
202     0363  1112
203     0364  7700
204     0365  1100
205     0366  0200
206     0367  0177
207     0370  0000
208     0371  0021
209     0372  1054
210     0373  0635
211     0374  1013
212     0375  1036
213     0376  0400
214     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
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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                     /
```

```
324   0514  1330   CNTRLS,  TAD    C8SETS        /IF1 DO NOT STORE IN C8RETR
325   0515  7640            SZA CLA
326   0516  5323            JMP    C8D07         /DONT SET UP C8RETR
327   0517  7001            IAC
328   0520  1200            TAD    XC8CNT        /GET RETURN FOR THIS CALL
329   0521  3331            DCA    C8RETR        /STORE IT HERE FOR USE BE CNTROL Q
330   0522  2330            ISZ    C8SETS        /UPDATE REENTRY FLAG1
331   0523  4762'  C8D07,   JMS    XC8TTY             /LOOK FOR CONTROL CHAR,
332   0524  4765'           JMS    C8GET         /REPLACE AC, MQ, AND LINK,
333   0525  4200            JMS    XC8CNT             /CHECK FOR CONTROL CHAR.
334   0526  7200            CLA
335   0527  5314            JMP    CNTRLS
336   0530  0000   C8SETS,  0
337   0531  0000   C8RETR,  0
338                /
339                /
340                /
341                /CONTROL E
342                /CONTINUE RUNNING FROM A INQUIRE OR ERROR
343                /
344                /
345   0532  4764'  CNTRLE,  JMS    UPAROW        /PRINT THE CONTROL CHAR
346   0533  4765'           JMS    C8GET         /GET THE REGISTERS
347   0534  5600            JMP I  XC8CNT        /RETURN TO CALL PLUS ONE
348                /
349                /
350                /CONTROL 0 TO RETURN TO FLD 0 LOC 202 FOR STATISTICAL INFO
351   0535  4764'  CNTRLO,  JMS    UPAROW
352   0536  6203            CDF CIF 0                 /SET UP TO FLD 0
353   0537  5761            JMP I  (202                /START OF STATISTIC PROG
354   0561  0202
355   0562  0311
356   0563  0746
357   0564  0615
358   0565  0624
359   0566  0100
360   0567  1036
361   0570  0277
362   0571  1112
363   0572  1111
364   0573  1110
365   0574  1142
366   0575  1143
367   0576  1151
368   0577  1141
      0600            PAGE
369                /
370                /
371                /
372                /CONTROL D
373                /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
374                /THE PROGRAM RUNNING,
375
376
377   0600  4215   CNTRLD,  JMS    UPAROW
```

```
378   0601  1213            TAD    C8SETD        /CHECK IF THE RETURN ADDRS IS SAFE
379   0602  7640            SZA CLA
380   0603  5207            JMP    C8D011        /DO NOT CHANGE THE RETURN ADDRS
381   0604  1777'           TAD    XC8CNT        /GET THE RETURN ADDRS AND SAVE IT
382   0605  3214            DCA    C8RETD        /SAVE THE RETURN HERE
383   0606  2213            ISZ    C8SETD        /INDICATE RETURN SAVED DONT DISTROY
384   0607  4252   C8D011,  JMS    XC8PSW             /GO CHANGE THE SWITCH REGISTER
385   0610  3213            DCA    C8SETD        /CLEAR THE FLAG
386   0611  4224            JMS    C8GET         /REPLACE AC, MQ, AND LINK,
387   0612  5614            JMP I  C8RETD        /RETURN TO THE PROGRAM
388                /
389   0613  0000   C8SETD,  0
390   0614  0000   C8RETD,  0
391                /
392
393
394
395   0615  0000   UPAROW,  0                    /C8PRNT THE "*" AND THE CHAR C8TYPED IN
396   0616  1376            TAD    (336          /CODE FOR *
397   0617  4775'           JMS    XC8TYP
398   0620  1774'           TAD    C8CHAR        /C8TYPE THE CHAR
399   0621  4775'           JMS    XC8TYP
400   0622  4773'           JMS    XC8CRLF
401   0623  5615            JMP I  UPAROW        /EXIT
402
403   0624  0000   C8GET,   0
404   0625  7200            CLA
405   0626  1772'           TAD    MQSAVE
406   0627  7421            MQL                  /RESTORE MQ
407   0630  1771'           TAD    FLSAVE
408   0631  7004            RAL                  /RESTORE THE LINK
409   0632  7200            CLA
410   0633  1770'           TAD    ACSAV         /RESTORE THE AC
411   0634  5624            JMP I  C8GET         /GET THE REGISTERS
412
413
414                /****************************************************************
415
416                /C8INQU
417                /C8INQU ROUTINE WILL PRINT A ASTERISK
418                /AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
419                /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
420                /IF NO CONTROL CHAR ENTERED THEN ASTERISK IS REPRINTED
421                /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN
422                //
423
424                /        JMS    XC8INQ= JMS XC8INQ
425
426                /EX      JMS    XC8INQ               /C8 WILL PRINT A * AND WAIT FOR INPUT
427                /        DO ANYTHING                 /RETURN IS CALL PLUS ONE AC =0 CONTINUE
428
429   0635  0000   XC8INQ,  0
430   0636  4767'           JMS    C8CK22        /CHECK FOR LOC 22 FLD 0
431   0637  7410            SKP
432   0640  5635            JMP I  XC8INQ        /NOT CONSOLE LEAVE
```

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433    0641  4773'          JMS     XC8CRLF
434    0642  4766'          JMS     XC8PNT
435    0643  1144           WATMES                  /INQUIR WAITTING
436    0644  4773'          JMS     XC8CRL
437    0645  4765'          JMS     XC8TTY          /SAVE CHARACTER!
438    0646  4224           JMS     C8GET           /REPLACE AC, MO, AND LINK.
439    0647  4777'          JMS     XC8CNT          /CHECK FOR CONTROL CHARACTER!
440    0650  5635           JMP I   XC8INQ          /EXIT AND CONTINUE
441    0651  5236           JMP     XC8INQ+1        /REASK
442                 /
443                 /**********************************************************************
444                 /C8SWIT
445                 /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
446                 /SW QUESTION, IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTIONBUT
447                 /RETURN TO CALL PLUS ONE AC=0.
448                 /C8SWIT WILL SET UP THE PSEUDO C8SWIT
449                 /REGISTER WITH THE NEW DATA ENTERED
450                 /THE TAG  C8DOR AT THE START OF THE CALL IS FOR THE RETURN OF CONTROL R
451                 /CHAR. THIS MAY BE CHANGED IF THIS IS NOT WHERE A GOOD RESTART
452                 /OF PROGRAM IS.
453                 /
454                 /       JMS     XC8PSW= JMS XC8PSW
455
456                 /EX.    C8DOR,  JMS     XC8PSW          /SET UP PSEUDO C8SWIT REGISTER IF
457                                                 /ON THE CONSOL PACKAGE. RETURN IS CALL PLUS ONE AC = 0
458
459
460
461
462    0652  0000   XC8PSW,  0
463    0653  4767'          JMS     C8CK22
464    0654  7410           SKP
465    0655  5652           JMP I   XC8PSW          /RETURN WITHOUT ASKING PSEUDO SWITCH
466    0656  1346           TAD     C8SWST
467    0657  7640           SZA CLA                 /SPECIAL D EXIT?
468    0660  5764'          JMP     C8BY4           /YES, PRINT SR=.
469    0661  2346           ISZ     C8SWST          /NO, SET FLAG!
470    0662  4773'  REDO1,  JMS     XC8CRLF
471    0663  4766'          JMS     XC8PNT                  /C8PRNT SR=XXX
472    0664  1004           MESA
473    0665  6201           CDF 00
474    0666  1763           TAD I   (20
475    0667  6211           CDF 10
476    0670  4762'          JMS     XC8OCT                  /CONVERT IT TO ASCII
477    0671  1361           TAD     (40             /GET SPACE
478    0672  4775'          JMS     XC8TYP
479    0673  2760'          ISZ     INMODE          /SET FLAG FOR CHAR EXECTED
480    0674  4757'          JMS     XC8ECH                  /LOOK FOR INPUT
481    0675  4322           JMS     TSTCHA          /NOT CONTROL TEST IT IS LEGAL
482    0676  1774'          TAD     C8CHAR          /STORE NEW CHAR IN SW REG
483    0677  6201           CDF 00
484    0700  3763           DCA I   (20
485    0701  6211           CDF 10
486    0702  1356           TAD     (-3             /GET A MINUS 3
487    0703  3347           DCA     TMPCNT          /STORE IN TEMP COUNT
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488    0704  4757'  GETCH1, JMS     XC8ECH                  /GET NEXT CHAR
489    0705  4322           JMS     TSTCHA          /CHECK IF CR + GOOD CHAR
490    0706  6201           CDF 00
491    0707  1763           TAD I   (20
492    0710  6211           CDF 10
493    0711  7106           RTL CLL                 /ROTATE IT LEFT 3 PLACES
494    0712  7004           RAL
495    0713  1774'          TAD     C8CHAR          /GET CHAR + ADD IT TO PREVIOUS CONTENTS
496    0714  6201           CDF 00
497    0715  3763           DCA I   (20
498    0716  6211           CDF 10
499    0717  2347           ISZ     TMPCNT          /BUMP COUNT
500    0720  5304           JMP     GETCH1          /JMP BACK + GET NEXT CHAR
501    0721  5343           JMP     ENDIT           /END 4 CHAR C8TYPED IN
502    0722  0000   TSTCHA, 0
503    0723  7041           CIA                     /CMPL CHAR IN AC
504    0724  1355           TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
505    0725  7650           SNA CLA                 /SKIP IN NOT CR.
506    0726  5343           JMP     ENDIT           /WAS CARRIAGE RETURN
507    0727  1774'          TAD     C8CHAR          /NOT CR. GET CHAR
508    0730  1354           TAD     (-260           /CHECK IF IT IS IN RANGE
509    0731  7710           SPA CLA                 /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
510    0732  5753'          JMP     C8ERR1          /C8ERR - CHAR TOO SMALL
511    0733  1774'          TAD     C8CHAR          /GET CHAR
512    0734  1352           TAD     (-270           /GET A -270 + CHECK IF IT IS LARGER THEN 7
513    0735  7700           SMA CLA                 /SKIP IF LESS THEN 7
514    0736  5753'          JMP     C8ERR1          /C8ERR ON CHAR NOT IN RANGE
515    0737  1774'          TAD     C8CHAR          /GET CHAR
516    0740  0351           AND     (7              /MASK FOR RIGHT BYTE
517    0741  3774'          DCA     C8CHAR          /STORE IN CHAR
518                                                 /GET CHAR IN AC
519    0742  5722           JMP I   TSTCHA          /EXIT
520    0743  4773'  ENDIT,  JMS     XC8CRL                  /DO A CR LF
521    0744  3346           DCA     C8SWST          /CLEAR REENTRY FLAG!
522    0745  5652           JMP I   XC8PSW          /EXIT ROUTINE
523                 /
524    0746  0000   C8SWST, 0
525    0747  0000   TMPCNT, 0
526
527    0751  0007
528    0752  7510
529    0753  1000
530    0754  7520
531    0755  0215
532    0756  7775
533    0757  1076
534    0760  1111
535    0761  0040
536    0762  1013
537    0763  0020
538    0764  0510
539    0765  0311
540    0766  0322
541    0767  1151
542    0770  1141
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543    0771  1143
544    0772  1142
545    0773  1036
546    0774  1110
547    0775  1112
548    0776  0336
549    0777  0400
             1000              PAGE
550
551    1000  1377   C8ERR1,  TAD      (277         /PRINT A ?
552    1001  4312            JMS      XC8TYPE
553    1002  4236            JMS      XC8CRLF
554    1003  5776'           JMP      REDO1
555    1004  2322   MESA,    TEXT     "SR="
       1005  7500            /
556                         /
557                         /
558                         /RETURN TO MONITOR
559    1006  3337   CNTRLC,  DCA      TTYLPT       /CLEAR EXIT FLAG,
560    1007  4775'           JMS      UPAROW       /C8PRNT A^ AND LETTER IN CHAR
561    1010  6203            CDF CIF               /GO TO 0 FLD
562    1011  6007            CAF                   /CLEAR THE WORLD
563    1012  5774            JMP I    (7600        /GO TO DIAGNOSTIC MONITOR
564                         /
565                         /
566
567                         /*******************************************************
568                         /C8OCTA
569                         /OCTAL TO ASCII CONVERSION
570                         /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
571                         /THE RESULT WILL BE PRINTED ON THE CONSOL DISPLAY
572                         /        JMS      XC8OCT= JMS XC8OCT
573                         /
574                         /EX,     JMS      XC8OCT       /AC CONTAINS NUMBER TO BE CHANGE
575                         /
576
577    1013  0000   XC8OCT,  0
578    1014  7106            CLL RTL
579    1015  7006            RTL                   /POSITION THE FIRST CHAR FOR PRINTING
580    1016  3234            DCA      C8TMP1       /SAVE CORRECT POSITIONED WORD HERE
581    1017  1373            TAD      (-4
582    1020  3235            DCA      C8CKP        /STORE COUNTER IN HERE
583    1021  1234   C8DO4,   TAD      C8TMP1       /GET FIRST NUMBER
584    1022  0372            AND      (0007        /MASK
585    1023  1371            TAD      (260         /ADD THE PRINT CONSTANT
586    1024  4312            JMS      XC8TYP               /TYPE THE NUMBER
587    1025  1234            TAD      C8TMP1       /
588    1026  7006            RTL
589    1027  7004            RAL                   /PUT NEXT NUMBER IN POSITION
590    1030  3234            DCA      C8TMP1       /STORE IT
591    1031  2235            ISZ      C8CKP        /DONE YET WITH FOUR NUMBERS
592    1032  5221            JMP      C8DO4        /NOT YET DO MORE
593    1033  5613            JMP I    XC8OCT       /DONE WITH FOUR
594    1034  0000            C8TMP1,  0
595    1035  0000            C8CKP,   0
```

```
596                         /*******************************************************
597
598                         /C8CRLF
599                         /C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
600                         /
601                         /        JMS      XC8CRL= JMS XC8CRL
602                         /
603                         /EX,     JMS      XC8CRL       /C8PRNT A CR AND LF WITH FILL
604                         /                              /RETURN TO CALL PLUS ONE AC =0
605
606    1036  0000   XC8CRL,  0
607    1037  7300            CLA CLL
608    1040  1370            TAD      (215         /GET CODE FOR CR
609    1041  4312            JMS      XC8TYP
610    1042  1252            TAD      C8FILLER
611    1043  7040            CMA
612    1044  3253            DCA      FILCNT       /STORE FILLER IN HERE
613    1045  1367            TAD      (212         /GET CODE FOR LF
614    1046  4312   C8DO2,   JMS      XC8TYP
615    1047  2253            ISZ      FILCNT       /CHECK ON FILLER CHAR
616    1050  5246            JMP      C8DO2        /TYPE A NON PRINTING CHAR
617    1051  5636            JMP I    XC8CRL       /EXIT
618    1052  0004   C8FILLER, 0004                /FILLER SET FOR 4 CHAR
619    1053  0000   FILCNT,  0                    /COUNTER FOR FILL
620
621
622
623                         //******************************************************
624                         /C8CKPA
625                         /THIS ROUTINE WILL CHECK IF A CONTROL CHARACTER WAS INPUTED
626                         /FROM THE CONSOLE TERMINAL, IF THE FLAG IS SET AND THE CONSOLE
627                         /PACKAGE IS ACTIVE A CHECK IS MADE TO DETERMINE IF IT IS A CONTROL
628                         /CHARACTER, IF SO THEN ITS FUNCTION IS PERFORMED, IF NOT OR A
629                         /CONTROL E-D-L-O IT WILL DO ITS FUNCTION AND RETURN TO THE CALL
630                         /+2, A NON-CONTROL CHARACTER WILL BE PRINTED WITH A ? AND
631                         /RETURN TO CALL +2, IF NO FLAG IS SET OR IF NOT THE CONSOLE
632                         /PACKAGE THE RETURN WILL BE TO THE CALL +1,
633                         /        JMS      XC8CKP= JMS XC8CKP
634
635                         /EX,     JMS      XC8CKP       /CHECK IF CONSOL DEVICE KEYBOARD SET
636                         /        NOP                  /RETURN
637                         /        NOP                  /RETURN
638
639
640    1054  0000   XC8CKP,  0
641    1055  3341            DCA      ACSAV        /SAVE AC, MQ, AND LINK:
642    1056  6004            GTF                   /GET THE FLAGS
643    1057  3343            DCA      FLSAVE
644    1060  7501            MQA
645    1061  3342            DCA      MQSAVE       /SAVE MQ,
646    1062  6031            KSF                   /CHECK THE CONSOL FLAG
647    1063  5274            JMP      C8BY3        /NO FLAG UP:
648    1064  4351            JMS      C8CK22       /CHECK LOC 22
649    1065  7410            SKP
650    1066  5274            JMP      C8BY3        /NO:
```

```
651    1067  4766'              JMS    XC8TTY          /SAVE CHARACTER!
652    1070  4765'              JMS    C8GET           /REPLACE AC, MQ, AND LINK!
653    1071  4764'              JMS    XC8CNT                  /CHECK IF IT WAS A CONTROL CHAR
654    1072  7000              NOP
655    1073  2254              ISZ    XC8CKP                  /UPDATE FOR RETURN +2.
656    1074  4765'    C8BY3,    JMS    C8GET                   /REPLACE FLAGS.
657    1075  5654              JMP I  XC8CKP          /EXIT
658                    /
659                    /
660                    //*********************************************************************
661
662                    /C8ECHO
663                    /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD.  STORE IT IN LOCATION CHAR
664                    /CHECK IF IT WAS A C8CNTR CHARACTER - SET INMODE - C8PRNT CHARACTER
665                    /         JMS    XC8ECH= JMS XC8ECH
666                    /EX.      JMS    XC8ECH          /LOOK FOR CONSOL CHAR C8PRNT IT
667                                                     /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN
668
669
670                    /
671    1076  0000     XC8ECH,  0
672    1077  4766'              JMS    XC8TTY                  /WAIT FOR CHAR FROM KEYBOARD
673    1100  4765'              JMS    C8GET                   /GET THE REGISTERS
674    1101  2311              ISZ    INMODE          /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
675    1102  4764'              JMS    XC8CNT                  /GO CHECK IF IT IS A CONTROL CHAR
676    1103  5676              JMP I  XC8ECH          /WAS A CONTROL CHAR - CONTINUE RUNNING
677    1104  4312              JMS    XC8TYP                  /NOT A CONTROL CHAR C8PRNT IT
678    1105  3311              DCA    INMODE          /CLEAR FLAG THAT CHAR EXPECTED
679    1106  1310              TAD    C8CHAR          /GET CHAR IN AC
680    1107  5676              JMP I  XC8ECH          /EXIT
681    1110  0000     C8CHAR,  0
682    1111  0000     INMODE,  0
683
684                    /*********************************************************************
685
686                    /C8TYPE
687                    /THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
688                    /
689                    /         JMS    XC8TYP= JMS XC8TYP
690
691                    /EX.      JMS    XC8TYP          /C8PRNT THE CHAR IN THE AC.
692                    /                                /RETURN CALL PLUS ONE AC =0000
693                                                     /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT
694
695
696    1112  0000     XC8TYP,  0
697    1113  3336              DCA    PNTBUF          /STORE CHAR
698    1114  1337              TAD    TTYLPT          /CHECK 0=TTY 7777=LPT
699    1115  7640              SZA CLA
700    1116  5325              JMP    XDOLPT          /DO OUT PUT ON LPT
701    1117  1336              TAD    PNTBUF
702    1120  6046              TLS
703    1121  6041              TSF
704    1122  5321              JMP    .-1
705    1123  6042              TCF
```

```
706    1124  5334              JMP    C8BY5           /EXIT
707    1125  1336     XDOLPT,  TAD    PNTBUF          /GET CHAR
708    1126  6666              PSTB   PCLF            /C8PRNT IT
709    1127  4254              JMS    XC8CKP          /CHECK FOR CONTROL C.
710    1130  7000              NOP
711    1131  6661              PSKF
712    1132  5327              JMP    .-3             /WAIT UNTIL DONE
713    1133  6662              PCLF
714    1134  7200     C8BY5,   CLA
715    1135  5712              JMP I  XC8TYP          /EXIT
716    1136  0000     PNTBUF,  0
717    1137  0000     TTYLPT,  0
718
719
720    1140  7777     PCSAVE,  7777
721    1141  7777     ACSAV,   7777
722    1142  7777     MQSAVE,  7777
723    1143  7777     FLSAVE,  7777
724    1144  2701     WATMES,  TEXT   "WAITING "
       1145  1124
       1146  1116
       1147  0740
       1150  0000
725
726                    /*********************************************************
727
728                    /C8CK22 WILL CHECK LOCATION 22 FLD 0
729
730    1151  0000     C8CK22,  0
731    1152  6201              CDF 00
732    1153  7200              CLA
733    1154  1763              TAD I  (22
734    1155  6211              CDF 10
735    1156  7650              SNA CLA
736    1157  2351              ISZ    C8CK22          /RETURN FORACTIVE CONSOL IS +1
737    1160  5751              JMP I  C8CK22
738
739
740
741    1163  0022
742    1164  0400
743    1165  0624
744    1166  0311
745    1167  0212
746    1170  0215
747    1171  0260
748    1172  0007
749    1173  7774
750    1174  7600
751    1175  0615
752    1176  0662
753    1177  0277
       1200     PAGE
754                    /
755                            /*********************************
```

```
756
757
758                              /THIS IS THE FIELD 0 CALL FOR CHECKING THE CONTROL CHAR
759
760     1200  0000              XXC8CNTR,       0
761     1201  4777'             JMS     XC8CNTR         /GO TO CONTROL CHAR ROUTINE
762     1202  7000              NOP
763     1203  6203              CDF CIF 00
764     1204  5600              JMP I   XXC8CNTR        /RETURN TO FIELD 0
765
766
767                              /************************************************
768
769     1205  0000              XXC8INQ,        0
770     1206  4776'             JMS     XC8INQU         /PRINT WAITING
771     1207  6203              CDF CIF 00
772     1210  5605              JMP I   XXC8INQ         /EXIT TO FLD 0
773
774                              /************************************************
775
776     1211  0000              XXC8PSW,        0
777     1212  4775'             JMS     XC8PSW          /FIELD 0 CALL FOR SWIT REG QUESTION
778     1213  6203              CDF CIF 00
779     1214  5611              JMP I   XXC8PSW         /EXIT TO FIELD 0
780
781
782
783                              /************************************************
784
785
786     1215  0000              XXC8SW, 0
787     1216  4774'             JMS     XC8SW           /FIELD 0 CALL FOR THIS CHECK OF SW SETTING
788     1217  6203              CDF CIF 00
789     1220  5615              JMP I   XXC8SW          /EXIT TO FIELD 0
790
791
792
793
794
795
796                              /LOOK IS A CHECK OF TTY AND CONTROL CHAR
797
798     1221  0000              XC8LOOK,        0
799     1222  4773'             JMS     XC8TTY          /GET THE CHAR
800     1223  4777'             JMS     XC8CNTR         /GET THE CONTROL CHAR FUNCTION
801     1224  7410              SKP             /IS A CONTINUE
802     1225  5230              JMP     REASK1
803     1226  6203              EXTLOOK         CDF CIF 00
804     1227  5621              JMP I   XC8LOOK
805     1230  4776'  REASK1,    JMS     XC8INQU
806     1231  5226              JMP     EXTLOOK
807
808
809
810     1373  0311
```

```
811     1374  0272
812     1375  0652
813     1376  0635
814     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
```

```
815                        / RX8 DATA RELIABILITY/EXERCISER * MAINDEC-08-DIRXB-D
816                        /
817                        /THIS TABLE OF PROCESSOR HLT 'S IS DESIGNED TO PROVIDE TO THE OPERATOR IMPORTANT
818                        /INFORMATION CONCERNING THAT HALT AND THE TYPE OF RECOVERY AVAILABLE
819                        /
820                        /THE CONTENTS OF THE AC AT THE TIME OF THE HALT REPRESENTS THE PSEUDO ADDRESS
821                        /OF THE 7402 (HLT).
822                        /
823                        /ALL OCTAL TO DECIMAL CONVERSION ROUTINES HAVE BEEN REMOVED
824                        /TO CONSERVE CORE. THE REAL TIME CLOCK HAS ALSO BEEN REMOVED
825                        /AGAIN TO SAVE CORE.
826                        /
827                        /
828                        /
829   1400  0243          HLT1    /           OK    WAITING FOR OPERATOR TO SELECT DRIVES
830                        /
831                        /
832                        /
833   1401  0412          HLT2    /           OK    WAITING FOR OPERATOR TO SELECT TESTS
834                        /
835                        /
836                        /
837   1402  2102          HLT6    /           OK    PROCESSOR HALTED AT ERROR
838                        /
839                        /
840                        /
841   1403  2131          HLT10   /           OK    PROCESSOR HALTED AT END OF TEST
842                        /
843                        /
844                        /
845   1404  4220          HLT16   /           OK    PROCESSOR HALTED AT ERROR (AC SW 0 = 1)
846                        /
847                        /
848                        /
849   1405  0204          HLT20   /           OK    PROCESSOR HALTED AT END OF
850                        /                         STATISTICAL INFORMATION DUMP (SA WAS 202)
851                        /
852                        /
853                        /
854   1406  1474          HLT7    /           OK    PROCESSOR HALTED AT ERROR (AC SW 0 = 1)
855                        /
856                        /
857                        /
858   1407  2261          HLT8    /           FATAL   AUTOMATIC PROGRAM RESTARTS EXCEEDED 4
859                        /
860                        /PATTERN OVERVIEW - AC SWITCHES 0-1-2
861                        /
862                        /   0 - RANDOM DATA        4 - 10101010
863                        /   1 - ALL 1'S           5 - 01010101
864                        /   2 - 00110011          6 -
865                        /   3 - 11001100          7 - ALL 0'S
866                        /
867                        /TEST OVERVIEW - AC SWITCHES 3-4-5
868                        /
869                        /   0 - THE ACCEPTANCE TEST        4 -READ (CRC CHECK)/
```

```
870                        /   1 - WRITE-READ            5 - WRITE ONLY
871                        /       (CRC CHECK)
872                        /   2 - WRITE-READ-READ       6 - NOT THE ACCEPTANCE TEST
873                        /       CHECK (PROGRAM            (BUT SIMILAR)
874                        /       VERIFY)
875                        /   3 - THE COUNTER PART OF    7 - THE COUNTERPART OF TEST 0
876                        /       (TEST 2, READ-PROGRAM VERIFY)    (READ-PROGRAM VERIFY)
877                        /
878                        /SEQUENCE OVERVIEW - AC SWITCHES 6-7-8
879                        /
880                        /TRACK ACCESS SEQUENCE IS SELECTED VIA AC SWITCHES 6,7,8 AT L/S 200
881                        /
882                        / 0 - RANDOM
883                        / 1 - INCREMENTAL OD TO ID
884                        / 2 - DECREMENTAL ID TO OD
885                        / 3 - COMBINATION OF SEQ 0, AND SEQ 1 (INC/DEC)
886                        / 4 - BOUNCE ID TO OD ONLY
887                        / 5 - BOUNCE: (ID, OD ; ID-1, OD+1 ; ...ETC TO 47, 45)
888                        / 6 - STROBE: (ID, OD ; ID-1, OD ; ...ETC TO 1, 0)
889                        / 7 -
890                        /PDP-8/E AUGMENTED INSTRUCTIONS
891                        /
892                        /BSW DEFINED AT A LATER POINT ON PAGE 0
893          6001          ION=6001
894          6002          IOF=6002
895          4407          LAS=CKSWIT            /CALL WILL CHECK THE HARDWARE SW OR LOC 20 DEPENDING
896                                              /ON THE STAET OF THE SWITCH REGISTER BIT IN LOCATION
897                                              /21
898
899          7501          MQA=7501                      / "OR" (MQ) WITH (AC)
900          7421          MQL=7421                      /MQ=AC (THEN CLEAR AC)
901                        /ACCUMULATOR SWITCH REGISTER DEFINITIONS
902                        /
903          4000          SW0=4000
904          2000          SW1=2000
905          1000          SW2=1000
906          0400          SW3=400
907          0200          SW4=200
908          0100          SW5=100
909          0040          SW6=40
910          0020          SW7=20
911          0010          SW8=10
912          0004          SW9=4
913          0002          SW10=2
914          0001          SW11=1
915                        /ITERRUPT SERVICE POINTERS
916                        /
917          0000              *0
918   0000  0304            304                              /REVISION D
919
920          0001              *1
921   0001  5402          JMP I .+1
922   0002  3400          PI
923   0003  0000    XA10,      0
924                        /
```

```
925                          /PROGRAM LOCATIONS XXX AND YYY ARE TEMPORARY STORAGE REGISTERS FOR DATA
926                          /OR FOR ADDRESSES OF DATA WHICH ARE CALLED WITHIN SUBROUTINES WHICH
927                          /DO NOT CALL SUBROUTINES WHICH CALL THESE STORAGE REGISTERS
928                          /
929                          /XXX AND YYY ARE CALLED WITHIN THE FOLLOWING SUBROUTINES
930                          /
931                          /       XXX                     YYY
932                          /
933                          /RDORWR (2)
934                          /DD/RX-ERROR (2)
935                          /LOCK (2)                       (2)
936                          /HUNGUP (4)
937                          /S202                           (4)
938                          /
939    0004  0000     XXX,           0
940    0005  0000     YYY,           0
941                          /
942                          /******************************
943                          /CONSOLE
944                          /******************************
945          4406     C8LOOK= JMS I  .              /LOOK FOR TTY INPUT AND CONTROL CHAR
946    0006  1221            XC8LOOK
947
948          4407     CKSWIT= JMS I  .                    /REPLACES LAS
949    0007  0744            XCKSWIT
950
951                          /
952          0010            *10
953                          /
954                          /
955                          /AUTO-INDEX REGISTER DEFINITIONS
956                          /
957    0010  0000     A10,   0
958    0011  0000     A11,   0
959    0012  0000     A12,   0
960    0013  0000     A13,   0
961    0014  0400     K0400, 0400
962    0015  0200     K0200, 0200
963
964          0020            *20
965                          /
966                          /THE FOLLOWING PROGRAM LOCATIONS (20, 21, AND 22) ARE RESERVED FOR ACT8/A
967                          /
968    0020  0750            0750            /PSEUDO SWITCH REGISTER  SET TO DEVICE CODE 75
969    0021  4000            4000            /PSEUDO SWITCH REGISTER=0000
970                                          /USE HARDWARE SWITCH REGISTER=4000
971    0022  0000            0000            /400 FOR CONSOL PACKAGE ACTIVE
972                                          /0000 FOR NONACTIVE CONSOLE PACKAGE
973
974    0023  0000            0000                            /RESERVED FOR FUTURE USE.
975                          /****************
976                          /CONSOLE
977                          /****************
978
979          4424            CHECKC8=JMS I  .     /CHECK IF ON CONSOLE
```

```
980    0024  5420            XCHECK
981
982
983          4425            C8PASS=JMS I   .
984    0025  0200            XC8PASS
985
986          4426            C8SWIT= JMS I  .                        /ASK THE SWITCH REG QUESTION
987    0026  1211            XXC8PSW
988
989          4427            AERROR=JMS I .
990    0027  3351            XAERRO
991
992          4430            C8INQU= JMS I .
993    0030  1205            XXC8INQ                          /PRINT THE WAITING MES
994          4431            C8CNTL=JMS I .
995    0031  1200            XXC8CNTR
996
997
998
999                          /
1000                         /THE FOLLOWING PROGRAM LOCATIONS "OD", "ID", "FIRST", AND "LAST" MAY BE
1001                         /CHANGED BY THE OPERATOR MANUALLY HOWEVER FOLLOWING THESE RESTRICTIONS.
1002                         /
1003                         /         1.   THE CONTENTS OF " OD " (MIN VAL 0) MUST BE <= THE
1004                         /                   CONTENTS OF " ID " (MAX VAL 114).
1005                         /
1006                         /         2.   THE CONTENTS OF "FIRST" (MIN VAL 1) MUST BE <= THE
1007                         /                   CONTENTS OF "LAST" (MAX VAL 32)
1008                         /
1009                         /THE PROGRAM WILL VERIFY THAT THESE PARAMATERS ARE WITHIN THE PERSCRIBED
1010                         /LIMITS, IF THE PROGRAM VERIFICATION DETECTS AN IRREGULARITY - THEN THE
1011                         /PARAMATER OUT OF BOUNDS WILL BE SET TO ITS PROPER VALUE AUTOMATICALLY
1012                         /
1013                         /THE PROGRAM WILL PRINT A COMFIRMATION MESSAGE IF THESE PARAMATERS ARE NON STANDARD
1014                         /
1015   0032  0001     OD,    1                    /OUTSIDE DIAMETER (MIN VALUE 0)
1016   0033  0114     ID,    114                  /INSIDE DIAMETER (MAX VALUE 114)
1017   0034  0001     FIRST, 1                     /FIRST SECTOR TO ACCESS (MIN VAL 1)
1018   0035  0032     LAST,  32                    /LAST SECTOR TO ACCESS (MAX VAL 32)
1019                         /
1020                         /PDP-8/E AUGMENTED INSTRUCTIONS
1021                         /
1022         4436     BSW=JMS I .
1023   0036  5144            XBSW      /PROGRAMMED BYTE SWAP
1024                         /
1025                         /DISKETTE IOT SUBROUTINES
1026                         /
1027         4437     LCD=JMS I .
1028   0037  4226            XLCD
1029         4440     LCDA=JMS I .
1030   0040  4233            XLCDA
1031         4441     LCDB=JMS I .
1032   0041  4260            XLCDB
1033         4442     XDRIN=JMS I .
1034   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
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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 COCKSELECT               /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                   /
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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
```

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1365                           /
1366                           /PROGRAMMING NOTE:
1367                           /
1368                           /THE LABEL " XAUTO " MUST RESIDE HERE BECAUSE OF REFERENCES WITHIN
1369                           /SUBROUTINES " XGETUNIT" AND " XDELUNIT "
1370                           /
1371   0305  4452    XAUTO,  DONE
1372   0306  5257            JMP AUTO
1373   0307  4464            PRINTDRIVESELECTED
1374                           /
1375                           /IF ENTRY TO HERE WAS FROM OF AN AUTOMATIC DUMP ERROR LOGS
1376                           /BECAUSE FOR SOME REASON ANY OR ALL THE UNITS BECAME DESELECTED
1377                           /THEN THE TESTING WITH THE (TESTP) PREVIOUSLY SELECTED AT S/A 200
1378                           /AUTOMATICALLY CONTINUES
1379                           /
1380                           / (AN AUTORESTART IS EQUIVALENT TO A L/S 201)
1381                           /
1382                           /THE LOGS ARE REFRESHED ONLY AT L/S 200, AND
1383                           /AT AN AUTORESTART, AND
1384                           /AT A LOG-OVERFLOW
1385                           /
1386                           /IF THE DRIVES SELECTED FOR THE RESTART ARE NOT THE ORIGINAL SELECTIONS
1387                           /
1388   0310  1775'            TAD XLOCK
1389   0311  7640             SZA CLA
1390   0312  5320             JMP XLOGREFRESH
1391   0313  1175             TAD SUNITS
1392   0314  7041             CIA
1393   0315  1770'            TAD UNITS
1394   0316  7650             SNA CLA
1395   0317  5764'            JMP XS201
1396                           / " DCA XLOCK " PREVENTS ILLEGAL LOG-REFRESH AT RESTART 201
1397                           /
1398   0320  3775'    XLOGREFRESH, DCA XLOCK
1399   0321  4463            PRINT
1400   0322  5577            MREFRESH
1401   0323  4463            PRINT
1402   0324  5624            MPASSES
1403   0325  4475            TY8OCT
1404   0326  6350            PASSES
1405                           /CLEAR ALL LOGS
1406                           /
1407   0327  1363    LOGREFRESH, TAD (LOGS-1)
1408   0330  3010            DCA A10                          / C L E A R
1409   0331  3410            DCA I A10
1410   0332  1010            TAD A10                          /  A L L
1411   0333  1362            TAD (-XLOGS)
1412   0334  7640            SZA CLA                          / L O G S
1413   0335  5331            JMP .-4
1414   0336  1777'            TAD S202
1415   0337  1361            TAD (-XNONE)
1416   0340  7640            SZA CLA
1417   0341  5760'            JMP NOTEST
1418   0342  5764'            JMP XS201
1419                           /
```

```
1420                           /ROUTINE TO DETERMINE IF ON APT-8. IF APT-8 IS SELECTED
1421                           /THEN CONSOLE AND TEST PARAMETER SELECTION FUNCTIONS ARE NOP.
1422                           /IF NOT ROUTINE IS NOP.
1423                           /
1424   0343  0000    XAPT8,  0
1425   0344  7300            CLA CLL
1426   0345  4500            CHEK22
1427   0346  7410            SKP                              /ON APT-8
1428   0347  5743            JMP I   XAPT8
1429   0350  1022            TAD     22
1430   0351  0126            AND     K7377                    /NOP CONSOLE PACKAGE
1431   0352  3022            DCA     22                       /RESTORE 22
1432   0353  5757'            JMP     DEVCDE                   /GET DEVICE CODE IN ADDRESS 20.
1433   0354  5743            JMP I   XAPT8                    /AND EXIT
1434                                                          /USE RELIABILITY FUNCTION.
1435   0357  5345
1436   0360  0405
1437   0361  5533
1438   0362  0330
1439   0363  6347
1440   0364  0400
1441   0365  0676
1442   0366  2272
1443   0367  2271
1444   0370  2270
1445   0371  6000
1446   0372  0734
1447   0373  3605
1448   0374  0722
1449   0375  2400
1450   0376  2245
1451   0377  4434
       0400                    PAGE
1452                           /THIS ROUTINE HAS BEEN MOVED FROM LOC 405 TO 400
1453                           /SAVE  ONE LOC BY MOVE
1454
1455   0400  2777'    XS201,  ISZ RESTARTS
1456   0401  5220            JMP XS20X
1457   0402  4461            LOCK
1458   0403  6352            RESTARTS
1459   0404  0113            K7777
1460                           /******************
1461                           /********************
1462                           / " SELECT OPERATING PARAMATERS " VIA AC SWITCHES
1463                           /
1464                           /           PPP. TTT. SSS. 8/12 DD (10)
1465                           /
1466   0405  4463    NOTEST, PRINT
1467   0406  5563            MSTEST
1468                           /******************
1469                           /CONSOLE
1470                           /******************
1471   0407  4424            CHECKC8
1472   0410  4426            C8SWIT                           /ASK THE SWITCH REGISTER QUESTION
1473   0411  7410            SKP                              /SKIP OVER HLT IN CODE AFTER RETURNING
```

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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
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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 9/12 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           TY40CT
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
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```
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 Ø 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, Ø
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 UNIT2
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) = Ø 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
```

```
2568                          /THEN DO NOT PRINT ERROR INFORMATION
2569                          /
2570                          /BUT,
2571                          /
2572                          /IF THIS IS A READ COMPARE TEST AND AC SW 3 = 0
2573                          /THEN PRINT ERROR INFORMATION
2574                          /
2575      1650  4407              LAS
2576      1651  0014              AND K0400
2577      1652  1133              TAD RDC
2578      1653  7640              SZA CLA
2579      1654  5360              JMP ISZCOMPRERROR
2580                          /IF THIS IS THE FIRST COMPARE ERROR THEN PRINT HEADER INFORMATION
2581                          /
2582      1655  1106              TAD COMPRERROR
2583      1656  7640              SZA CLA
2584      1657  5320              JMP CNOTFIRST
2585                          /
2586                          /IF A DATA NO CRC STATUS ERROR (DNS) THEN PRINT ENTIRE ERROR INFORMATION
2587                          /
2588      1660  1154              TAD DNSLOG
2589      1661  7640              SZA CLA
2590      1662  4772'             JMS FORCE
2591                          /IF THE PROGRAMMED INSTRUCTION IMMEDIATELY BEFORE " READ "
2592                          /IS A " WRITE " , THEN THIS IS A WRITE DATA ERROR, IF NOT,
2593                          /THEN THIS IS A READ DATA ERROR
2594                          /
2595
2596                          /PROGRAMMING NOTE:
2597                          /
2598                          /THE LABLE " XCOMPARE " MUST RESIDE HERE BECAUSE OF REFERENCES MADE WITHIN " XERROR "
2599                          /
2600      1663  4771'     XCOMPARE, JMS RDORWR
2601      1664  5270              JMP .+4
2602      1665  4463              PRINT
2603      1666  5741              MWRITE
2604      1667  5272              JMP .+3
2605      1670  4463              PRINT
2606      1671  5745              MREAD
2607                          /NOTATION:
2608                          /
2609                          /THE CONTENTS OF PROGRAM LOCATION XASTATUS REFLECTS THE STATUS OF THE
2610                          /RX01 AT THE COMPLETITION OF THE PREVIOUS " READ SECTOR "
2611                          /
2612                          /IF A CRC ERROR EXISTS THEN THIS IS A DATA ERROR WITH STATUS ERROR
2613                          /
2614                          /IF A CRC ERROR DOESN'T EXIST THEN THIS IS A DATA ERROR WITH NO ERROR STATUS
2615                          /
2616      1672  1362              TAD XASTATUS
2617      1673  7640              SZA CLA
2618      1674  5300              JMP DWESERROR
2619      1675  4463              PRINT
2620      1676  5751              MDNSERROR
2621      1677  5302              JMP .+3
2622      1700  4463     DWESERROR, PRINT
```

```
2623      1701  5757              MDWESERROR
2624      1702  4463              PRINT
2625      1703  5763              MDATAERROR
2626                          /PRINT " WORD " IF 12-BIT MODE, OR PRINT " BYTE " IF 8-BIT MODE
2627                          /
2628      1704  1370              TAD (MWORD)
2629      1705  3315              DCA XFLENGTH
2630                          / TEST 8/12-BIT MODE SELECTION
2631                          /
2632      1706  7304              CLL CLA RAL
2633      1707  0172              AND STESTP
2634      1710  7650              SNA CLA
2635      1711  5314              JMP .+3
2636      1712  1367              TAD (MBYTE)
2637      1713  3315              DCA XFLENGTH
2638      1714  4463              PRINT
2639      1715  5772     XFLENGTH, MWORD
2640      1716  4463              PRINT
2641      1717  6000              MGB
2642                          / AC 2 = 0 - PRINT ONLY FIRST 3 COMPARE ERRORS
2643                          / AC 2 = 1 - PRINT ALL COMPARE ERRORS
2644                          /
2645      1720  4407     CNOTFIRST, LAS
2646      1721  0366              AND (SW2)
2647      1722  7640              SZA CLA
2648      1723  5330              JMP .+5
2649      1724  7346              CLL STA RTL
2650      1725  1106              TAD COMPRERROR
2651      1726  7700              SMA CLA
2652      1727  5360              JMP ISZCOMPRERROR
2653      1730  4463              PRINT
2654      1731  5611              MCRLF
2655      1732  1012              TAD A12
2656      1733  7041              CIA
2657      1734  1011              TAD A11
2658      1735  3004              DCA    XXX               /TEMP STORAGE FOR VALUE
2659      1736  4473              TY4OCT
2660      1737  0004              XXX
2661      1740  4472              TAB
2662      1741  0005              5
2663                          /IF 8-BIT MODE THEN MASK THE 12-BIT "GOOD" WORDS K377
2664                          /
2665      1742  7301              CLL CLA IAC
2666      1743  7004              RAL
2667      1744  0172              AND STESTP
2668      1745  7112              CLL RTR
2669      1746  1174              TAD GOOD
2670      1747  7430              SZL
2671      1750  0125              AND K377
2672      1751  3167              DCA LSB
2673      1752  4473              TY4OCT
2674      1753  0167              LSB
2675      1754  4472              TAB
2676      1755  0012              12
2677      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 STESTP
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            TY40CT
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            TY40CT                          /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
```

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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 @ 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
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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   HLT8,    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, .
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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
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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
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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           TY80CT
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 Q460D
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 Q60D
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    Q60D,   TAD TARGET
3318    2615  7041           CIA
3319    2616  1032           TAD OD
3320    2617  7640           SZA CLA
3321    2620  5227           JMP Q460D
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
```

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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
```

```
3543                          /
3544    3071    1153    WHAT2,   TAD DWSLOG
3545    3072    7650             SNA CLA
3546    3073    5775'            JMP WHAT3
3547    3074    1152             TAD R2RETRY
3548    3075    3153             DCA DWSLOG
3549    3076    4162             LOG
3550    3077    7305             DATAERRORS
3551    3100    5775'            JMP WHAT3
3552                          /
3553    3101    2516    MMUNRECOVERABLE,TEXT "UNRECOVERABLE "
        3102    2205
        3103    0317
        3104    2605
        3105    2201
        3106    0214
        3107    0540
        3110    0000
3554                  /THIS SUBROUTINE IS ENTERED FROM ALL 3 STARTING ADDRESSES
3555                  /
3556                  /THIS SUBROUTINE CHECKS FOR OD, ID, FIRST, AND LAST TO BE STANDARD
3557                  /
3558                  /AND REPORTS A NON-STANDARD MESSAGE IF OTHERWISE
3559                  /
3560                  /THE STANDARD SELECTIONS ARE: OD = 1, ID = 114, FIRST = 1, LAST = 32
3561                  /
3562    3111    3111    CHECK,   .
3563    3112    4463             PRINT
3564    3113    6124             MTESTP
3565    3114    4473             TY4OCT
3566    3115    0145             TESTP
3567    3116    4463             PRINT
3568    3117    5611             MCRLF
3569    3120    7240             STA
3570    3121    1032             TAD OD
3571    3122    7640             SZA CLA
3572    3123    5340             JMP NSTANDARD
3573    3124    1033             TAD ID
3574    3125    1374             TAD (-114)
3575    3126    7640             SZA CLA
3576    3127    5340             JMP NSTANDARD
3577    3130    7240             STA
3578    3131    1034             TAD FIRST
3579    3132    7640             SZA CLA
3580    3133    5340             JMP NSTANDARD
3581    3134    1035             TAD LAST
3582    3135    1373             TAD (-32)
3583    3136    7650             SNA CLA
3584    3137    5711             JMP I CHECK
3585    3140    4463    NSTANDARD, PRINT
3586    3141    5717             MOD
3587    3142    4473             TY4OCT
3588    3143    0032             OD
3589    3144    4463             PRINT
3590    3145    5723             MID
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3591    3146    4473             TY4OCT
3592    3147    0033             ID
3593    3150    4463             PRINT
3594    3151    5727             MFIRST
3595    3152    4473             TY4OCT
3596    3153    0034             FIRST
3597    3154    4463             PRINT
3598    3155    5734             MLAST
3599    3156    4473             TY4OCT
3600    3157    0035             LAST
3601    3160    5711             JMP I CHECK
3602
3603                  /********
3604                  /CONSOLE
3605                  /*********
3606
3607                  /THIS ROUTINE IS FOR XKCC LOCATION 5511 IT WILL STORE THE CORRECTED
3608                  /8 BIT CHARACTER FROM THE TTY IN LOC CHAR IN FLD 1 FOR THE C8CNTR ROUTINE
3609
3610
3611    3161    0000             C8TST2,  0
3612    3162    1372             TAD      (200           /ADDD THE 8 TH BIT
3613    3163    6211             CDF 10
3614    3164    3770             DCA I    XC8CHAR        /STORE IT IN CHAR FLD 1
3615    3165    1770             TAD I    XC8CHAR        /GET THE CHAR
3616    3166    6201             CDF 0                   /RETURN TO CORRECT FIELD
3617    3167    5761             JMP I    C8TST2         /EXIT C8TST2
3618    3170    1110    XC8CHAR,         C8CHAR
3619                  /
3620    3172    0200
3621    3173    7746
3622    3174    7664
3623    3175    1552
3624    3176    7747
3625    3177    7745
        3200    PAGE
3626                  /
3627                  /SUBROUTINE ; TAB
3628                  /ENTRY ; TAB; +N
3629                  /COMMENT ; PRINT " N " SPACES WHERE N IS VIA INDEXED XTAB
3630                  /
3631    3200    3200    XTAB,    .
3632    3201    4467             SETUP
3633    3202    3200             XTAB
3634    3203    3226             DCA XXTAB      /FOR COUNT
3635    3204    7200    XTABL,   CLA
3636    3205    1226             TAD XXTAB
3637    3206    1600             TAD I XTAB     /FOR " N "
3638    3207    3226             DCA XXTAB
3639    3210    1305             TAD CHARLINE   / # OF CHARACTERS ALREADY TYPED ON THIS LINE
3640    3211    1377             TAD (110)      / 72 CHARACTER LINE STANDARD
3641    3212    7041             CIA
3642    3213    1226             TAD XXTAB
3643    3214    7550             SPA SNA
3644    3215    5204             JMP XTABL
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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 FOP 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
```

```
3755                            /
3756                            /ERROR REPORTER FOR APT. INDICATES THE PC AT THE TIME OF THE ERROR.
3757                            /
3758    3351  0000    XAERRO, 0
3759    3352  3004            DCA     XXX                     /SAVE ERROR PC
3760    3353  4500            CHEK22
3761    3354  7410            SKP
3762    3355  5751            JMP I   XAERRO
3763    3356  6002            IOF
3764    3357  1004            TAD     XXX                     /GET BACK ERROR PC
3765    3360  6201            CDF     00
3766    3361  6272            CIF     70
3767    3362  5530            JMP I   K6520
3768    3363  5363            JMP     .                       /SOMETHING WENT WRONG ON
3769                                                          /ON REPORTING ERROR TO APT
3770                            /
3771    3365  7571
3772    3366  7670
3773    3367  0212
3774    3370  0215
3775    3371  3702
3776    3372  4100
3777    3373  3473
3778    3374  7700
3779    3375  2152
3780    3376  0240
3781    3377  0110
        3400            PAGE
3782                    /ENTRY TO THIS POINT WAS CAUSED BY A PROGRAM INTERRUPT REQUEST
3783                    /
3784    3400  3300    PI,     DCA XAC
3785    3401  7010            RAR
3786    3402  3301            DCA XLINK        /SAVE (AC) AND (LINK)
3787    3403  6031            KSF
3788    3404  7410            SKP
3789    3405  5576            JMP I   XXKCC    /IGNORE KEYBOARD IRQ
3790    3406  6041            TSF
3791    3407  5215            JMP PICLSK
3792                    /IF THIS TELEPRINTER FLAG IS EXPECTED (TTYBUSY) = 1
3793                    /THEN "JMP XTCF"
3794                    /IF NOT THEN "JMP PIEXIT"
3795                    /
3796    3410  1171            TAD TTYBUSY
3797    3411  7740            SMA SZA CLA
3798    3412  5777'           JMP XTCF
3799    3413  6042            TCF
3800    3414  5273            JMP PIEXIT
3801                    /IF (BUSY) = 1, THEN AN RX01 PI IS ALREADY BEING PROCESSED
3802                    /
3803                    /IF (GOBIT) = 0, THEN THIS DISKETTE IRQ IS UNEXPECTED
3804                    /
3805                    /DISABLE RX01 INTERRUPT
3806                    /
3807                    /READ RX01 STATUS REGISTER
3808                    /
```

```
3809    3415  1104    PICLSK, TAD BUSY
3810    3416  7640            SZA CLA
3811    3417  5273            JMP PIEXIT
3812    3420  2104            ISZ BUSY
3813                    /REFRESH PROGRAM LOCATION " FORCE " BECAUSE THIS IS [NOT] A FORCED TYPEOUT
3814                    /
3815                    /IT MAY HOWEVER BE AN RX-ERROR TYPEOUT
3816                    /
3817    3421  3776'           DCA FORCE
3818                    /
3819    3422  6001            ION
3820                    /
3821                    /SPECIAL PROGRAMMING NOTE:
3822                    /
3823                    /THE FOLLOWING INSTRUCTION IMMEDIATELY AFTER THE PREVIOUS " ION "
3824                    /MUST BE THE IOT TO SKIP ON THE RX DONE FLAG (67X5)
3825                    /AND NOT THE PSEUDO INSTRUCTION " SDN " WHICH "JMS XSDN"
3826                    /BECAUSE THE PROGRAM WILL [HANG]
3827                    /
3828    3423  6755    K67X5B, 6755
3829    3424  5266            JMP UNKNOWN
3830    3425  1165            TAD GOBIT
3831    3426  7650            SNA CLA
3832    3427  5775'           JMP SDNUNEXPECTED
3833    3430  4447            INTR                    /CLEAR RX01 INTERRUPT ENABLE
3834                    /
3835    3431  4442            XDRIN
3836    3432  0125            AND K377
3837    3433  3141            DCA ASTATUS
3838                    /IF THE RETURN IS TO "AUTOOK" THEN THIS PI IS FROM THE AUTOSCAN AFTER
3839                    /[KEY] INIT - THEREFORE DELETED DATA MAY BE SET (OK FOR NOW)
3840                    /
3841    3434  1774'           TAD RETURN
3842    3435  1373            TAD (-JMPAUTOOK)
3843    3436  7650            SNA CLA
3844    3437  5256            JMP DDIGNORE
3845                    /
3846                    /THE COMMANDS FILL BUFFER AND EMPTY BUFFER SHOULD NOT ATTRACT DELETED DATA
3847                    /
3848    3440  1121            TAD K16
3849    3441  0105            AND COMMAND
3850    3442  7440            SZA                     /SKIP IF FILL BUFFER (0)
3851    3443  7112            CLL RTR
3852    3444  7640            SZA CLA                 /SKIP IF EMPTY BUFFER (2)
3853    3445  7301            CLL CLA IAC             /  1
3854    3446  0172            AND STESTP
3855    3447  7010            RAR                     /PUT TO LINK
3856    3450  1372            TAD (100)
3857    3451  0141            AND ASTATUS             / A STATUS D.D. MASK
3858                    /
3859                    /IF (L) = 0 AND (AC) = 0, O.K. - NO D.D. MARK
3860                    /
3861                    /IF (L) = 0 AND (AC) > 0 (=100), UNEXPECTED D.D.
3862                    /
3863                    /IF (L) = 1 AND (AC) = 0, D.D. MARK EXPECTED DIDN'T OCCUR
```

```
3864                        /
3865                        /IF (L) = 1 AND (AC) > 0  (=100), O.K. - D.D. MARK OCCURED
3866                        /
3867    3452  7430              SZL
3868    3453  7640              SZA CLA                  / (L) = 1
3869    3454  7440              SZA                      / (L) = 0, OR (L) = 1 AND (AC) > 0
3870    3455  5771'             JMP DDERROR              / (L) = 0 AND (AC) > 0  (=100) , OR (L) = 1 AND (AC) = 0
3871    3456  4445          DDIGNORE, SER
3872    3457  5261              JMP VFRIFY               /RX01 OK = RETURN TO INLINE CODE
3873    3460  5770'             JMP RXERROR
3874                        /
3875                        /VERIFY THAT THE CONTENTS OF THE A-STATUS REGISTER = 0
3876                        /
3877                        /WHEN NO RX01 ERROR FLAG EXISTS
3878                        /
3879                        /NOTE:
3880                        /
3881                        /THE A-STATUS MAY = 200 (IF ENTRY TO HERE IS FROM THE AUTO SCAN AT "AUTO"
3882                        /
3883                        /MASK OUT BITS 4 (DRIVE READY); AND 5 (DELETED DATA), AND 9 (INIT DONE)
3884                        /
3885    3461  1141          VERIFY, TAD ASTATUS
3886    3462  0367              AND (73)
3887    3463  7640              SZA CLA
3888    3464  5766'             JMP NOSER
3889    3465  5765'             JMP OKRETURN
3890                        /
3891                        /AN UNKNOWN PROGRAM INTERRUPT OCCURED
3892                        /
3893    3466  1364          UNKNOWN, TAD    (UNKNOWN                          /ERROR PC.
3894    3467  4427              AERROR                   /REPORT ERROR TO APT IF REQUIRED.
3895    3470  4463              PRINT
3896    3471  6327              MUNKNOWN
3897    3472  3104              DCA BUSY
3898    3473  1301          PIEXIT, TAD XLINK
3899    3474  7104              CLL RAL
3900    3475  1300              TAD XAC
3901    3476  6001              ION
3902    3477  5400              JMP I 0
3903    3500  0000          XAC,    0
3904    3501  0000          XLINK,  0
3905                        / " LOG ERRORS " (IF ANY)
3906                        /
3907                        /FORM: LOG; XERROR
3908                        /
3909                        /WHERE XERROR=
3910                        /
3911                        /WERRORS                          (R1RETRY)
3912                        /RERRORS                          (R2RETRY)
3913                        /DATAERRORS
3914                        /DNSERRORS
3915                        /SNDERRORS
3916                        /SERRORS                          (SRETRY)
3917                        /PERRORS                          (PRETRY)
3918                        /
```

```
3919                        /IF (RETRY) = 0       ; LOG "UNRECOVERABLE" (HARD) ERROR
3920                        /IF (RETRY) < -12     ; LOG "RECOVERABLE" (SOFT) ERROR
3921                        /IF (RETRY) = -12     ; NO ERROR TO LOG
3922                        /
3923                        /
3924                        /PROGRAMMING NOTE: ANY "XERROR" IS RESTRICTED TO A MAGNITUDE OF 4095 DECIMAL
3925                        /
3926                        /
3927    3502  3502          XLOG,    .
3928    3503  1702              TAD I XLOG               /ADDRESS OF LOG
3929    3504  1363              TAD (-WERRORS)           /
3930    3505  7110              CLL RAR                  /RIGHT JUSTIFIED 1 PLACE
3931    3506  1362              TAD (R1RETRY)            /
3932    3507  3327              DCA LSBX1                /CONTAINS ADDRESS OF X-RETRY COUNTER
3933    3510  1727              TAD I LSBX1              /AC CONTAINS CONTENTS OF THAT X-RETRY COUNTER
3934    3511  7450              SNA
3935    3512  5320              JMP UNRECOVERABLE        /UNRECOVERABLE ERROR EXISTS
3936    3513  7041              CIA
3937    3514  1134              TAD KRETRY
3938    3515  7450              SNA
3939    3516  5354              JMP LOGGED               /NO ERROR EXISTS OR PREVIOUSLY EXISTED
3940              /          DCA TTRETRY              / # OF RETRY RECOVERED AT
3941    3517  7610              CLA SKP
3942    3520  1121          UNRECOVERABLE, TAD K16      / UNRECOVERABLE OFFSET
3943    3521  1702              TAD I XLOG               / TO OBTAIN " XERROR "
3944    3522  1761'             TAD UNITZ                /UNIT OFFSET
3945    3523  3327              DCA LSBX1                /TO WORK FOR INDEX
3946    3524  2727              ISZ I LSBX1
3947    3525  5331              JMP .+4
3948    3526  4461              LOCK
3949    3527  0000          LSBX1,  0
3950    3530  0113              K7777
3951                        /
3952                        /AN ERROR HAS OCCURED THIS PASS
3953                        /
3954    3531  7330              STL CLA RAR
3955    3532  3132              DCA PASSINPROGRESS
3956    3533  1302              TAD     XLOG                     /POINTS TO TYPE OF ERROR.
3957    3534  4427              AERROR
3958                        /LOG TRACK ACCESS FREQUENCY ERROR (ANY ERROR) PER DRIVE PER TRACK
3959                        /
3960                        //IF A "PARITY ERROR" DO NOT LOG TAFE
3961                        //
3962                        /     TAD I XLOG; TAD (-PERRORS); SNA CLA; JMP LOGGED
3963                        /LOG TRACK ACCESS FREQUENCY ERROR (ANY ERROR) PER DRIVE PER TRACK
3964                        /
3965              /              TAD UNITZ
3966              /              CMA
3967              /              DCA LSBX2
3968              /              TAD (TAFE1-TAFE0)        /FOR DISKETTE UNIT OFFSET
3969              /              ISZ LSBX2
3970              /              JMP .-2
3971    3535  1761'             TAD UNITZ                / 0 OR 1
3972    3536  7640              SZA CLA
3973    3537  1360              TAD (TAFE1-TAFE0)
```

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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
```

```
4083                   /
4084                   / (DMTYPE) NOT = 0 IF A D.D. ERROR EXISTS
4085                   / (DMTYPE) = 0 IF NO D.D. ERROR EXISTS
4086                   /
4087    3642 3776'     RXERROR, DCA DMTYPE
4088    3643 1105             TAD COMMAND
4089    3644 3163             DCA ECOMMAND
4090                   /FORMAT ERRORS (STATUS B WORD):
4091                   /
4092                   / 40, 50, (60), 70, 100, 110, 120, 130, (140), 150, 160, 170, (200), (210)
4093                   /
4094                   /TECHNICAL NOTE:
4095                   /
4096                   /IF A PARITY ERROR OCCURS WHILE ATTEMPTING TO READ THE B-CODES, OR WHILE
4097                   /ATTEMPTING TO READ THE STATUS (COMMANDS #7, #5), THEN THE ORIGINAL ERROR
4098                   /WHICH BROUGHT THE PROGRAM TO THIS ERROR SERVICE ROUTINE WILL BE LOST
4099                   /
4100                   /SPECIAL PROGRAMMING NOTE:
4101                   /
4102                   /IF THIS IS A FORCED TYPEOUT FROM HUNGUP BECAUSE THE DEVICE TEST IS HUNG
4103                   /THEN THIS PROGRAM DOES NOT EVEN READ THE B- AND C- STATUS
4104                   /BECAUSE THE PROGRAM COULD GET HUNG WITHIN AN INFINITE LOOP
4105                   /BECAUSE A " JMS FORCE " IS ISSUED WITHIN HUNGUP WHICH WAS ENTERED IF
4106                   /THE IOT'S SDN OR SER OR STR FAILED TO SKIP WITHIN AN ALLOTED PERIOD OF TIME
4107                   /
4108                   /ALSO, AN ERROR MESSAGE IS FORCED EVEN IF SW 3 = 1
4109                   /
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
```

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4138    3676 0125             AND K377
4139    3677 3143             DCA CSTATUS
4140                   /LOG A AND B STATUS REGISTERS PER UNIT
4141                   /
4142                   /      DCODES, EXPECTED D.D. DIDN'T OCCUR
4143                   /               UNEXPEDTED D.D. OCCURED
4144                   /      ACODES, A0
4145                   /               ACRC
4146                   /               APAR
4147                   /      BCODES, B0
4148                   /               B10
4149                   /               B20
4150                   /               B30
4151                   /               B40
4152                   /               B50
4153                   /               B60
4154                   /               B70
4155                   /               B100
4156                   /               B110
4157                   /               B120
4158                   /               B130
4159                   /               B140
4160                   /               B150
4161                   /               B160
4162                   /               B170
4163                   /               B200
4164                   /    DCODES+25, B210
4165                   /
4166                   /THE BSTATUS SHOULD NEVER BE ANY OF THE FOLLOWING CODES
4167                   /
4168                   /               220
4169                   /               230
4170                   /               240
4171                   /               250
4172                   /               260
4173                   /               270
4174                   /               300
4175                   /               310
4176                   /               320
4177                   /               330
4178                   /               340
4179                   /               350
4180                   /               360
4181                   /    DCODES+43, 370
4182                   /
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
4226   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
```

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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 PREVIUS 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
                      /PROGRAM NOTE:
4426
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                  /
```

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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
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4630    4414  560J            JMP I LOGCOMMON
4631
4632                  /ENABLE / DISABLE RX01 INTERRUPT ENABLE
4633                  /
4634                  /   AC = 1 AT ENTRY TO ENABLE INTERRUPT
4635                  /
4636                  /FORM: (AC = 0, OR 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              TY40CT                        /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              TY40CT                        /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              TY40CT                        /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                          /CONSOLE
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    1564  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
```

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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              TY80CT                    /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              TY80CT                    /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
```

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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
```

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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,
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
        5000          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
```

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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
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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              UNITZ
5188   5102  4463              PRINT
5189   5103  6234              MDASH
5190   5104  1412              TAD I 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               /
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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
```

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5287                     /
5288                     /THE DONE FLAG SHOULD BE SET BY NOW
5289                     /
5290                     /THIS ROUTINE WILL ASK FOR DEVICE CODES IF NOT SELLECTED
5291                     /
5292                     /****************
5293                     /CODE CHANGE FOR GETTING DEVICE CODES
5294                     /
5295                     /
5296                     /ENTER THE DEVICE CODE IN THE SIX MIDDLE BITS OF THE SWITCH REG.
5297
5298                     /
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            TY40CT
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            TY40CT
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  1005
          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  5047
        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  4457    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  2001    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  1604
        6341  0503
        6342  5560
        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                    /UNRECOVERABLE 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
AUTORF	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	FIRST	0034	JMPWHI	1274
C8CNTL	4431	CSTATU	0143	FIRSTE	0110	JMS202	2240
C8DO1	0327	DASHAL	4063	FLSAVE	1143	JMSFOR	5275
C8DO11	0607	DASHBC	4067	FORCE	3605	K0003	4747
C8DO2	1046	DATAER	7305	GETASE	4453	K0007	0131
C8DO4	1021	DCADOA	0615	GETATR	4454	K0100	4750
C8DO7	0523	DCAGOO	1103	GETCH1	0704	K0200	0015
C8ERR1	1000	DCATAR	2511	GETDAT	0456	K0400	0014
C8EXT1	0236	DCODES	7335	GETLCD	4247	K0750	0123
C8EXT2	0310	DDCODE	3632	GETUNI	4455	K12	0120
C8FILL	1052	DDERRO	3616			K16	0121

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
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	NOTCL8	5443	Q46ID	2621
LCDDL	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

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
REDO1	0662	START	0140	TTYBUS	0171	XC8INQ	0635
REDOA	0415	STESTP	0172	TTYLPT	1137	XC8LOO	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        XXDRIN  0522
XLOGRE  0320        XXDROU  0525
XLOGS   7450        XXDUMP  5056
XLS     0233        XXGETA  3010
XMESSA  1316        XXINIT  4432
XMORED  2342        XXKCC   0176
XMX     0255        XXTAB   3226
XNOERR  5112        XXTHEL  0647
XNONE   2245        XXX     0004
XNULIN  3276        XYTHEL  0651
XOCTAL  2760        YDUMP   5167
XOUTPU  3250        YYY     0005
XPASSE  0260        ZERO    2755
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
```

ERRORS DETECTED: 0

LINKS GENERATED: 279

RUN-TIME: 31 SECONDS

4K CORE USED

Symbol	References
A0	4196 4202# 4926 4940 4941 5122 5123 5127 5129 5150 5151 5153
A10	957# 1408 1409 1410 4926 4940 4941 5122 5123 5127 5129 5150 5151 5153 5155 5179 5180 5199 5201 5322 5329 5331 5124 5141 5143 5149 5198 5202 5324
A11	958# 1898 1899 1924 1934 1954 2657 5325
A12	959# 1900 1922 2655 4922 4950 4958 4967 5152 5160 5162 5177 5178 5190
A13	960# 3715 3718 3733
A3	5687# 5688
ACCEPT	1677 1706 1718 1751# 1758 1763
ACODE	4198 4200 4204 4205 4208#
ACODES	4199 4203 5684# 5685
ACRC	4199 5685# 5686
ACSAV	232 235 410 641 721#
ACTIVE	5310 5311# 5320
AERROR	989# 3894 3957 4256
ANDRET	2861 2870#
ANOTO	4187 4197#
APAR	5686# 5687
APT8	1113# 1250
ARESTA	1125# 1288 2974 2982 4808
ASTATU	1155# 1361 1793 2267 2497 3837 3857 3885 4185 4317 4549
AUTO	1328# 1372
AUTOER	1339 1344#
AUTOL	1331# 1350
AUTOOK	1338 1346 1359#
AUTORE	1287 1320# 2984 5070
B10	4218 4222 5690#
BCODE	4217 4219 4223 4224 4227#
BCODES	4218 4222 5688# 5690 5692
BEGIN	1232 1233 1250#
BSTATU	1156# 4129 4213 4342 4440
BSW	1022# 3677 3694
BSWAC	1161# 5236 5241 5248 5251
BSWLIN	1162# 5238 5249
BSWRAL	5240 5246 5253#
BUSY	1126# 1254 1323 3809 3812 3897 4023 4042 4045 4046 5270
C8BY1	56 58 78# 91
C8BY3	647 650 656#
C8BY4	315# 468
C8BY5	706 714#
C8CHAR	147 148 247 256 264 266 268 398 482 495 507 511 515 517 679 681# 3618
C8CK22	50 233 430 463 648 730# 736 737
C8CKP	582 591 595#
C8CKSE	1295 1813# 1818 1820
C8CNTL	994# 4866
C8D01	174# 195
C8D011	380 384#
C8D02	614# 616
C8D04	583# 592
C8D07	326 331#
C8ERR1	510 514 551#
C8EXT1	55 79#

Symbol	References
C8EXT2	123 128#
C8FILL	610 618#
C8GET	303 332 346 386 403# 411 438 652 656 673
C8GET1	123 125#
C8INQU	992# 5223
C8LOOK	945# 1807
C8PASK	2848#
C8PASS	983# 1853
C8RET1	1639# 1854
C8RETD	382 387 390#
C8RETR	304 329 337#
C8SETD	378 383 385 389#
C8SETS	301 312 324 330 336#
C8STRT	318 1232#
C8SWIT	986# 1472 1479 1817 5302
C8SWST	315 466 469 521 524#
C8TEST	4865# 5402
C8TMP1	580 583 587 590 594#
C8TST2	3611# 3617 5381
CAF	30# 562 1801
CCNT	3416 3421 3426 3437#
CHARLI	3639 3702 3709 3711#
CHECK	1538 3562# 3584 3601 4792
CHECKC	979# 1471 1478 1806 1816 1852 4865 5222 5301
CHEK22	1115# 1290 1426 1827 3664 3716 3760 5214 5462
CHK22	1116 5052# 5056 5057
CKCOUT	57 70 72 81# 93 94
CKDEVI	5303 5306# 5436
CKSWIT	895 948#
CLKCNT	5465 5468 5476#
CNOTFI	2584 2645#
CNTRLC	288 559#
CNTRLD	293 377#
CNTRLE	292 345#
CNTRLO	294 351#
CNTRLQ	289 301#
CNTRLR	290 311#
CNTRLS	291 324# 335
CNTVAL	86 100#
COMMAN	1127# 1794 3849 4088 4465 4466 4482 4497 4516
COMPAR	2308 2356 2470 2490#
COMPRE	1128# 2309 2358 2509 2582 2650 2679 2772 2790 2797 2803 4279
COUNT	5467 5477#
CRCERR	2269 2305#
CSTATU	1157# 4139 4346 4459
DASHAL	4315 4330#
DASHBC	4329 4334#
DATAER	3550 5652# 5656
DCADOA	1658 1666#
DCAGOO	1928 1933 1950#
DCATAR	3197 3200 3208 3211#
DCODES	4064 4066 5682# 5683
DDCODE	4067 4068 4071#

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DDERRO   3870    4059#
DDIGNO   3844    3871#
DELUNI   1049#   1364
DEVCDE   1432    5330#
DIGITS   3395    3417    3434#
DISPLA   1780    1782    1791#
DMTYPE   4061    4062    4073    4087    4193    4841    4845#
DNS      2165#   2288    2362
DNSEPR   2434    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    2680    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     437     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
GFTCH1   488#    500
GETDAT   243     244     251     277#
GETLCD   4481    4495#   4506    4515
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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
GOTOA    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     858     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    2369    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
IOTWAT   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
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K377	1143#	2542	2671	2764	3836	4128	4138						
K4000	5054	5058#											
K6500	5472	5475#											
K6520	1146#	3767											
K67X1	4467#	5350											
K67X2A	1589#	5351											
K67X2B	1594#	5334											
K67X3	1600#	5352											
K67X4	1608#	5353											
K67X5	1615#	5354											
K67X5A	5335	5354#											
K67X5B	3828#	5336											
K67X6	4645#	5355											
K67X7	4652#	5356											
K7000	1145#	1657	1663	3411	4525	4877	5430						
K7377	1144#	1430											
K74	1140#												
K7777	1133#	1459	3210	3394	3950	3982	4072	4209	4228				
KEYSWI	1980	4303	4351	5411#	5426	5427							
KM10	1135#	4447	5338										
KM40	1136#	1256	1326	1776	3080	4444	5272						
KM6	1134#	5239											
KM74	1137#												
KRETRY	1150#	1329	2049	2051	2087	2167	2239	2244	2252	2254	2403	2411	2499	3937
LAS	895#	1298	1347	1476	1778	2072	2103	2151	2158	2180	2273	2318	2331	2575
	2645	2735	2766	2808	2838	4232	4436	4450	4557	4850	5305			
LASSW0	4439	4443	4446	4450#									
LASSW3	4232#												
LAST	1018#	1503	1507	1508	3451	3516	3581	3600					
LCD	1027#	4122	4132	4483	4517								
LCDA	1029#	1332	2056	2504									
LCDB	1031#	2094	2258										
LCDBL	4516#	4560											
LCDBRE	4523	4545#	4569										
LOCK	1070#	1457	3948	3980	4070	4207	4226	4627					
LOG	1072#	1359	2082	2129	2165	2279	2377	2414	2443	2451	2457	2799	3549	4565
LOGBST	4195	4206	4213#										
LOGCOD	4183#												
LOGCOM	2128	2174	2372	2831	4600	4618#	4621	4626	4630				
LOGGED	3939	3990#											
LOGLSB	4619	4620	4623	4628#									
LOGMSB	4624	4625	4629#										
LOGREF	1407#												
LOGRER	2413	2437	2457#										
LOGS	1407	5591#											
LOGSAM	4592	4597#											
LOGTAF	4589	4593#											
LSB	1216#	2672	2674	5136	5138	5142	5147	5161	5166	5339	5341		
LSBX1	3932	3933	3945	3946	3949#								
LSBX2	3977	3978	3981#										
MAREST	4810	5561#											
MBYTE	2636	5544#											
MCOLON	5550#												

MCOMMA	3065	5515#								
MCRLF	1860	2654	3568	4289	4291	4796	4813	4918	5133	5523#
MCRLFS	4939	5206	5524#							
MDASH	4331	4335	4339	5189	5566#					
MDATAE	2625	5542#								
MDELET	3029	5552#								
MDESUM	2794	4797	5549#							
MDEVIC	5300	5519#								
MDIREC	1997	1999	2001#							
MDISKE	3055	5514#								
MDNSER	2620	5540#								
MDUMP	4764	5553#								
MDUMPH	5120	5563#								
MDWESE	2623	5541#								
MEDDDI	4048	5574#								
MEHEAD	4267	5530#								
MEOT	2843	5526#								
MESA	472	555#								
MESPAS	62	101#								
MESSAG	3672	3673	3675	3676	3680#					
MFIRST	3594	5536#								
MGB	2641	5545#								
MHOME	4360	4394	5531#							
MHUNGP	5369	5529#								
MID	3590	5535#								
MIDENT	1803	2971	4762	5578#						
MIDUMP	4818	5562#								
MINCOM	4784	5556#								
MINIT	4301	5532#								
MINTER	4779	5555#								
MKEY	5424	5533#								
MLAST	3598	5537#								
MLEFTP	4805	5560#								
MLOGOV	4769	5554#								
MMDATA	4993	5569#								
MMDNS	4994	5570#								
MMERRO	4966	5573#								
MMPARI	4997	5572#								
MMREAD	4992	5568#								
MMSEEK	4996	5571#								
MMUNRE	3553#	4954								
MMWRIT	4991	5567#								
MNO	5528#									
MNOGON	2978	5518#								
MNONE	3062	5512#								
MNOSER	2149	5576#								
MNOTRE	2969	5516#								
MOD	3586	5534#								
MOK	2785	5548#								
MOREDR	3060	3066#								
MPASSE	1402	2711	5527#							
MQA	29#	239	644	899#						
MQL	31#	406	900#	1783						

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MQSAVE    240    405    645    722#
MREAD    2328   2606   5539#
MREFRE   1400   5522#
MRESTA   4802   5559#
MRS      2981   5517#
MRUNTI   5558#
MSB      1217#   5144   5163
MSDNUN   2147   3253#
MSDRIV   1815   5520#
MSLASH   4983   5565#
MSNDER   2330   4995   5546#
MSPACE   5195   5525#
MSTEST   1467   5521#
MSUMCH   2780   5547#
MTESTP   3564   5557#
MUDDDI   4049   5575#
MUNIT    3024   4932   5551#
MUNKNO   3896   5577#
MWORD    2628   2639   5543#
MWRITE   2325   2603   5538#
MWRSRD   4977   5564#
MX         95   2716   2828   2853#
NEXT     2908#   2918
NEXTSE   3490#   3520   3531
NOHEAD   4259   4276#
NOINFO   3021   3046#
NOPRIN   4235   4850#
NOSER    2149#   3888
NOSET      85     90#
NOTCL8   5493   5507#
NOTEST   1417   1466#   3172
NOTICK   3251   4413   4840#
NOTQ     5385   5396#
NRETUR   1862#
NSTAND   3572   3576   3580   3585#
NULINE   3690   3697#
NUREAD   2142   2189#   2197
NUWORD   3673#   3679
OD       1015#   1526   1530   1533   3123   3196   3232   3319   3331   3351   3372   3376   3570   3588
OKRETU   3889   4023#
OKSTAR   3498   3504#
ONECRL   4268   4281   4287   4290#
OTHERR   4545   4551   4556   4565#   4567
OUTPUT   3674   3678   3681#
PACKDO   5495   5501#
PAGE1    3527#
PASCNT     59     97#
PASMES   1852#   2836
PASSES     98   1404   2713   2830   3248   5595#   5601
PASSIN   1148#   2824   2829   3120   3955   4780
PASSRE   1640   2717   2838#
PAT2     1961   1970#
PAT3     1962   1971#
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PAT4     1963   1972#
PAT5     1964   1973#
PAT6     1965   1974#
PATR1    1871   1875#   1901
PATR2    1873   1876#   1903
PATSAV   1869#   1874   2848
PATSET   1882#   1905   2055   2501
PATTER   1887   1889   1959#
PCLF       24#    708    713
PCSAVE    720#
PERROR   1360   2083   2800   4566   5668#   5682
PHOME    4371   4393#
PI        922   3784#
PICLSK   3791   3809#
PIEXIT   3687   3723   3800   3811   3898#   4870   5363   5392   5407
PNTBUF    697    701    707    716#
PNTEXT   3665   3717   3726#
PNTID    1268   1800#   1809
PNTNOP   4876#   4879
POLL     2906   2908   2910   2911   2985#
PRETRY   1174#   1330   1344   1351   2052   2069   2076   2088   2255   2500   2732   2739   3987   4554
         4561
PRINT    1074#   1399   1401   1466   1802   1804   1814   1859   1998   2156   2324   2327   2329   2602
         2605   2619   2622   2624   2638   2640   2653   2710   2714   2779   2784   2793   2842   2968
         2970   2977   2980   3023   3028   3054   3061   3064   3563   3567   3585   3589   3593   3597
         3895   4266   4288   4290   4300   4330   4334   4338   4359   4393   4761   4763   4768   4778
         4783   4795   4801   4804   4809   4812   4817   4844   4917   4931   4938   4953   4963   4965
         4976   4982   5119   5132   5188   5194   5205   5299   5368   5423
PRINTD   1076#   1373   3036   4788
PSIE       27#
PSKE       25#
PSKF       23#    711
PSTB       26#    708
PTSTOR    172    174    185    194    196#
Q46ID    3277   3313   3325#
Q460D    3282   3321   3331#
Q40D     3261   3274#
Q60D     3303   3317#
QUIET    2154   2158#
R0       4975   4987#
R1       1870   1902   3176   3182   3743   3746   3749   3753#
R1RETR   1168#   2189   2198   2240   3931
R2       1872   1904   3178   3184   3744   3747   3750   3751   3754#
R2RETR   1169#   2175   2190   2245   2405   2441   2449   3547
RANGEN   1949   1959   3179   3741#   3752
RDC      1149#   2033   2237   2305   2353   2435   2577   3468
RDORWR   1625#   1632   1633   2196   2322   2383   2600
READ     1078#   1653   1661   1679
READCO   1080#   1655   1659   1708   1719
READER   2266#
READL    2239#   2460
READOK   2259   2352#
READRE   2143   2244#
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READS    2173   2371   4973   4987   5609#  5620
REASK1   802    805#
RECALI   4436#  4861
REDO1    470#   554
REDOA    244#   252
REFILL   2055#  2075
REMOVE   1805   5513#
REREAD   2183   2252#
RERROR   2458   5648#  5652
RESEEK   2254#  2276
RESEQU   3152#  3225   3234
RESTAR   1455   1458   4800   5601#  5605
RETUR1   1861   2710#
RETUR2   1859#
RETURN   3841   4015#  4017   4025   4485   4524   4571
REWRIT   2039#  2199
RLOGGE   2281   2416   2455   2459#
RNOTOK   2191   2200   2383#
ROK      2355   2363#
RS       2161   2953#  3115   3989   4462   5372
RXERRO   3873   4043   4087#
S200     1288#
S202     1236   1251   1285   1414   2962   3035   4760#  4773   4823
S202RE   4791   4823#  5207
SAME     4599   5148   5629#  5638
SAVEBS   4110#
SAVECS   4130#
SDN      1041#  1275   4124   4134   4656
SDNFIR   1275#  4383   5282   5420
SDNOK    5313   5320#
SDNSEC   2008   4656#
SDNUNE   2147#  3832
SECTOR   1151#  2133   2459   3040   3454
SEQ      3148   3150   3165#
SEQABO   3169   3361#
SEQBBO   3170   3258#
SEQDEC   3167   3203#  3356
SEQID    3168   3338#
SEQINC   1705   3166   3192#  3357
SEQR1    3175   3183   3187#
SEQR2    3177   3185   3188#
SEQRAN   3153   3165   3175#
SEQSTP   3171   3300#
SER      1039#  1276   3871   4078   4125   4135   4657
SERROR   2130   2166   2280   2378   5664#  5668
SETUP    1082#  3386   3637   4828
SHIFT    3396#  3418
SHIFTS   3397   3403   3436#
SND      2288#  2289   2334
SNDERR   2452   5660#  5664
SNDLOG   1172#  2249   2314   2352   2446   2450
SPECIA   1084#  4854   4936
SRETRY   1173#  2050   2100   2107   2140   2168   2253   2270   2277
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SSTART   1152#  1258   2122   2366   4356   4367   4590   4665
STARGE   1153#  1932   2121   2365   3506   3518   3527   3538   4401   4531
START    1154#  1704   2120   2364   3143   4363   4587
STESTP   1219#  1555   1762   1894   1995   2090   2538   2633   2667   2760   3475   3854   4503
STOP     1086#  1682   1722
STOPNT   197#
STR      1037#  2062   2516   4529   4533
SUMCHE   1214#  1891   1938   1946   1951   1953
SUNITS   1226#  1391   1488   4785
SW0      903#   1299
SW1      904#   1299   2839
SW10     913#   1779
SW11     914#   1779
SW2      905#   2646
SW3      906#
SW4      907#
SW5      908#   4851
SW6      909#   4437
SW7      910#
SW8      911#
SW9      912#
SWTNOP   5431   5437#
T0T7     1755   1759#
TAB      1088#  2661   2675   3245   4307   4318   4332   4336   4343   4347   4364   4368   4398   4402
         4947   5139   5158   5183
TAB27    4340   4347#
TAB41    4352   4361   4368#
TAB5     4302   4307#
TAB53    4395   4402#
TAB60    1981   1994   2000   3245#
TABLA    278    280#
TABLB    279    288#
TAF      4595   5121   5148   5620#  5629
TAFE     3976   5638#  5639
TAFE0    3973   3974   3976   5167   5174   5175   5639#  5640
TAFE1    3973   3974   3976   5174   5175   5640#  5644
TARGET   1158#  1259   1703   1761   1927   2119   2363   3142   3181   3198   3209   3211   3223   3230
         3317   3332   3370   3377   3534   3975   4397   4535   4585   4593   4597
TCTRLS   5284   5361#
TEST     1670#  1683   1684
TEST1    1576   1661#
TEST2    1577   1659#
TEST3    1578   1579   1655#
TEST4    1581   1653#
TEST5    1582   1663#
TEST7    1579#  1584
TESTL    1672#  1681
TESTP    1159#  1477   1543   1553   1752   1792   1884   1983   1991   3145   3566
TESTS    1547   1575#
THEL     1701#  1710
THENEX   2876#  3429   3652   4833
THETES   1560   1575   1583   1692#  1712   1724
TMPCNT   487    499    525#
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TRACKS   1179#  1680   1709   1720   3042   3124   3125   3193   3204   3259   3267   3269   3275   3280
         3301   3306   3309   3310   3326   3339   3342   3345   3346   3354   3362   3366   3367
TSTCHA    481    489    502#   519
TTRACK   1180#  3127   3192   3203   3258   3279   3300   3312   3325   3338   3348   3361   3369
TTYBUS   1218#  1235   1253   2858   2870   2878   3385   3666   3686   3721   3724   3796   4869   5209
         5361   5390   5394   5406   5496
TTYLPT    559    698    717#
TWOCRL   4278   4288#
TY1ASC   3701   3705   3707   3714#  3737
TY4OCT   1090#  1982   2659   2673   2677   2787   2795   3025   3067   3565   3587   3591   3595   3599
         4305   4316   4341   4345   4362   4366   4396   4400   4798   4806   4814   4945   5098   5137
         5185   5192   5340   5370
TY8OCT   1108#  1403   2712   3247   4978   4985   5145   5164
TYBSTA   4328   4341#
TYPEIT   1092#  3415   3431   3649   3695   4832
UDCODE   4064   5683#  5684
UNIT     2928   2995#  4130   4496
UNITS    1321   1393   1487   2904   2986#  3008   3009   3030   3046   3058   4786   4789
UNITX    2920   2921   2994#  3006
UNITZ    1325   2125   2171   2369   2899   2901   2916   2925   2993#  3027   3069   3944   3971   4065
         4202   4221   4924   4933   4969   5172   5187
UNKNOW   3829   3893#  3893
UNRECO   3935   3942#
UPAROW    311    345    351    377    395#   401    560
UREAD    2177   2196#
USEEK    2272   2279#
USTART   1224#  2900
VERIFY   3872   3885#
W0       4972   4974   4980#
WAIT     1119#  1272   4123   4133   4655
WATEX    3084   3091#
WATMES    435    724#
WERROR   2415   3929   4925   5644#  5648
WHAT2    2440   2445   3544#
WHAT3    2446#  3546   3551
WHATYP   2384   2435#
WHICHR   2039   2131   2140#
WNOTOK   2102   2108   2129#
WRESEE   2051#  2106
WRITE    1117#  1630   1665   1678   1707
WRITEL   2035#  2134
WRITEO   2095   2119#
WRITER   2100#
WRITES   2127   4971   4973   4980   5605#  5609
WUNITS   1322   2902   2905   2914   2923   2924   2987#  4787   5002
X1DUMP   4943   4967#
X3DUMP   4990   5119#
XA10      923#  2526   2533   2544   2678   5170   5176
XAC      3704   3900   3903#
XAERRO    990   3758#  3762
XANDRE   2864   2876   2877   2880   2881#
XAPT8    1114   1424#  1428   1433   5432
XASTAT   2498   2559   2616   2688#
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XAUTO    1371#  2958   3018
XBSW     1023   5235#  5252
XC8CHA   3614   3615   3618#
XC8CKP    116    640#   655    657    709
XC8CNT    231#   236    261    262    263    265    328    333    347    381    439    653    675    761
          800
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.V2512    3333    3378    3445#
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.V3071    2440    2445    2462#
.V3111    1538    1646#   4792    4888#
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.V3277    1630    1642#
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.V4000    4239    4231#
.V4100    3688    3776#
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.V4547    5402    5440#
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.V5775    2636    2700#
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.V6357    2173    2212#   2371    2464#
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.V6732    3976    3993#
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.V7663    5125    5265#
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.V7670    3708    3772#
.V7700     175     203#    1896    1897    2020#    3683    3778#
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.V7746    1498    1650#    3582    3621#
.V7747    3501    3624#
.V7757    5383    5443#
.V7762    4921    5114#
.V7771    5321    5452#
.V7774     501     749#
.V7775     486     532#
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