IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHRKA-E-D

PRODUCT NAME: RK8E DISKLESS CONTROL TEST

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MAINTAINER: DIAGNOSTIC ENGINEERING

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1.   ABSTRACT

      THE RK8E DISKLESS CONTROL TEST IS DESIGNED FOR
      THE PURPOSE OF CHECKOUT OF THE RK8E DISK CONTROL
      LOGIC NOT REQUIRING THE USE OF THE DISK DRIVE.
      THIS TEST SHOULD BE RUN WITH ALL EXISTING DRIVES
      SET TO THE LOAD POSITION.

2.   REQUIREMENTS

2.1   HARDWARE

      PDP-8/E, 8/M, OR 8/F COMPUTER OR OTHER
      FAMILY OF 8 COMPATIBLE COMPUTER WITH
      NECESSARY DW8E BUS ADAPTER.

      AT LEAST 4K OF READ/WRITE MEMORY. AT LEAST 8K OF MEMORY IS
      NEEDED FOR OPERATION OF THE CONSOLE PACKAGE.

      ASR-33 TELETYPE OR EQUIVALENT
      RK8E DISK CONTROL
      RK05J OR RK05F DISK DRIVE(S)

2.2   SPECIAL

      THE DISKLESS TEST CAN BE RUN WITH ALL DRIVES
      AVAILABLE CABLED TO THE RK8E CONTROL. HOWEVER,
      THE POWER MUST BE SUPPLIED TO THE DRIVES, AND
      ALL THE DRIVES MUST BE SET TO THE LOAD POSITION.

      THE DISKLESS TEST CAN ALSO BE RUN WITH THE
      CABLES TO THE DRIVES DISCONNECTED FROM THE
      RK8E CONTROL.

2.3   STORAGE

      THE PROGRAM UTILIZES OR OCCUPIES LOCATIONS 0000 TO
      7377 OF FIELD 0 AND LOCATIONS 0200 TO 1377 OF FIELD 1.

      THE PROGRAM WILL ALSO TEST DATA BREAK TRANSFER TO
      ALL EXISTING EXTENDED FIELDS AS INDICATED BY SWR9-11
      IF THE CONSOLE PACKAGE IS NOT ENABLED.

3.   PRELIMINARY PROGRAMS

      ALL BASIC AND EXTENDED MEMORY DIAGNOSTICS SHOULD
      BE RUN PRIOR TO THIS TEST.

4. SWITCH REGISTER SETTINGS

SWR0=1   ENTER SCOPE LOOP. AFTER AN ERROR HALT
                        AT LOCATION "ERHLT9" RAISING THIS
                        SWITCH AND PRESSING KEY CONTINUE
                        WILL CAUSE A SCOPE LOOP ON THE
                        CURRENT TEST. IF SWR2=0 AND THE
                        TEST IS STILL FAILING, THE ERROR
                        BELL SHOULD RING INDICATING AN
                        ERROR.

SWR1=1   INHIBIT END OF TEST HALT. AT THE COM-
                        PLETION OF THE TEST THE PROGRAM
                        SHOULD HALT AT LOCATION "ENDHLT".
                        RAISING THIS SWITCH WILL INHIBIT
                        THE END OF TEST HALT.

SWR2=1   INHIBIT ERROR BELL ON SCOPE LOOP.

SWR3=1   GET ALL REGISTERS AFTER "ERHLT9".
                        AFTER AN ERROR HALT AT LOCATION
                        "ERHLT9", RAISING THIS SWITCH AND
                        PRESSING KEY CONTINUE WILL RESULT
                        IN THE TYPEOUT OF THE ABSOLUTE CON-
                        TENTS OF THE STATUS, COMMAND, CPC,
                        LOWER DATA, AND SURFACE AND SECTOR
                        REGISTERS. ONCE THIS SWITCH IS USED
                        IT IS NECESSARY TO RESART THA DIAGNOSTIC
                        AT THE START (LOCATION 0200).

SWR4=1   STOP PROGRAM OR TEST HALT. RAISING THIS
                        SWITCH WILL HALT THE PROGRAM AT
                        THE COMPLETION OF THE CURRENT TEST.
                        IF POSSIBLE THIS SWITCH SHOULD
                        ALWAYS BE USED TO STOP THE PROGRAM.

SWR9-11   AMOUNT OF EXTENDED BANKS OF MEMORY.
                        AT INITIAL START OF THE PROGRAM,
                        SWR9-11 INDICATES THE AMOUNT OF
                        EXISTING EXTENDED MEMORY FIELDS
                        AVAILABLE TO TEST.

5. OPERATOR AND/OR PROGRAM ACTION

5.1 STANDARD TEST PROCEDURE

A. START AS SPECIFIED THROUGHOUT THIS DOCUMENTATION IS KEY
   CLEAR AND THEN KEY CONTINUE ON A PDP8/E, PDP8/F, OR
   PDP8/M COMPUTER.

B. LOAD THE PROGRAM INTO FIELD 0 USING THE
   STANDARD BINARY LOADER TECHNIQUE.

C. IF IT IS DESIRED TO CHANGE THE IOT CODES WITHIN THE
   PROGRAM, FOLLOW THE PROCEDURE IN SECTION 5.4.

D. RUN THE DISKLESS CONTROL TEST PORTION BY FOLLOWING
   THE PROCEDURE IN SECTION 5.2.

E. RUN THE MANUAL SCOPE TEST BY FOLLOWING THE PROCEDURE IN
   SECTION 5.3.

5.2   DISKLESS CONTROL TEST

A. SET THE SWITCH LABELED "RUN/LOAD" TO THE "LOAD" POSITION ON
   ALL DRIVES, OR DISCONNECT DRIVES FROM RK8E CONTROL.

B. IF DRIVES ARE CABLED TO THE RK8E CONTROL, VERIFY
   AC POWER IN THE DRIVE(S) IS ON.

C. SET THE SWITCH REGISTER TO 0200 AND PRESS LOAD ADDRESS.

D. SET THE SWITCH REGISTER TO 0000.

E. SET SWR9-11 TO THE AMOUNT OF AVAILABLE EXTENDED R/W
   MEMORY BANKS AND START THE COMPUTER RUNNING.

F. SET SWR1=1 IF THE OPERATOR DESIRES TO INHIBIT THE END
   OF TEST HALT AT LOCATION "ENDHLT".

G. SWR4=1 SHOULD ALWAYS BE USED TO STOP THE PROGRAM.

H. THE PROGRAM SHOULD PRINT THE FOLLOWING MESSAGE AT
   THE COMPLETION OF EACH SUCCESSFUL PASS APROX. EVERY 3.5
   MINUTES.

        "RK8E DISKLESS PASS COMPLETE"

I. ANY HALTS OR TYPEOUTS OTHER THAN THE PASS COMPLETE
   TYPEOUT AND THE END OF TEST HALT MENTIONED ABOVE
   WILL BE CONCIDERED AN ERROR CONDITION. IN ALL CASES
   ACCESS "ERRORS" SECTION 6 IN THIS DOCUMENTATION.

J. FOR ABSOLUTE LOCATIONS OF ALL KNOWN HALTS ACCESS PAGE 1
   OF THE PROGRAM LISTING.

5.3   MANUAL SCOPE TEST FOR 16 BIT COUNTER

THIS TEST ENABLES THE OPERATOR TO TEST THE 16 BIT COUNTER
WHICH CANNOT BE TESTED UNDER PROGRAM CONTROL IN THE REGULAR
DISKLESS TEST. TO RUN THIS TEST, SIMPLY FOLLOW THE
FOLLOWING INSTRUCTIONS.

A. RUN THE DISKLESS CONTROL TEST PORTION PRIOR TO THIS
   MANUAL TEST.

B. SET THE SWITCH REGISTER TO 0204 AND PRESS LOAD ADDRESS.

C. SET THE SWITCH REGISTER TO 0000 AND PRESS START.

D. SCOPE THE 16TH CARRY OUTPUT, TEST POINT 1 (T1), ON THE
   M7106 MODULE IN THE RKRE CONTROL LOGIC, FOR A POSITIVE
   GOING SIGNAL.

E. THE APROX. SIGNAL SHOULD BE A GROUND TO + 3 VOLT PULSE,
   9 MICRO-SECONDS WIDE, OCCURRING AT A 140 MICRO-SECOND RATE.

F. ALL THAT THE PROGRAM DOES IN THIS SCOPE TEST IS TO CON-
   SISTANTLY ISSUE HI MAIN SHIFT PULSES TO THE 16 BIT
   COUNTER ON THE M7106 MODULE.

5.4   CHANGE PROGRAM DEVICE IOT CODES

THE PROGRAM NORMALLY RECOGNIZES PROGRAM DEVICE IOT CODE
X74X. TO CHANGE THE PROGRAM DEVICE IOT CODE:

A. SET THE SWITCH REGISTER TO 0205 AND PRESS LOAD ADDRESS.

B. SET THE SWITCH REGISTER TO 0000, SET SWITCH REGISTER BITS
   3-8 TO THE DESIRED DEVICE IOT CODE, AND PRESS START.

C. THE PROGRAM WILL CHANGE THE DEVICE IOT CODES WITHIN
   THE PROGRAM AND THEN HALT.

D. PRESSING KEY CONTINUE WILL RESULT IN A START OF THE
   PROGRAM AT LOCATION 0200 (SEE SECTION 5.2 FOR
   OPERATION INSTRUCTIONS).

6.   ERRORS

6.1   USEFUL ERROR INFORMATION

THE LOCATION OF ALL KNOWN HALTS CAN BE FOUND BY
ACCESSING PAGE 1 OF THE PROGRAM LISTING.

ALL ERRORS FOUND WHEN RUNNING THIS TEST SHOULD BE
CORRECTED BEFORE PROCEEDING ON IN THE TEST.

WHEN AN OPERATOR ENCOUNTERS AN ERROR WHEN RUNNING THIS
TEST HE SHOULD, IN ALL CASES, READ THE ERROR TYPEOUT
INFORMATION, NOTE THE LOCATION OF THE FAILURE, READ
ALL THE INFORMATION UNDER ERRORS IN THIS DOCUMENTATION,
AND THEN ACCESS THE PROGRAM LISTING FOR FURTHER
INFORMATION.

6.2 NON-RECOVERABLE ERROR HALTS

NON-RECOVERABLE ERROR HALTS FOR WHICH THERE ARE NO
TYPEOUTS OR SCOPE LOOPS ARE LISTED AND DEFINED AS FOLLOWS:

ERHLT1   UNDEFINED INTERRUPT

ERHLT2   SKIP TRAP FOR IOT "DCLR"

ERHLT3   SKIP TRAP FOR IOT "DLAG"

ERHLT4   SKIP TRAP FOR IOT "DLCA"

ERHLT5   SKIP TRAP FOR IOT "DRST"

ERHLT6   SKIP TRAP FOR IOT "DLDC"

ERHLT7   SKIP TRAP FOR IOT "DMAN"

6.3 RECOVERABLE ERROR HALT

ALL RECOVERABLE ERRORS, FOR WHICH THERE ARE SCOPE LOOPS
AND ERROR TYPEOUTS, SHOULD RESULT IN AN ERROR HALT AT
"ERHLT9".

ERHLT9   RECOVERABLE ERROR HALT. READ INFORMATION
                TYPEOUT ON TTY AND ACCESS LISTNG.

6.4 ERROR TYPEOUTS

WHEN A RECOVERABLE ERROR OCCURS THE PROGRAM WILL
PRINT AN "ERROR HEADER" WHICH WILL SPECIFY THE
PARTICULAR REGISTER IN ERROR OR TYPE OF ERROR FOUND
AT THE TIME OF THE FAILURE.

POSSIBLE "ERROR HEADERS" ARE AS FOLLOWS.

AC REGISTER ERROR
STATUS REGISTER ERROR
COMMAND REGISTER ERROR
DISK ADDRESS REGISTER ERROR
DATA BREAK ERROR
CRC REGISTER ERROR
DATA REGISTER ERROR
DISK SKIP ERROR
DISK INTERRUPT ERROR

AFTER THE "ERROR HEADER" MENTIONED ABOVE IS TYPED, THE
PROGRAM WILL PRINT THE FOLLOWING ERROR INFORMATION
FOUND AT THE TIME OF THE FAILURE, PERTAINING TO THE
FAILURE. POSSIBLE TYPEOUTS ARE AS FOLLOWS.

PC: PROGRAM LOCATION OF THE ACTUAL FAILURE.

GD: REFERS TO THE DATA EXPECTED IN THE REGISTER
        OR TYPE OF TEST SPECIFIED IN THE "ERROR HEADER".

CR: CONTENTS OF THE CRC REGISTER.

ST: CONTENTS OF THE STATUS REGISTER.

DB: CONTENTS OF THE LOWER DATA REGISTER.

CM: CONTENTS OF THE COMMAND REGISTER.

DA: CONTENTS OF THE DISK ADDRESS REGISTER OF
        THE CYLINDER, SURFACE, AND SECTOR BITS.

AD: BREAK ADDRESS OF DATA BREAK.

DT: DATA FOUND DURING DATA BREAK.

AC: CONTENTS OF THE AC REGISTER.

THE "GD:" INFORMATION TYPED OUT POINTS TO THE DATA
EXPECTED IN THE REGISTER IN ERROR OR TYPE OF ERROR TYPED
OUT IN THE "ERROR HEADER".

THE ERROR INFORMATION INDICATOR SUGGESTED BY THE "ERROR
HEADER" (I.E. DA: FOR DISK ADDRESS ERROR, CM: FOR COMMAND
REGISTER ERROR, CR: FOR CRC REGISTER ERROR, ETC.), IS THE
ACTUAL CONTENTS OF THAT PARTICULAR REGISTER. ERROR INFORMA-
TION OTHER THAN THAT SUGGESTED BY THE "ERROR HEADER" IS THE
SOFTWARE INFORMATION LOADED INTO THAT REGISTER PRIOR TO
THE FAILURE.(NOTE: "ST:" STATUS ALWAYS INDICATES THE ACTUAL
CONTENTS.)

TO TYPEOUT THE ACTUAL CONTENTS OF THE CRC, STATUS,
LOWER DATA, COMMAND, AND SURFACE AND SECTOR REGISTERS,
AFTER AN ERROR HALT AT LOCATION "ERHLT9", SET SWR3=1
AND PRESS KEY CONTINUE.

6.5   SCOPE LOOPS

           THERE ARE SCOPE LOOPS AVAILABLE FOR ALL ERRORS
           RESULTING IN AN ERROR HALT AT "ERHLT9".

           TO ENTER SCOPE LOOP, INHIBIT ERROR TYPEOUT, AND INHIBIT
           ERROR HALT, AFTER AN ERROR HALT AT "ERHLT9", SET SWR0=1
           AND PRESS KEY CONTINUE.

           IF THE SCOPE LOOP IS WORKING CORRECTLY AND IF THE TEST
           IS STILL FAILING THE TTY BELL SHOULD RING. SET SWR2=1
           TO INHIBIT THE TTY BELL.

6.6   TYPICAL ERROR TYPEOUTS

           THE FOLLOWING IS A TYPICAL EXAMPLE OF AN "ERROR HEADER"
           AND TYPEOUT THAT COULD HAVE OCCURRED IF A DISK IOT
           FAILED TO CLEAR THE AC REGISTER.

           AC REGISTER ERROR
           PC:1541 GD:0000 AC:0100

           THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND
           TYPEOUT THAT COULD HAVE OCCURRED WHEN READING THE
           COMMAND REGISTER.

           COMMAND REGISTER ERROR
           PC:2100 GD:0222 CM:0200

           THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND
           TYPEOUT THAT COULD HAVE OCCURRED IF THE DISK
           SKIP IOT FAILED TO SKIP.

           DISK SKIP ERROR
           PC:3332

           THE FOLLOWING IS AN EXAMPLE OF AN "ERROR HEADER" AND
           TYPEOUT THAT COULD HAVE OCCURRED ON A WRITE DATA BREAK.

           DATA BREAK ERROR
           PC:4453 GD:5252 CM:4000 AD:7777 DT:5250

7.   RESTRICTIONS

           THE PROGRAM IS ONLY OPERATIONAL IN FIELD 0.

           IF THE DRIVES ARE CABLED TO THE RK8E CONTROL LOGIC,
           THE AC POWER TO THE DRIVES MUST BE ON AND THE DRIVES
           MUST BE SET TO THE LOAD POSITION.

TROUBLE SHOOTING INFORMATION

IOT	FUNCTION
6741 DSKP	"SKIP" SKIP IF TRANSFER DONE FLAG OR ERROR FLAG IS SET.
6742 DCLR	"CLEAR" FUNCTION IS REGULATED BY AC BITS 10 AND 11. THE AC IS THEN CLEARED.

AC10	AC11	
0	0	CLEAR THE AC AND STATUS REGISTER.
0	1	CLEAR THE AC, CONTROL, AND MAJOR REGISTERS. THIS INSTRUCTION WILL STOP THE CONTROL EVEN IF IT IS WRITING A HEADER. THIS IS THE ONLY INSTRUCTION THAT WILL CLEAR MAINTENANCE MODE.
1	0	CLEAR AC, RECALIBRATE DISK DRIVE, AND CLEAR STATUS REGISTER.

6743 DLAG	"LOAD DISK ADDRESS AND GO" LOAD THE DISK CYLINDER, SURFACE, AND SECTOR FROM THE AC, CLEAR THE AC, AND DO THE COMMAND IN THE COMMAND REGISTER.

AC	
0-6	CYLINDER
7	SURFACE (1= UPPER) (0= LOWER)
8-11	SECTOR

6744 DLCA	"LOAD CURRENT ADDRESS" LOAD THE CURRENT ADDRESS FROM AC. THE AC IS THEN CLEARED.

AC	
0-11	CURRENT ADDRESS

6745 DRST	"READ STATUS" CLEAR THE AC AND READ THE CONTENTS OF THE STATUS REGISTER INTO THE AC.

```
AC
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0                           TRANSFER DONE
1                           READY TO SEEK, READ, OR WRITE.
2                           NOT USED
3                           SEEK FAIL
4                           DISK FILE READY
5                           CONTROL BUSY ERROR
6                           TIME OUT ERROR
7                           WRITE LOCK ERROR
8                           CRC ERROR
9                           DATA RATE ERROR
10                          DRIVE STATUS ERROR
11                          CYLINDER ADDRESS ERROR

6746 DLDC                   "LOAD COMMAND" LOAD THE COMMAND
                            REGISTER FROM AC, CLEAR THE AC,
                            AND CLEAR THE STATUS REGISTER.

AC
--

0-2=0                       READ DATA
0-2=1                       READ ALL
0-2=2                       WRITE LOCK
0-2=3                       SEEK ONLY
0-2=4                       WRITE DATA
0-2=5                       WRITE ALL
0-2=6                       NOT USED
0-2=7                       NOT USED
3                           ENABLE INTERRUPT
4                           ENABLE SET TRANSFER DONE ON SEEK DONE
5                           HALF BLOCK 128 WORDS
6                           EXTENDED MEMORY ADDRESS
7                           EXTENDED MEMORY ADDRESS
8                           EXTENDED MEMORY ADDRESS
9                           UNIT SELECT
10                          UNIT SELECT
11                          EXTENDED CYLINDER ADDRESS

6747 DMAN                   "MAINTENANCE IOT" LOAD THE
                            MAINTENANCE REGISTER FROM THE AC, THE
                            FUNCTION IS REGULATED BY THE AC BITS.
                            MAINTENANCE MODE CAN ONLY BE CLEARED
                            BY DCLR "CLEAR CONTROL".
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AC
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0	ENTER MAINTENANCE MODE
1	ENABLE SHIFT TO LOWER BUFFER
2	AC BIT 10, CRC REGISTER, AND THE LOWER DATA BUFFER ARE CONNECTED AS A SHIFT REGISTER. AC BIT 10 DATA SHIFTS TO THE CRC, THE CRC SHIFTS TO THE LOWER DATA BUFFER.
3	SHIFT COMMAND REGISTER TO THE LOWER DATA BUFFER.
4	SHIFT THE SURFACE AND SECTOR REGISTER TO THE LOWER DATA BUFFER.
5	SHIFT AC 10 DATA TO THE UPPER DATA BUFFER. THE UPPER BUFFER SHOULD SINK IN THE SILO WHEN FULL.
6	ONE SINGLE CYCLE BREAK REQUEST. DIRECTION IS REGULATED BY FUNCTION IN THE COMMAND REGISTER.
7	CLEAR AC THEN READ THE LOWER DATA BUFFER TO THE AC.
8	NOT USED.
9	NOT USED.
10	USED AS DATA WITH OTHER BITS IN THE MAINTENANCE MODE.
11	NOT USED.

9.   PROGRAM DESCRIPTION

THE RK8E DISKLESS CONTROL TEST IS BASICALLY A STATIC
REGISTER AND IOT TEST ON THE RK8E DISK CONTROL LOGIC NOT
REQUIRING THE USE OF THE DISK DRIVE. SINGLE CYCLE BREAKS
ARE ALSO EXECUTED TO AND FROM THE CONTROL LOGIC.

THE PROGRAM IS DIVIDED INTO MANY SEPARATE INDIVIDUAL
SUBTESTS, WHICH WILL TEST DIFFERENT PARTS OF THE CONTROL
LOGIC. THE SUBTESTS ARE ARRANGED IN SUCH A MANNER TO TEST
THE EASIEST FUNCTIONS FIRST. PRECEEDING EACH SUBTEST, IN
THE LISTING, IS A SHORT EXPLANATION OF THE TEST AND LOGIC
TESTED.

A BRIEF EXPLANATION OF SUBTESTS AND PROGRAM FLOW IS
AS FOLLOWS:

A. SETUP

   SETUP POINTERS AND RETURNS FOR CURRENT FIELD, AMOUNT
   OF EXTENDED FIELDS, AND INTERRUPT SERVICE.

B. TST0-TST3

   VERIFY REGISTERS AND CONTROL FLIP-FLOPS WERE CLEARED
   BY "CLR ALL" AT START OF TEST. (NOTE: "CLR ALL" GENERATED
   BY KEY START ON MOST PDP-8'S OR KEYS CLEAR AND THEN
   CONTINUE ON A PDP-8/E, 8/F OR 8/M.)

C. TST4

   VERIFY ALL DRIVES ARE SET TO "LOAD" OR WERE
   DISCONNECTED FROM CONTROL AT START OF TEST.

D. TST5

   VERIFY "DSKP" DISK SKIP IOT DOESN'T AFFECT AC REGISTER.

E. TST6-TST9

   VERIFY THAT IOTS "DLCA LOAD CURRENT ADDRESS", "DLDC LOAD
   COMMAND", "DLAG LOAD DISK ADDRESS", AND "DCLR CLEAR CONTROL
   FUNCTION" DO CLEAR THE AC REGISTER AFTER THEIR EXECUTION.

F. TST10-TST14

   VERIFY LOADING, CLEARING, AND READING THE COMMAND REGISTER
   USING VARIOUS DATA PATTERNS

G. TST15-TST28

   VERIFY LOADING, CLEARING, AND READING THE DISK ADDRESS
   REGISTER USING VARIOUS DATA PATTERNS.

H. TST29-TST30

   VERIFY LOADING, CLEARING, AND READING THE COMMAND REGISTER
   USING VARIOUS DATA PATTERNS

I. TST31

   VERIFY LOADING, CLEARING, AND READING THE DISK ADDRESS
   REGISTER.

J. TST32-TST33

   VERIFY "DMAN MAINTENANCE IOT" DOES NOT EFFECT AC REGISTER.

K. TST34-TST35

   VERIFY MAINTENANCE MODE CAN BE SET AND CLEARED CORRECTLY.

L. TST36-TST40

   VERIFY LOADING, READING, AND CLEARING THE CPC REGISTER
   USING VARIOUS DATA PATTERNS.

M. TST41-TST48

   VERIFY LOADING, READING, AND CLEARING THE BUFFER REGISTERS
   USING VARIOUS DATA PATTERNS

N. TST49-TST76

   VERIFY SETTING AND CLEARING VARIOUS STATUS REGISTER
   BITS, ERROR FLAGS, SKIP FUNCTIONS, AND INTERRUPT
   FUNCTIONS.

O. TST77-TST100

   VERIFY READ AND WRITE MAINTENANCE DATA BREAKS TO AND
   FROM CONTROL USING VARIOUS DATA PATTERNS IN CURRENT FIELD.

P. TST101-TST105

   VERIFY READ AND WRITE MAINTENANCE DATA BREAKS TO AND
   FROM CONTROL USING VARIOUS DATA PATTERNS IN ALL EXISTING
   EXTENDED R/W MEMORY FIELDS.

Q. TYPE PASS COMPLETE AND LOOP TO TST4.

10. CONSOLE PACKAGE ADDENDUM

10.1. DESCRIPTION

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 CONTINUING WITH EXECUTION OF THE
DIAGNOSTIC. ALL ERRORS AND PASS COMPLETES WILL BE PRINTED AT
THE TERMINAL. NO HALTS WILL BE EXECUTED.
2) CONSOLE PACKAGE NOT ACTIVE-THIS WILL RESULT IN THE
NORMAL STANDALONE OPERATION OF THE PROGRAM AS DISCRIBED IN
SECTIONS 1 THROUGH 9 OF THIS DOCUMENT.

10.2 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.

10.3 INITIALIZATION

FOR A ACTIVE CONSOLE PACKAGE

1.)   SET LOCATION 21 BIT$0=0$ TO INDICATE USE PSEUDO SWITCH
        REGISTER.

2.)   SET LOCATION 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

FOR A NON ACTIVE CONSOLE PACKAGE

1.)   SET LOCATION 21 BIT$0=1$ TO INDICATE NOT TO USE PSEUDO
        SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.

2.)   SET LOCATION 22 BIT3=0 TO INDICATE CONSOLE PACKAGE NOT
        ACTIVE.

10.4   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 AS
DESCRIBED IN SETION 10.2.

CONTROL E

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

CONTROL L

THIS WILL SWITCH THE TERMINAL MESSAGES
FROM THE DISPLAY TO A LINE PRINTER.
TO RESTORE THE MESSAGES ON THE TERMINAL
CONTROL L MUST BE TYPED AGAIN.IF
NO PRINTER IS AVAIBLE AND CONTROL L
IS TYPED THE RESULT WILL BE THAT THE
CONSOLE PACKAGE WILL WAIT FOR CONTROL C OR R.
THE CONTROL L WILL OUTPUT TO THE LINE
PRINTER AND THE PROGRAM WILL
ATTEMPT TO CONTINUE AS IF A CONTROL E
WAS TYPED IN.

CONTROL D

THIS WILL ALLOW THE ABILITY TO CHANGE
THE SWITCH REGISTER DURING PROGRAM
OPERATION. TYPING THIS CHARACTER WILL RESULT
IN AN INTERIGATION OF THE SWITCH REGISTER
QUESTION AS DESCRIBED IN SECTION 10.6.

CONTROL S

THIS WILL STOP PROGRAM EXECTUION AND WAIT IN A
LOOP FOR A CONTINUE. THE ONLY WAY TO CONTINUE
WILL BE TO TYPE A CONTROL Q, R OR C .
THIS IS A NONPRINTING CHARACTER.

CONTROL Q

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

10.5   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 PASS 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.

10.6   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

10.7   END OF PASS

AN 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 0246.

IF HALT AT END OF PASS IS SET THEN THE PASS MESSAGE WILL BE
PRINTED AND A WAITING STATEMENT WILL ALSO BE PRINTED,
A CONTROL CHARACTER IS NEEDED TO CONTINUE FROM THIS MESSAGE.
THE FORMAT OF THE END OF PASS MESSAGE IS

****

NAME PASS 0001

****

10.8   ERRORS

THE STANDARD ERROR REPORTS AS DESCRIBED IN SECTION 6
OF THIS DOCUMENT WILL BE USED.

10.9   SWITCH REGISTER SETTINGS

THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 4
OF THIS DOCUMENT WILL BE USED.

10.10   PARAMETER CONTROL WORDS

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	

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                                          2K=01
                                          7K=06
                                         32K=31
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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

10.11 LOCATION CHANGES

THE FOLLOWING FIELD 1 LOCATIONS CAN BE CHANGED TO MEET THE
SPECIFIC NEED FOR MODIFICATION OF THE DIAGNOSTIC.

0246	IS THE LOCATION FOR THE VALUE OF THE NUMBER OF PROGRAM PASSES NEED TO PRINT THE END OF PASS MESSAGE.
1037	IS THE LOCATION SET FOR THE NUMBER OF FILLER CHARACTERS AFTER A CRLF SET TO FOUR (4)

11. APT-8 HOOKS

11.1 DESCRIPTION.

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

1. ERROR INTERFACE

2. TIMING INTERFACE

EACH WILL BE EXPLAINED IN MORE DETAIL.

11.2 SET-UP

ONLY HARDWARE CONFIGURATION WORD 2 NEED BE ESTABLISHED
AT PROGRAM START UP. BIT ZERO (0) MUST BE SET TO A ONE (1)
TO INDICATE THAT THE PROGRAM IS TO RUN UNDER APT-8.

11.3 APT-8 INTERFACES

11.3.1. TIMING

APT-8 IS NOTIFIIED OF PROGRAM RUN WITHIN A .2 SEC TO
2.0 SEC WINDOW WHEN USED WITH A 1.2 MICROSECOND MEMORY CYCLE
TIME. THIS WINDOW WAS ESTABLISHED SO THAT IF RUN ON THE SLOWER
MOS MEMORY THE DIAGNOSTIC WOULD NOT CAUSE A TIMEOUT ERROR ON
THE APT-8 SYSTEM.

11.3.2 ERRORS

WHEN ON APT-8 ALL ERRORS ARE CONSIDERED FATAL. WHEN
REPORTING AN ERROR ONLY THE ERROR PC IS REPORTED TO APT. ERRORS
WHICH CAUSE A SYSTEM HALT ARE NOT REPORTED. THESE ERRORS ARE
INDICATED BY A TIMEOUT ERROR ON APT. THE ACTUAL ERROR CAN BE
DETERMINED BY EXAMINING THE AC AT THE TIME OF THE HALT.

PROGRAMED HALTS ARE EXPLAINED EARLIER IS THIS
DOCUMENT.

12.   PROGRAM LISTING

```
  1                     /RK8E DISKLESS CONTROL TEST
  2                     /
  3                     /MAINDEC-08-DHRKA-E-L
  4                     /
  5                     /COPYRIGHT (C) 1972, 1975 DIGITAL EQUIP. CORP.
  6                     /
  7                     /
  8                     /MAYNARD, MASS. 01754.
  9                     /
 10        0001              FIELD   1
 11                     /
 12
 13                     /CONSOL SRC -V2-R0- CONSOLE PACKAGE
 14
 15
 16                     /LAS= CALL C8CKSW OR JMS XC8SW
 17                     /THIS WILL READ THE SWITCH REGISTER FROM THE PLACE SPECIFIED
 18                     /BY LOCATION 20 BIT 0.
 19
 20
 21                     /THE PROGRAM SHOULD CHECK FOR A CONTROL CHARACTER FROM THE TERMINAL
 22                     /EVERY FIVE(5) SECONDS OR SOONER.
 23
 24                     /LOCATIONS THAT NEED TO BE SET UP FOR USING THE CONSOLE PACKAGE.
 25
 26                     /CNTVAL IN XC8PASS    THIS LOCATION DETERMINDS THE NUMBER OF
 27                     /PROGRAM COMPLETIONS THAT ARE NEEDED BEFORE THE PASS MESSAGE IS TYPED
 28                     /THE VALUE SHOULD PUT THE PASS MESSAGE OUT IN THE RANGE OF 1 TO 5 MINUTES.
 29                     /THIS SHOULD BE A POSITIVE NUMBER.
 30
 31                     /C8STRT   THIS IS FOUND IN CNTRL ROUTINE CONTROL R PART
 32                     /IT IS THE RETURN WHEN CONTROL R IS ENTERED (RESTART PROGRAM)
 33                     /THE RETURN JUMPS TO XDOSW WHICH CONTAINS C8STRT SO PUT THE LABEL C8STRT
 34                     /WHERE YOU WANT TO RESTART THE PROGRAM.
 35
 36
 37                     /SETUP1 IN XC8ERP    THIS IS THE MASK BIT FOR HALT ON ERROR
 38                     /PLACE THE CORRECT BIT IN THIS LOCATION FOR HALTING ON ERRORS.
 39
 40                     /SETUP2 IN XC8PASS    THIS IS THE MASK FOR HALT A END OF PASS.
 41
 42                     /THE CALL TABLE IS A CONDITIONAL ASSEMBLY.
 43                     /TO ASSEMBLE THE CALL REMOVE THE / BEFORE CONSOL=0.
 44                     /IN COMBINING THE CONSOL PACKAGE TO A DIAGNOSTIC.
 45                     /THE CALL TABLE IS TO BE AT THE BEGINNING OF A PROGRAM.
 46
 47
 48        0000    CONSOL=0
 49        6661              PSKF=   6661
 50        6662              PCLF=   6662
 51        6663              PSKE=   6663
 52        6664              PSTB=   6664
 53        6665              PSIE=   6665
 54        6004              GTF=    6004
 55        7701              ACL=    7701
```

```
 56        6007              CAF=    6007
 57        7421              MQL=    7421.
 58        7501              MQA=    7501
 59                     /
 60        0020          *20
 61                     /
 62   0020  0000    F1SWR,  0                       /PSEUDO SWITCH REGISTER
 63   0021  0000    F1OP1,  0                       /CONTROL 1
 64   0022  0000    F1OP2,  0                       /CONTROL 2
 65                     /
 66                     /
 67                     IFDEF CONSOL <
 68
 69
 70        0024          *24
 71
 72        4424              CRPASS= JMS I   .
 73   0024  0200                      XC8PAS          /C8 PASS COMPLETION ROUTINE
 74        4425              C8CKSW= JMS I   .
 75   0025  0262                      XC8SW           /CHECK SW REG SETTING
 76        4426              C8TTYI= JMS I   .
 77   0026  0272                      XC8TTY          /FETCH CONSOL CHAR
 78        4427              C8CNTR= JMS I   .
 79   0027  0400                      XC8CNT          /CHECK FOR CONTROL CHAR
 80        4430              C8PRNT= JMS I   .
 81   0030  0303                      XC8PNT          /C8 PRINT A BUFFER
 82        4431              C8SWIT= JMS I   .
 83   0031  0656                      XC8PSW          /SET UP PSEUDO SW. REG
 84        4432              C8OCTA= JMS I   .
 85   0032  1000                      XC8OCT          /CONVERT TO ASCII AND PRINT
 86        4433              C8CRLF= JMS I   .
 87   0033  1023                      XC8CRL          /DO A CARRIGE RETUR + LINE FEED
 88        4434              C8ECHO= JMS I   .
 89   0034  1063                      XC8ECH          /CHECK INPUT CHAR
 90        4435              C8TYPE= JMS I   .
 91   0035  1077                      XC8TYP          /C8 PRINT ONE CHAR
 92        4436              C8ERR=  JMS I   .
 93   0036  1207                      XC8ERR          /C8 ERROR  HANDLER
 94        4437              C8INQU= JMS I   .
 95   0037  0635                      XC8INQ          /LOOK FOR OPERATOR INTERVENTION
 96        4440              C8CKPA= JMS I   .
 97   0040  1241                      XC8CKP          /CHECK IF CONTROL CHAR
 98        4441              C8PAUS= JMS I   .
 99   0041  0337                      XC8PAU          /IF CONSOL PACKAGE RETURN CALL PLUS ONE
100                                                   /IF NOT USING CONSOL REPLACE CALL WITH
101                                                   /A HLT AND THEN GO TO THE HALT
102
103                     /*******************************************************************
104                                                   /*20              /PSEUDO SWITCH REGISTER
105
106                                                   /*21              /HARDWARE INDICATORS
107                                                   /4000=USE FRONT PANEL SWITCH REGISTER
108                                                   /0000=USE THE PSEUDO SWITCH REGISTER LOC.20
109
110                                                   /*22              /SYSTEM CONFIGURATION
```

```
111                                      /400=CONSOL PACKAGE SET ACTIVE
112                                      /0000=CONSOLE PACKAGE SFT DEACTIVE
113
114                                      /*23                    /RESERVED FOR FUTURE USE
115                    >
116      0200          *200
117                    /*****************************************************************
118                    /C8PASS
119                    /THIS IS CALLED AT THE END OF EACH PROGRAM COMPLETION
120                    /THE VALUE OF** CNTVAL** WILL BE DETERMINED BY THE TIME IT TAKES
121                    /THE PROGRAM TO COMPLETE THIS MANY C8PASS TO BE IN THE 1 TO 4 MINUTE
122                    /RANGE
123                    /        C8PASS=JMS    XC8PAS
124                    /EX. OF CALL            C8PASS
125                    /                       HLT              /HALT IF NON CONSOL PACKAGE
126                    /              JMP      START1           /CONTINUE RUNNING THIS PROGRAM
127
128
129                    /RETURN TO LOCATION CALL PLUS ONE WITH THE AC=0 IF NON CONSOL PACKAGE AND HLT
130                    /IF CONTINUE TO RUN THEN RETURN TO CALL PLUS2 AC=0
131                    /THE LOCATION SETUP2 IS THE MASK BIT FOR THE HALT AT END OF PASS
132                    /CHECK THAT IT IS CORRECT FOR THE CURRENT PROGRAM
133
134                    /CALLS USED BY XC8PAS ARE  CHKCLA=XC8CRLF=XC8OCTA=XC8SW=XC8PNT=XC8INQ=
135
136
137      0200  0000    XC8PAS,  0
138      0201  7200             CLA
139      0202  4777'            JMS      CHKCLA          /IS WORD 22 BIT 3 ACTIVE CONSOLE?
140      0203  5212             JMP      DOPACK          /IS CLASSIC
141      0204  4776'            JMS      C8GET           /GET ALL REGISTERS,
142      0205  4262             JMS      XC8SW           /DEACTIVE CONSOL CHECK SR SETTING
143      0206  0375             AND      (400            /FOR HALT ON END OF C8PASS
144      0207  7640             SZA CLA                  /1= HALT 0 CONTINUE
145      0210  5600             JMP I    XC8PAS          /GO TO HALT
146      0211  5230             JMP      C8BY1           /CONTINUE ON RUNNING PROGRAM
147      0212  4232    DOPACK,  JMS      CKCOUT          /CLASS CHECK C8PASS COUNT
148      0213  5230             JMP      C8BY1           /C8PASS COUNT NOT DONE REDO PROGRAM
149      0214  2250             ISZ      PASCNT          /C8PASS COUNT DONE SET C8PASS COUNT
150      0215  4774'            JMS      XC8CRLF
151      0216  4303             JMS      XC8PNT          /C8PRNT BUFFER
152      0217  0253             MESPAS                   /
153      0220  1250             TAD      PASCNT          /GET NUMBER
154      0221  4773'            JMS      XC8OCTA         /CONVERT IT TO ASCII
155      0222  4774'            JMS      XC8CRLF         /DO A CARRIAGE RETURN
156      0223  4776'            JMS      C8GET           /GET ALL REGISTERS,
157      0224  4262             JMS      XC8SW           /CHECK A HALT AT END OF C8PASS
158      0225  0375    SETUP2,  AND      (400            /MASK BIT
159      0226  7640             SZA CLA                  /HALT =1 NO SKIP CONTINUE =0
160      0227  4772'            JMS      XC8INQ          /STOP PROGRAM EXECUTION=LOOK FOR INPUT
161      0230  2200    C8BY1,   ISZ      XC8PAS          /BUMP RETURN
162      0231  5600             JMP I    XC8PAS
163      0232  0000    CKCOUT,  0
164      0233  1251             TAD      DOSET           /CHECK IF SET UP NEEDED
165      0234  7640             SZA CLA                  /0=SET UP C8PASS COUNT VALUE
```

```
166                                      /1=C8PASS COUNT VALUE OK
167      0235  5242             JMP      NOSET           /C8PASS COUNT VALUE ON
168      0236  1252             TAD      CNTVAL          /GET COUNT VALUE FOR THIS PROG
169      0237  7040             CMA                      /SET TO NEGATIVE
170      0240  3247             DCA      DOCNT           /STORE IN HERE
171      0241  2251             ISZ      DOSET           /INDICATE VALUE SET UP
172      0242  2247    NOSET,   ISZ      DOCNT           /COUNT THE NUMBER OF PASSES
173      0243  5230             JMP      C8BY1           /EXIT FOR ANOTHER PASS
174      0244  3251             DCA      DOSET           /SET TO C8PRNT C8PASS
175      0245  2232             ISZ      CKCOUT          /BUMP RETURN FOR
176      0246  5632             JMP I    CKCOUT          /C8PASS C8TYPE OUT
177      0247  0000    DOCNT,   0
178      0250  0000    PASCNT,  0                        /
179      0251  0000    DOSET,   0
180      0252  0000    CNTVAL,  0
181      0253  0410    MESPAS,  TEXT     "DHRKAE  PASS "
         0254  2213
         0255  0105
         0256  4040
         0257  2001
         0260  2323
         0261  4000
182
183
184
185                    /*****************************************************************
186
187                    /C8CKSW
188
189                    /THIS ROUTINE CAN BE USED INPLACE OF A READ THE SWITCHES LAS.
190                    /ROUTINE THAT WILL CHECK WHERE TO READ THE
191                    /C8 SWITCHES FROM IE. FROM PANEL OR PSEUDO SWITCH REGISTER
192                    /THE SELECTION IS DETERMINED BY THE STATE OF BIT 0 IN LOCATION 21.
193
194                                      /C8CKSW=          JMS XC8SW
195                                      /EX.    JMS       XC8SW            /READ THE C8SWIT REGISTER
196                                      /RETURN WITH THE CONTENTS OF SWITCH REGISTER
197
198                    /RETURN TO NEXT LOCATION FOLLOWING CALL WITH THE AC= TO VALUE OF C8SWIT SETTING
199
200                    /CALLS USED ARE=XC8CKPA=
201
202
203
204      0262  0000    XC8SW,   0
205      0263  4771'            JMS      XC8CKPA         /GO CHECK THE IF ANY CONTRL
206      0264  7000             NOP
207      0265  1921             TAD      21              /GET WD FOR INDICATOR
208      0266  7710             SPA CLA                  /CHECK IF FROM PANEL 4000
209      0267  7614             7614                     /DO LAS AND SKIP GET FROM PANEL WITH LAS
210      0270  1020             TAD      20              /PSEUDO SWITCH
211      0271  5662             JMP I    XC8SW           /EXIT WITH STATUS BIT IN AC,
212
213
214                    /*****************************************************************
```

```
215
216                         /C8TTYI
217                         /THIS ROUTINE WILL LOOK FOR A INPUT FROM THE TERMINAL
218                         /AND PEMOVE ANY PARITY BITS, THEN MAKE IT 8 BIT ASCI.
219                         /          C8TTYI= JMS XC8TTY
220                         /EX.       JMS       XC8TTYI          /READ CHAR FROM THE CONSOL DEVICE
221                         /                                             /RETURN TO CALL PLUS ONE AC CONTAINS THE CHAR
222
223
224                         /CALLS USED -NONE- BUT C8CHAR IS OFF PAGE AND IN ROUTINE CALLED XC8ECHO
225
226                         /
227                         /
228      0272  0000    XC8TTY, 0
229      0273  6031            KSF                              /LOOK FOR KEYBOARD FLAG
230      0274  5273            JMP       .-1
231      0275  6036            KRB                              /GET CHAR
232      0276  0370            AND       (177                   /MASK FOR 7 BITS
233      0277  1367            TAD       (200                   /ADD THE EIGTH BIT
234      0300  3766'           DCA       C8CHAR                 /STORE IT
235      0301  1766'           TAD       C8CHAR
236      0302  5672            JMP I     XC8TTY                 /EXIT
237
238
239
240                         /*************************************************************
241
242                         /C8PRNT
243
244                         /THIS ROUTINE WILL TYPE THE CONTENTS OF THE C8 PRINT BUFFER, THE LOCATION
245                         /OF THE BUFFER WILL BE IN THE ADDRS FOLLOWING THE CALL.    PRINTING OF THE BUFFER
246                         /WILL STOP WHEN A 00 CHAR IS DETECTED, CHARACTERS ARE PACKED 2 PER WORD.
247
248                         /          C8PRNT= JMS XC8PNT
249
250
251                         /EX.       JMS       XC8PNT              /C8PRNT THE CONTENTS OF THE FOLLOWING BUFFER
252                         /          MESS77                       /LOCATION OF C8PRNT BUFFER
253
254                         /C8PRNT WILL USE THE LOCATION FOLLOWING THE CALL AS THE POINTER FOR THE
255                         /C8PRNT ROUTINE,RETURN TO CALL PLUS TWO WITH AC= 0
256
257                         /CALLS USED ARE-XC8TYPE-XC8PNT
258
259
260
261      0303  0000    XC8PNT, 0
262      0304  7300            CLA CLL
263      0305  1703            TAD I     XC8PNT                 /GET C8PRNT BUFFERS STARTING LOCATION
264      0306  3336            DCA       PTSTOR                 /STORE IN PTSTOR
265      0307  2303            ISZ       XC8PNT                 /BUMP RETURN
266      0310  1736    C8D01,  TAD I     PTSTOR                 /GET DATA WORD
267      0311  0365            AND       (7700                  /MASK FOR LEFT BYTE
268      0312  7450            SNA                              /CHECK IF 00 TERMINATE
269      0313  5703            JMP I     XC8PNT                 /EXIT
```

```
271      0315  7020            CML                              /MAKE CHAR A 300 AFTER ROTATE
272      0316  7001            IAC                              /MAKE CHAR A 200 AFTER ROTATE
273      0317  7012            RTR
274      0320  7012            RTR
275      0321  7012            RTR                              /PUT CHAR IN BITS 4-11 MAKE IT 8 BIT ASCII
276      0322  4764'           JMS       XC8TYPE                /C8PRNT IT ON CONSOLE
277      0323  1736            TAD I     PTSTOR                 /GET DATA WORD
278      0324  0363            AND       (0077                  /MASK FOR RIGHT BYTE
279      0325  7450            SNA                              /CHECK IF 00 TERMINATOR
280      0326  5703            JMP I     XC8PNT                 //EXIT
281      0327  1362            TAD       (3740                  /ADD FUDGE FACTOR TO DETERMINE IF 200
282      0330  7500            SMA                              /OR 300 IS TO BE ADD TO CHAR
283      0331  1361            TAD       (100                   /ADD 100
284      0332  1360            TAD       (240                   /ADD 200
285      0333  4764'           JMS       XC8TYPE                /C8TYPE ONLY BITS 4-11
286      0334  2336            ISZ       PTSTOR                 /BUMP POINTER FOR NEXT WORD
287      0335  5310            JMP       C8D01                  /DO AGAIN
288      0336  0000    PTSTOR, 0                                /STOR FOR C8PRNT BUFFER
289                         /*************************************************************
290
291
292                         /C8PAUS
293                         /THIS ROUTINE WILL CHECK IF THE CONSOL PACKAGE IS ACTIVE,IF ACTIVE
294                         /IT WILL RETURN TO CALL PLUS ONE AC= 0, AND DO THAT INSTRUCTION.
295                         /IF THE CONSOL PACKAGE IS NOT ACTIVE THE CALL WILL BE REPLACED
296                         /WITH A 7402 HALT AND THEN RETURN TO THE HALT.
297
298                         /          C8PAUS= JMS XC8PAU
299                         /
300                         /
301                         /EX.             JMS       XC8PAUS          /CHECK IF ON ACTIVE CONSOL IF NOT HALT HERE
302                         /                ANYTHING                   /RETURN HERE IF ON ACTIVE CONSOL
303                         /
304                         /
305
306                         /CALLS USED ARE -CHKCLA-
307
308
309
310      0337  0000    XC8PAU, 0
311      0340  7300            CLA CLL
312      0341  4777'           JMS       CHKCLA                 /CHECK LOC 22 BIT 3 CONSOLE BIT
313      0342  5350            JMP       C8D03                  /GO DO CONSOL PART RETUPN CALL +1
314      0343  7040            CMA                              /DEACTIVE CONSOLE PACKAGE PUT HLT IN CALL
315      0344  1337            TAD       XC8PAU                 /GET CORRECT RETURN ADDRS
316      0345  3337            DCA       XC8PAU                 /SET UP RETURN
317      0346  1357            TAD       (7402                  /GET CODE FOR HLT
318      0347  3737            DCA I     XC8PAU                 /PUT HALT IN CALL LOCATION
319      0350  5737    C8D03,  JMP I     XC8PAU                 /GO TO HALT OR RETURN TO NEXT LOCATION
320
321
322      0357  7402
323      0360  0240
324      0361  0100
```

```
325   0362  3740
326   0363  0077
327   0364  1077
328   0365  7700
329   0366  1075
330   0367  0200
331   0370  0177
332   0371  1041
333   0372  0635
334   0373  1000
335   0374  1023
336   0375  0400
337   0376  0624
338   0377  1200
      0400        PAGE
339               /**************************************************************
340
341
342               /C8CNTR
343               /THIS ROUTINE WILL CHECK FOR THE PRESENCE OF CONTROL CHARACTERS
344               /IT WILL CHECK FOR THE FOLLOWING CHAR C-R-Q-L-S
345               /        C8CNTR= JMS XC8CNT
346
347               /EX,    JMS     XC8CNT              /CHECK FOR CONTROL CHARACTER
348               /       JMP     ANYTHING            /LOC FOLLOWING CALL IS FOR CONTINUING THE PROGRAM
349               /       JMP     ANYTHING            /LOC, IS FOR RETURN IF INMODE SET AND NOT CNTRL CHAR
350               /
351
352               /RETURN IS TO CALL PLUS ONE IF CONTINUE
353               /RETURN IS TO CALL PLUS TWO IF INMODE SET AND NOT CONTROL CHAR
354               /RETURN IS TO CALL PLUS TWO IF INMODE IS NOT SET AND NO
355               /CONTROL CHAR ..THIS WILL PRINT THE CHARACTER AND A ?
356               /CLEAR THE AC AND RETURN CALL+2,
357
358               /CALLS USED ARE-CHKCLA-XC8TYPE-XC8CRLF-C8GET-UPAROW-XC8TYI-XC8PSW-
359               /
360               /
361
362   0400  0000  XC8CNT, 0
363   0401  3777'          DCA     ACSAVE              /SAVE THE AC
364   0402  4776'          JMS     CHKCLA              /CHECK LOC,22 BIT3 FOR CONSOLE BIT
365   0403  5206           JMP     .+3                 /ON ACTIVE CONSOLE
366   0404  1777'          TAD     ACSAVE              /DEACTIVE CONSOLEGET AC FOR RETURN
367   0405  5600           JMP I   XC8CNT              /EXIT NOT ON ACTIVE CONSOLE
368   0406  6004           GTF
369   0407  3775'          DCA     FLSAVE
370   0410  7501           MQA
371   0411  3774'          DCA     MQSAVE              /SAVE THE MQ
372   0412  3255           DCA     INDEXA              /SET DISPLACEMENT INTO TABLE B
373   0413  1257           TAD     XTABLA              /GET ADDRS OF TABLE A
374   0414  3256           DCA     GETDAT              /CONTAINS POINTER TO CONTROL CHAR
375   0415  1656  REDOA,   TAD I   GETDAT              /GET CONTROL CHAR FROM TABLE
376   0416  7450           SNA                         /CHECK FOR A 0 END OF TABLE
377   0417  5226           JMP     DONEA               /END OF TABLE NO CONTROL CHAR
378   0420  1773'          TAD     C8CHAR              /COMPARE CHAR TO CONTROL CHAR
```

```
379   0421  7650           SNA CLA                     /0 IF MATCH
380   0422  5243           JMP     GOITA               /MATCH
381   0423  2255           ISZ     INDEXA              /NO MATCH NOT END OF TABLE REDO
382   0424  2256           ISZ     GETDAT              /BUMP INDEX FOR EXIT WHEN CONTROL FOUND
383   0425  5215           JMP     REDOA               /BUMP GETDAT FOR COMPARE OF NEXT CNTRL CHAR.
384   0426  1772'  DONEA,  TAD     INMODE              /CHECK IF PROGRAM EXPECTS CHAR
385   0427  7640           SZA CLA                     /1=CHAR EXPECTED  0= NO CHAR EXPECTED
386   0430  5240           JMP     EXITA               /CHAR EXPECTED
387   0431  1773'          TAD     C8CHAR              /GET CHAR - NOT CONTROL + NOT EXPECTED
388   0432  4771'          JMS     XC8TYPE             /C8PRNT CHAR
389   0433  1370           TAD     (277                /GET CODE FOR "?"
390   0434  4771'          JMS     XC8TYPE
391   0435  4767'          JMS     XC8CRLF
392   0436  2200           ISZ     XC8CNT              /BUMP RETURN
393   0437  5600           JMP I   XC8CNT              /EXIT CALL+2
394   0440  2200  EXITA,   ISZ     XC8CNT              /BUMP RETURN FOR MAIN PROGRAM CHECK OF CHAR
395   0441  1773'          TAD     C8CHAR              /PUT CHAR IN AC,
396   0442  5600           JMP I   XC8CNT              /EXIT
397   0443  1773'  GOITA,  TAD     C8CHAR              /GET THE CONTENTS OF CHAR
398   0444  1366           TAD     (100                /ADD 100 TO FORM A GOOD ASCII CHARACTER
399   0445  3773'          DCA     C8CHAR              /RESTORE COFFECT CHAR
400   0446  1260           TAD     XTABLB              /GET START OF TABLE B
401   0447  1255           TAD     INDEXA              /GET NOW FAR INTO TABLE
402   0450  3254           DCA     GOTOA               /STORE IT
403   0451  1654           TAD I   GOTOA               /GET THE ROUTINE STARTTING ADDRESS
404   0452  3254           DCA     GOTOA               /STORE IT IN HERE
405   0453  5654           JMP I   GOTOA               /GOTO CONTROL CHAR ROUTINE
406   0454  0000  GOTOA,   0000                        /ADD OF CNTRL ROUTINE TO EXECUTE
407   0455  0000  INDEXA,  0000                        /DISPLACEMENT INTO CNTRL TABLE
408   0456  0000  GETDAT,  0000                        /LOCATION OF ADDRS OF CONTROL CHAR,
409   0457  0461  XTABLA,  TABLA                       /ADDRS OF TABLEA
410   0460  0471  XTABLB,  TABLB                       /ADDRS OF TABLEB
411   0461  7575  TABLA,   7575                        /CNTRL C BACK TO MONITOR 203
412   0462  7564           7564                        /CNTRL L SWITCH ERROR PRINTTING DEVICE 214
413   0463  7557           7557                        /CNTRL O START DISPLAYING CHAR, AGAIN 221
414   0464  7556           7556                        /CNTRL R BACK TO BEGINNING OF PROGRAM 222
415   0465  7555           7555                        /CNTRL S STOP SENDING CHAR TO DISPLAY WAIT FOR CNTRL Q 223
416   0466  7573           7573                        /CNTRL E CONTINUE WITH PROGRAM 205
417   0467  7574           7574                        /CONTROL D CHANGE SWITCH REGISTER ON FLY
418   0470  0000           0000
419
420   0471  0551  TABLB,   CNTRLC
421   0472  0537           CNTRLL
422   0473  0500           CNTRLQ
423   0474  0511           CNTRLR
424   0475  0521           CNTRLS
425   0476  0545           CNTRLE
426   0477  0600           CNTRLD
427               /
428               /CONTROL Q
429               /START SENDING CHAR, TO THE DISPLAY
430               /THIS WILL RETURN CONTROL TO CALL THAT WAS SET BY
431               /THE CALL FOR CONTROL S,
432               /
433   0500  3772'  CNTRLQ, DCA     INMODE              /SET SOFT FLAG FOR UNEXPECTED CHAR
```

```
434    0501  1335               TAD      C8SETS      /CHECK IF CONTROL S TYPED IN
435    0502  7640               SZA CLA
436    0503  5306               JMP      BYRETR      /CONTROL S TYPED IN
437    0504  4765*              JMS      C8GET       /NO CONTROL S TYPED PREVIOUSLY
438    0505  5600               JMP I    XC8CNTR     /LEAVE VIA CNTR ENTRY ADDRESS
439    0506  3335    BYRETR, DCA       C8SETS      /CLEAR THE SOFT FLAG
440    0507  4765*              JMS      C8GET       /RESTORE REGISTERS
441    0510  5736               JMP I    C8RETR      /EXIT TO ADDRESS SET BY CONTROL S
442                             /
443                             /
444                             /CONTROL R
445                             /GO TO THE QUESTION C8SWIT
446    0511  3764*   CNTRLR, DCA       TTYLPT      /CLEAR THE TYPE FLAG SET TO TTY
447    0512  3335               DCA      C8SETS      /CLEAR SOFT FLAG FOR CNTRL S
448    0513  3772*              DCA      INMODE
449    0514  4763*              JMS      UPAROW      /PRINT THE * AND C8CHAR
450    0515  3762*   C8BY4,  DCA       C8SWST      /CLEAR FLAG FOR CNTRL D OR R
451    0516  6203               CDF CIF
452    0517  5720               JMP I    XDOSW       /GO TO ADDRS OF C8SWIT
453    0520  0200    XDOSW,  BGN                   /DOSW IS LABEL FOR C8SWIT QUESTION
454                             /
455                             /
456                             /CONTROL S
457                             /STOP SENDING CHAR. TO DISPLAY UNTIL A *Q IS RECEIVED
458                             /
459                             /
460    0521  1335    CNTRLS, TAD       C8SETS      /IF1 DO NOT STORE IN C8RETR
461    0522  7640               SZA CLA
462    0523  5327               JMP      C8D07       /DONT SET UP C8RETR
463    0524  7001               IAC                  /MAKE RETURN CALL PLUS 2
464    0525  1200               TAD      XC8CNT      /GET RETURN FOR THIS CALL
465    0526  3336               DCA      C8RETR      /STORE IT HERE FOR USE BE CNTROL Q
466    0527  2335    C8D07,  ISZ       C8SETS      /SET FLAG TO SAVE CALL
467    0530  4761*              JMS      XC8TTYI     /LOOK FOR THE INPUT
468    0531  4765*              JMS      C8GET       /GET REGISTERS
469    0532  4200               JMS      XC8CNTR     /CHECK FOR THE CONTROL CHAR
470    0533  7200               CLA
471    0534  5321               JMP      CNTRLS      /IF NOT A CNTRL Q R C REASK
472    0535  0000    C8SETS, 0
473    0536  0000    C8RETR, 0
474                             /
475                             /SWITCH OUTPUT FROM ONE OUTPUT DEVICE TO ANOTHER - THE TWO OUTPUTS ARE THE
476                             /CONSOLE AND THE PRINTER WITH DEVICE CDOE 66.
477                             /
478                             /
479    0537  1764*   CNTRLL, TAD       TTYLPT      /GET PRESENT C8SWIT INDICATOR
480    0540  7040               CMA                  /COMPLEMENT IT
481    0541  3764*              DCA      TTYLPT      /STOR NEW C8SWIT
482    0542  4763*              JMS      UPAROW      /C8PRNT * AND CHAR ON NEW DEVICE
483    0543  4765*              JMS      C8GET       /RESTORE THE REGISTERS
484    0544  5600               JMP I    XC8CNT      /EXIT
485                             /
486                             /CONTROL E
487                             /CONTINUE RUNNING FROM A INQUIRE OR ERROR
488                             /
```

```
489                             /
490    0545  4763*   CNTRLE, JMS       UPAROW      /PRINT THE CONTROL CHAR
491    0546  3762*              DCA      C8SWST      /CLEAR FLAG.
492    0547  4765*              JMS      C8GET       /GET THE REGISTERS
493    0550  5600               JMP I    XC8CNT      /RETURN TO CALL PLUS ONE
494                             /
495
496                             /CONTROL C
497                             /RETURN TO MONITOR CONTROL C
498    0551  3764*   CNTRLC, DCA       TTYLPT      /CLEAR THE LPT FLAG TO PRINT ON DISPLAY
499    0552  3762*              DCA      C8SWST      /CLEAR FLAG.
500    0553  4763*              JMS      UPAROW      /C8PRNT A* AND LETTER IN CHAR
501    0554  6203               CDF CIF              /GO TO 0 FLD
502    0555  6007               CAF                  /CLEAR THE WORLD
503    0556  5760               JMP I    (7600       /GO TO DIAGNOSTIC MONITOR
504                             /************************************************************
505                             /
506                             /
507                             /
508    0560  7600
509    0561  0272
510    0562  0745
511    0563  0615
512    0564  1121
513    0565  0624
514    0566  0100
515    0567  1023
516    0570  0777
517    0571  1777
518    0572  1076
519    0573  1075
520    0574  1346
521    0575  1347
522    0576  1200
523    0577  1345
               0600    PAGE
524
525                             /
526                                                 /CONTROL D
527                                                 /CHANGE THE SWITCH REGISTER ANYTIME CNTRL D AND RETURN TO
528                                                 /THE PROGRAM RUNNING.
529
530
531    0600  4215    CNTRLD, JMS       UPAROW
532    0601  1213               TAD      C8SETD      /CHECK IF THE RETURN ADDRS IS SAFE
533    0602  7640               SZA CLA
534    0603  5207               JMP      C8D011      /DO NOT CHANGE THE RETURN ADDRS
535    0604  1777*              TAD      XC8CNT      /GET THE RETURN ADDRS AND SAVE IT
536    0605  3214               DCA      C8RETD      /SAVE THE RETURN HERE
537    0606  2213               ISZ      C8SETD      /INDICATE RETURN SAVED DONT DISTROY
538    0607  4256    C8D011, JMS       XC8PSW      /GO CHANGE THE SWITCH REGISTER
539    0610  3213               DCA      C8SETD      /CLEAR THE FLAG
540    0611  4224               JMS      C8GET       /RESTORE THE AC MQ LINK ETC
541    0612  5614               JMP I    C8RETD      /RETURN TO THE PROGRAM
542                             /
```

```
543    0613  0900    C8SETD, 0
544    0614  0000    C8RETD, 0
545
546
547
548                  /THIS WILL TYPE A UP ARROW AND THE CHAR IN C8CHAR.
549
550    0615  0000    UPAROW, 0                        /C8PRNT THE ""* AND THE CHAR C8TYPED IN
551    0616  1376            TAD     (336             /CODE FOR *
552    0617  4775*           JMS     XC8TYPE
553    0620  1774*           TAD     C8CHAR           /C8TYPE THE CHAR
554    0621  4775*           JMS     XC8TYPE
555    0622  4773*           JMS     XC8CRLF
556    0623  5615            JMP I   UPAROW           /EXIT
557
558
559
560                  /****************************************************************
561
562    0624  0000    C8GET,  0
563    0625  7200            CLA
564    0626  1772*           TAD     MQSAVE
565    0627  7421            MQL                       /RESTORE MQ
566    0630  1771*           TAD     FLSAVE
567    0631  7004            RAL                       /RESTORE THE LINK
568    0632  7200            CLA
569    0633  1770*           TAD     ACSAVE           /RESTORE THE AC
570    0634  5624            JMP I   C8GET            /GET THE REGISTERS
571
572
573
574                  /****************************************************************
575
576                  /C8INQU
577                  /C8INQU ROUTINE WILL PRINT A WAITING
578                  /AND THE PROGRAM IS EXPECTING A CONTROL CHAR INPUT
579                  /IF CONTINUE FROM CONTROL CHAR RETURN IS CALL PLUS ONE
580                  /IF NO CONTROL CHAR ENTERED THEN WAITING IS REPRINTED
581                  /AND PROGRAM WAITS FOR A CONTROL CHAR AGAIN.
582
583                  /        C8INQU *        JMS XC8INQ
584
585                  /EX.    JMS     XC8INQ                   /C8 WILL PRINT A WAITINGAND WAIT FOR INPUT
586                  /       DO ANYTHING                      /RETURN IS CALL PLUS ONE AC =0 CONTINUE
587
588                  /CALLS USED ARE -CHKCLA-XC8PNT-XC8TYI-C8GET-XC8CNTR-
589
590
591    0635  0000    XC8INQ, 0
592    0636  7300            CLA CLL
593    0637  4767*           JMS     CHKCLA           /CHECK LOC 22 BIT 3 CONSOLE BIT
594    0640  7410            SKP                       /ACTIVE CONSOLE PACKAGE
595    0641  5635            JMP I   XC8INQ           /NOT CONSOLE LEAVE
596    0642  4766*           JMS     XC8PNT
597    0643  0651            WATMES                    /INQUIR WAITTING
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```
598    0644  4765*           JMS     XC8TTYI          /GET CHARACTER
599    0645  4224            JMS     C8GET
600    0646  4777*           JMS     XC8CNTR          /CHECK IF CONTROL CHARACTER
601    0647  5635            JMP I   XC8INQ           /EXIT AND CONTINUE
602    0650  5236            JMP     XC8INQ+1         /REASK
603    0651  2701    WATMES, TEXT    "WAITING "
       0652  1124
       0653  1116
       0654  0740
       0655  0000
604
605
606                  /****************************************************************
607
608                  /C8SWIT
609
610                  /ROUTINE WILL CHECK IF CONSOL IS ACTIVE IF IT IS ACTIVE DISPLAY
611                  /SW QUESTION . IN NOT ACTIVE IT WILL NOT PRINT THE SW QUESTION BUT
612                  /RETURN TO CALL PLUS ONE AC=0.
613                  /C8SWIT WILL SET UP THE PSEUDO SWITCH
614                  /REGISTER WITH THE NEW DATA ENTERED
615                  /
616                  /        C8SWIT *        JMS XC8PSW
617
618                  /EX.            JMS     XC8PSW           /SET UP PSEUDO C8SWIT REGISTER IF
619                  /                                        /ON THE CONSOL PACKAGE. RETURN IS CALL PLUS ONE AC = 0
620
621                  /CALLS USED ARE -CHKCLA-XC8PSW-XC8PNT-XC8OCTA-XC8TYPE-
622
623
624    0656  0000    XC8PSW, 0
625    0657  4767*           JMS     CHKCLA           /CHECK LOC 22 BIT 3 CONSOLE BIT
626    0660  7410            SKP                       /ACTIVE CONSOLE
627    0661  5656            JMP I   XC8PSW           /DEACTIVE CONSOLE PACKAGE
628                                                   /RETURN WITHOUT ASKING PSEUDO SWITCH
629    0662  1345            TAD     C8SWST           /IS THE SOFT FLAG SET FOR SWITCH?
630    0663  7640            SZA CLA                   /SKIP IF ONE ENTRY AT ATIME OK
631    0664  5764*           JMP     C8BY4            /SECOND ENTRY WITH OUT A EXIT GO TO SW QUESTION
632    0665  2345            ISZ     C8SWST           /FIRST ENTRY SET FLAG
633    0666  4766*   C8RDPS, JMS     XC8PNT           /C8PRNT SP=
634    0667  0747            MESA
635    0670  1020            TAD     20               /GET CONTENIS OF SW
636    0671  4763*           JMS     XC8OCTA          /CONVERT IT TO ASCII
637    0672  1362            TAD     (40              /GET SPACE
638    0673  4775*           JMS     XC8TYPE
639    0674  2761*           ISZ     INMODE           /SET FLAG FOR CHAR EXECTED
640    0675  4760*           JMS     XC8ECHO          /LOOK FOR INPUT
641    0676  4315            JMS     TSTCHA           /NOT CONTROL TEST IT IS LEGAL
642    0677  1774*           TAD     CRCHAR           /STORF NEW CHAR IN SW REG
643    0700  3020            DCA     20
644
645    0701  1357            TAD     (-3
646    0702  3346            DCA     TMPCNT           /STOPE IN TEMP COUNT
647    0703  4760*   GETCH1, JMS     XC8ECHO          /GET NFXT CHAR
648    0704  4315            JMS     TSTCHA           /CHFCK IF CP + GOOD CHAR
```

```
  649    0705  1020          TAD     20              /GET C8SWIT REGISTER
  650    0706  7106          RTL CLL                 /ROTATE IT LEFT 3 PLACES
  651    0707  7004          RAL
  652    0710  1774*         TAD     C8CHAR          /GET CHAR + ADD IT TO PREVIOUS CONTENTS
  653    0711  3020          DCA     20              /SAVE NEW CONTENTS
  654    0712  2346          ISZ     TMPCNT          /BUMP COUNT
  655    0713  5303          JMP     GETCH1          /JMP BACK + GET NEXT CHAR
  656    0714  5342          JMP     ENDIT           /END 4 CHAR C8TYPED IN
  657    0715  0000  TSTCHA, 0
  658    0716  7041          CIA                     /CMPL CHAR IN AC
  659    0717  1356          TAD     (215            /TEST IF IT IS A CARRIAGE RETURN
  660    0720  7650          SNA CLA                 /SKIP IN NOT CR.
  661    0721  5342          JMP     ENDIT           /WAS CARRIAGE RETURN
  662    0722  1774*         TAD     C8CHAR          /NOT CR. GET CHAR
  663    0723  1355          TAD     (-260           /CHECK IF IT IS IN RANGE
  664    0724  7710          SPA CLA                 /IF NOT POSITIVE C8ERR CHAR SMALLER THEN 260
  665    0725  5336          JMP     ERR1            /C8ERR - CHAR TOO SMALL
  666    0726  1774*         TAD     C8CHAR          /GET CHAR
  667    0727  1354          TAD     (-270           /GET A -270 + CHECK IF IT IS LARGER THEN 7
  668    0730  7700          SMA CLA                 /SKIP IF LESS THEN 7
  669    0731  5336          JMP     ERR1            /C8ERR ON CHAR NOT IN RANGE
  670    0732  1774*         TAD     C8CHAR          /GET CHAR
  671    0733  0353          AND     (7              /MASK FOR RIGHT BYTE
  672    0734  3774*         DCA     C8CHAR          /STORE IN CHAR
  673                                                /GET CHAR IN AC
  674    0735  5715          JMP I   TSTCHA          /EXIT
  675    0736  1352  ERR1,   TAD     (277            /C8PRNT
  676    0737  4775*         JMS     XC8TYPE         /?
  677    0740  4773*         JMS     XC8CRLF         /
  678    0741  5266          JMP     C8RDPS          /EXIT + ASK AGAIN
  679    0742  4773*  ENDIT, JMS     XC8CRLF         /DO A CR LF
  680    0743  3345          DCA     C8SWST          /CLEAR THE PSW ENTRY FLAG
  681    0744  5656          JMP I   XC8PSW          /EXIT ROUTINE
  682    0745  0000  C8SWST, 0
  683
  684    0746  0000  TMPCNT, 0
  685    0747  2322  MESA,   TEXT    "SR= "
         0750  7540
         0751  0000
  686
  687
  688    0752  0277
  689    0753  0007
  690    0754  7510
  691    0755  7520
  692    0756  0215
  693    0757  7775
  694    0760  1063
  695    0761  1076
  696    0762  0040
  697    0763  1000
  698    0764  0515
  699    0765  0272
  700    0766  0303
  701    0767  1200
```

```
  702    0770  1345
  703    0771  1347
  704    0772  1346
  705    0773  1023
  706    0774  1075
  707    0775  1077
  708    0776  0336
  709    0777  0400
         1000          PAGE
  710
  711                  /C8OCTA
  712
  713                  /OCTAL TO ASCII CONVERSION
  714                  /THIS ROUTINE WILL TAKE THE OCTAL NUMBER IN THE AC AND CONVERT IT TO ASCII
  715                  /THE RESULT WILL BE PRINTED ON THE CONSOL TERMINAL
  716                  /       C8OCTA= JMS XC8OCT
  717                  /
  718                  /EX.    JMS     XC8OCTA         /AC CONTAINS NUMBER TO BE CHANGE
  719                  /       RETURN IS TO CALL PLUS ONE AC=0
  720                  /
  721                  /CALLS USED ARE -XC8TYPE-
  722
  723
  724    1000  0000  XC8OCT, 0
  725    1001  7106          CLL RTL
  726    1002  7006          RTL                     /POSITION THE FIRST CHAR FOR PRINTING
  727    1003  3221          DCA     C8TMP1          /SAVE CORRECT POSITIONED WORD HERE
  728    1004  1377          TAD     (-4
  729    1005  3222          DCA     C8CKP           /STORE COUNTER IN HERE
  730    1006  1221  C8DO4,  TAD     C8TMP1          /GET FIRST NUMBER
  731    1007  0376          AND     (0007           /MASK
  732    1010  1375          TAD     (260            /ADD THE PRINT CONSTANT
  733    1011  4277          JMS     XC8TYPE         /TYPE THE NUMBER
  734    1012  1221          TAD     C8TMP1          /
  735    1013  7006          RTL
  736    1014  7004          RAL                     /PUT NEXT NUMBER IN POSITION
  737    1015  3221          DCA     C8TMP1          /STORE IT
  738    1016  2222          ISZ     C8CKP           /DONE YET WITH FOUR NUMBERS
  739    1017  5206          JMP     C8DO4           /NOT YET DO MORE
  740    1020  5600          JMP I   XC8OCT          /DONE WITH FOUR
  741    1021  0000  C8TMP1, 0
  742    1022  0000  C8CKP,  0
  743
  744
  745                  /***********************************************************************
  746
  747                  /C8CRLF
  748                  /C8TYPE CR AND LF WITH FILLERS FOLLOWING EACH LF AND CR
  749                  /
  750                  /       C8CRLF= JMS XC8CRL
  751                  /
  752                  /EX.    JMS     XC8CRLF         /C8PRNT A CR AND LF WITH FILL
  753                  /       /RETURN TO CALL PLUS ONE AC =0
  754                  /CALLS USED ARE -XC8TYPE-
  755
```

```
756
757    1023  0000    XC8CRLF,0
758    1024  7300            CLA CLL
759    1025  1374            TAD     (215            /GET CODE FOR CR
760    1026  4277            JMS     XC8TYPE
761    1027  1237            TAD     FILLER
762    1030  7040            CMA
763    1031  3240            DCA     FILCNT         /STORE FILLER IN HERE
764    1032  1373            TAD     (212            /GET CODE FOR LF
765    1033  4277    C8DO2,  JMS     XC8TYPE
766    1034  2240            ISZ     FILCNT         /CHECK ON FILLER CHAR
767    1035  5233            JMP     C8DO2          /TYPE A NON PRINTING CHAR
768    1036  5623            JMP I   XC8CRL         /EXIT
769    1037  0004    FILLER, 0004                   /FILLER SET FOR 4 CHAP
770    1040  0000    FILCNT, 0                      /COUNTER FOR FILL
771
772
773
774                 //******************************************************
775                 /C8CKPA
776                 /THIS ROUTINE WILL CHECK IF A CHARACTER WAS ENTERED FROM THE
777                 /TERMINAL. IFTHE FLAG IS SET AND THE CONSOLE PACKAGE IS
778                 /ACTIVE A CHECK IS MADE TO DETERMIND IF IT IS A CONTROL CHAR.
779                 /IF IT WAS A CONTROL CHAR THEN ITS CONTROL FUNCTION IS PERFORMED.
780                 /IF NOT A CONTROL CHARACTER OR A CONTROL E=D=L=O. IT WILL DO
781                 /THE CONTROL FUNCTION AND RETURN TO CALL PLUS 2.
782                 /A NON CONTROL CHARACTER WILL BE PRINTEDAND A "?" IT WILL RETURN TO
783                 /CALL PLUS 2.
784                 /IF NO FLAG IS SET OR THE CONSOL IS NOT ACTIVE THE RETURN IS TO
785                 /CALL PLUS 1.
786
787
788                 /        C8CKPA= JMS     XC8CKP
789
790
791                 /EX.    JMS     XC8CKPA                 /CALL TO CHECK IF CONTROL CHAR SET
792                 /       ANYTHING(SKIP)                  /RETURN IF NOT FLAG OR NOT CONSOLE ACTIVE
793                 /       ANYTHING(JMP EXIT SKIP CHAIN)   /RETURN IF NOT CONTROL OR CONTINUE CONTROL
794
795
796                 /CALLS USED ARE =XC8TTYI=XC8CNTR=C8GET=
797
798
799    1041  0000    XC8CKP, 0
800    1042  3772'           DCA     ACSAVE         /SAVE THE AC
801    1043  6004            GTF                    /SAVE THE FLAGS
802    1044  3771'           DCA     FLSAVE         /SAVE THE FLAGS
803    1045  7501            MQA                    /PUT MQ IN AC
804    1046  3770'           DCA     MQSAVE         /SACE THE MQ
805    1047  6031            KSF                    /CHECK THE KEYBOARD FLAG
806    1050  5261            JMP     C8BY3          /EXIT TO CALL PLUS 1
807    1051  4767'           JMS     CHKCLA         /CHECK LOC 22 BIT 3 CONSOLE BIT
808    1052  7410            SKP                    /ACTIVE CONSOLE PACKAGE
809    1053  5261            JMP     C8BY3          /EXIT TO CALL PLUS 1
810    1054  4766'           JMS     XC8TTYI        /GET THE CHAR
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811    1055  4765'           JMS     C8GET          /GET THE FLAGS
812    1056  4764'           JMS     XC8CNTR        /CHECK IF CONTROL  CHAR.
813    1057  7000            NOP                    /RETURN IF A CONTINUE CHAR.
814    1060  2241            ISZ     XC8CKP         /BUMP RETURN FOR CALL PLUS 2
815    1061  4765'   C8BY3,  JMS     C8GET          /GET REGISTERS
816    1062  5641            JMP I   XC8CKP         /SAY GOOD BY
817
818                 //******************************************************************
819
820                 /C8ECHO
821                 /THIS ROUTINE WILL LOOK FOR A CHAR FROM THE KEYBOARD. STORE IT IN LOCATION CHAR
822                 /CHECK IF IT WAS A CONTROL CHARACTER = SET INMODE = PRINT CHARACTER
823
824                 /        C8ECHO =        JMS XC8ECH
825                 /EX.    JMS     XC8ECHO        /LOOK FOR CONSOL CHAR C8PRNT IT
826                 /                               /RETURN CALL PLUS ONE AC = CHAR C8TYPED IN
827
828                 /CALLS USED ARE =XC8TTYI=XC8CNTR=C8GET=XC8ECH=XC8TTYPE
829
830                 /
831    1063  0000    XC8ECH, 0
832    1064  4766'           JMS     XC8TTYI        /WAIT FOR CHAR FROM KEYBOARD
833    1065  4765'           JMS     C8GET          /RESTORE THE REGISTERS
834    1066  2276'           ISZ     INMODE         /SET INMODE IDENTIFYING THIS AS A EXPECTED CHAR
835    1067  4764'           JMS     XC8CNTR        /GO CHECK IF IT IS A CONTROL CHAR
836    1070  5663            JMP I   XC8ECH         /WAS A CONTROL CHAR = CONTINUE RUNNING
837    1071  4277            JMS     XC8TYPE        /NOT A CONTROL CHAR C8PRNT IT
838    1072  3276            DCA     INMODE         /CLEAR FLAG THAT CHAR EXPECTED
839    1073  1275            TAD     C8CHAR         /GET CHAR IN AC
840    1074  5663            JMP I   XC8ECH         /EXIT
841    1075  0000    C8CHAR, 0
842    1076  0000    INMODE, 0
843
844                 /******************************************************************
845
846                 /C8TYPE
847                 /THIS ROUTINE WILL C8PRNT ON THE CONSOLE OR THE LPT WITH DEVICE CODE 66.
848                 /
849                 /        C8TYPE= JMS XC8TYP
850
851                 /EX.    JMS     XC8TYPE        /C8PRNT THE CHAR IN THE AC.
852                 /                               /RETURN CALL PLUS ONE AC =0000
853                 /                               /DO NOT CLEAR THE LINK IN THIS ROUTINE NEEDED BYC8OCT
854
855                 /CALLS USED ARE =C8HANG=XC8CNTR=XC8PNT=XC8CRLF=XC8INQU=
856
857
858    1077  0000    XC8TYP, 0
859    1100  3320            DCA     PNTBUF         /STORE CHAR
860    1101  1321            TAD     TTYLPT         /CHECK 0=TTY 7777=LPT
861    1102  7640            SZA CLA
862    1103  5312            JMP     XDOLPT         /DO OUT PUT ON LPT
863    1104  1320            TAD     PNTBUF
864    1105  6046            TLS
865    1106  6041            TSF
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866    1107  5306            JMP     .-1
867    1110  6042            TCF
868    1111  5316            JMP     C8BY5
869    1112  1320   XDOLPT,  TAD     PNTBUF          /GET CHAR
870    1113  6666            PSTB    PCLF            /C8PRNT IT
871    1114  4322            JMS     C8HANG          /CHECK KEYBOARD IF HUNG
872    1115  6662            PCLF                    /CLEAR THE FLAG
873    1116  7600   C8BY5,   7600                    /CLEAR THE AC
874    1117  5677            JMP I   XC8TYP          /EXIT
875    1120  0000   PNTBUF,  0
876    1121  0000   TTYLPT,  0
877
878
879    1122  0000   C8HANG,  0
880    1123  7200            CLA                     /
881    1124  1316            TAD     C8BY5           /GET CONSTANT 7600
882    1125  3320            DCA     PNTBUF          /PNTBUF IS NOW A COUNTER
883    1126  6661            PSKF                    /SKIP ON PRINTER DONE
884    1127  7410            SKP                     /NOT DONE YET
885    1130  5722            JMP I   C8HANG          /SAW FLAG DONE
886    1131  2345            ISZ     C8CONT          /FIRST COUNTER FAST ONE
887    1132  5326            JMP     .-4             /CHECK IF FLAG SET YET
888    1133  2320            ISZ     PNTBUF          /MADE 4096 COUNTS ON FAST COUNTER
889    1134  5331            JMP     .-3             /KEEP IT UP FOR 5 SEC
890    1135  1764*           TAD     XC8CNTR         /GET THE RETURN ADDRESS IN CONTROL
891    1136  3322            DCA     C8HANG          /SAVE IT IN HANG
892    1137  3321            DCA     TTYLPT          /ALLOW PRINTING ON TTY
893    1140  4763*           JMS     XC8PNT
894    1141  1146            MES8HANG                /LPT ERROR
895    1142  4223            JMS     XC8CRLF
896    1143  4762*           JMS     XC8INQU         /PRINT WAITING
897    1144  5722            JMP I   C8HANG          /CONTINUE TO SAVE ADDRESS
898    1145  0000   C8CONT,  0                       /COUNTER FOR TIMER
899    1146  1420   MES8HANG,TEXT    "LPT ERROR"
       1147  2440
       1150  0522
       1151  2217
       1152  2200
900
901    1162  0635
902    1163  0303
903    1164  0400
904    1165  0624
905    1166  0272
906    1167  1200
907    1170  1346
908    1171  1347
909    1172  1345
910    1173  0212
911    1174  0215
912    1175  0260
913    1176  0007
914    1177  7774
       1200            PAGE
915                    /***********************************************************
```

```
916                    /***********************************************************
917
918                    /THIS ROUTINE WILL CHECK LOCATION 22 THE HARD WARE CONFIG WORD.
919                    /TO SEE IF THE CONSOLE BIT 3 )400) IS SET IF SET THEN RETURN
920                    /TO CALL PLUS TWO FO A ACTIVE CONSOLR PACKAGE AC=0
921                    /IF NOT SET THEN TO CALL PLUS ONE FOR A DEACTIVE CONSOLE PACKAGE.
922
923
924    1200  0000   CHKCLA,  0
925    1201  7200            CLA
926    1202  1022            TAD     22              /GET THE COTENTA OF LOCATION 22
927    1203  0377            AND     (400            /MASK FOR BIT 3 (400
928    1204  7650            SNA CLA                  /
929    1205  2200            ISZ     CHKCLA          /ACTIVE CONSOLE PACKAGE RETURN
930                                                  /CALL PLUS ONE (1) FOR ACTIVE
931    1206  5600            JMP I   CHKCLA          /DEACTIVE CONSOLE PACKAGE RETURN
932                                                  /CALL PLUS TWO (2)
933
934                    /C8ERR
935                    /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
936                    /WILL CHECK IF CLASSIC SYSTEM, WILL CHECK C8SWIT REGISTERS.
937                    /       C8ERR=  JMS XC8ERR
938                    /EX.     JMS     XC8ERR          /GO TO C8ERR CALL IF NOT CONSOL
939                    /                                /RETURN IS CALL PLUS ONE AC =0000
940
941                    /CALLS USED ARE =CHKCLA=XC8CRLF=XC8SW=XC8INQU=XC8PNT=XC8OCTA=
942
943
944    1207  0000   XC8ERR,  0
945    1210  6002            IOF
946    1211  3345            DCA     ACSAVE          /SAVE AC
947    1212  6004            GTF
948    1213  3347            DCA     FLSAVE          /SAVE THE FLAGS
949    1214  7501            MQA
950    1215  3346            DCA     MQSAVE          /SAVE THE MQ
951    1216  7340            CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
952    1217  1207            TAD     XC8ERR          /GET RETTURN LOCATION
953    1220  3344            DCA     PCSAVE          /SAVE ADD OF C8ERR CALL
954    1221  6201            CDF
955    1222  7340            CLA CLL CMA
956    1223  1776            TAD I   (CLASTK)
957    1224  3316            DCA     REALPC          /SAVE REAL PC.
958    1225  6211            CDF     10
959    1226  4200            JMS     CHKCLA          /CHECK LOC.22 BIT 3 CONSOL BIT
960    1227  7410            SKP                     /ACTIVE CONSOLE PACKAGE
961    1230  5270            JMP     NTCLAS          /NOT CLASSIC SYSTEM
962    1231  4775*           JMS     C8GET           /GET ALL REGISTERS.
963    1232  4774*           JMS     XC8SW           /CHECK SWITCH REG FOR BIT THAT INDICATES
964                                                  /NO ERROR MESSAGE
965    1233  0373   SETUP1,  AND     (0000           /MASK FOR BIT FOR NO ERROR PRINTING
966                                                  /IF THIS ERROR MESSAGE IS TO ALWAYS
967                                                  /BE PRINTED LEAVE AND VALUE AT 0000
968    1234  7640            SZA CLA                 /SKIP IF BIT IS 0 PRINT ERROR MESSAGE
969    1235  5262            JMP     C8D010          /DO NOT PRINT
970    1236  4772*           JMS     XC8CRLF
```

```
 971   1237  4771'          JMS    XC8PNT
 972   1240  1320          EPRMES                          /PRINT THE ERROR MESSAGE
 973   1241  4771'          JMS    XC8PNT
 974   1242  1330          MESPC                           /PRINT THE PC STSTEMENT
 975   1243  1316          TAD    REALPC
 976   1244  4770'          JMS    XC8OCTA                  /CONVERT 4 DIGIT PC TO ASCII
 977   1245  4771'          JMS    XC8PNT
 978   1246  1333          MESAC                           /PRINT THE AC MESS
 979   1247  1345          TAD    ACSAVE
 980   1250  4770'          JMS    XC8OCTA
 981   1251  4771'          JMS    XC8PNT
 982   1252  1336          MESMQ                           /PRINT MQ
 983   1253  1346          TAD    MQSAVE
 984   1254  4770'          JMS    XC8OCTA
 985   1255  4771'          JMS    XC8PNT
 986   1256  1341          MESFL                           /PRINT FL
 987   1257  1347          TAD    FLSAVE
 988   1260  4770'          JMS    XC8OCTA
 989   1261  4772'          JMS    XC8CRLF
 990   1262  4775'  C8D010, JMS    C8GET                    /GET ALL REGISTERS.
 991   1263  4774'          JMS    XC8SW                    /CHECK SWITCH REGISTER
 992   1264  7610          SKP CLA                          /SKIP IF BIT 0 SET
 993   1265  5300          JMP    C8BY2                     /LEAVE
 994   1266  4767'          JMS    XC8INQ                   /GO TO THE INQUIRE ROUTINE
 995   1267  5300          JMP    C8BY2                     /LEAVE
 996   1270  4775'  NTCLAS, JMS    C8GET                    /GET ALL REGISTERS.
 997   1271  4774'          JMS    XC8SW                    /CHECK PSEUDO SWITCH REGISTER
 998                                                        /CHECK THE C8SWIT REGISTER
 999   1272  7610          SKP CLA                          /SKIP IF HALT
1000   1273  5607          JMP I  XC8ERR                    /NO HALT CONTINUE
1001   1274  1366          TAD    (7402                     /CODE FOR HLT
1002   1275  3744          DCA I  PCSAVE                    /PUT IT IN CALL LOC.
1003   1276  4775'          JMS    C8GET
1004   1277  5744          JMP I  PCSAVE                    /EXIT  TO CALL AND HALT
1005   1300  4775'  C8BY2,  JMS    C8GET                    /GET THE REGISTERS
1006   1301  5607          JMP I  XC8ERR
1007                       /
1008   1302  7402  ROUINS, HLT                              /PUT INSTRUCTION TO EXECUTE HEHE!!!!
1009   1303  7000          NOP
1010   1304  3317          DCA    MYAC                      /SAVE AC.
1011   1305  6201          CDF    0
1012   1306  1020          TAD    SWR
1013   1307  3765          DCA I  (SWR)                     /MOVE SWITCHES DOWN.
1014   1310  1776          TAD I  (CLASIK)
1015   1311  3315          DCA    CLRTRN
1016   1312  1317          TAD    MYAC
1017   1313  6202          CIF    0
1018   1314  5715          JMP I  CLRTRN                    /RETURN TO FIELD 0.
1019                       /
1020   1315  0000  CLRTRN, 0
1021   1316  0000  REALPC, 0
1022   1317  0000  MYAC,   0
1023                       /
1024   1320  0410  ERRMES, TEXT   "DHRKAE  FAILED "
       1321  2213
```

```
       1322  0105
       1323  4040
       1324  0601
       1325  1114
       1326  0504
       1327  4000
1025   1330  4040  MESPC,  TEXT   "  PC:"
       1331  2003
       1332  7200
1026   1333  4040  MESAC,  TEXT   "  AC:"
       1334  0103
       1335  7200
1027   1336  4040  MESMQ,  TEXT   "  MQ:"
       1337  1521
       1340  7200
1028   1341  4040  MESFL,  TEXT   "  FL:"
       1342  0614
       1343  7200
1029   1344  7777  PCSAVE, 7777
1030   1345  7777  ACSAVE, 7777
1031   1346  7777  MQSAVE, 7777
1032   1347  7777  FLSAVE, 7777
1033                       /
1034   1365  0020
1035   1366  7402
1036   1367  0635
1037   1370  1000
1038   1371  0303
1039   1372  1023
1040   1373  0000
1041   1374  0262
1042   1375  0624
1043   1376  5732
1044   1377  0400
       0000          FIELD  0
```

```
0000  00000000  00000000  11101111  11111111  11000000  00000000  00000000  00000000
0100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  10000001  11111111  11111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111110  11111111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11100000  00111111  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  00000000  00000111  11111111

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
```

```
1045                      /
1046                      /ALL KNOWN HLTS.
1047                      /
1048                      /
1049   1400   6031    ERHLT1                          /UNDEFINED INTERRUPT
1050   1401   6142    ERHLT2                          /SKIP TRAP FOR DCLR
1051   1402   6115    ERHLT3                          /SKIP TRAP FOR DLAG
1052   1403   6104    ERHLT4                          /SKIP TRAP FOR DLCA
1053   1404   6070    ERHLT5                          /SKIP TRAP FOR DRST
1054   1405   6126    ERHLT6                          /SKIP TRAP FOR DLDC
1055   1406   6151    ERHLT7                          /SKIP TRAP FOR DMAN
1056   1407   6726    ERHLT9                          /RECOVERABLE ERROR HALT
1057   1410   5716    ENDHLT                          /END OF TEST HALT
1058   1411   7014    STPHLT                          /HALT FROM SWR4=1
1059   1412   7126    CHNHLT                          /IOT CHANGE HALT
1060                      /
1061          6741    DSKP=6741                       /SKIP ON TRANSFER DONE OR ERROR
1062          6742    DCLR=6742                       /CLEAR DISK CONTROL LOGIC
1063          6743    DLAG=6743                       /LOAD ADDRESS AND GO
1064          6744    DLCA=6744                       /LOAD CURRENT ADDRESS
1065          6745    DRST=6745                       /READ STATUS REGISTER
1066          6746    DLDC=6746                       /LOAD COMMAND REGISTER
1067          6747    DMAN=6747                       /LOAD MAINTENANCE
1068                      /
1069          4405    SET=JMS I         XSET
1070          4424    TICK=JMS I        XTICK
1071          4425    AERRO=JMS I       XAERRO
1072          4423    APT8A=JMS I       XAPT8A
1073          4404    LAS=JMS I         XLAS
1074          4406    CLASIC=JMS I      XCLAS
```

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1075          5426    IOTCHN=JMP I      XCHANG
1076          5430    MANUAL=JMP I      MANTST
1077          4444    ENMAN1=JMS I      XMAIN1
1078          4445    ENMAN2=JMS I      XMAIN2
1079          4435    NERROR=JMS I      XNERRO
1080          4436    ERROR=JMS I       XERRO
1081          4437    IONWAT=JMS I      XIONWT
1082          4440    ACCMP1=JMS I      XCOMP1
1083          4441    ACCMP2=JMS I      XCOMP2
1084          4442    RDSTAT=JMS I      XRDST
1085          4443    RDCMD=JMS I       XRDCM
1086          4446    RDADD=JMS I       XRDAD
1087          4427    LDBUF=JMS I       XUPPER
1088          4452    LDADD=JMS I       XLDAD
1089          4447    DSKSKP=JMS I      XSDKP
1090          4450    LDCMD=JMS I       XLDCM
1091          4451    LDCUR=JMS I       XLDCA
1092          4453    CLRALL=JMS I      XCLDR
1093          4454    RDCRC=JMS I       XRDCR
1094          4455    LDMAN=JMS I       XLDMN
1095          4456    RDBUF=JMS I       XRDBF
1096          4457    PRNTER=JMS I      XPRN
1097          4460    OCTEL=JMS I       XFROCT
1098          4461    TWOCT=JMS I       XTOCT
1099          4434    TYPE=JMS I        XPRINT
1100          4462    CRLF=JMS I        XCRLF
1101                      /
1102          0000    *0
1103                      /
1104   0000   0305              305                  /REV E
1105   0001   5001              5001
1106   0002   0002              0002
1107   0003   0003              0003
1108                      /
1109   0004   5764    XLAS,     MYLAS
1110   0005   7040    XSET,     SETUP
1111   0006   5732    XCLAS,    CLASIK
1112   0007   0000    SAVEND,   0
1113                      /
1114          0010    *10
1115                      /
1116   0010   0000    AUTO10,   0
1117                      /
1118          0020    *20
1119                      /
1120   0020   0000    SWR,      0
1121   0021   4000    OP1,      4000
1122   0022   0000    OP2,      0
1123                      /
1124   0023   7200    XAPT8A,   APT8
1125   0024   7220    XTICK,KTICK
1126   0025   7241    XAERRO,WAERRO
1127   0026   7101    XCHANG, CHANG
1128   0027   7055    XUPPER, UPPER
1129   0030   5723    MANTST, MANUL
```

```
1130  0031  6011    INTRQ,  INTADD
1131  0032  5670    XEND,   ENDTST
1132  0033  0210    THSFLD, PRSFLD
1133  0034  6463    XPRINT, PRINT
1134  0035  7000    XNERRO, NERRO
1135  0036  6600    XERRO,  ERRO
1136  0037  6900    XIONWT, IONWT
1137  0040  6033    XCOMP1, COMP1
1138  0041  6044    XCOMP2, COMP2
1139  0042  6063    XRDST,  RDST
1140  0043  6240    XRDCM,  RDCM
1141  0044  6256    XMAIN1, MAIN1
1142  0045  6760    XMAIN2, MAIN2
1143  0046  6200    XRDAD,  RDAD
1144  0047  6130    XSDKP,  SDKP
1145  0050  6117    XLDCM,  LDCM
1146  0051  6075    XLDCA,  LDCA
1147  0052  6106    XLDAD,  LDAD
1148  0053  6135    XCLDR,  CLDR
1149  0054  6263    XRDCR,  RDCR
1150  0055  6144    XLDMN,  LDMN
1151  0056  6226    XRDBF,  RDBF
1152  0057  6423    XPRN,   PRN
1153  0060  6400    XFROCT, FROCT
1154  0061  6314    XTOCT,  TOCT
1155  0062  6331    XCRLF,  UPONE
1156  0063  0260    K0260,  0260
1157  0064  0000    K0000,  0000
1158  0065  0001    K0001,  0001
1159  0066  0002    K0002,  0002
1160  0067  0003    K0003,  0003
1161  0070  0004    K0004,  0004
1162  0071  0006    K0006,  0006
1163  0072  0007    K0007,  0007
1164  0073  0010    K0010,  0010
1165  0074  0020    K0020,  0020
1166  0075  0037    K0037,  0037
1167  0076  0040    K0040,  0040
1168  0077  0100    K0100,  0100
1169  0100  0200    K0200,  0200
1170  0101  0207    K0207,  0207
1171  0102  0400    K0400,  0400
1172  0103  1000    K1000,  1000
1173  0104  2000    K2000,  2000
1174  0105  3777    K3777,  3777
1175  0106  4000    K4000,  4000
1176  0107  7000    K7000,  7000
1177  0110  7776    K7776,  7776
1178  0111  7775    K7775,  7775
1179  0112  7700    K7700,  7700
1180  0113  7740    K7740,  7740
1181  0114  0070    K0070,  0070
1182  0115  0077    K0077,  0077
1183  0116  0377    K0377,  0377
1184  0117  0177    K0177,  0177
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1185  0120  2525    K2525,  2525
1186  0121  5252    K5252,  5252
1187  0122  3737    K3737,  3737
1188  0123  7717    K7717,  7717
1189  0124  4100    K4100,  4100
1190  0125  7600    K7600,  7600
1191  0126  5000    K5000,  5000
1192  0127  5777    K5777,  5777
1193  0130  7774    K7774,  7774
1194  0131  7771    K7771,  7771
1195  0132  7777    K7777,  7777
1196              /
1197              DECIMAL
1198              /
1199  0133  7774    M4,     -4
1200  0134  7773    M5,     -5
1201  0135  7771    M7,     -7
1202  0136  7764    M12,    -12
1203  0137  7760    M16,    -16
1204  0140  7720    M48,    -48
1205  0141  7600    M128,   -128
1206  0142  7501    M191,   -191
1207  0143  7401    M255,   -255
1208  0144  7324    M300,   -300
1209              /
1210              OCTAL
1211              /
1212  0145  0017    K0017,  0017
1213  0146  0215    K0215,  0215
1214  0147  0212    K0212,  0212
1215  0150  6201    KCDF,   CDF
1216  0151  6244    KRMF,   RMF
1217  0152  3741    MTS85,  -TST85 -1
1218  0153  0000    REG1,   0
1219  0154  0000    REG2,   0
1220  0155  0000    SBCNT1, 0
1221  0156  0000    TCNTR1, 0
1222  0157  0000    TCNTR2, 0
1223  0160  0000    TCNTR3, 0
1224  0161  0000    TCNTR4, 0
1225              /
1226  0162  0000    GDREG1, 0
1227  0163  0000    GDREG2, 0
1228  0164  0000    CRREG1, 0
1229  0165  0000    CRREG2, 0
1230  0166  0000    STREG,  0
1231  0167  0000    DBREG,  0
1232  0170  0000    CMREG,  0
1233  0171  0000    DAREG,  0
1234  0172  0000    ADREG,  0
1235  0173  0000    DTREG,  0
1236  0174  0000    ACREG,  0
1237  0175  0000    HOMEMA, 0
1238  0176  0000    FLDMAX, 0
1239  0177  2200    STCON,  2200
```

```
1240
1241            0200            *200
1242                    /
1243                    /SETUP POINTERS FOR AMOUNT OF EXTENDED
1244                    /BANKS OF MEMORY, INTERRUPT SERVICE, CURRENT
1245                    /FIELD , AND TESTS FOR CLASSIC PACKAGE OR APT SYSYTEM.
1246                    /IF CONSOLE IS ACTIVE APT FUNTIONS OR NOP.
1247
1248                    /
1249    0200    5203    BGN,    JMP     .+3             /RUN DISKLESS.
1250    0201    5430            MANUAL                  /TO MANUAL SCOPE TEST
1251    0202    5426            IOTCHN                  /TO IOT CHANGE ROUTINE
1252    0203    6224            RIF
1253    0204    3175            DCA     HOMEMA
1254    0205    1175            TAD     HOMEMA
1255    0206    1150            TAD     KCDF            /MAKE HOMEDF
1256    0207    3210            DCA     PRSFLD
1257    0210    7402    PRSFLD, HLT                     /MAKE DF=IF
1258    0211    4405            SET                     /SETUP FIELD 0
1259    0212    1176            TAD     FLDMAX          /GET FIRST PASS POINTER
1260    0213    7640            SZA CLA                 /IS IT FIRST PASS
1261    0214    5217            JMP     .+3             /NO, MUST BE A RESTART
1262    0215    1532            TAD I   K7777           /GET LAST LOCATION
1263    0216    3007            DCA     SAVEND          /SAVE IT FOR A RESTORE
1264    0217    4423            APT8A                   /NOP CONSOLE IF ON APT8A
1265    0220    4406            CLASIC                  /CHECK FOR CONSOLE CLASSIC
1266    0221    4431            C8SWIT                  /CHECK FOR SWITCH SR=.
1267    0222    7000            NOP
1268    0223    4404            LAS
1269    0224    0072            AND     K0007           /MASK 9-11
1270    0225    7040            CMA
1271    0226    3176            DCA     FLDMAX          /SAVE AMOUNT OF EXTENDED MEMORY
1272    0227    1022            TAD     22
1273    0230    0102            AND     K0400
1274    0231    7640            SZA CLA                 /ON CLASSIC.
1275    0232    6007            6007                    /YES, THEN CLEAR ALL FLAGS.
1276                    /
1277                    /VERIFY THAT THE DISK MOTOR IS OFF. THE
1278                    /STATUS REGISTER SHOULD ONLY CONTAIN NOT READY TO
1279                    /SEEK, READ, OR WRITE AND NOT DISK FILE READY.
1280                    /INITIALIZE SHOULD HAVE CLEARED ALL OTHER BITS
1281                    /
1282
1283    0233    3153            DCA     REG1
1284    0234    1177            TAD     STCON           /GET EXPECTED STATUS
1285    0235    3163            DCA     GDREG2          /SETUP TEST HANDLER
1286                    /
1287    0236    1153    TST0,   TAD     REG1            /GET AC VALUE
1288    0237    4442            RDSTAT                  /READ STATUS REGISTER
1289    0240    4440            ACCMP1                  /CHECK RESULTS
1290    0241    4435            NERROR                  /AC O.K. 4096 LOOPS
1291    0242    4436            ERROR                   /ERROR, "INITIALIZE" CLEAR STATUS
1292                                                    /REGISTER FAILED.
1293    0243    0236            TST0                    /SCOPE LOOP POINTER
1294    0244    5000            5000                    /TEXT POINTER
```

```
1295                    /
1296                    /VERIFY THAT SKIP CONDITIONS WERE CLEARED
1297                    /BY "INITIALIZE" ON START OF TEST.
1298                    /
1299    0245    4447    TST1,   DSKSKP                  /ISSUE "DSKP" IOT
1300    0246    4435            NERROR                  /DSKP O.K. 4096 LOOPS
1301    0247    4436            ERROR                   /ERROR, "INITIALIZE" CLEAR
1302                                                    /SKIP CONDITIONS
1303    0250    0245            TST1                    /SCOPE LOOP POINTER
1304    0251    0006            0006                    /TEXT POINTER
1305                    /
1306                    /VERIFY THAT INTERRUPT REQUESTS WERE
1307                    /CLEARED BY "INITIALIZE" AT START OF TEST
1308                    /
1309    0252    4437    TST2,   IONWAT                  /GO WAIT FOR INT.
1310    0253    4435            NERROR                  /INT. O.K. 4096 LOOPS
1311    0254    4436            ERROR                   /ERROR, "INITIALIZE" CLEAR
1312                                                    /INT. CONDITION
1313    0255    0252            TST2                    /SCOPE LOOP POINTER
1314    0256    0007            0007                    /TEXT POINTER
1315                    /
1316                    /VERIFY THAT COMMAND REGISTER WAS CLEARED
1317                    /BY "INITIALIZE" AT START OF TEST, READ COMMAND
1318                    /REGISTER WITH "DMAN" (MAINTENANCE IOT)
1319                    /
1320    0257    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1321    0260    4443    TST3,   RDCMD                   /READ COMMAND REGISTER
1322    0261    7650            SNA CLA                 /AC SHOULD BE 0
1323    0262    4435            NERROR                  /AC O.K. 4096 LOOPS
1324    0263    4436            ERROR                   /ERROR, "INITIALIZE" CLEAR
1325                                                    /COMMAND REGISTER
1326    0264    0260            TST3                    /SCOPE LOOP POINTER
1327    0265    4201            4201                    /TEXT POINTER
1328                    /
1329                    /VERIFY THAT ALL DRIVES ON CONTROL ARE OFF.
1330                    /THE STATUS SHOULD BE 2200 WHEN DRIVES ARE SELECTED.
1331                    /
1332    0266    1177    TST4,   TAD     STCON           /EXPECTED STATUS
1333    0267    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1334    0270    7301            CLA CLL IAC             /ENABLE CLEAR CONTROL
1335    0271    4453            CLRALL                  /DCLR "CLR ALL"
1336    0272    1153            TAD     REG1            /GET AC VALUE
1337    0273    4450            LDCMD                   /LOAD COMMAND
1338    0274    4442            RDSTAT                  /READ STATUS
1339    0275    4440            ACCMP1                  /CHECK RESULTS
1340    0276    4435            NERROR                  /O.K. 4096 LOOPS
1341    0277    4436            ERROR                   /ERROR, STATUS
1342    0300    0266            TST4                    /SCOPE LOOP POINTER
1343    0301    5000            5000                    /TEXT POINTER
1344                    /
1345                    /VERIFY THAT IOT "DSKP" DOES NOT AFFECT
1346                    /AC REGISTER, TRY ALL COMBINATIONS IN AC.
1347                    /
1348    0302    1153    TST5,   TAD     REG1            /GET AC VALUE
1349    0303    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
```

```
1350    0304  1153              TAD    REG1
1351    0305  4447              DSKSKP                   /ISSUE "DSKP" IOT
1352    0306  7000              NOP
1353    0307  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1354    0310  4435              NERROR                   /AC O.K. 4096 LOOPS
1355    0311  4436              ERROR                    /ERROR, "DSKP" CHANGED AC.
1356    0312  0302              TST5                     /SCOPE LOOP POINTER
1357    0313  4010              4010                     /TEXT POINTER
1358
1359                     /VERIFY THAT "DLCA" LOAD CURRENT ADDRESS
1360                     /REGISTER CLEARS THE AC, TRY ALL COMBINATIONS IN AC
1361                     /
1362    0314  3163              DCA    GDREG2            /SETUP COMPARE REGISTER
1363    0315  1153       TST6,  TAD    REG1              /GET AC VALUE
1364    0316  4451              LDCUR                    /LOAD CURRENT ADDRESS "DLCA"
1365    0317  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1366    0320  4435              NERROR                   /AC O.K. 4096 LOOPS
1367    0321  4436              ERROR                    /ERROR, DLCA CLEAR AC
1368    0322  0315              TST6                     /SCOPE LOOP POINTER
1369    0323  4010              4010                     /TEXT POINTER
1370                     /
1371                     /VERIFY THAT "DLDC" LOAD COMMAND REGISTER
1372                     /CLEARS THE AC, TRY ALL COMBINATIONS IN AC.
1373                     /
1374    0324  1153       TST7,  TAD    REG1              /GET AC VALUE
1375    0325  4450              LDCMD                    /"DLDC" LOAD COMMAND REGISTER
1376    0326  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1377    0327  4435              NERROR                   /AC O.K. 4096 LOOPS
1378    0330  4436              ERROR                    /ERROR, DLDC CLEAR AC
1379    0331  0324              TST7                     /SCOPE LOOP POINTER
1380    0332  4010              4010                     /TEXT POINTER
1381
1382                     /VERIFY THAT "DLAG" CLEARS THE AC REGISTER.
1383                     /TRY ALL COMBINATIONS IN AC.
1384                     /
1385    0333  7301       TST8,  CLA CLL IAC
1386    0334  4453              CLRALL                   /CLEAR CONTROL
1387    0335  1154              TAD    REG2              /GET DATA
1388    0336  4452              LDADD                    /LOAD DISK ADDRESS
1389    0337  4440              ACCMP1                   /CHECK RESULTS
1390    0340  4435              NERROR                   /O.K. 4096 LOOPS
1391    0341  4436              ERROR                    /ERROR, DLAG, CLEAR AC
1392    0342  0333              TST8                     /SCOPE LOOP POINTER
1393    0343  4010              4010                     /TEXT POINTER
1394                     /
1395                     /VERIFY THE  IOT "DCLR" CLEARS THE AC.
1396                     /TRY ALL COMBINATIONS IN AC
1397                     /
1398    0344  1153       TST9,  TAD    REG1
1399    0345  4453              CLRALL                   /DCLR "CLR ALL"
1400    0346  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1401    0347  4435              NERROR                   /AC O.K. 4096 LOOPS
1402    0350  4436              ERROR                    /ERROR, DCLR CLEAR AC
1403    0351  0344              TST9                     /SCOPE LOOP POINTER
1404    0352  4010              4010                     /TEXT POINTER
```

```
1405                     /
1406                     /VERIFY THAT THE COMMAND REGISTER CAN BE LOADED
1407                     /AND SHIFTED INTO THE LOWER DATA BUFFER WITH
1408                     /THE MAINTENANCE IOT. USE DATA PATTERN 0000 + 7777.
1409                     /
1410    0353  7301       TST10, CLA CLL IAC
1411    0354  4453              CLRALL                   /DCLR "CLR ALL"
1412    0355  1153              TAD    REG1
1413    0356  7110              CLL RAR
1414    0357  7630              SZL CLA                   /DATA 7777 IF LINK IS SET
1415    0360  7240              CLA CMA
1416    0361  3163              DCA    GDREG2            /SETUP COMPARE REGISTER
1417    0362  1163              TAD GDREG2
1418    0363  7040              CMA
1419    0364  4450              LDCMD                    /SET COMMAND TO OPOSITE
1420    0365  1163              TAD GDREG2
1421    0366  4450              LDCMD                    /SET COMMAND TO VALUE EXPECTED
1422    0367  4443              RDCMD                    /READ COMMAND REGISTER
1423    0370  4440              ACCMP1                   /CHECK RESULTS
1424    0371  4435              NERROR                   /O.K. 4096 LOOPS
1425    0372  4436              ERROR                    /ERROR, COMMAND REGISTER
1426    0373  0353              TST10                    /SCOPE LOOP POINTER
1427    0374  4201              4201                     /TEXT POINTER
1428                     /
1429                     /VERIFY THAT THE COMMAND REGISTER CAN BE LOADED
1430                     /AND SHIFTED INTO THE LOWER DATA BUFFER WITH
1431                     /THE MAINTENANCE IOT. USE DATA PATTERN 2525 + 5252
1432                     /
1433    0375  7301       TST11, CLA CLL IAC
1434    0376  4453              CLRALL                   /DCLR "CLR ALL"
1435    0377  1153              TAD    REG1
1436    0400  7110              CLL RAR
1437    0401  7630              SZL CLA                   /DATA 5252 IF LINK IS SET
1438    0402  1120              TAD    K2525
1439    0403  1120              TAD    K2525
1440    0404  3163              DCA    GDREG2            /SETUP COMPARE REGISTER
1441    0405  1163              TAD    GDREG2
1442    0406  7040              CMA
1443    0407  4450              LDCMD                    /SET COMMAND TO OPOSITE
1444    0410  1163              TAD    GDREG2
1445    0411  4450              LDCMD                    /SET COMMAND TO VALUE EXPECTED
1446    0412  4443              RDCMD                    /READ COMMAND REGISTER
1447    0413  4440              ACCMP1                   /CHECK RESULTS
1448    0414  4435              NERROR                   /O.K. 4096 LOOPS
1449    0415  4436              ERROR                    /ERROR, COMMAND REGISTER
1450    0416  0375              TST11                    /SCOPE LOOP POINTER
1451    0417  4201              4201                     /TEXT POINTER
1452                     /
1453                     /VERIFY THAT THE COMMAND REGISTER
1454                     /BE LOADED AND THEN SHIFTED INTO THE LOWER
1455                     /DATA BUFFER. TRY ALL COMBINATIONS.
1456                     /
1457    0420  1154       TST12, TAD    REG2              /GET AC VALUE
1458    0421  4450              LDCMD                    /LOAD COMMAND REGISTER
1459    0422  1153              TAD    REG1
```

```
1460    0423  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1461    0424  1153            TAD     REG1
1462    0425  4450            LDCMD                   /LOAD COMMAND REGISTER
1463    0426  4443            RDCMD                   /READ COMMAND REGISTER
1464    0427  4440            ACCMP1                  /CHECK AC, COMPARE TO GDREG2
1465    0430  4435            NERROR                  /AC O.K. 4096 LOOPS
1466    0431  4436            ERROR                   /ERROR, LOAD OR READ
1467                                                  /COMMAND REGISTER
1468    0432  0420            TST12                   /SCOPE LOOP POINTER
1469    0433  4201            4201                    /TEXT POINTER
1470
1471                  /VERIFY THAT DCLR DOES NOT CLEAR COMMAND
1472                  /REGISTER WHEN AC10=0 AND A11=0
1473                  /
1474    0434  1153    TST13,  TAD     REG1
1475    0435  4450            LDCMD                   /LOAD COMMAND REGISTER
1476    0436  1154            TAD     REG2
1477    0437  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1478    0440  1154            TAD     REG2
1479    0441  4450            LDCMD                   /LOAD COMMAND REGISTER
1480    0442  4453            CLRALL                  /DCLR "CLR ALL"
1481    0443  4443            RDCMD                   /READ COMMAND REGISTER
1482    0444  4440            ACCMP1                  /CHECK AC, COMPARE TO GDREG2
1483    0445  4435            NERROR                  /AC O.K. 4096 LOOPS
1484    0446  4436            ERROR                   /ERROR, DCLR CLEAR COMMAND
1485                                                  /REGISTER WHEN AC10=0 + AC11=0
1486    0447  0434            TST13                   /SCOPE LOOP POINTER
1487    0450  4201            4201
1488
1489                  /VERIFY THAT DCLR DOES CLEAR COMMAND
1490                  /REGISTER WHEN AC10=0 AND AC11=1
1491                  /
1492    0451  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1493    0452  1153    TST14,  TAD     REG1
1494    0453  4450            LDCMD                   /LOAD COMMAND REGISTER
1495    0454  7301            CLA CLL IAC             /ENABLE CLEAR CONTROL
1496    0455  4453            CLRALL                  /DCLR "CLR ALL"
1497    0456  4443            RDCMD                   /READ COMMAND REGISTER
1498    0457  7650            SNA CLA                 /CHECK AC, SHOULD EQUAL 0
1499    0460  4435            NERROR                  /AC O.K. LOOP 4096
1500    0461  4436            ERROR                   /ERROR, DCLR CLEAR COMMAND
1501                                                  /REGISTER WHEN AC10=0+AC11=1
1502    0462  0452            TST14                   /SCOPE LOOP POINTER
1503    0463  4201            4201                    /TEXT POINTER
1504                  /
1505                  /VERIFY THAT DLAG DOES LOAD THE SURFACE AND SECTOR
1506                  /REGISTER, USE DATA PATTERN 00 + 37.
1507                  /
1508    0464  7301    TST15,  CLA CLL IAC             /ENABLE CLEAR CONTROL
1509    0465  4453            CLRALL                  /CLEAR CONTROL
1510    0466  1136            TAD     M12
1511    0467  3156            DCA     TCNTR1          /SETUP 12 BIT SHIFT COUNTER
1512    0470  1153            TAD     REG1
1513    0471  7110            CLL RAR
1514    0472  7630            SZL CLA                 /DATA 00 + 3777
```

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1515    0473  7340            CLA CLL CMA             /371
1516    0474  4452            LDADD                   /LOAD DISK ADDRESS "DLAG"
1517    0475  1171            TAD     DAREG
1518    0476  0075            AND     K0037           /MASK EXPECTED VALUE
1519    0477  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1520    0500  4445            ENMAN2                  /ENTER MAINTENANCE
1521    0501  1100            TAD     K0200           /ENABLE SHIFT LOWER BUFFER
1522    0502  4455            LDMAN                   /LOAD MAINTENANCE
1523    0503  2156            ISZ     TCNTR1          /COUNT 12 SHIFTS
1524    0504  5302            JMP     .-2
1525    0505  7300            CLA CLL
1526    0506  1074            TAD     K0020           /ENABLE READ LOWER BUFFER
1527    0507  4455            LDMAN                   /LOAD MAINTENANCE
1528    0510  3171            DCA     DAREG           /SAVE VALUE FOUND
1529    0511  1171            TAD     DAREG
1530    0512  4440            ACCMP1                  /CHECK RESULTS
1531    0513  4435            NERROR                  /O.K. 4096 LOOPS
1532    0514  4436            ERROR                   /ERROR, SURFACE AND SECTOR SHIFT
1533    0515  0464            TST15                   /SCOPE LOOP POINTER
1534    0516  4102            4102                    /TEXT POINTER
1535                  /
1536                  /VERIFY THAT DLAG LOADS THE SURFACE AND
1537                  /SECTOR REGISTER, USE DATA PATTERN ALL
1538                  /COMBINATIONS.
1539                  /
1540    0517  7301    TST16,  CLA CLL IAC             /ENABLE CLEAR CONTROL
1541    0520  4453            CLRALL                  /CLEAR CONTROL
1542    0521  1136            TAD     M12
1543    0522  3156            DCA     TCNTR1          /SETUP 12 BIT SHIFT COUNTER
1544    0523  1153            TAD     REG1
1545    0524  0075            AND     K0037           /MASK EXPECTED VALUE
1546    0525  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
1547    0526  1153            TAD     REG1
1548    0527  4452            LDADD                   /LOAD DISK ADDRESS "DLAG"
1549    0530  4445            ENMAN2                  /ENTER MAINTENANCE
1550    0531  1100            TAD     K0200           /ENABLE SHIFT LOWER BUFFER
1551    0532  4455            LDMAN                   /LOAD MAINTENANCE
1552    0533  2156            ISZ     TCNTR1          /COUNT 12 SHIFTS
1553    0534  5332            JMP     .-2
1554    0535  7300            CLA CLL
1555    0536  1074            TAD     K0020           /ENABLE READ LOWER BUFFER
1556    0537  4455            LDMAN                   /LOAD MAINTENANCE
1557    0540  3171            DCA     DAREG           /SAVE VALUE FOUND
1558    0541  1171            TAD     DAREG
1559    0542  4440            ACCMP1                  /CHECK RESULTS
1560    0543  4435            NERROR                  /O.K. 4096 LOOPS
1561    0544  4436            ERROR                   /ERROR, SURFACE AND SECTOR SHIFT
1562    0545  0517            TST16                   /SCOPE LOOP POINTER
1563    0546  4102            4102                    /TEXT POINTER
1564                  /
1565                  /VERIFY THAT THE DISK ADDRESS REGISTER CAN BE LOADED
1566                  /AND SHIFTED TO LOWER DATA BUFFER WITH THE MAINTENANCE
1567                  /IOT, USE DATA PATTERN 0000 + 7777
1568                  /SHIFT THE SURFACE AND SECTOR FROM THE SURFACE AND SECTOR
1569                  /REGISTER, SHIFT THE LOWER CYLINDER BITS FROM THE CRC REGISTER.
```

```
1570                    /
1571    0547  7301      TST17,  CLA CLL IAC
1572    0550  4453              CLRALL                  /DCLR "CLR ALL"
1573    0551  1153              TAD      REG1
1574    0552  7110              CLL RAR
1575    0553  7630              SZL CLA                  /USE DATA 7777 IF LINK IS SET
1576    0554  7240              CLA CMA
1577    0555  3163              DCA GDREG2               /SETUP COMPARE REGISTER
1578    0556  1163              TAD      GDREG2
1579    0557  7040              CMA
1580    0560  4452              LDADD                    /SET DISK ADDRESS TO OPOSITE
1581    0561  1163              TAD GDREG2
1582    0562  4452              LDADD                    /SET DISK ADDRESS TO EXPECTED
1583    0563  4446              RDADD                    /READ DISK ADDRESS
1584    0564  4440              ACCMP1                   /CHECK RESULTS
1585    0565  4435              NERROR                   /O.K, 4096 LOOPS
1586    0566  4436              ERROR                    /ERROR, DISK ADDRESS REGISTER
1587    0567  0547              TST17                    /SCOPE LOOP POINTER
1588    0570  4102              4102                     /TEXT POINTER
1589                    /
1590                    /VERIFY THAT THE DISK ADDRESS REGISTER CAN BE LOADED
1591                    /AND SHIFTED TO LOWER DATA BUFFER WITH THE MAINTENANCE
1592                    /IOT. USE DATA PATTERN 2525 + 5252.
1593                    /SHIFT THE SURFACE AND SECTOR FROM THE SURFACE AND SECTOR
1594                    /REGISTER. SHIFT THE LOWER CYLINDER BITS FROM THE CRC REGISTER.
1595                    /
1596    0571  7301      TST18,  CLA CLL IAC
1597    0572  4453              CLRALL                  /DCLR "CLR ALL"
1598    0573  1153              TAD      REG1
1599    0574  7110              CLL RAR
1600    0575  7630              SZL CLA                  /USE DATA 5252 IF LINK IS SET
1601    0576  1120              TAD      K2525
1602    0577  1120              TAD      K2525
1603    0600  3163              DCA      GDREG2          /SETUP COMPARE REGISTER
1604    0601  1163              TAD      GDREG2
1605    0602  7040              CMA
1606    0603  4452              LDADD                    /SET DISK ADDRESS TO OPOSITE
1607    0604  1163              TAD GDREG2
1608    0605  4452              LDADD                    /SET DISK ADDRESS TO EXPECTED
1609    0606  4446              RDADD                    /READ DISK ADDRESS
1610    0607  4440              ACCMP1                   /CHECK RESULTS
1611    0610  4435              NERROR                   /O.K, 4096 LOOPS
1612    0611  4436              ERROR                    /ERROR, DISK ADDRESS REGISTER
1613    0612  0571              TST18                    /SCOPE LOOP POINTER
1614    0613  4102              4102                     /TEXT POINTER
1615                    /
1616                    /VERIFY THAT THE DISK ADDRESS REGISTER
1617                    /CAN BE LOADED AND SHIFTED INTO THE LOWER
1618                    /DATA BUFFER. TRY ALL COMBINATIONS IN AC
1619                    /SHIFT THE SURFACE AND SECTOR FROM THE SURFACE AND SECTOR
1620                    /REGISTER. SHIFT THE LOWER CYLINDER BITS FROM THE CRC REGISTER.
1621                    /
1622    0614  1153      TST19,  TAD      REG1            /GET AC VALUE
1623    0615  3163              DCA      GDREG2          /SETUP COMPARE REGISTER
1624    0616  1153              TAD      REG1
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1625    0617  4452              LDADD                    /LOAD DISK ADDRESS REGISTER
1626    0620  4446              RDADD                    /READ DISK ADDRESS REGISTER
1627    0621  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1628    0622  4435              NERROR                   /AC O.K., LOOP 4096 TIMES
1629    0623  4436              ERROR                    /ERROR, LOAD OR READ DISK
1630                                                     /ADDRESS REGISTER
1631    0624  0614              TST19                    /SCOPE LOOP POINTER
1632    0625  4102              4102                     /TEXT POINTER
1633                    /
1634                    /VERIFY THAT DCLR DOES NOT AFFECT THE SURFACE
1635                    /AND SECTOR WHEN AC10=0 + AC11=0
1636                    /
1637    0626  1153      TST20,  TAD      REG1            /GET AC VALUE
1638    0627  3163              DCA      GDREG2          /SETUP COMPARE REGISTER
1639    0630  1154              TAD      REG2            /AC VALUE, COMPLIMENT OF REG1
1640    0631  4452              LDADD                    /LOAD DISK ADDRESS
1641    0632  1153              TAD      REG1
1642    0633  4452              LDADD                    /LOAD DISK ADDRESS
1643    0634  4453              CLRALL                   /DCLR "CLR ALL"
1644    0635  4446              RDADD                    /READ DISK ADDRESS
1645    0636  4440              ACCMP1                   /CHECK AC, COMPARE TO GDREG2
1646    0637  4435              NERROR                   /AC O.K, LOOP 4096 TIMES
1647    0640  4436              ERROR                    /ERROR, LOAD OR READ DISK
1648                                                     /ADDRESS OR DCLR CLEAR
1649    0641  0626              TST20                    /SCOPE LOOP POINTER
1650    0642  4102              4102                     /TEXT POINTER
1651                    /
1652                    /VERIFY THAT "DCLR" DOESN'T  CLEAR SURFACE AND SECTOR
1653                    /REGISTER WHEN A10=0 + A11=1
1654                    /
1655    0643  1153      TST21,  TAD      REG1            /GET AC VALUE
1656    0644  3163              DCA      GDREG2          /SETUP COMPARE REGISTER
1657    0645  1153              TAD      REG1
1658    0646  4452              LDADD                    /LOAD DISK ADDRESS
1659    0647  7301              CLA CLL IAC              /ENABLE "CLR ALL" BIT
1660    0650  4453              CLRALL                   /DCLR "CLR ALL"
1661    0651  4446              RDADD                    /READ DISK ADDRESS
1662    0652  4440              ACCMP1                   /CHECK RESULTS
1663    0653  4435              NERROR                   /AC O.K, LOOP 4096
1664    0654  4436              ERROR                    /ERROR, LOAD, READ, OR CLEAR
1665                                                     /DISK ADDRESS
1666    0655  0643              TST21                    /SCOPE LOOP POINTER
1667    0656  4102              4102                     /TEXT POINTER
1668                    /
1669                    /VERIFY THAT THE CRC CAN BE LOADED BY "DLAG"
1670                    /AND "DLDC". USE DATA PATTERN 0000 + 7777.
1671                    /THIS WILL VERIFY THAT THE CRC CAN BE LOADED
1672                    /BY THE EXTENDED CYLINDER BIT IN THE COMMAND REGISTER
1673                    /BY THE "DLAG" IOT.
1674                    /
1675    0657  7301      TST22,  CLA CLL IAC
1676    0660  4453              CLRALL                   /DCLR
1677    0661  1153              TAD      REG1
1678    0662  7110              CLL RAR
1679    0663  7630              SZL CLA                  /USE DATA 7777 IF LINK IS SET
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1680    0664  7240              CLA CMA
1681    0665  0113              AND     K7740
1682    0666  3163              DCA     GDREG2          /SETUP COMPARE # 1
1683    0667  7004              RAL                     /LINK FOR EXTENDED BIT
1684    0670  3162              DCA     GDREG1          /SETUP COMPARE REGISTER
1685    0671  1162              TAD     GDREG1          /GET DATA
1686    0672  4450              LDCMD                   /LOAD CRC
1687    0673  1163              TAD     GDREG2
1688    0674  4452              LDADD                   /LOAD CRC
1689    0675  4454              RDCRC                   /READ CRC
1690    0676  4441              ACCMP2                  /CHECK RESULTS
1691    0677  4435              NERROR                  /O.K. 4096 LOOPS
1692    0700  4436              ERROR                   /EPROR, CRC REGISTER
1693    0701  0657              TST22                   /SCOPE LOOP POINTER
1694    0702  6004              6004                    /TEXT POINTER
1695                    /
1696                    /VERIFY THAT THE CRC CAN BE LOADED BY "DLAG"
1697                    /AND "DLDC", USE DATA PATTERN 2525 + 5252.
1698                    /THIS WILL VERIFY THAT THE CRC CAN BE LOADED
1699                    /BY THE EXTENDED CYLINDER BIT IN THE COMMAND REGISTER
1700                    /BY THE "DLAG" IOT.
1701                    /
1702    0703  7301      TST23,  CLA CLL IAC
1703    0704  4453              CLRALL                  /DCLR
1704    0705  1153              TAD     REG1
1705    0706  7110              CLL RAR
1706    0707  7630              SZL CLA                 /USE DATA 5252 IF LINK IS SET
1707    0710  1120              TAD     K2525
1708    0711  1120              TAD     K2525
1709    0712  0113              AND     K7740
1710    0713  3163              DCA     GDREG2          /SETUP COMPARE # 1
1711    0714  7004              RAL                     /LINK FOR EXTENDED BIT
1712    0715  3162              DCA     GDREG1          /SETUP COMPARE REGISTER
1713    0716  1162              TAD     GDREG1          /GET DATA
1714    0717  4450              LDCMD                   /LOAD CRC
1715    0720  1163              TAD     GDREG2
1716    0721  4452              LDADD                   /LOAD CPC
1717    0722  4454              RDCRC                   /READ CRC
1718    0723  4441              ACCMP2                  /CHECK RESULTS
1719    0724  4435              NERROR                  /O.K. 4096 LOOPS
1720    0725  4436              ERROR                   /ERROR, CPC REGISTER
1721    0726  0703              TST23                   /SCOPE LOOP POINTER
1722    0727  6004              6004                    /TEXT POINTER
1723                    /
1724                    /VERIFY THAT THE CRC CAN BE LOADED BY "DLAG"
1725                    /AND DLDC", USE DATA PATTERN ALL COMBINATIONS.
1726                    /THIS WILL VERIFY THAT THE CRC CAN BE LOADED
1727                    /BY THE EXTENDED CYLINDER BIT IN THE COMMAND REGISTER
1728                    /BY THE "DLAG" IOT.
1729                    /
1730    0730  1153      TST24,  TAD     REG1            /GET AC VALUE
1731    0731  7106              CLL RTL
1732    0732  7006              RTL
1733    0733  7004              RAL
1734    0734  0113              AND     K7740
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1735    0735  3163              DCA     GDREG2          /SETUP COMPARE REGISTER
1736    0736  7004              RAL                     /LINK FOR EXTENDED BIT
1737    0737  3162              DCA     GDREG1          /SETUP COMPARE REGISTER
1738    0740  1162              TAD     GDREG1          /GET DATA
1739    0741  4450              LDCMD                   /LOAD COMMAND REGISTER
1740    0742  1163              TAD     GDREG2
1741    0743  4452              LDADD                   /LOAD DISK ADDRESS
1742    0744  4454              RDCRC                   /READ CRC REGISTER
1743    0745  4441              ACCMP2                  /CHECK AC, COMPARE TO GDREG1 + GDREG2
1744    0746  4435              NERPOR                  /AC O.K. LOOP 4096
1745    0747  4436              ERROR                   /ERROR, CPC REGISTER LOAD BY
1746                                                    /DLAG OR DLDC.
1747    0750  0730              TST24                   /SCOPE LOOP POINTER
1748    0751  6004              6004                    /TEXT POINTER
1749                    /
1750                    /
1751                    /VERIFY THAT DCLR DOES NOT AFFECT CRC REGISTER.
1752                    /LOAD CRC WITH DLAG + DLDC.
1753                    /
1754    0752  1154      TST25,  TAD     REG2
1755    0753  7106              CLL RTL
1756    0754  7006              RTL
1757    0755  7004              RAL
1758    0756  0113              AND     K7740
1759    0757  3163              DCA     GDREG2          /SETUP COMPARE REGISTER
1760    0760  7004              RAL                     /LINK FOR EXTENDED BIT
1761    0761  3162              DCA     GDREG1          /SETUP COMPARE REGISTER
1762    0762  1162              TAD     GDREG1
1763    0763  4450              LDCMD                   /LOAD COMMAND REGISTER
1764    0764  1163              TAD     GDREG2
1765    0765  4452              LDADD                   /LOAD DISK ADDRESS
1766    0766  1154              TAD     REG2
1767    0767  0111              AND     K7775           /DON'T DO RECAL.
1768    0770  4453              CLRALL                  /DCLR "CLR ALL"
1769    0771  4454              RDCRC                   /READ CRC REGISTER
1770    0772  4441              ACCMP2                  /CHECK RESULTS, COMPARE TO GDREG1
1771                                                    /AND GDREG2
1772    0773  4435              NERROR                  /O.K. 4096 LOOPS
1773    0774  4436              ERROR                   /ERROR, LOAD, READ, CLEAR CPC
1774                                                    /REGISTER
1775    0775  0752              TST25                   /SCOPE LOOP POINTER
1776    0776  6004              6004                    /TEXT POINTER
1777                    /
1778                    /VERIFY THAT THE CRC REGISTER IS NOT AFFECTED BY
1779                    /"DLDC", "DSKP", "DRST", "RDBUF", OR "DLCA".
1780                    /USE DATA PATTERN 2525 + 5252.
1781                    /
1782    0777  7301      TST26,  CLA CLL IAC
1783    1000  4453              CLRALL                  /DCLR
1784    1001  1153              TAD     REG1
1785    1002  7110              CLL RAR
1786    1003  7630              SZL CLA                 /USE DATA 5252 IF LINK IS SET
1787    1004  1120              TAD     K2525
1788    1005  1120              TAD     K2525
1789    1006  0113              AND     K7740
```

```
1790    1007   3163           DCA     GDREG2          /SETUP COMPARE REGISTER
1791    1010   7004           RAL                     /LINK FOR EXTENDED BIT
1792    1011   3162           DCA     GDREG1          /SETUP COMPARE REGISTER
1793    1012   1162           TAD     GDREG1          /GET UPPER DATA
1794    1013   4450           LDCMD                   /LOAD COMMAND
1795    1014   1163           TAD     GDREG2
1796    1015   4452           LDADD                   /LOAD DISK ADDRESS
1797    1016   1154           TAD     REG2
1798    1017   4442           RDSTAT                  /READ STATUS
1799    1020   1154           TAD     REG2
1800    1021   4447           DSKSKP                  /"DSKP"
1801    1022   7000           NOP
1802    1023   4456           RDBUF                   /READ BUFFER
1803    1024   1154           TAD     REG2
1804    1025   4451           LDCUR                   /LOAD CURRENT ADDRESS
1805    1026   1154           TAD     REG2
1806    1027   4450           LDCMD                   /LOAD COMMAND
1807    1030   1153           TAD     REG1
1808    1031   4427           LDBUF                   /LOAD UPPER BUFFER
1809    1032   4454           RDCRC                   /READ CRC REGISTER
1810    1033   4441           ACCMP2                  /CHECK RESULTS
1811    1034   4435           NERROR                  /O.K. 4096 LOOPS
1812    1035   4436           ERROR                   /ERROR, CRC REGISTER
1813    1036   0777           TST26                   /SCOPE LOOP POINTER
1814    1037   6004           6004                    /TEXT POINTER
1815                  /
1816                  /VERIFY THAT WRITE LOCK INHIBITS LOAD ADDRESS
1817                  /WHEN IT IS SET.
1818                  /
1819    1040   7301   TST27,  CLA CLL IAC             /CLEAR CONTROL
1820    1041   4453           CLRALL                  /SETUP COMPARE REGISTER
1821    1042   3163           DCA     GDREG2          /SETUP COMPARE REGISTER
1822    1043   1153           TAD     REG1            /GET AC VALUE
1823    1044   4452           LDADD                   /LOAD DISK ADDRESS
1824    1045   1104           TAD     K2000
1825    1046   4450           LDCMD                   /SET WRITE LOCK
1826    1047   1154           TAD     REG2            /GET AC VALUE
1827    1050   4452           LDADD                   /TRY TO LOAD DISK ADDRESS
1828    1051   4446           RDADD                   /READ DISK ADDRESS
1829    1052   4440           ACCMP1                  /CHECK RESULTS
1830    1053   4435           NERROR                  /O.K. 4096 LOOPS
1831    1054   4436           ERROR                   /ERROR LOAD DISK ADDRESS
1832    1055   1040           TST27                   /SCOPE LOOP POINTER
1833    1056   4102           4102
1834                  /
1835                  /VERIFY THAT THE DISK ADDRESS REGISTER IS NOT
1836                  /AFFECTED BY "DCLR", "DLCA", "DRST", "DLDC", "DSKP"
1837                  /OR "RDBUF". USE DATA PATTERN ALL COMBINATIONS.
1838                  /
1839    1057   1153   TST28,  TAD     REG1            /GET AC VALUE
1840    1060   3163           DCA     GDREG2          /SETUP COMPARE REGISTER
1841    1061   1153           TAD     REG1
1842    1062   4452           LDADD                   /LOAD DISK ADDRESS
1843    1063   1154           TAD     REG2
1844    1064   0127           AND     K5777           /MASK OUT WRITE LOCK
```

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1845    1065   4450           LDCMD                   /LOAD COMMAN REGISTER
1846    1066   1154           TAD     REG2
1847    1067   4451           LDCUR                   /LOAD CURRENT ADDRESS
1848    1070   1154           TAD     REG2
1849    1071   4447           DSKSKP                  /DSKP
1850    1072   7000           NOP
1851    1073   4442           RDSTAT                  /READ STATUS
1852    1074   1154           TAD     REG2
1853    1075   4427           LDBUF                   /LOAD BUFFERS
1854    1076   4456           RDBUF                   /READ LOWER BUFFER
1855    1077   7300           CLA CLL
1856    1100   4453           CLRALL                  /CLEAR STATUS
1857    1101   4446           RDADD                   /READ DISK ADDRESS
1858    1102   4440           ACCMP1                  /CHECK AC, COMPARE TO GDREG2
1859    1103   4435           NERROR                  /AC O.K. 4096 LOOPS
1860    1104   4436           ERROR                   /ERROR, DISK ADDRESS AFFECTED
1861    1105   1057           TST28                   /SCOPE LOOP POINTED
1862    1106   4107           4107                    /TEXT POINTER
1863                  /
1864                  /VERIFY THAT THE COMMAND REGISTER IS NOT AFFECTED BY
1865                  /"DLCR", "DLCA", "DRST", "DLAG", "DSKP", OR "RDBUF".
1866                  /USE DATA PATTERN ALL COMBINATIONS.
1867                  /
1868    1107   7301   TST29,  CLA CLL IAC             /CLEAR CONTROL
1869    1110   4453           CLRALL
1870    1111   1153           TAD     REG1            /GET AC VALUE
1871    1112   3163           DCA     GDREG2          /SETUP COMPARE REGISTER
1872    1113   1153           TAD     REG1
1873    1114   4450           LDCMD                   /LOAD COMMAND REGISTER
1874    1115   1154           TAD     REG2
1875    1116   4452           LDADD                   /LOAD DISK ADDRESS
1876    1117   1154           TAD     REG2
1877    1120   4451           LDCUR                   /LOAD CURRENT ADDRESS
1878    1121   1154           TAD     REG2
1879    1122   4447           DSKSKP                  /DSKP
1880    1123   7000           NOP
1881    1124   4442           RDSTAT                  /READ STATUS
1882    1125   1154           TAD     REG2
1883    1126   4427           LDBUF                   /LOAD UPPER BUFFER
1884    1127   4456           RDBUF                   /READ LOWER BUFFER
1885    1130   7300           CLA CLL
1886    1131   4453           CLRALL                  /CLEAR STATUS
1887    1132   7326           CLA CLL CML RTL
1888    1133   4453           CLRALL                  /RECALIBRATE
1889    1134   4443           RDCMD                   /READ COMMAND REGISTER
1890    1135   4440           ACCMP1                  /CHECK AC, COMPARE TO GDREG2
1891    1136   4435           NERROR                  /AC O.K. 4096 LOOPS
1892    1137   4436           ERROR                   /ERROR, COMMAND REGISTER
1893    1140   1107           TST29                   /SCOPE LOOP POINTER
1894    1141   4201           4201                    /TEXT POINTER
1895                  /
1896                  /VERIFY THAT RECALIBRATE INHIBITS LOAD COMMAND
1897                  /
1898    1142   7301   TST30,  CLA CLL IAC             /ENABLE CLEAR CONTROL
1899    1143   4453           CLRALL                  /CLEAR CONTROL
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```
1900    1144   4444          ENMAN1                     /ENTER MAINTENANCE
1901    1145   7326          CLA CLL CML RTL            /ENABLE RECALIBRATE
1902    1146   4453          CLRALL                     /RECALIBRATE
1903    1147   7326          CLA CLL CML RTL            /ENABLE RECALIBRATE
1904    1150   4453          CLRALL                     /RECALIBRATE
1905    1151   3163          DCA     GDREG2             /SETUP COMPARE REGISTER
1906    1152   1153          TAD     REG1
1907    1153   4450          LDCMD                      /TRY TO LOAD COMMAND
1908    1154   4443          RDCMD                      /READ COMMAND
1909    1155   4440          ACCMP1                     /CHECK RESULTS
1910    1156   4435          NERROR                     /O.K. 4096 LOOPS
1911    1157   4436          ERROR                      /ERROR, IDLE (1)
1912    1160   1142          TST30                      /SCOPE LOOP POINTER
1913    1161   4201          4201                       /TEXT POINTER
1914                 /
1915                         /VERIFY THAT RECALIBRATE INHIBITS
1916                         /LOAD DISK ADDRESS DLAG
1917                 /
1918    1162   7301   TST31, CLA CLL IAC                /ENABLE CLEAR CONTROL
1919    1163   4453          CLRALL                     /CLEAR CONTROL
1920    1164   4444          ENMAN1                     /ENTER MAINTENANCE
1921    1165   1153          TAD     REG1               /GET AC VALUE
1922    1166   3163          DCA     GDREG2             /SETUP COMPARE
1923    1167   1163          TAD     GDREG2
1924    1170   4452          LDADD                      /LOAD DISK ADDRESS (DLAG)
1925    1171   7326          CLA CLL CML RTL            /ENABLE RECAL.
1926    1172   4453          CLRALL                     /RECALIBRATE
1927    1173   1154          TAD     REG2
1928    1174   4452          LDADD                      /LOAD DISK ADDRESS (DLAG)
1929    1175   4446          RDADD                      /READ DISK ADDRESS
1930    1176   4440          ACCMP1                     /CHECK RESULTS
1931    1177   4435          NERROR                     /O.K. 4096 LOOPS
1932    1200   4436          ERROR                      /ERROR ON INHIBIT
1933    1201   1162          TST31                      /SCOPE POINTER
1934    1202   4102          4102                       /TEXT POINTER
1935                 /
1936                         /VERIFY THAT "DMAN" (MAINTENANCE) DOES NOT
1937                         /AFFECT AC WHEN AC0≠0 AND AC7=1 OR 0.
1938                 /
1939    1203   7301   TST32, CLA CLL IAC                /CLEAR ENABLE BIT
1940    1204   4453          CLRALL                     /DCLR "CLR ALL"
1941    1205   1153          TAD     REG1
1942    1206   0122          AND     K3737              /MASK OUT 0
1943    1207   3163          DCA     GDREG2             /SETUP COMPARE REGISTER
1944    1210   1163          TAD     GDREG2
1945    1211   4455          LDMAN                      /LOAD MAINTENANCE "DMAN"
1946    1212   4440          ACCMP1                     /CHECK AC, COMPARE TO GDREG2
1947    1213   4435          NERROR                     /AC O.K. 4096 LOOPS
1948    1214   4436          ERROR                      /ERROR, "DMAN" AFFECTED AC
1949    1215   1203          TST32                      /SCOPE LOOP POINTER
1950    1216   4010          4010                       /TEXT POINTER
1951                 /
1952                         /VERIFY THAT "DMAN" DOES NOT AFFECT AC WHEN
1953                         /AC7=0 AND AC0=1 OR 0.
1954                 /
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1955    1217   7301   TST33, CLA CLL IAC                /CLEAR ENABLE BIT
1956    1220   4453          CLRALL                     /DCLR "CLR ALL"
1957    1221   1153          TAD     REG1               /GET AC VALUE
1958    1222   0123          AND     K7717              /MASK OUT BIT 7
1959    1223   3163          DCA     GDREG2             /SETUP COMPARE REGISTER
1960    1224   1163          TAD     GDREG2
1961    1225   4455          LDMAN                      /LOAD MAINTENANCE
1962    1226   4440          ACCMP1                     /CHECK AC, COMPARE TO GDREG2
1963    1227   4435          NERROR                     /AC O.K., 4096 LOOPS
1964    1230   4436          ERROR                      /ERROR, DMAN AFFECT AC
1965    1231   1217          TST33                      /SLOPE LOOP POINTER
1966    1232   4010          4010                       /TEXT POINTER
1967                 /
1968                         /VERIFY THAT "DMAN" ONLY GETS CLEARED BY
1969                         /DCLR NOT BY ANOTHER DMAN.
1970                 /
1971    1233   7301   TST34, CLA CLL IAC                /CLEAR ENABLE BIT
1972    1234   4453          CLRALL                     /DCLR "CLR ALL"
1973    1235   1153          TAD     REG1
1974    1236   3163          DCA     GDREG2             /SETUP COMPARE REGISTER
1975    1237   1153          TAD     REG1
1976    1240   4450          LDCMD                      /LOAD COMMAND REGISTER
1977    1241   1136          TAD     M12                /NO. OF SHIFTS
1978    1242   3156          DCA     TCNTR1             /STORE IN COUNTER
1979    1243   4445          ENMAN2                     /ENTER MAINTENANCE MODE + DB4=1
1980    1244   1102          TAD     K0404              /GET ENABLE COMMAND REG.
1981    1245   4455          LDMAN                      /LOAD MAINTENANCE
1982    1246   2156          ISZ     TCNTR1             /COUNT + SHIFT 12
1983    1247   5245          JMP     .-2
1984    1250   7300          CLA CLL
1985    1251   4455          LDMAN                      /"DMAN" TRY TO CLEAR MAIN FLOP
1986    1252   1074          TAD     K0020              /ENABLE BIT FOR READ BUFFER
1987    1253   4455          LDMAN                      /READ BUFFER
1988    1254   3167          DCA     DBREG              /SAVE FOR PRINTER
1989    1255   1167          TAD     DBREG
1990    1256   4440          ACCMP1                     /CHECK AC
1991    1257   4435          NERROR                     /AC O.K. 4096 LOOPS
1992    1260   4436          ERROR                      /ERROR, MAIN FLIP FLOP
1993    1261   1233          TST34                      /SCOPE LOOP POINTER
1994    1262   4405          4405
1995                 /
1996                 /
1997                         /VERIFY THAT "DMAN" GETS CLEARED BY DCLR
1998                         /"CLR ALL"
1999                 /
2000    1263   7301   TST35, CLA CLL IAC
2001    1264   4453          CLRALL                     /DCLR "CLR ALL"
2002    1265   1074          TAD     K0020
2003    1266   3163          DCA     GDREG2             /SETUP COMPARE REGISTER
2004    1267   1153          TAD     REG1
2005    1270   4450          LDCMD                      /LOAD COMMAND REGISTER
2006    1271   1136          TAD     M12
2007    1272   3156          DCA     TCNTR1             /SHIFT 12 COUNTER
2008    1273   4445          ENMAN2                     /ENTER MAINTENANCE MODE + DB4=1
2009    1274   1102          TAD     K0404
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2010    1275  4455            LDMAN                        /LOAD MAINTENANCE "DMAN"
2011    1276  2156            ISZ     TCNTR1
2012    1277  5275            JMP     .-2                  /12 COUNT
2013    1300  7301            CLA CLL IAC
2014    1301  4453            CLRALL                       /CLEAR ALL "DCLR"
2015    1302  1074            TAD     K0020
2016    1303  4455            LDMAN                        /LOAD MAINTENCE
2017    1304  4440            ACCMP1                       /CHECK AC, COMPARE TO GDREG2
2018    1305  4435            NERROR                       /AC O.K. 4096 LOOPS
2019    1306  4436            ERROR                        /ERROR, DMAN AFFECTED AC
2020    1307  1263            TST35                        /SCOPE LOOP POINTER
2021    1310  4010            4010                         /TEXT POINTER
2022
2023                          /
2024                          /VERIFY THAT "AC10 DATA" CAN BE SHIFTED TO
2025                          /CRC REGISTER, THEN READ CRC REGISTER.
2026                          /TRY ALL 1'S AND ALL 0'S.
2027    1311  7301    TST36,  CLA CLL IAC
2028    1312  4453            CLRALL                       /DCLR "CLR ALL"
2029    1313  1153            TAD     REG1
2030    1314  7110            CLL RAR
2031    1315  7630            SZL CLA                      /SKIP IF ALL 0'S DATA
2032    1316  7340            CLA CLL CMA                  /ALL ONE'S DATA
2033    1317  3163            DCA     GDREG2               /SETUP COMPARE REGISTER
2034    1320  1163            TAD     GDREG2
2035    1321  0145            AND     K0017
2036    1322  3162            DCA     GDREG1               /SETUP COMPARE REGISTER
2037    1323  1137            TAD     M16
2038    1324  3156            DCA     TCNTR1               /SHIFTER FOR CRC
2039    1325  4444            ENMAN1                       /ENTER MAINTENANCE MODE
2040    1326  1153            TAD     REG1
2041    1327  7104            CLL RAL
2042    1330  0066            AND     K0002
2043    1331  1103            TAD     K1000                /ENABLE BITS
2044    1332  4455            LDMAN                        /LOAD MAINTENANCE
2045    1333  2156            ISZ     TCNTR1
2046    1334  5332            JMP     .-2                  /16 COUNT
2047    1335  4454            RDCRC                        /READ CRC REGISTER
2048    1336  4441            ACCMP2                       /COMPARE RESULTS
2049    1337  4435            NERROR                       /AC O.K. 4096 LOOPS
2050    1340  4436            ERROR                        /ERROR, CRC REGISTER
2051    1341  1311            TST36                        /SCOPE LOOP POINTER
2052    1342  6004            6004                         /TEXT POINTER
2053
2054                          /
2055                          /VERIFY THAT "AC 10 DATA" CAN BE SHIFTED TO
2056                          /CRC REGISTER, THEN READ CRC REGISTER.
2057                          /TRY PATTERN "125252"
2058
2059
2060
2061
2062
2063
2064
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2065
2066
2067
2068                          /
2069    1343  7301    TST37,  CLA CLL IAC
2070    1344  4453            CLRALL                       /DCLR "CLR ALL"
2071    1345  1121            TAD     K5252
2072    1346  3163            DCA     GDREG2               /SETUP COMPARE REGISTER
2073    1347  1163            TAD     GDREG2
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2074   1350  0145            AND      K0017
2075   1351  3162            DCA      GDREG1          /SETUP COMPARE REGISTER
2076   1352  1137            TAD      M16
2077   1353  3156            DCA      TCNTR1          /SETUP 16 COUNT
2078   1354  4444            ENMAN1                   /ENTER MAINTENANCE MODE
2079   1355  7300   T37R,    CLA CLL
2080   1356  1156            TAD      TCNTR1
2081   1357  7004            RAL
2082   1360  0066            AND      K0002           /SETUP DATA BIT
2083   1361  1103            TAD      K1000           /ENABLE BITS
2084   1362  4455            LDMAN                    /LOAD MAINTENANCE
2085   1363  2156            ISZ      TCNTR1
2086   1364  5355            JMP      T37R            /16 COUNT
2087   1365  4454            RDCRC                    /READ CRC REGISTER
2088   1366  4441            ACCMP2                   /CHECK RESULTS
2089
2090   1367  4435            NEPROR                   /AC O.K. 4096 LOOPS
2091   1370  4436            ERROR                    /ERROR, CRC REGISTER
2092   1371  1343            TST37                    /SCOPE LOOP POINTER
2093   1372  6004            6004                     /TEXT POINTER
2094                /
2095   1373  5774            JMP I    .+1             /TO NEXT TEST
2096   1374  1400            TST38
2097                /
2098          1400   PAGE
2099                /
2100                /VERIFY THAT "AC10 DATA" CAN BE SHIFTED
2101                /TO CRC REGISTER, THEN READ CRC REGISTER.
2102
2103
2104
2105
2106                /TRY PATTER "052525"
2107                /
2108   1400  7301   TST38,   CLA CLL IAC
2109   1401  4453            CLRALL                   /CLEAR ALL "DCRL"
2110   1402  1120            TAD      K2525
2111   1403  3163            DCA      GDREG2          /SETUP COMPARE REGISTER
2112   1404  1163            TAD      GDREG2
2113   1405  0145            AND      K0017
2114   1406  3162            DCA      GDREG1          /SETUP COMPARE REGISTER
2115   1407  1137            TAD      M16
2116   1410  3156            DCA      TCNTR1          /16 COUNTER SHIFTER
2117   1411  4444            ENMAN1                   /ENTER MAINTENANCE MODE
2118   1412  7300   T38R,    CLA CLL
2119   1413  1156            TAD      TCNTR1
2120   1414  7044            CMA RAL
2121   1415  0066            AND      K0002           /SETUP "AC 10 DATA"
2122   1416  1103            TAD      K1000           /ENABLE BITS
2123   1417  4455            LDMAN                    /LOAD MAINTENANCE
2124   1420  2156            ISZ      TCNTR1
2125   1421  5212            JMP      T38R            /16 COUNT
2126   1422  4454            RDCRC                    /READ CRC REGISTER
2127   1423  4441            ACCMP2                   /CHECK RESULTS
2128   1424  4435            NERROR                   /O.K. 4096 LOOPS
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2129   1425  4436            ERROR                    /ERROR, CRC REGISTER
2130   1426  1400            TST38                    /SCOPE LOOP POINTER
2131   1427  6004            6004                     /TEXT POINTER
2132                /
2133
2134                /
2135                /VERIFY THAT "AC10 DATA" CAN BE SHIFTED TO CRC
2136                /REGISTER, TRY ALL COMBINATIONS.
2137                /
2138
2139   1430  7301   TST39,   CLA CLL IAC
2140   1431  4453            CLRALL                   /DCLR "CLR ALL"
2141   1432  1153            TAD      REG1
2142   1433  3163            DCA      GDREG2          /SETUP COMPARE REGISTER
2143   1434  1153            TAD      REG1
2144   1435  0145            AND      K0017
2145   1436  3162            DCA      GDREG1          /SETUP COMPARE REGISTER
2146   1437  7301            CLA CLL IAC
2147   1440  3156            DCA      TCNTR1          /SETUP BIT MASKER
2148   1441  1137            TAD      M16
2149   1442  3157            DCA      TCNTR2          /SETUP FIRST SHIFT COUNTER
2150   1443  4444            ENMAN1                   /ENTER MAINTENANCE MODE
2151   1444  1153   T39R,    TAD      REG1
2152   1445  0156            AND      TCNTR1
2153   1446  7640            SZA CLA                  /SKIF IF 0
2154   1447  1066            TAD      K0002           /WAS A 1
2155   1450  1103            TAD      K1000           /ENABLE BITS
2156   1451  4455            LDMAN                    /LOAD MAINTENANCE
2157   1452  7300            CLA CLL
2158   1453  1156            TAD      TCNTR1
2159   1454  7004            RAL                      /ROTATE BIT MASKER
2160   1455  3156            DCA      TCNTR1
2161   1456  7630            SZL CLA                  /WAIT FOR FIRST LINK THEN
2162   1457  5254            JMP      .-3             /RESET BIT 11 IN MASKER
2163   1460  2157            ISZ      TCNTR2
2164   1461  5244            JMP      T39R            /LOOP BACK
2165   1462  4454            RDCRC                    /READ CRC REGISTER
2166   1463  4441            ACCMP2                   /CHECK RESULTS
2167   1464  4435            NERROR                   /O.K. 4096 LOOPS
2168   1465  4436            ERROR                    /ERROR, CRC REGISTER
2169   1466  1430            TST39                    /ERROR, CRC REGISTER
2170   1467  6004            6004                     /TEXT POINTER
2171                /
2172                /VERIFY THAT "DLAG" CLEARS ALL OF THE
2173                /CRC REGISTER, TRY ALL COMBINATIONS IN CRC.
2174                /
2175   1470  7301   TST40,   CLA CLL IAC
2176   1471  4453            CLRALL                   /DCLR "CLR ALL"
2177   1472  3163            DCA      GDREG2
2178   1473  3162            DCA      GDREG1          /SETUP COMPARE REGISTERS
2179   1474  7301            CLA CLL IAC
2180   1475  3156            DCA      TCNTR1          /SETUP BIT MASKER
2181   1476  1137            TAD      M16
2182   1477  3157            DCA      TCNTR2          /SETUP FIRST SHIFT COUNTER
2183   1500  4444            ENMAN1                   /ENTER MAINTENANCE MODE
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2184   1501  1154   T40R,    TAD      REG2
2185   1502  0156            AND      TCNTR1
2186   1503  7640            SZA CLA                    /SKIF IF 0
2187   1504  1066            TAD      K0002             /WAS A 1
2188   1505  1103            TAD      K1000             /ENABLE BITS
2189   1506  4455            LDMAN                      /LOAD MAINTENANCE
2190   1507  7300            CLA CLL
2191   1510  1156            TAD      TCNTR1
2192   1511  7004            PAL                        /ROTATE BIT MASKER
2193   1512  3156            DCA      TCNTR1
2194   1513  7630            SZL CLA                    /WAIT FOR FIRST LINK THEN
2195   1514  5311            JMP      .-3               /RESET BIT 11 IN MASKER
2196   1515  2157            ISZ      TCNTR2
2197   1516  5301            JMP      T40R              /LOOP BACK
2198   1517  4452            LDADD                      /LOAD DISK ADDRESS AND CLEAR CRC
2199   1520  4454            RDCRC                      /READ CRC REGISTER
2200   1521  4441            ACCMP2                     /CHECK RESULTS
2201   1522  4435            NERROR                     /O.K. 4096 LOOPS
2202   1523  4436            ERROR                      /ERROR, CRC REGISTER
2203   1524  1470            TST40                      /ERROR, CRC REGISTER
2204   1525  6004            6004                       /TEXT POINTER
2205                /
2206                /VERIFY THAT "AC10 DATA" CAN BE SHIFTED TO
2207                /UPPER DATA BUFFEP THEN SINK TO LOWER DATA
2208                /BUFFER, TRY ALL 1'S AND 0'S.
2209                /
2210   1526  7301   TST41,   CLA CLL IAC
2211   1527  4453            CLRALL                     /"DCLR" "CLR ALL"
2212
2213   1530  1153            TAD      REG1
2214   1531  7110            CLL RAR
2215   1532  7630            SZL CLA
2216   1533  7240            CLA CMA
2217   1534  3163            DCA      GDREG2
2218   1535  1163            TAD      GDREG2            /GET VALUE TO LOAD
2219   1536  4427            LDBUF                      /LOAD UPPER BUFFER
2220   1537  4456            RDBUF                      /READ LOWER BUFFER
2221   1540  4440            ACCMP1                     /CHECK AC, COMPARE TO GDREG2
2222   1541  4435            NERROR                     /AC O.K. 4096 LOOPS
2223   1542  4436            ERROR                      /ERROR, DATA REGISTERS
2224   1543  1526            TST41                      /SCOP LOOP POINTER
2225   1544  4405            4405                       /TEXT POINTER
2226                /
2227                /VERIFY THAT "AC10 DATA" CAN BE SHIFTED TO
2228                /UPPER DATA BUFFER THEN SINK TO LOWER DATA
2229                /BUFFER, TRY PATTERN 2525 + 5252
2230                /
2231   1545  7301   TST42,   CLA CLL IAC
2232   1546  4453            CLRALL                     /"DCKR" "CLR ALL"
2233   1547  1153            TAD      REG1
2234   1550  7110            CLL RAR
2235   1551  7630            SZL CLA                    /WHAT DATA????
2236   1552  1120            TAD      K2525             /DATA 5252
2237   1553  1120            TAD      K2525
2238   1554  3163            DCA      GDREG2            /SETUP COMPARE REGISTER
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2239   1555  1163            TAD      GDREG2            /GET VALUE TO LOAD
2240   1556  4427            LDBUF                      /LOAD UPPER BUFFER
2241   1557  4456            RDBUF                      /READ LOWER DATA BUFFER
2242   1560  4440            ACCMP1                     /CHECK AC, COMPARE TO GDREG2
2243   1561  4435            NERROR                     /AC O.K. 4096 LOOPS
2244   1562  4436            ERROR                      /ERROR, DATA BUFFERS
2245   1563  1545            TST42                      /SCOPE LOOP POINTER
2246   1564  4405            4405                       /TEXT POINTER
2247
2248                /
2249                /VERIFTY THAT "AC10 DATA" CAN BE SHIFTED TO
2250                /UPPER DATA BUFFER THEN SINK TO LOWER
2251                /DATA BUFFER, TRY PATTERN ALL COMBINSTIONS
2252                /
2253   1565  7301   TST43,   CLA CLL IAC
2254   1566  4453            CLRALL                     /"DCLR" "CLR ALL"
2255   1567  1154            TAD      REG2              /GET VALUE TO LOAD
2256   1570  3163            DCA      GDREG2            /SETUP COMPARE REGISTER
2257   1571  1163            TAD      GDREG2            /GET IT
2258   1572  4427            LDBUF                      /LOAD UPPER BUFFER
2259   1573  4456            RDBUF                      /READ LOWER DATA BUFFER
2260   1574  4440            ACCMP1                     /CHECK AC
2261   1575  4435            NERROR                     /AC O.K. 4096 LOOPS
2262   1576  4436            ERROR                      /ERROP, DATA REGISTFRS
2263   1577  1565            TST43                      /SCOPE LOOP POINTER
2264   1600  4405            4405                       /TEXT POINTER
2265                /
2266                /VERIFY THAT "AC10 DATA" CAN BE SHIFTED
2267                /TO UPPER DATA BUFFER THEN SINK TO LOWER
2268                /DATA BUFFFR, TRY ALL COMBINATIONS.
2269                /
2270   1601  7301   TST44,   CLA CLL IAC
2271   1602  4453            CLRALL
2272   1603  1153            TAD      REG1
2273   1604  3163            DCA      GDREG2            /SETUP COMPARE REGISTER
2274   1605  1153            TAD      REG1              /GET VALUE TO LOAD
2275   1606  4427            LDBUF                      /LOAD UPPER BUFFEP
2276   1607  4456            RDBUF                      /READ DATA BUFFER
2277   1610  4440            ACCMP1                     /CHECK AC, COMPARE TO GDREG2
2278   1611  4435            NERROR                     /AC O.K. 4096 LOOPS
2279   1612  4436            ERROR                      /ERROR, DATA REGISTERS
2280   1613  1601            TST44                      /SCOPE LOOP POINTER
2281   1614  4405            4405                       /TEXT POINTER
2282                /
2283                /VERIFY THAT ALL DATA BUFFEPS CAN BE FULL
2284                /AT ONCE, TRY ALL COMBINATIONS
2285                /
2286   1615  7301   TST45,   CLA CLL IAC
2287   1616  4453            CLRALL                     /DCLR "CLR ALL"
2288   1617  1153            TAD      REG1
2289   1620  3161            DCA      TCNTR4
2290   1621  1133            TAD      M4
2291   1622  3160            DCA      TCNTR3            /COUNTEP FOR # OF BUFFEPS
2292   1623  1161   T45R1,   TAD      TCNTR4
2293   1624  4427            LDBUF                      /LOAD UPPER BUFFER
```

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2294   1625  7301           CLA CLL IAC
2295   1626  1161           TAD     TCNTR4
2296   1627  3161           DCA     TCNTR4
2297   1630  2160           ISZ     TCNTR3
2298   1631  5223           JMP     T45R1           /4 COUNT, SKIP WHEN BUFFERS FULL
2299   1632  1153           TAD     REG1
2300   1633  3163           DCA     GDREG2          /SETUP FOR FIRST CNMPARE
2301   1634  1133           TAD     M4
2302   1635  3160           DCA     TCNTR3
2303   1636  4456   T45R3,  RDBUF                   /READ BUFFER
2304   1637  4440           ACCMP1                  /CHECK
2305   1640  7610           SKP CLA                 /O.K. CHECK NEXT
2306   1641  5247           JMP     T45E            /ERROR DATA BUFFERS
2307   1642  2163           ISZ     GDREG2
2308   1643  7000           NOP
2309   1644  2160           ISZ     TCNTR3
2310   1645  5236           JMP     T45R3
2311   1646  4435           NERROR                  /O.K. 4096 LOOPS
2312   1647  4436   T45E,   ERROR                   /ERROR, DATA BUFFERS
2313   1650  1615           TST45                   /SCOPE LOOP POINTER
2314   1651  4405           4405                    /TEXT POINTER
2315                /
2316                /VERIFY THAT THE SILO BUFFERS ARE NOT AFFECTED BY
2317                /"DCLR", "DLAG", "DLDC", "DLCA", "DSKP", OR "DRST" IOTS.
2318                /USE DATA PATTERN ALL COMBINATIONS
2319                /
2320   1652  7301   TST46,  CLA CLL IAC
2321   1653  4453           CLRALL                  /DCLR
2322   1654  1154           TAD     REG2
2323   1655  3163           DCA     GDREG2          /SETUP COMPARE REGISTER
2324   1656  1133           TAD     M4
2325   1657  3156           DCA     TCNTR1          /COUNTER FOP AMOUNT OF BUFFERS
2326   1660  1163   T46A1,  TAD     GDREG2          /GET VALUE TO LOAD
2327   1661  4427           LDBUF                   /LOAD UPPER BUFFER
2328   1662  2156           ISZ     TCNTR1          /COUNT AMOUNT
2329   1663  5260           JMP     T46A1           /MORE TO LOAD
2330   1664  1153           TAD     REG1
2331   1665  4452           LDADD                   /LOAD DISK ADDRESS
2332   1666  1153           TAD     REG1
2333   1667  4451           LDCUR                   /LOAD CURRENT ADDRESS
2334   1670  1153           TAD     REG1
2335   1671  0105           AND     K3777           /MASK OFF WRITE
2336   1672  4450           LDCMD                   /LOAD COMMAND REGISTER
2337   1673  1153           TAD     RFG1
2338   1674  4447           DSKSKP                  /DSKP
2339   1675  7000           NOP
2340   1676  4442           RDSTAT                  /READ STATUS
2341   1677  7300           CLA CLL
2342   1700  4453           CLRALL                  /CLEAR STATUS
2343   1701  1133           TAD     M4
2344   1702  3156           DCA     TCNTR1          /SETUP COUNTER
2345   1703  7300   T46A2,  CLA CLL
2346   1704  1074           TAD     K0020           /ENABLE READ BUFFER
2347   1705  4455           LDMAN                   /DMAN
2348   1706  3167           DCA     DBREG           /SAVE RESULTS
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2349   1707  1167           TAD     DBREG
2350   1710  4440           ACCMP1                  /CHECK RESULTS
2351   1711  7610           SKP CLA                 /DATA O.K.
2352   1712  5316           JMP     T46E            /ERROR
2353   1713  2156           ISZ     TCNTR1          /READ ALL FOUR
2354   1714  5303           JMP     T46A2           /LOOP
2355   1715  4435           NERROR                  /O.K. 4096 LOOPS
2356   1716  4436   T46E,   ERROR                   /ERROR, BUFFER AFFECTED
2357   1717  1652           TST46                   /SCOPE LOOP POINTER
2358   1720  4405           4405                    /TEXT POINTER
2359                /
2360                /VERIFY THAT THE UPPER BUFFER CAN BE LOADED
2361                /THEN SINK TO LOWER BUFFER, USE A FLOATING
2362                /1'S PATTERN.
2363                /
2364   1721  3156           DCA     TCNTR1          /START AT 0
2365   1722  7301   TST47,  CLA CLL IAC             /ENABLE CLEAR CONTROL
2366   1723  4453           CLRALL                  /CLEAR CONTROL
2367   1724  1156           TAD     TCNTR1          /GET VALUE TO LOAD
2368   1725  3163           DCA     GDREG2          /SETUP COMPARE REGISTER
2369   1726  1156           TAD     TCNTR1          /GET VALUE TO LOAD
2370   1727  4427           LDBUF                   /LOAD UPPER BUFFER
2371   1730  4456           RDBUF                   /READ LOWER BUFFER
2372   1731  4440           ACCMP1                  /CHECK RESULTS
2373   1732  7610           SKP CLA                 /DATA O.K.
2374   1733  5342           JMP     T47E            /ERROR
2375   1734  1156           TAD     TCNTR1
2376   1735  7104           CLL RAL
2377   1736  7450           SNA
2378   1737  7001           IAC
2379   1740  3156           DCA     TCNTR1          /SET ONE TO LEFT
2380   1741  4435           NERROR                  /LOOP 4096 TIMES
2381   1742  4436   T47E,   ERROR                   /FRPOR SILO BUFFERS
2382   1743  1722           TST47                   /SCOPE LOOP POINTER
2383   1744  4405           4405                    /TEXT POINTER
2384                /
2385                /VERIFY THAT THE UPPER BUFFER CAN BE LOADED
2386                /THEN SINK TO LOWER BUFFER, USE A FLOATING
2387                /0'S PATTERN.
2388                /
2389   1745  3156           DCA     TCNTR1          /START AT 7777
2390   1746  7301   TST48,  CLA CLL IAC             /ENABLE CLEAR CONTROL
2391   1747  4453           CLRALL                  /CLEAR CONTROL
2392   1750  1156           TAD     TCNTR1          /GET VALUE TO LOAD
2393   1751  7040           CMA                     /INVERT FOR P'S
2394   1752  3163           DCA     GDREG2          /SETUP COMPARE REGISTER
2395   1753  1163           TAD     GDREG2          /GET VALUE TO LOAD
2396   1754  4427           LDBUF                   /LOAD UPPER BUFFER
2397   1755  4456           RDBUF                   /READ LOWER BUFFER
2398   1756  4440           ACCMP1                  /CHECK RESULTS
2399   1757  7610           SKP CLA                 /DATA O.K.
2400   1760  5367           JMP     T48E            /ERROR
2401   1761  1156           TAD     TCNTR1
2402   1762  7104           CLL RAL
2403   1763  7450           SNA
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2404   1764  7001          IAC
2405   1765  3156          DCA     TCNTR1              /SET ONE TO LEFT
2406   1766  4435          NERROR                      /LOOP 4096 TIMES
2407   1767  4436   T48E,  ERROR                       /ERROR SILO BUFFERS
2408   1770  1746          TST48                       /SCOPE LOOP POINTER
2409   1771  4405          4405                        /TEXT POINTER
2410
2411   1772  5773          JMP I   .+1                 /TO NEXT TEST
2412   1773  2000          TST49
2413                /
2414         2000   PAGE
2415                /
2416                /VERIFY THAT "DRL" OCCURES WHEN BUFFER
2417                /EMPTY.
2418                /
2419   2000  7301   TST49,  CLA CLL IAC
2420   2001  4453          CLRALL                      /"DCLR" CLEAR ALL
2421   2002  1177          TAD     STCON               /GET EXPECTED BITS
2422   2003  3163          DCA     GDREG2              /SETUP COMPARE REGISTER
2423   2004  1153          TAD     REG1
2424   2005  4442          RDSTAT                      /READ STATUS REGISTER
2425   2006  4440          ACCMP1                      /CHECK RESULTS
2426   2007  7610          SKP CLA                     /O.K.
2427   2010  5232          JMP     T49E                /ERROR, STATUS REGISTER
2428   2011  1177          TAD     STCON
2429   2012  1070          TAD     K0004               /GET EXPECTED BITS
2430   2013  3163          DCA     GDREG2              /SETUP COMPARE REGISTER
2431   2014  4444          ENMAN1                      /ENTER MAINTENANCE MODE
2432   2015  1103          TAD     K1000
2433   2016  4455          LDMAN                       /LOAD MAINTENANCE
2434   2017  7240          CLA CMA
2435   2020  4442          RDSTAT                      /READ STATUS REGISTER
2436   2021  4440          ACCMP1                      /CHECK RESULTS
2437   2022  7610          SKP CLA                     /O.K.
2438   2023  5232          JMP     T49E                /ERROR, STATUS REGISTER
2439   2024  1177          TAD     STCON
2440   2025  3163          DCA     GDREG2              /SETUP COMPARE REGISTER
2441   2026  4453          CLRALL                      /DCLR "CLEAR STATUS"
2442   2027  4442          RDSTAT                      /READ STATUS REGISTER
2443   2030  4440          ACCMP1                      /CHECK RESULTS
2444   2031  4435          NERROR                      /STATUS O.K., 4096 LOOPS
2445   2032  4436   T49E,  ERROR                       /ERROR, STATUS REGISTER
2446   2033  2000          TST49                       /SCOPE LOOP POINTER
2447   2034  5000          5000                        /TEXT POINTER
2448                /
2449                /VERIFY THAT BUFFER FULL CAUSES "DRL".
2450                /
2451   2035  7301   TST50,  CLA CLL IAC
2452   2036  4453          CLRALL                      /DCLR "CLR ALL"
2453   2037  1177          TAD     STCON
2454   2040  3163          DCA     GDREG2              /SETUP COMPARE REGISTER
2455   2041  1154          TAD     REG2
2456   2042  4442          RDSTAT                      /READ STATUS REGISTER
2457   2043  4440          ACCMP1                      /CHECK RESULTS
2458   2044  7610          SKP CLA                     /O.K.
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2459   2045  5274          JMP     T50E                /ERROR, STATUS REGISTER
2460   2046  1140          TAD     M48
2461   2047  3156          DCA     TCNTR1              /48 COUNTER
2462   2050  4444          ENMAN1                      /ENTER MAINTENANCE MODE
2463   2051  1077          TAD     K0100               /ENABLE BITS
2464   2052  4455          LDMAN                       /LOAD MAINTENANCE
2465   2053  2156          ISZ     TCNTR1
2466   2054  5252          JMP     .-2                 /SKIP WHEN BUFFERS ARE FULL
2467   2055  7300          CLA CLL
2468   2056  4442          RDSTAT                      /READ STATUS REGISTER
2469   2057  4440          ACCMP1                      /CHECK RESULTS
2470   2060  7610          SKP CLA                     /O.K.
2471   2061  5274          JMP     T50E                /ERROR, STATUS REGISTER
2472   2062  1077          TAD     K0100
2473   2063  4455          LDMAN                       /CAUSE "DRL" DMAN
2474   2064  7300          CLA CLL
2475   2065  1177          TAD     STCON
2476   2066  1070          TAD     K0004               /BIT EXPECTED
2477   2067  3163          DCA     GDREG2              /SETUP COMPARE REGISTER
2478
2479   2070  1153          TAD     REG1
2480   2071  4442          RDSTAT                      /READ STATUS REGISTER
2481   2072  4440          ACCMP1                      /CHECK RESULTS
2482   2073  4435          NERROR                      /STATUS O.K., 4096 LOOPS
2483   2074  4436   T50E,  ERROR                       /ERROR, STATUS REGISTER
2484   2075  2035          TST50                       /SCOPE LOOP POINTER
2485   2076  5000          5000                        /TEXT POINTER
2486                /
2487                /VERIFY THAT "DSKP" SKIPS ON "DPL" ERROR
2488                /
2489   2077  7301   TST51,  CLA CLL IAC
2490   2100  4453          CLRALL                      /DCLR "CLR ALL"
2491   2101  4444          ENMAN1                      /ENTER MAINTENANCE MODE
2492   2102  1103          TAD     K1000
2493   2103  4455          LDMAN                       /SET "DRL" "DMAN"
2494   2104  7300          CLA CLL
2495   2105  4447          DSKSKP                      /"DSKP"
2496   2106  5314          JMP     T51E                /ERROR, "DSKP"
2497   2107  4447          DSKSKP                      /"DSKP"
2498   2110  5314          JMP     T51E                /ERROR, "DSKP"
2499   2111  4453          CLRALL                      /CLEAR STATUS "DCRL"
2500   2112  4447          DSKSKP                      /"DSKP" SKIP
2501   2113  4435          NERROR                      /SKIP O.K. 4096 LOOPS
2502   2114  4436   T51E,  ERROR                       /ERROR, "DSKP" SKIP ON "DRL"
2503   2115  2077          TST51                       /SLOPE LOOP POINTER
2504   2116  0006          0006                        /TEXT POINTER
2505                /
2506                /VERIFTY THAT "DRL" DOES CAUSE DISK "INTERRUPT" IF
2507                /ENABLED BY "ENABLE INTERRUPT" BIT IN COMMAND REGISTER.
2508                /
2509   2117  7301   TST52,  CLA CLL IAC
2510   2120  4453          CLRALL                      /"DCRL" "CLR ALL"
2511   2121  1102          TAD     K0400
2512   2122  4450          LDCMD                       /SET INT. ENABLE "LOAD COMMAND REG."
2513   2123  4444          ENMAN1                      /ENTER MAINTENANCE MODE
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2514    2124  1103            TAD    K1000
2515    2125  4455            LDMAN                    /"SET DRL" "DMAN"
2516    2126  4437            IONWAT                   /WAIT FOR INTERRUPT
2517    2127  7610            SKP CLA                  /ERROR, NO INT. RQ.
2518    2130  4435            NERROR                   /O.K. INT. OCCURRED
2519    2131  4436            ERROR                    /ERROR, INT. REQUEST
2520    2132  2117            TST52                    /SCOP LOOP POINTER
2521    2133  0007            0007                     /TEXTPOINTER
2522
2523                  /
2524                          /VERIFY THAT "DRL" SHOULD CAUSE INT. RQ. ONLY
2525                          /WHEN "INT. ENABLE BIT IS SET. DOES LDCMD CLEAR INT.
2526                          /
2527
2528    2134  7301    TST53,  CLA CLL IAC
2529    2135  4453            CLRALL                   /DCLR "CLR ALL"
2530    2136  4444            ENMAN1                   /ENTER MAINTENANCE MODE
2531    2137  1103            TAD    K1000
2532    2140  4455            LDMAN                    /SET "DRL" DMAN
2533    2141  4437            IONWAT                   /WAIT FOR INT.
2534    2142  7610            SKP CLA                  /O.K. NO INT.
2535    2143  5356            JMP    T53E              /ERROR, INT. OCCURRED
2536    2144  1102            TAD    K0400
2537    2145  4450            LDCMD                    /SET INT. ENABLE AND CLEAR INT.
2538    2146  4437            IONWAT                   /WAIT FOR INT.
2539    2147  7610            SKP CLA                  /O.K. NO INT. RQ.
2540    2150  5356            JMP    T53E              /ERROR, INT. OCCURED
2541    2151  1103            TAD    K1000
2542    2152  4455            LDMAN                    /SET "DRL" "DMAN"
2543    2153  4437            IONWAT                   /WAIT INT., SHOULD INT.
2544    2154  7610            SKP CLA                  /ERROR, NO INT.
2545    2155  4435            NERROR                   /O.K. INT. OCCURRED
2546    2156  4436    T53E,   ERROR                    /ERROR,, INT. RQ
2547    2157  2134            TST53                    /SCOPE LOOP POINTER
2548    2160  0007            0007                     /TEXT POINTER
2549                  /
2550    2161  5762            JMP I  .+1               /TO NEXT TEST
2551    2162  2200            TST54
2552                  /
2553          2200    PAGE
2554                  /
2555                          /VERIFY THAT "LDCMD" CLEARS STATUS REGISTER
2556                          /
2557    2200  7301    TST54,  CLA CLL IAC
2558    2201  4453            CLRALL                   /DCLR "CLR ALL"
2559    2202  1177            TAD    STCON
2560    2203  1070            TAD    K0004
2561    2204  3163            DCA    GDREG2            /SETUP COMPARE REGISTER
2562    2205  4444            ENMAN1                   /ENTER MAINTENANCE MODE
2563    2206  1103            TAD    K1000             /ENABLE
2564    2207  4455            LDMAN                    /SET "DRL" DMAN
2565    2210  7300            CLA CLL
2566    2211  1154            TAD    REG2
2567    2212  4442            RDSTAT                   /READ STATUS REGISTER
2568    2213  4440            ACCMP1                   /CHECK RESULTS
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2569    2214  7610            SKP CLA                  /O.K. CHECK CLEAR
2570    2215  5225            JMP    T54E              /STATUS REGISTER ERROR
2571    2216  4450            LDCMD                    /CLEAR STATUS, "LOAD COMMAND"
2572    2217  1177            TAD    STCON
2573    2220  3163            DCA    GDREG2            /SETUP COMPARE REGISTER
2574    2221  1153            TAD    REG1
2575    2222  4442            RDSTAT                   /READ STATUS REGISTER
2576    2223  4440            ACCMP1                   /CHECK RESULTS
2577    2224  4435            NERROR                   /STATUS O.K. 4096 LOOPS
2578    2225  4436    T54E,   ERROR                    /ERROR, STATUS REGISTER
2579    2226  2200            TST54                    /SCOPE LOOP POINTER
2580    2227  5000            5000                     /TEXT POINTER
2581                  /
2582                          /VERIFY THAT RECALIBRATE DOES SET DRIVE STATUS
2583                          /ERROR IN THE STATUS REGISTER.
2584                          /
2585    2230  7301    TST55,  CLA CLL IAC              /ENABLE CLEAR CONTROL
2586    2231  4453            CLRALL                   /CLEAR CONTROL
2587    2232  7301            CLA CLL IAC              /ENABLE CLEAR CONTROL
2588    2233  4453            CLRALL                   /ENABLE CLEAR CONTROL
2589    2234  1177            TAD    STCON
2590    2235  3163            DCA    GDREG2            /SETUP EXPECTED COMPARE
2591    2236  4442            RDSTAT                   /READ STATUS REGISTER
2592    2237  4440            ACCMP1                   /CHECK RESULTS
2593    2240  7610            SKP CLA                  /STATUS O.K.
2594    2241  5252            JMP    T55E              /ERROR, STATUS
2595    2242  7326            CLA CLL CML RTL
2596    2243  1177            TAD    STCON
2597    2244  3163            DCA    GDREG2            /SETUP EXPECTED COMPARE
2598    2245  7326            CLA CLL CML RTL           /ENABLE RECALIBRATE
2599    2246  4453            CLRALL                   /RECALIBRATE
2600    2247  4442            RDSTAT                   /READ STATUS
2601    2250  4440            ACCMP1                   /CLECK RESULTS
2602    2251  4435            NERROR                   /O.K. 4096 LOOPS
2603    2252  4436    T55E,   ERROR                    /ERROR, STATUS
2604    2253  2230            TST55                    /SCOPE LOOP POINTER
2605    2254  5000            5000                     /TEXT POINTER
2606                  /
2607                          /VERIFY THAT "LOAD DISK ADDRESS CAUSES" "DRIVE STATUS ERROR"
2608                          /
2609    2255  7301    TST56,  CLA CLL IAC              /ENABLE CLEAR CONTROL
2610    2256  4453            CLRALL
2611    2257  4452            LDADD
2612    2260  1177            TAD    STCON
2613    2261  1066            TAD    K0002
2614    2262  3163            DCA    GDREG2
2615    2263  1153            TAD    REG1
2616
2617    2264  4442            RDSTAT                   /READ STATUS REGISTER
2618    2265  4440            ACCMP1                   /CHECK RESULTS
2619    2266  4435            NERROR                   /STATUS O.K. 4096 LOOPS
2620    2267  4436            ERROR                    /ERROR, STATUS REGISTER
2621    2270  2255            TST56                    /SCOPE LOOP POINTER
2622    2271  5000            5000                     /TEXT POINTER
2623                  /
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2624                      /VERIFY THAT "DRIVE STATUS ERROR" CAUSES INT. RQ.
2625                      / "DOES LDCMD CLEAR INT."
2626                      /
2627    2272  7301    TST57,  CLA CLL IAC
2628    2273  4453            CLRALL                  /DCLR "CLR ALL"
2629    2274  1102            TAD     K0400
2630    2275  4450            LDCMD                   /SET INT. ENABLE "LOAD COMMAND"
2631    2276  4452            LDADD                   /SET "SELECT", LOAD DISK ADDRESS
2632    2277  4437            IONWAT                  /WAIT FOR EXPECTED INT.
2633    2300  5305            JMP     T57E            /ERROR, NO INT.
2634    2301  1102            TAD     K0400
2635    2302  4450            LDCMD                   /CLEAR INT. "LOAD COMMAND"
2636    2303  4437            IONWAT
2637    2304  4435            NERROR                  /O.K. INT. WORKED
2638    2305  4436    T57E,   ERROR                   /ERROR, SELECT ERROR INT.
2639    2306  2272            TST57                   /SCOPE LOOP POINTER
2640    2307  0007            0007                    /TEXT POINTER
2641                      /
2642                      /VERIFY THAT "LOAD DISK ADDRESS" CAUSES
2643                      /"DRIVE STATUS ERROR". TEST WITH DISK SKIP
2644                      /
2645    2310  7301    TST58,  CLA CLL IAC
2646    2311  4453            CLRALL                  /DCLR "CLR ALL"
2647    2312  4452            LDADD                   /LOAD DISK AND GO
2648    2313  4447            DSKSKP                  /DSKP DISK SKIP IOT
2649    2314  5320            JMP     T58E            /ERROR, NO SKIP
2650    2315  4447            DSKSKP                  /DSKP DISK SKIP IOT
2651    2316  5320            JMP     T58E            /ERROR, NO SKIP
2652    2317  4435            NERROR                  /STATUS O.K.
2653    2320  4436    T58E,   ERROR                   /ERROR, STATUS REGISTER
2654    2321  2310            TST58                   /SCOPE LOOP POINTER
2655    2322  0006            0006                    /TEXT POINTER
2656
2657                      /
2658                      /VERIFY THAT SELECT ERROR CAUSES "DSKP" TO SKIP ON ERROR
2659                      /
2660    2323  7301    TST59,  CLA CLL IAC
2661    2324  4453            CLRALL                  /DCLR "CLR ALL"
2662    2325  4452            LDADD                   /LOAD DISK ADDRESS AND GO
2663    2326  4447            DSKSKP                  /DSKP "SKIP ON ERROR"
2664    2327  5333            JMP     T59E            /ERROR, NO SKIP
2665    2330  4453            CLRALL                  /CLEAR SKIP
2666    2331  4447            DSKSKP                  /DSKP
2667    2332  4435            NERROR                  /O.K. 4096 LOOPS
2668    2333  4436    T59E,   ERROR                   /ERROR, "DSKP SKIP"
2669    2334  2323            TST59                   /SCOPE LOOP POINTER
2670    2335  0006            0006                    /TEXT POINTER
2671                      /
2672                      /
2673                      /
2674                      /VERIFY THAT SELECT ERROR CAUSES "DSKP" TO SKIP ON ERROR
2675                      /THEN INTERRUPT
2676                      /
2677
2678    2336  7301    TST60,  CLA CLL IAC
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2679    2337  4453            CLRALL                  /DCLR "CLR ALL"
2680    2340  1071            TAD     K0006
2681    2341  3356            DCA     T60E+2          /SETUP TEXT POINTER
2682    2342  1102            TAD     K0400
2683    2343  4450            LDCMD                   /SET INT. ENABLE
2684    2344  4452            LDADD                   /LOAD DISK AND GO
2685    2345  4447            DSKSKP                  /DSKP  DISK SKIP
2686    2346  5354            JMP     T60E            /ERROR, NO SKIP
2687    2347  1072            TAD     K0007
2688    2350  3356            DCA     T60E+2          /SETUP TEXT POINTER
2689    2351  4437            IONWAT                  /WAIT FOR INT.
2690    2352  7610            SKP CLA                 /ERROR, NO INT. OCCURRED
2691    2353  4435            NERROR                  /SKIP AND INT. O.K.
2692    2354  4436    T60E,   ERROR                   /ERROR, DSKP OR INT.
2693    2355  2336            TST60                   /SCOPE LOOP POINTER
2694    2356  0006            0006                    /MODIFIED TEXT POINTER
2695                      /
2696    2357  5760            JMP I   .+1             /TO NEXT TEST
2697    2360  2400            TST61
2698          2400    PAGE
2699                      /
2700                      /VERIFY THAT "DRL" CAUSES AN INT. THEN SKIP
2701                      /
2702    2400  7301    TST61,  CLA CLL IAC
2703    2401  4453            CLRALL                  /DCLR "CLR ALL"
2704    2402  1072            TAD     K0007
2705    2403  3222            DCA     T61E+2          /SETUP TEXT POINTER
2706    2404  1102            TAD     K0400
2707    2405  4450            LDCMD                   /SETUP INT. ENABLE
2708    2406  4444            ENMAN1                  /ENTER MAINTENANCE MODE
2709    2407  1103            TAD     K1000
2710    2410  4455            LDMAN                   /SET "DRL" DMAN
2711    2411  4437            IONWAT                  /WAIT FOR INT.
2712    2412  5220            JMP     T61E            /ERROR, NO INT.
2713    2413  1071            TAD     K0006
2714    2414  3222            DCA     T61E+2          /SETUP TEXT POINTER
2715    2415  4447            DSKSKP                  /"DSKP" SHOULD SKIP
2716    2416  7610            SKP CLA                 /ERROR, NO SKIP
2717    2417  4435            NERROR                  /O.K. 4096 LOOPS
2718    2420  4436    T61E,   ERROR                   /ERROR, SKIP OR INT.
2719    2421  2400            TST61                   /SCOPE LOOP POINTER
2720    2422  0007            0007                    /MODIFIED TEXT POINTER
2721                      /
2722                      /VERIFY THAT MAINTENANCE DOES INHIBIT
2723                      /DRIVE STATUS ERROR SKIP
2724                      /
2725    2423  7301    TST62,  CLA CLL IAC
2726    2424  4453            CLRALL                  /CLEAR CONTROL
2727    2425  4447            DSKSKP                  /DISK SKIP
2728    2426  7610            SKP CLA                 /O.K. NO SKIP
2729    2427  5244            JMP     T62E            /ERROR, SKIP
2730    2430  7326            CLA CLL CML RTL
2731    2431  4453            CLRALL                  /RECALIBRATE
2732    2432  4447            DSKSKP                  /DISK SKIP
2733    2433  5244            JMP     T62E            /ERROR, NO SKIP
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2734    2434    4444            ENMAN1                  /SET MAIN
2735    2435    4447            DSKSKP                  /DISK SKIP
2736    2436    7610            SKP CLA                 /O.K. NO SKIP
2737    2437    5244            JMP     T62E            /ERROR, SKIP
2738    2440    7326            CLA CLL CML RTL
2739    2441    4453            CLRALL                  /RECALIBRATE
2740    2442    4447            DSKSKP                  /DISK SKIP
2741    2443    4435            NERROR                  /O.K. 4096 LOOPS
2742    2444    4436    T62E,   ERROR                   /ERROR, DISK SKIP
2743    2445    2423            TST62                   /SCOPE LOOP POINTER
2744    2446    0006            0006                    /TEXT POINTER
2745                    /
2746                    /VERIFY THAT "RECALIBRATE" THEN DCLR DOES SET BUSY
2747                    /AND DRIVE STATUS ERROR
2748                    /
2749    2447    7301    TST63,  CLA CLL IAC
2750    2450    4453            CLRALL                  /CLEAR CONTROL
2751    2451    1177            TAD     STCON           /EXPECTED STATUS
2752    2452    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
2753    2453    4442            RDSTAT                  /READ STATUS
2754    2454    4440            ACCMP1                  /CHECK RESULTS
2755    2455    7610            SKP CLA                 /STATUS O.K.
2756    2456    5304            JMP     T63E            /ERROR, STATUS
2757    2457    4444            ENMAN1                  /ENTER MAINTENANCE
2758    2460    7326            CLA CLL CML RTL
2759    2461    1177            TAD     STCON           /EXPECTED STATUS
2760    2462    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
2761    2463    7326            CLA CLL CML RTL
2762    2464    4453            CLRALL                          /"RECALIBRATE" DCLR
2763    2465    4442            RDSTAT                  /READ STATUS
2764    2466    4440            ACCMP1                  /CHECK RESULTS
2765    2467    7610            SKP CLA                 /STATUS O.K.
2766    2470    5304            JMP     T63E            /ERROR, STATUS
2767    2471    1153            TAD     REG1
2768    2472    0110            AND     K7776           /MASK OUT CLEAR CONTROL
2769    2473    4453            CLRALL                  /DCLR
2770    2474    7326            CLA CLL CML RTL
2771    2475    1177            TAD     STCON
2772    2476    1077            TAD     K0100           /BUSY BIT
2773    2477    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
2774    2500    1154            TAD     REG2
2775    2501    4442            RDSTAT                          /READ STATUS REGISTER
2776    2502    4440            ACCMP1                  /CHECK RESULTS
2777    2503    4435            NERROR                  /STATUS, O.K. 4096 LOOPS
2778    2504    4436    T63E,   ERROR                   /ERROR, RECALIBRATE
2779    2505    2447            TST63                   /SCOPE LOOP POINTER
2780    2506    5000            5000                    /TEXT POINTER
2781                    /
2782                    /VERIFY THAT "RECALIBRATE" THEN "DRL" RESULTS IN DRL,
2783                    /DRIVE STATUS, AND TRANSFER DONE
2784                    /
2785    2507    7301    TST64,  CLA CLL IAC
2786    2510    4453            CLRALL                  /CLEAR CONTROL
2787    2511    1177            TAD     STCON
2788    2512    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
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2789    2513    4442            RDSTAT                  /READ STATUS
2790    2514    4440            ACCMP1                  /CHECK RESULTS
2791    2515    7610            SKP CLA                 /STATUS O.K.
2792    2516    5344            JMP     T64E            /ERROR, STATUS
2793    2517    4444            ENMAN1                  /ENTER MAINTENANCE
2794    2520    7326            CLA CLL CML RTL
2795    2521    1177            TAD     STCON           /EXPECTED STATUS
2796    2522    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
2797    2523    7326            CLA CLL CML RTL
2798    2524    4453            CLRALL                  /DCLR
2799    2525    4442            RDSTAT                  /READ STATUS
2800    2526    4440            ACCMP1                  /CHECK RESULTS
2801    2527    7610            SKP CLA                 /STATUS O.K.
2802    2530    5344            JMP     T64E            /ERROR, STATUS
2803    2531    7326            CLA CLL CML RTL
2804    2532    1177            TAD     STCON
2805    2533    1106            TAD     K4000
2806    2534    1070            TAD     K0004           /EXPECTED STATUS
2807    2535    3163            DCA     GDREG2
2808    2536    1103            TAD     K1000           /ENABLE SHIFT
2809    2537    4455            LDMAN                   /LOAD MAINTENANCE SET DRL
2810    2540    1153            TAD     REG1
2811    2541    4442            RDSTAT                  /READ STATUS REGISTER
2812    2542    4440            ACCMP1                  /CHECK RESULTS
2813    2543    4435            NERROR                  /O.K. 4096 LOOPS
2814    2544    4436    T64E,   ERROR                   /ERROR, STATUS REGISTER
2815    2545    2507            TST64                   /SCOPE LOOP POINTER
2816    2546    5000            5000                    /TEXT POINTER
2817                    /
2818    2547    5750            JMP I   .+1             /TO NEXT TEST
2819    2550    2600            TST65
2820                    /
2821            2600    PAGE
2822                    /
2823                    /VERIFY THAT "RECALIBRATE" THEN "DLCA" SETS
2824                    /DRIVE STATUS AND BUSY ERROR IN STATUS REGISTER
2825                    /
2826    2600    7301    TST65,  CLA CLL IAC
2827    2601    4453            CLRALL                  /CLEAR CONTROL
2828    2602    1177            TAD     STCON           /EXPECTED STATUS
2829    2603    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
2830    2604    4442            RDSTAT                  /READ STATUS
2831    2605    4440            ACCMP1                  /CHECK RESULTS
2832    2606    7610            SKP CLA                 /STATUS O.K.
2833    2607    5233            JMP     T65E            /ERROR, STATUS
2834    2610    4444            ENMAN1                  /ENTER MAINTENANCE
2835    2611    7326            CLA CLL CML RTL
2836    2612    1177            TAD     STCON           /EXPECTED STATUS
2837    2613    3163            DCA     GDREG2          /SETUP COMPARE REGISTER
2838    2614    7326            CLA CLL CML RTL
2839    2615    4453            CLRALL
2840    2616    4442            RDSTAT                  /READ STATUS
2841    2617    4440            ACCMP1                  /CHECK RESULTS
2842    2620    7610            SKP CLA                 /STATUS O.K.
2843    2621    5233            JMP     T65E            /ERROR, STATUS
```

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2844    2622    7326            CLA CLL CML RTL
2845    2623    1077            TAD     K0100
2846    2624    1177            TAD     STCON           /EXPECTED STATUS
2847    2625    3163            DCA     GDREG2
2848    2626    4451            LDCUR                   /LOAD CURRENT ADDRESS
2849    2627    1154            TAD     REG2
2850    2630    4442            RDSTAT                  /READ STATUS REGISTER
2851    2631    4440            ACCMP1                  /CHECK RESULTS
2852    2632    4435            NERROR                  /O.K. 4096 LOOPS
2853    2633    4436    T65E,   ERROR                   /ERROR, STATUS REGISTER
2854    2634    2600            TST65                   /SCOPE LOOP POINTER
2855    2635    5000            5000                    /TEXT POINTER
2856                    /
2857                            /VERIFY THAT "RECALIBRATE" THEN "DLDC"
2858                            /DOES SET BUSY ERROR IN STATUS
2859                            /
2860    2636    7301    TST66,  CLA CLL IAC
2861    2637    4453            CLRALL                  /CLEAR CONTROL
2862    2640    4444            ENMAN1                  /ENTER MAINTENANCE
2863    2641    7326            CLA CLL CML RTL
2864    2642    4453            CLRALL
2865    2643    7326            CLA CLL CML RTL
2866    2644    1077            TAD     K0100
2867    2645    1177            TAD     STCON           /EXPECTED STATUS
2868    2646    3163            DCA     GDREG2
2869    2647    4450            LDCMD                   /LOAD COMMAND REGISTER
2870    2650    1154            TAD     REG2
2871    2651    4442            RDSTAT                  /READ STATUS REGISTER
2872    2652    4440            ACCMP1                  /CHECK RESULTS
2873    2653    4435            NERROR                  /O.K. 4096 LOOPS
2874    2654    4436            ERROR                   /ERROR, STATUS REGISTER
2875    2655    2636            TST66                   /SCOPE LOOP POINTER
2876    2656    5000            5000                    /TEXT POINTER
2877                    /
2878                            /VERIFY THAT RECALIBRATE THEN DLAG RESULTS IN
2879                            /BUSY AND DRIVE STATUS ERROR.
2880                            /
2881    2657    7301    TST67,  CLA CLL IAC
2882    2660    4453            CLRALL                  /CLEAR CONTROL
2883    2661    4444            ENMAN1                  /ENTER MAINTENANCE
2884    2662    7326            CLA CLL CML RTL
2885    2663    1077            TAD     K0100
2886    2664    1177            TAD     STCON           /EXPECTED STATUS
2887    2665    3163            DCA     GDREG2          /SETUP EXPECTED COMPARE
2888    2666    7326            CLA CLL CML RTL         /ENABLE RECALIBRATE
2889    2667    4453            CLRALL
2890    2670    4452            LDADD                   /LOAD DISK ADDRESS
2891    2671    4442            RDSTAT                  /READ STATUS
2892    2672    4440            ACCMP1                  /CHECK RESULTS
2893    2673    4435            NERROR                  /O.K. 4096 LOOPS
2894    2674    4436            ERROR                   /ERROR, BUSY OR DRIVE STATUS
2895    2675    2657            TST67                   /SCOPE LOOP POINTER
2896    2676    5000            5000                    /TEXT POINTER
2897                    /
2898                            /VERIFY THAT SKIP OCCURRES ON BUSY ERROR
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2899                    /
2900    2677    7301    TST68,  CLA CLL IAC
2901    2700    4453            CLRALL                  /CLEAR CONTROL
2902    2701    4447            DSKSKP                  /DSKP
2903    2702    7610            SKP CLA                 /SKIP O.K.
2904    2703    5315            JMP     T68E            /ERROR, DISK SKIP
2905    2704    4444            ENMAN1                  /ENTER MAINTENANCE
2906    2705    7326            CLA CLL CML RTL
2907    2706    4453            CLRALL                  /DCLR
2908    2707    4451            LDCUR                   /LOAD CURRENT ADDRESS
2909    2710    4447            DSKSKP                  /DSKP DISK SKIP
2910    2711    5315            JMP     T68E            /ERROR, NO SKIP
2911    2712    4447            DSKSKP                  /DSKP DISK SKIP
2912    2713    5315            JMP     T68E            /ERROR
2913    2714    4435            NERROR                  /O.K. 4096 LOOPS
2914    2715    4436    T68E,   ERROR                   /ERROR, DSKP
2915    2716    2677            TST68                   /SCOPE LOOP POINTER
2916    2717    0006            0006                    /TEXT POINTER
2917                    /
2918                            /VERIFY THAT DCLR CLEARS ALL OF STATUS REGISTER
2919                            /
2920    2720    7301    TST69,  CLA CLL IAC
2921    2721    4453            CLRALL                  /CLEAR CONTROL
2922    2722    4444            ENMAN1                  /ENTER MAINTENANCE
2923    2723    7326            CLA CLL CML RTL
2924    2724    4453            CLRALL                  /DCLR
2925    2725    7326            CLA CLL CML RTL
2926    2726    1177            TAD     STCON
2927    2727    1106            TAD     K4000
2928    2730    1070            TAD     K0004           /EXPECTED STATUS
2929    2731    3163            DCA GDREG2
2930    2732    1103            TAD     K1000           /ENABLE SHIFT
2931    2733    4455            LDMAN                   /LOAD MAINTENANCE SET DRL
2932    2734    1153            TAD     REG1
2933    2735    4442            RDSTAT                  /READ STATUS REGISTER
2934    2736    4440            ACCMP1                  /CHECK RESULTS
2935    2737    7610            SKP CLA                 /O.K
2936    2740    5350            JMP     T69E            /ERROR
2937    2741    4453            CLRALL                  /DCLR
2938    2742    1177            TAD     STCON
2939    2743    3163            DCA GDREG2              /SETUP COMPARE REGISTER
2940    2744    1154            TAD     REG2
2941    2745    4442            RDSTAT                  /READ STATUS
2942    2746    4440            ACCMP1                  /CHECK RESULTS
2943    2747    4435            NERROR                  /O.K. 4096 LOOPS
2944    2750    4436    T69E,   ERROR                   /ERROR, STATUS REGISTER
2945    2751    2720            TST69                   /SCOPE LOOP POINTER
2946    2752    5000            5000                    /TEXT POINTER
2947                    /
2948                            /VERIFY THAT INTERRUPT OCCURES ON BUSY ERROR
2949                            /
2950    2753    7301    TST70,  CLA CLL IAC
2951    2754    4453            CLRALL                  /CLEAR CONTROL
2952    2755    1102            TAD     K0400           /ENABLE INT. BIT
2953    2756    4450            LDCMD                   /LOAD COMMAND
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2954   2757   4444           ENMAN1          /ENTER MAINTENANCE
2955   2760   7326           CLA CLL CML RTL
2956   2761   4453           CLRALL          /DCLR
2957   2762   4437           IONWAT          /WAIT FOR INT.
2958   2763   7610           SKP CLA         /INT. O.K.
2959   2764   5374           JMP    T70E     /ERROR, DISK INT.
2960   2765   4453           CLRALL          /CLEAR STATUS
2961   2766   4437           IONWAT          /WAIT FOR INTERRUPT
2962   2767   5374           JMP    T70E     /ERROR, NO INT.
2963   2770   4453           CLRALL          /DCLR
2964   2771   4437           IONWAT          /WAIT FOR INT.
2965   2772   7610           SKP CLA         /INT, O.K.
2966   2773   4435           NERROR          /O.K, 4096 LOOPS
2967   2774   4436   T70E,   ERROR           /ERROR, INT.
2968   2775   2753           TST70           /SCOPE LOOP POINTER
2969   2776   0007           0007            /TEXT POINTER
2970                 /
2971                 /VERIFY THAT "RDBUF", "DLCA", "DRST", "DLAG"
2972                 /OR "DSKP" DOES NOT AFFECT STATUS REGISTER.
2973                 /
2974   2777   7301   TST71,  CLA CLL IAC
2975   3000   4453           CLRALL          /CLEAR CONTROL
2976   3001   4444           ENMAN1          /ENTER MAINTENANCE
2977   3002   7326           CLA CLL CML RTL
2978   3003   4453           CLRALL          /DCLR
2979   3004   1103           TAD    K1000    /ENABLE SHIFT
2980   3005   4455           LDMAN           /LOAD MAINTENANCE
2981   3006   7326           CLA CLL CML RTL
2982   3007   1177           TAD    STCON
2983   3010   1070           TAD    K0004
2984   3011   1106           TAD    K4000    /EXPECTED STATUS
2985   3012   3163           DCA    GDREG2   /SETUP COMPARE REGISTER
2986   3013   4456           RDBUF           /READ BUFFER
2987   3014   1153           TAD    REG1
2988   3015   4442           RDSTAT          /READ STATUS
2989   3016   1154           TAD    REG2
2990   3017   4451           LDCUR           /LOAD CURRENT ADDRESS
2991   3020   1153           TAD    REG1
2992   3021   4447           DSKSKP          /DSKP
2993   3022   7000           NOP
2994   3023   4452           LDADD           /LOAD DISK ADDRESS
2995   3024   1153           TAD    REG1
2996   3025   4427           LDBUF           /LOAD BUFFER REGISTER
2997   3026   1154           TAD    REG2
2998   3027   4442           RDSTAT          /READ STATUS
2999   3030   4440           ACCMP1          /CHECK RESULTS
3000   3031   7610           SKP CLA         /STATUS O.K.
3001   3032   5241           JMP    T71E     /ERROR, STATUS
3002   3033   4453           CLRALL          /CLEAR STATUS
3003   3034   1177           TAD    STCON    /EXPECTED STATUS
3004   3035   3163           DCA    GDREG2   /SETUP COMPARE REGISTER
3005   3036   4442           RDSTAT          /READ STATUS
3006   3037   4440           ACCMP1          /CHECK RESULTS
3007   3040   4435           NERROR          /O.K, 4096 LOOPS
3008   3041   4436   T71E,   ERROR           /ERROR, STATUS REGISTER
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3009   3042   2777           TST71           /SCOPE LOOP POINTER
3010   3043   5000           5000            /TEXT POINTER
3011                 /
3012                 /VERIFY THAT "WORD COUNT" OVERFLOWS AND SETS
3013                 /TRANSFER DONE ONLY AFTER 256 (12 BIT COUNTS).
3014                 /TRANSFER DONE SHOULD SET ON THE 11 TH. SHIFT
3015                 /OF THE 256 TH. WORD.
3016                 /
3017   3044   7240   TST72,  CLA CMA
3018   3045   3153           DCA    REG1     /SET FOR 1 PASS PER TEST
3019   3046   7301           CLA CLL IAC
3020   3047   4453           CLRALL                  /DCLR "CLR ALL"
3021   3050   1177           TAD    STCON
3022   3051   3163           DCA    GDREG2   /SETUP COMPARE REGISTER
3023   3052   7326           CLA CLL CML RTL  /TWO
3024   3053   1136           TAD    M12
3025   3054   3156           DCA    TCNTR1           /FOR FINAL WORD!
3026   3055   1143           TAD    M255
3027   3056   3157           DCA    TCNTR2           /FOR ONE LESS THAN "LAST WORD"
3028   3057   4444           ENMAN1                  /ENTER MAINTENANCE MODE
3029   3060   1136   T72R,   TAD    M12
3030   3061   3160           DCA    TCNTR3           /FOR EACH 12 BIT WORD
3031   3062   1077           TAD    K0100            /ENABLE BITS TOSHIFT SILO
3032   3063   4455           LDMAN            /LOAD MAINTENANCE
3033   3064   2160           ISZ    TCNTR3           /SKIP ON EVERY "12 BIT WORD"
3034   3065   5263           JMP    .-2
3035   3066   4456           RDBUF                   /THIS SHOULD PREVENT A "DRL"
3036   3067   4442           RDSTAT                  /GET STATUS
3037   3070   4440           ACCMP1           /CHECK RESULTS
3038   3071   7610           SKP CLA
3039   3072   5315           JMP    T72E             /STATUS ERROR
3040   3073   2157           ISZ    TCNTR2
3041   3074   5260           JMP    T72R             /COUNT 255 "12 BIT WORDS"
3042   3075   1077           TAD    K0100    /ENABLE SHIFT SILO
3043   3076   4455           LDMAN            /LOAD MAINTENANCE
3044   3077   2156           ISZ    TCNTR1           /BIT COUNTER
3045   3100   5276           JMP    .-2              /COUNT 11 BITS
3046   3101   4442           RDSTAT                  /READ STATUS
3047   3102   4440           ACCMP1           /CHECK RESULTS
3048   3103   7610           SKP CLA          /STATUS O.K.
3049   3104   5315           JMP    T72E             /ERROR, STATUS
3050   3105   7330           CLA CLL CML RAR
3051   3106   1177           TAD    STCON
3052   3107   3163           DCA    GDREG2           /SETUP COMPARE REGISTER
3053   3110   1077           TAD    K0100
3054   3111   4455           LDMAN                    /SHIFT IN LAST WORD
3055   3112   4442           RDSTAT                   /READ STATUS
3056   3113   4440           ACCMP1                   /ONLY TRANSFER DONE
3057   3114   4435           NERROR                   /STATUS OK
3058   3115   4436   T72E,   ERROR                    /ERROR, 12 BIT COUNTER
3059   3116   3044           TST72                    /SCOP LOOP
3060   3117   5000           5000                     /TEXT POINTER
3061                 /
3062   3120   5721           JMP I  .+1       /TO NEXT TEST
3063   3121   3209           TST73
```

```
3064                        /
3065            3200        PAGE
3066                        /
3067                        /VERIFY THAT DCLR DOES CLEAR 12  BIT COUNTER
3068                        /
3069    3200  7240    TST73,  CLA CMA
3070    3201  3153            DCA     REG1            /SET FOR 1 PASS PER TEST
3071    3202  1143            TAD     M255
3072    3203  3161            DCA     TCNTR4          /SETUP COUNTER
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3073    3204  7301    T73R1,  CLA CLL IAC
3074    3205  4453            CLRALL                          /DCLR "CLR ALL"
3075    3206  1161            TAD     TCNTR4
3076    3207  3156            DCA     TCNTR1
3077    3210  1136    T73R2,  TAD     M12
3078    3211  3157            DCA     TCNTR2          /12 BIT WORD COUNTER
3079    3212  4444            ENMAN1                  /ENTER MAINTENANCE MODE
3080    3213  1077            TAD     K0100           /ENABLE SHIFT
3081    3214  4455            LDMAN                   /LOAD MAINTENANCE
3082    3215  2157            ISZ     TCNTR2          /COUNT SHIFTS
3083    3216  5214            JMP     .-2             /MORE TO GO
3084    3217  4456            RDBUF                   /PREVENT DRL
3085    3220  2156            ISZ     TCNTR1          /DO IT 12 TIMES
3086    3221  5210            JMP     T73R2           /MORE 12 BIT COUNTS
3087    3222  7301            CLA CLL IAC             /ENABLE CLEAR CONTROL
3088    3223  4453            CLRALL                  /AND CLEAR THE COUNTER
3089    3224  1177            TAD     STCON
3090    3225  3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3091    3226  1136            TAD     M12
3092    3227  3156            DCA     TCNTR1                  /FOR FINAL WORD1
3093    3230  1143            TAD     M255
3094    3231  3157            DCA     TCNTR2                  /FOR ONE LESS THAN "LAST WORD"
3095    3232  4444            ENMAN1                  /ENTER MAINTENANCE MODE
3096    3233  1136    T73R3,  TAD     M12
3097    3234  3160            DCA     TCNTR3                  /FOR EACH 12 BIT WORD
3098    3235  1077            TAD     K0100                   /ENABLE BITS TOSHIFT SILO
3099    3236  4455            LDMAN                   /LOAD MAINTENANCE
3100    3237  2160            ISZ     TCNTR3                  /SKIP ON EVERY "12 BIT WORD"
3101    3240  5236            JMP     .-2
3102    3241  4456            RDBUF                   /THIS SHOULD PREVENT A "DRL"
3103    3242  4442            RDSTAT                  /GET STATUS
3104    3243  4440            ACCMP1          /CHECK RESULTS
3105    3244  7610            SKP CLA
3106    3245  5266            JMP     T73E                    /STATUS ERROR
3107    3246  2157            ISZ     TCNTR2
3108    3247  5233            JMP     T73R3                   /COUNT 255 "12 BIT WORDS"
3109    3250  7330            CLA CLL CML RAR
3110    3251  1177            TAD     STCON
3111    3252  3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3112    3253  1077            TAD .   K0100                   /SHIFT IN LAST WORD
3113    3254  4455            LDMAN
3114    3255  2156            ISZ     TCNTR1
3115    3256  5254            JMP     .-2
3116    3257  4442            RDSTAT                  /READ STATUS
3117    3260  4440            ACCMP1                  /ONLY TRANSFER DONE
3118    3261  7610            SKP CLA         /STATUS O.K.
3119    3262  5266            JMP     T73E            /ERROR, STATUS
3120    3263  2161            ISZ     TCNTR4          /UPDATE SPECIAL COUNTER
3121    3264  5204            JMP     T73R1           /MORE TO TEST
3122    3265  4435            NERROR                  /STATUS OK
3123    3266  4436    T73E,   ERROR                   /ERROR, 12 BIT COUNTER
3124    3267  3200            TST73                   /SCOP LOOP
3125    3270  5000            5000                    /TEXT POINTER
3126                        /
3127                        /
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3128                              /VERIFY THAT 12TH BIT O.K. H DOES INHIBIT
3129                              /SETTING DB CONT1=1. THIS IS WHAT STOPS
3130                              /HALF BLOCK DATA BREAKS ON A READ BPEAK.
3131                              /
3132     3271   7301      TST74,  CLA CLL IAC
3133     3272   4453              CLRALL            /CLEAR CONTROL
3134     3273   1077              TAD     K0100     /HALF BLOCK TRANSFERS
3135     3274   4450              LDCMD             /LOAD COMMAND
3136     3275   7340              CLA CLL CMA
3137     3276   3153              DCA     REG1      /SETUP FOR 1 PASS
3138     3277   1141              TAD     M128
3139     3300   3156              DCA     TCNTR1    /COUNTER FOR 128 WORDS
3140     3301   4444              ENMAN1            /ENTER MAINTENANCE MODE
3141     3302   3163      T74R1,  DCA     GDREG2    /SETUP COMPARE REGISTER
3142     3303   1136      T74R1A, TAD     M12
3143     3304   3157              DCA     TCNTR2    /12 BIT WORD COUNTER
3144     3305   7300      T74R2,  CLA CLL
3145     3306   1077              TAD     K0100     /ENABLE SHIFT
3146     3307   4455              LDMAN             /LOAD MAINTENANCE
3147     3310   2157              ISZ     TCNTR2
3148     3311   5307              JMP     .-2
3149     3312   4456              RDBUF             /READ LOWER BUFFER
3150     3313   4440              ACCMP1            /CHECK RESULTS
3151     3314   7610              SKP CLA           /DATA O.K.
3152     3315   5340              JMP     T74E      /ERROR
3153     3316   2156              ISZ     TCNTR1    /COUNT 128 WORDS
3154     3317   5302              JMP     T74R1     /MORE TO GO
3155     3320   1141              TAD     M128
3156     3321   3156              DCA     TCNTR1    /SETUP COUNTER
3157     3322   1136      T74R3,  TAD     M12
3158     3323   3157              DCA     TCNTR2    /SETUP BIT COUNTER
3159     3324   7326              CLA CLL CML RTL
3160     3325   1077              TAD     K0100     /ENABLE SHIFT
3161     3326   4455              LDMAN             /LOAD MAINTENANCE
3162     3327   2157              ISZ     TCNTR2    /COUNT BITS
3163     3330   5326              JMP     .-2       /MORE TO GO
3164     3331   4456              RDBUF             /READ LOWER BUFFER
3165     3332   4440              ACCMP1            /CHECK RESULTS
3166     3333   7610              SKP CLA           /DATA O.K.
3167     3334   5340              JMP     T74E      /ERROR
3168     3335   2156              ISZ     TCNTR1    /UPDATE COUNTER
3169     3336   5322              JMP     T74R3     /TEST 128 TIMES
3170     3337   4435              NERROR            /TO NEXT TEST
3171     3340   4436      T74E,   ERROR             /ERROR, 128 WORD
3172     3341   3271              TST74             /SCOPE LOOP POINTER
3173     3342   4405              4405              /TEXT POINTER
3174                              /
3175     3343   5744              JMP I   .+1       /TO NEXT TEST
3176     3344   3400              TST75
3177                              /
3178                              /VERIFY THAT TRANSFER DONE "ALONE" CAUSES
3179                              /DSKP TO SKIP.
3180                              /
3181            3400      PAGE
3182     3400   7340      TST75,  CLA CLL CMA
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3183     3401   3153              DCA     REG1      /SET FOR 1 PASS PER TEST
3184     3402   7301              CLA CLL IAC
3185     3403   4453              CLRALL            /DCLR "CLR ALL"
3186     3404   1143              TAD     M255
3187     3405   3156              DCA     TCNTR1    /ONE LESS THAN "LAST WORD"
3188     3406   1136              TAD     M12
3189     3407   3157              DCA     TCNTR2    /FINAL WORD
3190     3410   4444              ENMAN1            /ENTER MAINTENANCE MODE
3191     3411   1136      T75R,   TAD     M12
3192     3412   3160              DCA     TCNTR3    /"12 BIT" WORD COUNTER
3193     3413   1077              TAD     K0100
3194     3414   4455              LDMAN             /LOAD MAINTENANCE
3195     3415   2160              ISZ     TCNTR3
3196     3416   5214              JMP     .-2       /COUNT 12 BIT WORDS
3197     3417   4456              RDBUF             /PREVENT "DRL"
3198     3420   4447              DSKSKP            /SHOULD NOT SKIP HERE
3199     3421   7610              SKP CLA           /O.K.
3200     3422   5234              JMP     T75E      /ERROR, DSKP
3201     3423   2156              ISZ     TCNTR1
3202     3424   5211              JMP     T75R      /COUNT 255 WORDS
3203     3425   1077              TAD     K0100
3204     3426   4455              LDMAN             /LOAD MAINTENANCE
3205     3427   2157              ISZ     TCNTR2
3206     3430   5226              JMP     .-2       /DO ONE MORE WORD
3207     3431   4447              DSKSKP            /DSKP "SKIP"
3208     3432   7610              SKP CLA           /ERROR, DSKP DID NOT SKIP
3209     3433   4435              NERROR            /O.K. 4096 LOOPS
3210     3434   4436      T75E,   ERROR             /ERROR, DSKP
3211     3435   3400              TST75             /SCOPE LOOP POINTER
3212     3436   0006              0006              /TEXT POINTER
3213                              /
3214                              /VERFIFY THAT TRANSFER DONE CAUSES "INT. RQ."
3215                              /
3216     3437   7340      TST76,  CLA CLL CMA
3217     3440   3153              DCA     REG1      /SETUP FOR 1 PASS PER TEST
3218     3441   7301              CLA CLL IAC
3219     3442   4453              CLRALL            /DCLR "CLR ALL"
3220     3443   1143              TAD     M255
3221     3444   3156              DCA     TCNTR1    /ONE LESS THAN "LAST WORD"
3222     3445   1136              TAD     M12
3223     3446   3157              DCA     TCNTR2    /FINAL WORD
3224     3447   1102              TAD     K0400     /ENABLE INT. BIT
3225     3450   4450              LDCMD             /LOAD COMMAND REGISTER
3226     3451   4444              ENMAN1            /ENTER MAINTENANCE MODE
3227     3452   1136      T76R,   TAD     M12
3228     3453   3160              DCA     TCNTR3    /"12 BIT" WORD COUNTER
3229     3454   1077              TAD     K0100     /ENABLE SHIFT SILO
3230     3455   4455              LDMAN             /LOAD MAINTENANCE
3231     3456   2160              ISZ     TCNTR3
3232     3457   5255              JMP     .-2       /COUNT "12 BIT" WORDS
3233     3460   4456              RDBUF             /PREVENT "DRL"
3234     3461   4437              IONWAT            /WAIT FOR INT.
3235     3462   7610              SKP CLA           /O.K. NO INT.
3236     3463   5275              JMP     T76E      /ERROR, INT. OCCURED
3237     3464   2156              ISZ     TCNTR1
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3238    3465  5252              JMP      T76P               /COUNT 255 WORDS
3239    3466  1077              TAD      K0100
3240    3467  4455              LDMAN                       /LOAD MAINTENANCE
3241    3470  2157              ISZ      TCNTR2
3242    3471  5267              JMP      .-2                /DO ONE MORE WORD
3243    3472  4437              IONWAT                      /WAIT FOR EXPECTED INT.
3244    3473  7610              SKP CLA                     /ERROR, INT. DIDN'T OCCUR
3245    3474  4435              NERROR                      /O.K. 4096 LOOPS
3246    3475  4436       T76E,  ERROR                       /ERROR, INT.
3247    3476  3437              TST76                       /SCOPE LOOP POINTER
3248    3477  0007              0007                        /TEXT POINTER
3249                     /
3250                     /
3251                     /
3252                     /
3253                     /VERIFY "DATA BREAK" FROM CURRENT FIELD LOCATION 0
3254                     /USE DATA PATTERN 0000 AND 7777. "DO A WRITE"
3255                     /
3256    3500  7301       TST77,  CLA CLL IAC                /DCLR
3257    3501  4453              CLRALL
3258    3502  4444              ENMAN1                      /ENTER MAINTENANCE MODE
3259    3503  1175              TAD      HOMEMA             /CURRENT FIELD BITS
3260    3504  1106              TAD      K4000              /ENABLE "WRITE"
3261    3505  4450              LDCMD                       /LOAD COMMAND
3262    3506  1153              TAD      REG1
3263    3507  7110              CLL RAR
3264    3510  7630              SZL CLA
3265    3511  7340              CLA CLL CMA                 /MAKE "DATA WORD"
3266    3512  3163              DCA      GDREG2             /SETUP COMPARE REGISTER
3267    3513  1163              TAD      GDREG2
3268    3514  3000              DCA      0                  /STORE OUT BOUND DATA
3269    3515  7340              CLA CLL CMA                 /SET CURRENT ADDRESS TO 7777
3270    3516  4451              LDCUR                       /LOAD CURRENT ADDRESS TO 0
3271    3517  4451              LDCUR
3272    3520  1076              TAD      K0040              /ENABLE "BREAK"
3273    3521  4455              LDMAN                       /LOAD AND GO
3274    3522  4456              RDBUF                       /READ DATA BUFFER
3275    3523  4440              ACCMP1                      /CHECK RESULTS
3276    3524  4435              NERROR                      /O.K. 4096 LOOPS
3277
3278    3525  4436       T77E,  ERROR                       /ERROR, DATA BREAK
3279    3526  3500              TST77                       /SCOPE LOOP POINTER
3280    3527  4263              4263                        /TEXT POINTER
3281
3282                     /
3283                     /VERIFY THAT "DATA BREAK" WORKS FROM LOCATION 0
3284                     /OF CURRENT FIELD, DO   "A WRITE" AND USE DATA
3285                     /PATTERN "2525 AND 5252"
3286                     /
3287    3530  7301       TST78,  CLA CLL IAC
3288    3531  4453              CLRALL                      /DCLR "CLR ALL"
3289    3532  4444              ENMAN1                      /ENTER MAINTENANCE MODE
3290    3533  1153              TAD      REG1
3291    3534  7110              CLL RAR
3292    3535  7630              SZL CLA
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3293    3536  1120              TAD      K2525
3294    3537  1120              TAD      K2525              /TAKE DATA WORD
3295    3540  3163              DCA      GDREG2             /SETUP COMPARE REGISTER
3296    3541  1163              TAD      GDREG2
3297    3542  3000              DCA      0                  /STORE OUTBOUND DATA
3298    3543  1175              TAD      HOMEMA             /GET CURRENT FIELD BITS
3299    3544  1126              TAD      K5000              /GET "WRITE ENABLE BIT"
3300    3545  4450              LDCMD                       /LOAD COMMAND REGISTER
3301    3546  1154              TAD      REG2
3302    3547  4451              LDCUR                       /SET CURRENT ADDRESS TO 7777
3303    3550  4451              LDCUR                       /LOAD CURRENT ADDRESS TO 0
3304    3551  1076              TAD      K0040              /DATA BREAK ENABLE BIT
3305    3552  4455              LDMAN                       /LOAD AND GO
3306    3553  4456              RDBUF                       /READ DATA BUFFER
3307    3554  4440              ACCMP1                      /CHECK RESULTS
3308    3555  4435              NERROR                      /O.K. 4096 LOOPS
3309    3556  4436       T78E,  ERROR                       /ERROR, DATA BREAK
3310    3557  3530              TST78                       /SCOPE LOOP POINTER
3311    3560  4263              4263                        /TEXT POINTER
3312                     /
3313                     /VERIFY THAT "DATA BREAK" WORK FROM LOCATION 7777
3314                     /OF CURRENT FIELD, DO A WRITE AND          USE DATA PATTERN
3315                     /0000 AND 7777.
3316                     /
3317    3561  7301       TST79,  CLA CLL IAC
3318    3562  4453              CLRALL                      /DCLR "CLR ALL"
3319    3563  4444              ENMAN1                      /ENTER MAINTENANCE MODE
3320    3564  1153              TAD      REG1
3321    3565  7110              CLL RAR
3322    3566  7630              SZL CLA
3323    3567  7340              CLA CLL CMA                 /MAKE DATA WORD
3324    3570  3163              DCA      GDREG2             /SETUP COMPARE REGISTER
3325    3571  1163              TAD      GDREG2
3326    3572  3532              DCA I    K7777              /STORE OUTBOUND DATA
3327    3573  1153              TAD      REG1
3328    3574  4451              LDCUR                       /SET CURRENT ADDRESS
3329    3575  7340              CLA CLL CMA
3330    3576  4451              LDCUR                       /LOAD  CURRENT ADDRESS TO 7777
3331    3577  1175              TAD      HOMEMA             /CURRENT FIELD BITS
3332    3600  1106              TAD      K4000              /WRITE ENABLE
3333    3601  4450              LDCMD                       /LOAD COMMAND REGISTER
3334    3602  1076              TAD      K0040              /BREAK ENABLE BIT
3335    3603  4455              LDMAN                       /LOAD AND GO
3336    3604  4456              RDBUF                       /READ DATA BUFFER
3337    3605  4440              ACCMP1                      /CHECK RESULTS
3338    3606  4435              NERROR                      /O.K. 4096 LOOPS
3339    3607  4436       T79E,  ERROR                       /ERROR, DATA BREAK
3340    3610  3561              TST79                       /SCOPE LOOP POINTER
3341    3611  4263              4263                        /TEXT POINTER
3342                     /
3343                     /
3344                     /VERIFY "DATA BREAK" FROM LOCATION 7777 OF
3345                     /CURRENT FIELD, DO A "WRITE" AND USE DATA
3346                     /PATTERN 2525 AND 5252.
3347                     /
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3348   3612   7301   TST80,  CLA CLL IAC
3349   3613   4453           CLRALL                     /DCLR "CLR ALL"
3350   3614   4444           ENMAN1                     /ENTER MAINTENANCE MODE
3351   3615   1153           TAD     REG1
3352   3616   7110           CLL RAR
3353   3617   7630           SZL CLA
3354   3620   1120           TAD     K2525              /MAKE DATA WORD
3355   3621   1120           TAD     K2525
3356   3622   3163           DCA     GDREG2             /SETUP COMPARE REGISTER
3357   3623   1163           TAD     GDREG2
3358   3624   3532           DCA I   K7777              /STORE OUTBOUND DATA
3359   3625   1175           TAD     HOMEMA             /CURRENT FIELD BITS
3360   3626   1126           TAD     K5000              /FUNCTION "WRITE"
3361   3627   4450           LDCMD                      /LOAD COMMAND
3362   3630   1154           TAD     REG2
3363   3631   4451           LDCUR                      /SET CURRENT ADDRESS
3364   3632   7340           CLA CLL CMA
3365   3633   4451           LDCUR                      /LOAD CURRENT ADDRESS TO 7777
3366   3634   1076           TAD     K0040              /BREAK ENABLE BIT
3367   3635   4455           LDMAN                      /LOAD MAINTENANCE AND GO
3368   3636   4456           RDBUF                      /READ BUFFER
3369   3637   4440           ACCMP1                     /CHECK RESULTS
3370   3640   4435           NERROR                     /O.K, 4096 LOOPS
3371   3641   4436   T80E,   ERROR                      /ERROR, DATA BREAK
3372   3642   3612           TST80                      /SCOPE LOOP POINTER
3373   3643   4263           4263                       /TEXT POINTER
3374
3375                  /VERIFY THAT "DATA BREAK" WORKS FROM CURRENT FIELD
3376                  /LOCATION 0, DO A "WRITE" AND USE ALL COMBINATION PATTERN
3377                  /ALSO VERIFY THAT DATA IN LOCATION 0 DOESN'T CHANGE
3378                  /ON A WRITE BREAK, (NOTE: DATA FROM LOCATION 0 PUT
3379                  /IN INDICATOR "DT:")
3380                  /
3381   3644   7301   TST81,  CLA CLL IAC
3382   3645   4453           CLRALL                     /DCLR "CLR ALL"
3383   3646   4444           ENMAN1                     /ENTER MAINTENANCE MODE
3384   3647   1154           TAD     REG2
3385   3650   3163           DCA     GDREG2             /SETUP COMPARE REGISTER
3386   3651   1163           TAD     GDREG2
3387   3652   3000           DCA     0                  /STORE OUTBOUND DATA
3388   3653   4451           LDCUR                      /SET CURRENT ADDRESS TO 0
3389   3654   1175           TAD     HOMEMA             /CURRENT FIELD BITS
3390   3655   1106           TAD     K4000              /WRITE FUNCTION
3391   3656   4450           LDCMD                      /LOAD COMMAND
3392   3657   1076           TAD     K0040              /DATA BREAK ENABLE BIT
3393   3660   4455           LDMAN                      /LOAD AND GO
3394   3661   4456           RDBUF                      /READ BUFFER
3395   3662   4440           ACCMP1                     /CHECK RESULTS
3396   3663   7610           SKP CLA
3397   3664   5272           JMP     T81E               /ERROR
3398   3665   1000           TAD     0
3399   3666   3173           DCA     DTREG              /SAVE IN CASE OF ERROR
3400   3667   1173           TAD     DTREG
3401   3670   4440           ACCMP1                     /CHECK RESULTS
3402   3671   4435           NERROR                     /O.K, 4096 LOOPS
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3403   3672   4436   T81E,   ERROR                      /ERROR, DATA BREAK
3404   3673   3644           TST81                      /SCOPE LOOP POINTER
3405   3674   4263           4263                       /TEXT POINTER
3406
3407                  /
3408                  /VERIFY "DATA BREAK" FROM LOCATION 7777 OF
3409                  /CURRENT FIELD, DO A "WRITE" AND USE ALL COMBINATIONS,
3410                  /ALSO VERIFY THAT OUTBOUND DATA IN LOCATION 7777
3411                  /DOESN'T CHANGE WHEN DOING A WRITE BREAK, (NOTE: DATA FROM
3412                  /LOCATION 7777 PUT IN INDICATOR "DT:")
3413                  /
3414   3675   7301   TST82,  CLA CLL IAC
3415   3676   4453           CLRALL                     /DCLR "CLR ALL"
3416   3677   4444           ENMAN1                     /ENTER MAINTENANCE MODE
3417
3418   3700   1153           TAD     REG1
3419   3701   3163           DCA     GDREG2             /SETUP COMPARE REGISTER
3420   3702   1163           TAD     GDREG2
3421   3703   3532           DCA I   K7777              /STORE OUTBOUND DATA
3422   3704   7340           CLA CLL CMA
3423   3705   4451           LDCUR                      /SET CURRENT ADDRESS TO          7777
3424   3706   1175           TAD     HOMEMA             /CURRENT FIELD BITS
3425   3707   1126           TAD     K5000              /WRITE FUNCTION
3426   3710   4450           LDCMD                      /LOAD COMMAND
3427   3711   1076           TAD     K0040              /BREAK ENABLE BIT
3428   3712   4455           LDMAN                      /LOAD AND GO
3429   3713   4456           RDBUF                      /READ BUFFER
3430   3714   4440           ACCMP1                     /CHECK RESULTS
3431   3715   7610           SKP CLA
3432   3716   5324           JMP     T82E               /ERROR
3433   3717   1532           TAD I   K7777
3434   3720   3173           DCA     DTREG              /SAVE INCASE OF ERROR
3435   3721   1173           TAD     DTREG
3436   3722   4440           ACCMP1                     /CHECK RESULTS
3437   3723   4435           NERROR                     /O.K, 4096 LOOPS
3438   3724   4436   T82E,   ERROR                      /ERROR, DATA BREAK
3439   3725   3675           TST82                      /SCOPE LOOP POINTER
3440   3726   4263           4263                       /TEXT POINTER
3441                  /
3442                  /VERIFY THAT "DCLR" CLEARS CURRENT ADDRESS
3443                  /FIRST DO A DATA BREAK FROM LOCATION 7776
3444                  /THEN "DCLR" FROM LOCATION 0000, DO    "A WRITE"
3445                  /AND USE DATA PATTERN ALL COMBINATIONS,
3446                  /
3447   3727   7301   TST83,  CLA CLL IAC
3448   3730   4453           CLRALL                     /DCLR "CLR ALL"
3449   3731   4444           ENMAN1                     /ENTER MAINTENANCE MODE
3450   3732   1153           TAD     REG1
3451   3733   3163           DCA     GDREG2             /SETUP COMPARE REGISTER
3452   3734   1163           TAD     GDREG2
3453   3735   3510           DCA I   K7776              /STORE OUTBOUND DATA BREAK 1
3454   3736   1154           TAD     REG2
3455   3737   3000           DCA     0                  /STORE OUTBOUND DATA BREAK 2
3456   3740   1175           TAD     HOMEMA             /CURRENT          FIELD BITS
3457   3741   1106           TAD     K4000              /WRITE FUNCTION
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3458    3742   4450            LDCMD                           /LOAD COMMAND
3459    3743   7344            CLA CLL CMA RAL
3460    3744   4451            LDCUR                           /LOAD CURRENT ADDRESS TO 7776
3461    3745   1076            TAD     K0040                   /BREAK ENABLE BIT
3462    3746   4455            LDMAN                           /LOAD AND GO
3463    3747   4456            RDBUF                           /READ BUFFER
3464    3750   4440            ACCMP1                          /CHECK RESULTS
3465    3751   7610            SKP CLA                         /O.K. TPY LOCATION A
3466    3752   5371            JMP     T83E                    /ERROR, DATA BREAK
3467    3753   7301            CLA CLL IAC
3468    3754   4453            CLRALL                          /DCLR "CLEAR CURRENT ADDRESS"
3469    3755   4444            ENMAN1                          /ENTER MAINTENANCE MODE
3470    3756   3172            DCA     ADREG                   /SETUP FOR ERROR PRINTER
3471    3757   1175            TAD     HOMEMA                  /CURRENT FIELD BITS
3472    3760   1126            TAD     K5000                   /FUNCTION WRITE
3473    3761   4450            LDCMD                           /LOAD COMMAND
3474    3762   1154            TAD     REG2
3475    3763   3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3476    3764   1076            TAD     K0040                   /BREAK ENABLE BIT
3477    3765   4455            LDMAN                           /LOAD AND GO
3478    3766   4456            RDBUF                           /READ BUFFER
3479
3480    3767   4440            ACCMP1                          /CHECK RESULTS
3481    3770   4435            NERROR                          /ALL WORKED 4096 LOOPS
3482    3771   4436   T83E,    ERROR                           /ERROR, DATA BREAK
3483    3772   3727            TST83                           /SCOPE LOOP POINTER
3484    3773   4263            4263                            /TEXT POINTER
3485                   /
3486                   /VERIFY THAT CURRENT ADDRESS DOES INCREMENT FROM 7777
3487                   /TO 0000, DO A WRITE DATA BREAK AND USE DATA PATTERN
3488                   /ALL COMBINATION.
3489                   /
3490    3774   7301   TST84,   CLA CLL IAC
3491    3775   4453            CLRALL                          /CLEAR CONTROL
3492    3776   1153            TAD     REG1
3493    3777   3000            DCA     0                       /STORE OUTBOUND DATA
3494    4000   1154            TAD     REG2
3495    4001   3532            DCA I   K7777                   /STORE OUTBOUND DATA
3496    4002   7340            CLA CLL CMA
3497    4003   4451            LDCUR                           /LOAD CURRENT ADDRESS
3498    4004   4444            ENMAN1                          /ENTER MAINTENANCE MODE
3499    4005   1126            TAD     K5000                   /WRITE FUNCTION
3500    4006   1175            TAD     HOMEMA                  /CURRENT FIELD
3501    4007   4450            LDCMD                           /LOAD COMMAND
3502    4010   7344            CLA CLL CMA RA                  
3503    4011   3156            DCA     TCNTR1                  /2 BREAK COUNTER
3504    4012   1076            TAD     K0040                   /ENABLE BREAK BIT
3505    4013   4455            LDMAN                           /LOAD MAINTENANCE
3506    4014   2156            ISZ     TCNTR1                  /COUNT BREAKS
3507    4015   5213            JMP     .-2                     /DO 2
3508    4016   7300            CLA CLL
3509    4017   1154            TAD     REG2
3510    4020   3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3511    4021   4456            RDBUF                           /GET FIRST WORD
3512    4022   4440            ACCMP1                          /CHECK IT
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3513    4023   7610            SKP CLA                         /FIRST O.K.
3514    4024   5233            JMP     T84E                    /ERROR, FIRST WORD
3515    4025   3172            DCA     ADREG                   /SETUP ERROR PRINTER
3516    4026   1153            TAD     REG1
3517    4027   3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3518    4030   4456            RDBUF                           /GET SECOND WORD
3519    4031   4440            ACCMP1                          /CHECK IT
3520    4032   4435            NERROR                          /O.K. 4096 LOOPS
3521    4033   4436   T84E,    ERROR                           /DATA BREAK
3522    4034   3774            TST84                           /SCOPE LOOP POINTER
3523    4035   4263            4263                            /TEXT POINTER
3524                   /
3525                   /
3526                   /VERIFY THAT CURRENT ADDRESS DOES INCREMENT
3527                   /ADDRESS TEST FROM 0200 TO TST85 OF CURRENT
3528                   /FIELD. DO A WRITE DATA BREAK.
3529                   /
3530    4036   7301   TST85,   CLA CLL IAC
3531    4037   4453            CLRALL                          /DCLR "CLR ALL"
3532    4040   7340            CLA CLL CMA
3533    4041   3153            DCA     REG1                    /SETUP FOR 1 PASS PER TEST
3534    4042   1100            TAD     K0200
3535    4043   3157            DCA     TCNTR2                  /START AT ADDRESS 0200
3536    4044   1100            TAD     K0200
3537    4045   4451            LDCUR                           /LOAD CURRENT ADDRESS
3538    4046   4444   T85R1,   ENMAN1                          /ENTER MAINTENANCE MODE
3539    4047   4452            LDADD                           /KEEP WRITE INHIBIT CLEAR
3540    4050   1557            TAD I   TCNTR2                  /GET INSTRUCTION
3541    4051   3156            DCA     TCNTR1                  /SAVE INSTRUCTION
3542    4052   1157            TAD     TCNTR2
3543    4053   7110            CLL RAR
3544    4054   7630            SZL CLA
3545    4055   7240            CLA CMA                         /USE DATA 7777
3546    4056   3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3547    4057   1163            TAD     GDREG2
3548    4060   3557            DCA I   TCNTR2                  /STORE OUTBOUND DATA
3549    4061   1175            TAD     HOMEMA                  /CURRENT FIELD BITS
3550    4062   1106            TAD     K4000                   /WRITE FUNCTION
3551    4063   4450            LDCMD                           /LOAD COMMAND REGISTER
3552    4064   1076            TAD     K0040                   /BREAK ENABLE BIT
3553    4065   4455            LDMAN                           /LOAD AND GO
3554    4066   7300            CLA CLL
3555    4067   1156            TAD     TCNTR1                  /GET INSTRUCTION
3556    4070   3557            DCA I   TCNTR2                  /REPLACE INSTRUCTION
3557    4071   1157            TAD     TCNTR2
3558    4072   3172            DCA     ADREG                   /ADDRESS OF BREAK
3559    4073   4456            RDBUF                           /GET DATA
3560    4074   4440            ACCMP1                          /CHECK RESULTS
3561    4075   7610            SKP CLA
3562    4076   5306            JMP     T85E                    /ERROR, DATA BREAK
3563    4077   1157            TAD     TCNTR2
3564    4100   1152            TAD     MTS85                   /SPECIAL POINTER FOR START OF
3565    4101   7650            SNA CLA                         /THIS TEST.
3566    4102   5305            JMP     T850K                   /TEST O.K.
3567    4103   2157            ISZ     TCNTR2
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3568    4104    5246                  JMP      T85R1         /LOOP DO 0200 TO TST60
3569    4105    4435        T85OK,    NERROR                       /THIS ADDRESS WORKED TRY NEXT
3570    4106    4436        T85E,     ERROR                 /ERROR, DATA BREAK
3571    4107    4036                  TST85                 /SCOPE LOOP POINTER
3572    4110    4263                  4263                  /TEXT POINTER
3573                        /
3574    4111    5712                  JMP I    .+1          /TO NEXT TEST
3575    4112    4200                  TST86
3576                        /
3577                        /VERIFY THAT 8 LAST BREAK SETS AFTER 256 WRITE DATA BREAKS
3578                        /AND VERIFY THAT DCLR CLEARS WRITE INHIBIT COUNTER.
3579                        /
3580            4200        PAGE
3581    4200    7340        TST86,    CLA CLL CMA
3582    4201    3153                  DCA      REG1          /SETUP FOR 1 PASS PER TEST
3583    4202    1143                  TAD      M255
3584    4203    3156                  DCA      TCNTR1        /SPECIAL COUNTER
3585    4204    7301        T86R1,    CLA CLL IAC
3586    4205    4453                  CLRALL                 /CLEAR CONTROL
3587    4206    1156                  TAD      TCNTR1
3588    4207    3157                  DCA      TCNTR2        /AMOUNT OF BREAKS TO DO
3589    4210    4444                  ENMAN1                 /ENTER MAINTENANCE MODE
3590    4211    1175                  TAD      HOMEMA               /CURRENT FIELD BITS
3591    4212    1106                  TAD      K4000                /WRITE FUNCTION
3592    4213    4450                  LDCMD                  /LOAD COMMAND
3593    4214    4451        T86R2,    LDCUR                  /LOAD CURRENT ADDRESS
3594    4215    7340                  CLA CLL CMA
3595    4216    3000                  DCA      0             /STORE OUTBOUND DATA
3596    4217    7340                  CLA CLL CMA
3597    4220    3163                  DCA      GDREG2        /SETUP COMPARE REGISTER
3598    4221    1076                  TAD      K0040                /BREAK ENABLE BIT
3599    4222    4455                  LDMAN                  /LOAD AND GO
3600    4223    4456                  RDBUF                  /GET WORD
3601    4224    4440                  ACCMP1                 /CHECK RESULTS
3602    4225    7610                  SKP CLA
3603    4226    5276                  JMP      T86E                 /DATA ERROR
3604    4227    2157                  ISZ      TCNTR2
3605    4230    5214                  JMP      T86R2         /DO 0-255 BREAKS
3606    4231    7301                  CLA CLL IAC
3607    4232    4453                  CLRALL                 /CLEAR CONTROL AND COUNTER
3608    4233    7340                  CLA CLL CMA
3609    4234    1143                  TAD      M255
3610    4235    3157                  DCA      TCNTR2        /256 BREAK COUNTER
3611    4236    7300        T86R3,    CLA CLL
3612                                                         /MAKE DATA PATTERN
3613    4237    3000                  DCA      0             /STORE OUTBOUND DATA
3614    4240    3163                  DCA      GDREG2        /SETUP COMPARE REGISTER
3615    4241    4444                  ENMAN1                 /ENTER MAINTENANCE MODE
3616    4242    4451                  LDCUR                  /LOAD CURRENT ADDRESS
3617    4243    1126                  TAD      K5000         /WRITE FUNCTION
3618    4244    1175                  TAD      HOMEMA        /CURRENT FIELD
3619    4245    4450                  LDCMD                  /LOAD COMMAND
3620    4246    1076                  TAD      K0040         /ENABLE BREAK BIT
3621    4247    4455                  LDMAN                  /LOAD MAINTENANCE
3622    4250    4456                  RDBUF                  /GET WORD
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3623    4251    4440                  ACCMP1                 /CHECK RESULTS
3624    4252    7610                  SKP CLA                /WORD O.K.
3625    4253    5276                  JMP      T86E          /DATA ERROR
3626    4254    2157                  ISZ      TCNTR2
3627    4255    5236                  JMP      T86R3         /DO 256 WRITE BREAKS
3628    4256    1107                  TAD      K7000
3629    4257    3160                  DCA      TCNTR3        /CLEAR COUNTER
3630    4260    7340        T86R4,    CLA CLL CMA
3631    4261    3000                  DCA      0             /STORE NOT OUTBOUND DATA
3632    4262    4451                  LDCUR                  /LOAD CURRENT ADDRESS
3633    4263    1076                  TAD      K0040         /ENABLE BREAK BIT
3634    4264    4455                  LDMAN                  /LOAD "SHOULD NOT BREAK"
3635    4265    4456                  RDBUF                         /GET DATA
3636    4266    4440                  ACCMP1                 /CHECK IT
3637    4267    7610                  SKP CLA                /DATA O.K.
3638    4270    5276                  JMP      T86E          /ERROR, DATA BREAK INHIBIT
3639    4271    2160                  ISZ      TCNTR3
3640    4272    5260                  JMP      T86R4                /DO "1000 FAKE" BREAKS
3641    4273    2156                  ISZ      TCNTR1
3642    4274    5204                  JMP      T86R1         /START ALL OVER WITH ONE LESS
3643    4275    4435                  NERROR                       /TO NEXT TEST
3644    4276    4436        T86E,     ERROR                 /ERROR, DATA BREAK
3645    4277    4200                  TST86                 /SCOPE LOOP POINTER
3646    4300    4263                  4263                  /TEXT POINTER
3647                        /
3648    4301    5702                  JMP I    .+1          /TO NEXT TEST
3649    4302    4303                  TST87
3650                        /
3651                        /
3652                        /VERIFY THAT 8 LAST BREAK SETS AFTER 128 BREAKS IF
3653                        /HALF BIT IS SET. ALSO MAKE SURE LOAD DISK ADDRESS LOADS
3654                        /THE INHIBIT COUNTER CORRECTLY.
3655                        /
3656    4303    7340        TST87,    CLA CLL CMA
3657    4304    3153                  DCA      REG1          /SETUP FOR 1 PASS PER TEST
3658    4305    1143                  TAD      M255
3659    4306    3156                  DCA      TCNTR1        /SPECIAL COUNTER
3660    4307    7301        T87R1,    CLA CLL IAC
3661    4310    4453                  CLRALL                 /CLEAR CONTROL
3662    4311    1156                  TAD      TCNTR1
3663    4312    3157                  DCA      TCNTR2        /AMOUNT OF BREAKS TO DO
3664    4313    4444                  ENMAN1                 /ENTER MAINTENANCE MODE
3665    4314    1077                  TAD      K0100         /HALF BIT
3666    4315    1175                  TAD      HOMEMA               /CURRENT FIELD BITS
3667    4316    1106                  TAD      K4000                /WRITE FUNCTION
3668    4317    4450                  LDCMD                        /LOAD COMMAND
3669    4320    4451        T87R2,    LDCUR                  /LOAD CURRENT ADDRESS
3670    4321    7340                  CLA CLL CMA
3671    4322    3000                  DCA      0             /STORE OUTBOUND DATA
3672    4323    7340                  CLA CLL CMA
3673    4324    3163                  DCA      GDREG2        /SETUP COMPARE REGISTER
3674    4325    1076                  TAD      K0040                /BREAK ENABLE BIT
3675    4326    4455                  LDMAN                        /LOAD AND GO
3676    4327    4456                  RDBUF                  /GET WORD
3677    4330    4440                  ACCMP1                 /CHECK RESULTS
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3678    4331    7610            SKP CLA
3679    4332    5374            JMP     T87E                    /DATA ERROR
3680    4333    2157            ISZ     TCNTR2
3681    4334    5320            JMP     T87R2                   /DO SO MANY BREAKS
3682    4335    4452            LDADD                           /LOAD ADDRESS AND INHIBIT COUNT
3683    4336    1141            TAD     M128
3684    4337    3157            DCA     TCNTR2                  /128 BREAK COUNTER
3685    4340    7300    T87R3,  CLA CLL
3686                                                            /MAKE DATA WORD
3687    4341    3000            DCA     0                       /STORE OUTBOUND DATA
3688    4342    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3689    4343    4451            LDCUR                           /LOAD CURRENT ADDRESS
3690    4344    1076            TAD     K0040                   /ENABLE BREAK BIT
3691    4345    4455            LDMAN                           /LOAD MAINTENANCE
3692    4346    4456            RDBUF                           /GET WORD
3693    4347    4440            ACCMP1                          /CHECK RESULTS
3694    4350    7610            SKP CLA                         /WORD O.K.
3695    4351    5374            JMP     T87E                    /DATA ERROR
3696    4352    2157            ISZ     TCNTR2
3697    4353    5340            JMP     T87R3                   /DO 128 WRITE BREAKS
3698    4354    1107            TAD     K7000
3699    4355    3160            DCA     TCNTR3                  /CLEAR COUNTER
3700    4356    7340    T87R4,  CLA CLL CMA
3701    4357    3000            DCA     0                       /STORE NOT OUTBOUND DATA
3702    4360    4451            LDCUR                           /LOAD CURRENT ADDRESS
3703    4361    1076            TAD     K0040                   /ENABLE BREAK BIT
3704    4362    4455            LDMAN                           /LOAD "SHOULD NOT BREAK"
3705    4363    4456            RDBUF                           /GET DATA
3706    4364    4440            ACCMP1                          /CHECK IT
3707    4365    7610            SKP CLA                         /DATA O.K.
3708    4366    5374            JMP     T87E                    /ERROR, DATA BREAK INHIBIT
3709    4367    2160            ISZ     TCNTR3
3710    4370    5356            JMP     T87R4                   /DO "1000 FAKE" BREAKS
3711    4371    2156            ISZ     TCNTR1
3712    4372    5307            JMP     T87R1                   /START ALL OVER WITH ONE LESS
3713    4373    4435            NERROR                          /TO NEXT TEST
3714    4374    4436    T87E,   EPROR                           /ERROR, DATA BREAK
3715    4375    4303            TST87                           /SCOPE LOOP POINTER
3716    4376    4263            4263                            /TEXT POINTER
3717
3718                    /VERIFY THAT "DATA BREAK" WORKS WITH A "READ"
3719                    /TO LOCATION 0 OF CURRENT FIELD. USE DATA
3720                    /PATTERN 0000 AND 7777.
3721                    /
3722    4377    7301    TST88,  CLA CLL IAC
3723    4400    4453            CLRALL                          /DCLR "CLR ALL"
3724    4401    1175            TAD     HOMEMA                  /CURRENT FIELD
3725    4402    4450            LDCMD                           /LOAD COMMAND TO 0
3726    4403    1153            TAD     REG1
3727    4404    7110            CLL RAR
3728    4405    7630            SZL CLA
3729    4406    7240            CLA CMA
3730    4407    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3731    4410    1163            TAD     GDREG2                  /GET VALUE TO LOAD
3732    4411    4427            LDBUF                           /LOAD UPPER BUFFER
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3733    4412    1076            TAD     K0040
3734    4413    4455            LDMAN                           /LOAD AND GO
3735    4414    7300            CLA CLL
3736    4415    3172            DCA     ADREG                   /ADDRESS FOR PRINTER
3737    4416    1000            TAD     0                       /GET INBOUND WORD
3738    4417    3173            DCA     DTREG                   /SAVE IT
3739    4420    1173            TAD     DTREG
3740    4421    4440            ACCMP1                          /CHECK
3741    4422    4435            NERROR                          /O.K. 4096 LOOPS
3742    4423    4436            ERROR                           /ERROR, DATA BREAK
3743    4424    4377            TST88                           /SCOPE LOOP POINTER
3744    4425    4263            4263                            /TEXT POINTER
3745
3746
3747                    /
3748                    /VERIFY WITH A "READ" THAT "DATA BREAK" WORKS
3749                    /FROM LOCATION "7777" OF CURRENT FIELD USE
3750                    /DATA PATTERN 0000 AND 7777.
3751                    /
3752    4426    7301    TST89,  CLA CLL IAC
3753    4427    4453            CLRALL
3754    4430    1103            TAD     K1000
3755    4431    1175            TAD     HOMEMA                  /CURRENT FIELD
3756    4432    4450            LDCMD                           /LOAD COMMAND FOR READ
3757    4433    1153            TAD     REG1
3758    4434    7110            CLL RAR
3759    4435    7630            SZL CLA
3760    4436    7240            CLA CMA
3761    4437    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3762    4440    7240            CLA CMA
3763    4441    4451            LDCUR                           /LOAD CURRENT ADDRESS
3764    4442    1163            TAD     GDREG2                  /GET VALUE TO LOAD
3765    4443    4427            LDBUF                           /LOAD UPPER BUFFER
3766    4444    1076            TAD     K0040                   /ENABLE BREAK BIT
3767    4445    4455            LDMAN                           /LOAD AND GO
3768    4446    7300            CLA CLL
3769    4447    1532            TAD I   K7777                   /GET "WORD"
3770    4450    3173            DCA     DTREG                   /SAVE INBOUND WORD
3771    4451    1173            TAD     DTREG
3772    4452    4440            ACCMP1                          /CHECK IT
3773    4453    4435            NERROR                          /O.K. 4096 LOOPS
3774    4454    4436            EPROR                           /ERROR, DATA BREAK
3775    4455    4426            TST89                           /SCOPE LOOP POINTER
3776    4456    4263            4263                            /TEXT POINTER
3777                    /
3778                    /VERIFY THAT "DATA BREAK" WITH A "READ" TO
3779                    /CURRENT FIELD LOCATION 0 USE DATA PATTERN
3780                    /5252 + 2525
3781                    /
3782    4457    7301    TST90,  CLA CLL IAC
3783    4460    4453            CLRALL                          /DCLR
3784    4461    1175            TAD     HOMEMA                  /CURRENT FIELD
3785    4462    4450            LDCMD                           /LOAD COMMAND TO READ
3786    4463    1153            TAD     REG1
3787    4464    7110            CLL RAR
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3788    4465    7630            SZL CLA                 /WHAT DDATA
3789    4466    1120            TAD     K2525           /DATA 5252
3790    4467    1120            TAD     K2525
3791    4470    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3792    4471    1163            TAD     GDREG2          /GET VALUE TO LOAD
3793    4472    4427            LDBUF                   /LOAD UPPER BUFFER
3794    4473    4451            LDCUR                   /LOAD CURRENT ADDRESS TO 0
3795    4474    1076            TAD     K0040           /ENABLE BREAK
3796    4475    4455            LDMAN                   /LOAD AND GO
3797    4476    7300            CLA CLL
3798    4477    1000            TAD     0
3799    4500    3173            DCA     DTREG                   /SAVE DATA
3800    4501    1000            TAD     0
3801    4502    4440            ACCMP1                          /CHECK
3802    4503    4435            NERROR                  /O.K. 4096 LOOPS
3803    4504    4436            ERROR                   /ERROR, DATA BREAK
3804    4505    4457            TST90                   /SCOPE LOOP POINTER
3805    4506    4263            4263                    /TEXT POINTER
3806
3807                    /VERIFY THAT "DATA BREAK" WORD WITH     A "READ"
3808                    /TO CURRENT FIELD LOCATION LOCATION 7777.
3809                    /USE DATA PATTERN 5252 + 2525
3810                    /
3811    4507    7301    TST91,  CLA CLL IAC
3812    4510    4453            CLRALL
3813    4511    1175            TAD     HOMEMA          /CURRENT FIELD
3814    4512    4450            LDCMD                   /LOAD COMMAND
3815    4513    7240            CLA CMA
3816    4514    4451            LOCUR                           /LOAD CURRENT ADDRESS
3817    4515    1153            TAD     REG1
3818    4516    7110            CLL RAR
3819    4517    7630            SZL CLA                 /WHAT DATA TO USE
3820    4520    1120            TAD     K2525           /DATA 5252
3821    4521    1120            TAD     K2525
3822    4522    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
3823    4523    1163            TAD     GDREG2          /GET VALUE TO LOAD
3824    4524    4427            LDBUF                   /LOAD UPPER BUFFER
3825    4525    1076            TAD     K0040           /ENABLE BREAK BIT
3826    4526    4455            LDMAN                   /LOAD MAINTENANCE
3827    4527    7300            CLA CLL
3828    4530    1532            TAD I   K7777                   /GET BREAK WORD
3829    4531    3173            DCA     DTREG           /SAVE FOR ERROR PRINTER
3830    4532    1173            TAD     DTREG
3831    4533    4440            ACCMP1                          /CHECK
3832    4534    4435            NERROR                  /O.K. 4096 LOOPS
3833    4535    4436            ERROR                   /ERROR, DATA BREAK
3834    4536    4507            TST91                   /SCOPE LOOP POINTER
3835    4537    4263            4263                    /TEXT POINTER
3836                    /
3837    4540    5741            JMP I   .+1             /TO NEXT TEST
3838    4541    4600            TST92
3839                    /
3840
3841                    /VERIFY THAT "DATA BUFFERS" CAN BE FILLED
3842                    /ON A WRITE DATA BREAK FROM LOCATION
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3843                    /0 OF CURRENT FIELD, USE ALL COMBINATIONS.
3844                    /
3845            4600    PAGE
3846    4600    7301    TST92,  CLA CLL IAC
3847    4601    4453            CLRALL                          /DCLR "CLR ALL"
3848    4602    4444            ENMAN1                  /ENTER MAINTENANCE MODE
3849    4603    1133            TAD     M4
3850    4604    3156            DCA     TCNTR1                  /FOR FOUR WORDS
3851    4605    1153            TAD     REG1
3852    4606    3157            DCA     TCNTR2                  /DATA START
3853    4607    1175            TAD     HOMEMA          /CURRENT FIELD
3854    4610    1106            TAD     K4000           /WRITE FUNCTION
3855    4611    4450            LDCMD                   /LOAD COMMAND
3856    4612    4451    T92R1,  LOCUR                   /LOAD CURRENT ADDRESS TO 0
3857    4613    1157            TAD     TCNTR2
3858    4614    3000            DCA     0               /STORE OUT BOUND DATA
3859    4615    1076            TAD     K0040           /ENABLE BREAK BIT
3860    4616    4455            LDMAN                   /LOAD AND GO
3861    4617    7300            CLA CLL
3862    4620    2157            ISZ     TCNTR2                  /UPDATE DATA WORD
3863    4621    7000            NOP
3864    4622    2156            ISZ     TCNTR1
3865    4623    5212            JMP     T92R1                   /FILL BUFFER
3866    4624    1133            TAD     M4
3867    4625    3156            DCA     TCNTR1
3868    4626    1153            TAD     REG1
3869    4627    3163            DCA     GDREG2
3870    4630    4456    T92R2,  RDBUF
3871    4631    4440            ACCMP1
3872    4632    7610            SKP     CLA
3873    4633    5241            JMP     T92E
3874    4634    2163            ISZ     GDREG2
3875    4635    7000            NOP
3876    4636    2156            ISZ     TCNTR1
3877    4637    5230            JMP     T92R2
3878    4640    4435            NERROR                          /O.K. 4096 LOOPS
3879    4641    4436    T92E,   ERROR                   /ERROR, DATA BREAK
3880    4642    4600            TST92                   /SCOPE LOOP POINTER
3881    4643    4263            4263                    /TEXT POINTER
3882                    /
3883    4644    5645            JMP I   .+1             /TO NEXT TEST
3884    4645    4646            TST93
3885                    /
3886                    /
3887                    /VERIFY THAT "DATA BREAK" WORKS WITH
3888                    /A "READ" TO CURRENT FIELD LOCATION 0
3889                    /TRY ALL COMBINATIONS
3890                    /
3891    4646    7301    TST93,  CLA CLL IAC
3892    4647    4453            CLRALL                          /DCLR "CLR ALL"
3893    4650    1175            TAD     HOMEMA          /CURRENT FIELD
3894    4651    4450            LDCMD                   /LOAD COMMAND FOR READ
3895    4652    3172            DCA     ADREG                   /SAVE ADDRESS
3896    4653    1154            TAD     REG2
3897    4654    3163            DCA     GDREG2                  /SETUP COMPARE REGISTER
```

```
3898    4655  1163              TAD     GDREG2          /GET VALUE TO LOAD
3899    4656  4427              LDBUF                   /LOAD UPPER BUFFER
3900    4657  1076              TAD     K0040                   /BREAK ENABLE BIT
3901    4660  4455              LDMAN                   /LOAD AND GO
3902    4661  7300              CLA CLL
3903    4662  1000              TAD     0                       /GET DATA WORD
3904    4663  3173              DCA     DTREG           /SAVE FOR ERROR PRINTER
3905    4664  1173              TAD     DTREG
3906    4665  4440              ACCMP1                  /CHECK
3907    4666  4435              NERROR                  /O.K. 4096 LOOPS
3908    4667  4436              ERROR                   /ERROR, DATA BREAK
3909    4670  4646              TST93                   /SCOPE LOOP POINTER
3910    4671  4263              4263                    /TEXT POINTER
3911                    /
3912                    /VERIFY THAT A READ DATA BREAK DOES OCCUR
3913                    /WHEN FUNCTION = 2
3914                    /
3915    4672  7301      TST94,  CLA CLL IAC
3916    4673  4453              CLRALL                  /DCLR
3917    4674  1153              TAD     REG1            /GET VALUE TO LOAD
3918    4675  3163              DCA     GDREG2          /SETUP COMPARE REGISTER
3919    4676  1163              TAD     GDREG2
3920    4677  4427              LDBUF                   /LOAD UPPER BUFFER
3921    4700  1163              TAD     GDREG2
3922    4701  7040              CMA
3923    4702  3000              DCA     0
3924    4703  4451              LDCUR                   /SET CURRENT ADDRESS TO 0
3925    4704  1175              TAD     HOMEMA          /CURRENT FIELD
3926    4705  1104              TAD     K2000
3927    4706  4450              LDCMD                   /LOAD COMMAND REGISTER
3928    4707  1076              TAD     K0040           /ENABLE BREAK
3929    4710  4455              LDMAN                   /GO
3930    4711  7300              CLA CLL
3931    4712  1000              TAD     0
3932    4713  3173              DCA     DTREG           /SAVE FOR ERROR PRINTER
3933    4714  1173              TAD     DTREG
3934    4715  4440              ACCMP1                  /DID 0 CHANGE
3935    4716  4435              NERROR                  /ALL O.K.
3936    4717  4436      T94E,   EPROR                   /ERROR, DATA BREAK
3937    4720  4672              TST94                   /SCOPE LOOP POINTER
3938    4721  4263              4263                    /TEXT POINTER
3939                    /
3940                    /VERIFY THAT A READ DATA BREAK DOES OCCUR
3941                    /WHEN FUNCTION = 3
3942                    /
3943    4722  7301      TST95,  CLA CLL IAC
3944    4723  4453              CLRALL                  /DCLR
3945    4724  1154              TAD     REG2
3946    4725  3163              DCA     GDREG2          /SETUP COMPARE REGISTER
3947    4726  1163              TAD     GDREG2
3948    4727  4427              LDBUF                   /LOAD UPPER BUFFER
3949    4730  1163              TAD     GDREG2
3950    4731  7040              CMA
3951    4732  3000              DCA     0
3952    4733  4451              LDCUR                   /SET CURRENT ADDRESS TO 0
```

```
3953    4734  1175              TAD     HOMEMA          /CURRENT FIELD
3954    4735  1103              TAD     K1000
3955    4736  1104              TAD     K2000
3956    4737  4450              LDCMD                   /LOAD COMMAND REGISTER
3957    4740  1076              TAD     K0040           /ENABLE BREAK
3958    4741  4455              LDMAN                   /GO
3959    4742  7300              CLA CLL
3960    4743  1000              TAD     0
3961    4744  3173              DCA     DTREG           /SAVE FOR ERROR PRINTER
3962    4745  1173              TAD     DTREG
3963    4746  4440              ACCMP1                  /DID 0 CHANGE
3964    4747  4435              NERROR                  /ALL O.K.
3965    4750  4436      T95E,   EPROR                   /ERROR, DATA BREAK
3966    4751  4722              TST95                   /SCOPE LOOP POINTER
3967    4752  4263              4263                    /TEXT POINTER
3968                    /
3969    4753  5754              JMP I   .+1             /TO NEXT TEST
3970    4754  5000              TST97
3971          5000      PAGE
3972                    /
3973                    /
3974                    /VERIFY THAT A READ DATA BREAK DOES OCCUR
3975                    /WHEN FUNCTION = 6
3976                    /
3977    5000  7301      TST97,  CLA CLL IAC
3978    5001  4453              CLRALL                  /DCLR
3979    5002  1153              TAD     REG1
3980    5003  3163              DCA     GDREG2          /SETUP COMPARE REGISTER
3981    5004  1163              TAD     GDREG2
3982    5005  4427              LDBUF                   /LOAD UPPER BUFFER
3983    5006  1163              TAD     GDREG2
3984    5007  7040              CMA
3985    5010  3000              DCA     0
3986    5011  4451              LDCUR                   /SET CURRENT ADDRESS TO 0
3987    5012  1175              TAD     HOMEMA          /CURRENT FIELD
3988    5013  1106              TAD     K4000
3989    5014  1104              TAD     K2000
3990    5015  4450              LDCMD                   /LOAD COMMAND REGISTER
3991    5016  1076              TAD     K0040           /ENABLE BREAK
3992    5017  4455              LDMAN                   /GO
3993    5020  7300              CLA CLL
3994    5021  1000              TAD     0
3995    5022  3173              DCA     DTREG           /SAVE FOR ERROR PRINTER
3996    5023  1173              TAD     DTREG
3997    5024  4440              ACCMP1                  /DID 0 CHANGE
3998    5025  4435              NERROR                  /ALL O.K.
3999    5026  4436      T97E,   ERROR                   /ERROR, DATA BREAK
4000    5027  5000              TST97                   /SCOPE LOOP POINTER
4001    5030  4263              4263                    /TEXT POINTER
4002                    /
4003                    /VERIFY THAT A READ DATA BREAK DOES OCCUR
4004                    /WHEN FUNCTION = 7
4005                    /
4006    5031  7301      TST98,  CLA CLL IAC
4007    5032  4453              CLRALL                  /DCLR
```

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4008  5033  1154          TAD     REG2
4009  5034  3163          DCA     GDREG2        /SETUP COMPARE REGISTER
4010  5035  1163          TAD     GDREG2
4011  5036  4427          LDBUF                 /LOAD UPPER BUFFER
4012  5037  1163          TAD     GDREG2
4013  5040  7040          CMA
4014  5041  3000          DCA     0
4015  5042  4451          LDCUR                 /SET CURRENT ADDRESS TO 0
4016  5043  1175          TAD     HOMEMA        /CURRENT FIELD
4017  5044  1106          TAD     K4000
4018  5045  1103          TAD     K1000
4019  5046  1104          TAD     K2000
4020  5047  4450          LDCMD                 /LOAD COMMAND REGISTER
4021  5050  1076          TAD     K0040         /ENABLE BREAK
4022  5051  4455          LDMAN                 /GO
4023  5052  7300          CLA CLL
4024  5053  1000          TAD     0
4025  5054  3173          DCA     DTREG         /SAVE FOR ERROR PRINTER
4026  5055  1173          TAD     DTREG
4027  5056  4440          ACCMP1                /DID 0 CHANGE
4028  5057  4435          NERROR                /ALL O.K.
4029  5060  4436  T98E,   ERROR                 /ERROR, DATA BREAK
4030  5061  5031          TST98                 /SCOPE LOOP POINTER
4031  5062  4263          4263                  /TEXT POINTER
4032                /
4033                /VERIFY THAT ALL DATA BUFFERS CAN BE FULL
4034                /AT ONCE. USE A READ BREAK AND PATTERN
4035                /ALL COMBINATIONS.
4036                /
4037  5063  7301  TST99,  CLA CLL IAC
4038  5064  4453          CLRALL                /DCLR "CLR ALL"
4039  5065  1154          TAD     REG2
4040  5066  3161          DCA     TCNTR4
4041  5067  1133          TAD     M4
4042  5070  3160          DCA     TCNTR3        /COUNTER FOR # OF BUFFERS
4043  5071  1161  T99R1,  TAD     TCNTR4
4044  5072  4427          LDBUF                 /LOAD UPPER BUFFER
4045  5073  7340          CLA CLL CMA
4046  5074  1161          TAD     TCNTR4
4047  5075  3161          DCA     TCNTR4
4048  5076  2160          ISZ     TCNTR3
4049  5077  5271          JMP     T99R1         /4 COUNT, SKIP WHEN BUFFERS FULL
4050  5100  1154          TAD     REG2
4051  5101  3163          DCA     GDREG2        /SETUP FOR FIRST CMMPARE
4052  5102  1133          TAD     M4
4053  5103  3160          DCA     TCNTR3
4054  5104  1175          TAD     HOMEMA        /CURRENT FIELD
4055  5105  4450          LDCMD                 /LOAD COMMAND
4056  5106  4451  T99R2,  LDCUR                 /LOAD CURRENT ADDRESS
4057  5107  1076          TAD     K0040         /GET ENABLE BREAK
4058  5110  4455          LDMAN                 /LOAD MAINTENANCE
4059  5111  7300          CLA CLL
4060  5112  1000          TAD     0             /GET DATA
4061  5113  3173          DCA     DTREG         /SAVE FOR PRINTER
4062  5114  1173          TAD     DTREG
```

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4063  5115  4440          ACCMP1                /CHECK
4064  5116  7610          SKP CLA               /O.K. CHECK NEXT
4065  5117  5326          JMP     T99E          /ERROR DATA BUFFERS
4066  5120  7340          CLA CLL CMA
4067  5121  1163          TAD     GDREG2
4068  5122  3163          DCA     GDREG2        /SETUP FOR NEXT
4069  5123  2160          ISZ     TCNTR3
4070  5124  5306          JMP     T99R2
4071  5125  4435          NERROR                /O.K. 4096 LOOPS
```

```
4072    5126    4436    T99E,    ERROR                      /ERROR, DAT  BUFFERS
4073    5127    5063             TST99                      /SCOPF LOOF  JINTER
4074    5130    4263             4263                       /TFXT POINTER
4075
4076                    /
4077                    /VERIFY A WRITE THEN READ BREAK FROM
4078                    /LOCATIONS 7777 THEN 0000 OF THE
4079                    /CURRENT FIELD.  USE PATTERS 0-7777.
4080                    /
4081    5131    7301    TST100, CLA CLL IAC
4082    5132    4453             CLRALL                     /CLEAR CONTROL
4083    5133    4444             ENMAN1                     /ENTER MAINTENANCE
4084    5134    7340             CLA CLL CMA
4085    5135    4451             LDCUR                      /LOAD CURRENT ADDRESS
4086    5136    1154             TAD      REG2
4087    5137    3532             DCA I    K7777             /STORE OUT BOUND DATA
4088    5140    1175             TAD      HOMEMA            /CURRENT FIELD
4089
4090
4091    5141    1106             TAD      K4000             /WRITE FUNCTION
4092    5142    4450             LDCMD                      /LOAD COMMAND REGISTER
4093    5143    1076             TAD      K0040             /ENABLE BREAK
4094    5144    4455             LDMAN                      /ISSUE MAINTENANCE IOT
4095    5145    7300             CLA CLL                    /READ FUNCTION
4096    5146    1175             TAD      HOMEMA            /CURRENT FIELD
4097    5147    4450             LDCMD                      /LOAD COMMAND REGISTER
4098    5150    1076             TAD      K0040             /ENABLE BREAK
4099    5151    4455             LDMAN                      /ISSUE MAINTENANCE IOT
4100    5152    7300             CLA CLL
4101    5153    2172             ISZ      ADREG
4102    5154    7000             NOP
4103    5155    1154             TAD      REG2
4104    5156    3163             DCA      GDREG2            /SETUP COMPARE
4105    5157    1000             TAD      0
4106    5160    3173             DCA      DTREG             /STORE DATA READ FOR PRINTER
4107    5161    1000             TAD      0
4108    5162    4440             ACCMP1                     /CHECK RESULTS
4109    5163    4435             NERROR                     /O.K. 4096 LOOPS
4110    5164    4436             ERROR                      /ERROR, WRITE OR READ
4111    5165    5131             TST100                     /SCOPE POINTER
4112    5166    4263             4263
4113    5167    7301             CLA CLL IAC
4114    5170    1176             TAD      FLDMAX
4115    5171    7650             SNA CLA                    /IS IT TEST EXTENDED MEM.
4116    5172    5432             JMP I    XEND              /NO, END OF TEST
4117                    /
4118    5173    5774             JMP I    .+1               /TO NEXT TEST
4119    5174    5201             EXTFLD
4120                    /
4121            5200    PAGE
4122                    /
4123                    /ROUTINE TO CHECK IF CONSOLE PACKAGE ACTIVE.
4124                    /IF SO, THEN INHIBIT EXTENDED MEMORY TESTS.
4125                    /
4126    5200    5670    TSTLAS, ENDTST
```

```
4127    5201    1022    EXTFLD, TAD      22
4128    5202    0102             AND      K0400             /MASK CLASSIC BIT
4129    5203    7640             SZA CLA                    /ON CLASSIC SYSTEM?
4130    5204    5600             JMP I    TSTLAS            /BY-PASS EXT. TESTS.
4131                    /
4132                    /VERIFY THAT DATA BREAK WORKS WITH A WRITE FROM
4133                    /LOCATION 0000 IN ALL EXISTING EXTENDED FIELDS.
4134                    /USE DATA PATTERN 0000 + 7777.
4135                    /
4136    5205    7301    TST101, CLA CLL IAC
4137
4138
4139
4140
4141
4142
4143    5206    4453             CLRALL                     /DCLR
4144    5207    4444             ENMAN1                     /ENTER MAINTENANCE MODE
4145    5210    1150             TAD      KCDF
4146    5211    3232             DCA      TOFLD2            /START FIELD 0
4147    5212    1176             TAD      FLDMAX
4148    5213    3156             DCA      TCNTR1            /FIELDS TO TEST -1
4149    5214    1433             TAD I    THSFLD
4150    5215    3234             DCA      RTFLD2            /RETURN FIELD CDF
4151    5216    1153             TAD      REG1
4152    5217    7110             CLL RAR
4153    5220    7630             SZL CLA                    /USE DATA 7777 IF LINK IS SET
4154    5221    7240             CLA CMA
4155    5222    3163             DCA      GDREG2            /SETUP COMPARE REGISTER
4156    5223    4451    T101R,   LDCUR                     /SET CURRENT ADDRESS TO 0000
4157    5224    1232             TAD      TOFLD2
4158    5225    7041             CIA
4159    5226    1234             TAD      RTFLD2
4160    5227    7650             SNA CLA                    /CURRENT FIELD
4161    5230    5247             JMP      NEXFL2            /YES, NOT THIS ONE
4162    5231    1163             TAD      GDREG2            /OUTBOUND DATA
4163    5232    7402    TOFLD2,  HLT                        /MODIFIED CDF
4164    5233    3464             DCA I    K0000             /STORE DATA
4165    5234    7402    RTFLD2,  HLT                        /HOME CDF
4166    5235    1232             TAD      TOFLD2
4167    5236    0114             AND      K0070
4168    5237    1106             TAD      K4000             /WRITE
4169    5240    4450             LDCMD                      /LOAD COMMAND REGISTER
4170    5241    1076             TAD      K0040             /ENABLE WRITE BPEAK
4171    5242    4455             LDMAN                      /GO
4172    5243    4456             RDBUF                      /GET RESULTS
4173    5244    4440             ACCMP1                     /CHECK RESULTS
4174    5245    7610             SKP CLA                    /O.K. TRY NEXT
4175    5246    5257             JMP      T101E             /ERROR
4176    5247    2156    NEXFL2,  ISZ      TCNTR1
4177    5250    7610             SKP CLA
4178    5251    5256             JMP      T101D             /DONE WITH ALL
4179    5252    1232             TAD      TOFLD2
4180    5253    1073             TAD      K0010
4181    5254    3232             DCA      TOFLD2            /SET TO NEXT FIELD
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4182    5255  5223            JMP     T101R           /TRY IT
4183    5256  4435    T101D,  NERROR                  /O.K 4096 LOOPS
4184    5257  4436    T101E,  ERROR                   /ERROR, DATA BREAK
4185    5260  5205            TST101                  /SCOPE LOOP POINTER
4186    5261  4263            4263                    /TEXT POINTER
4187                  /
4188                  /
4189                  /
4190                  /VERIFY THAT DATA BREAK WORKS WITH A WRITE FROM
4191                  /LOCATION 0000 IN ALL EXISTING EXTENDED FIELDS.
4192                  /USE DATA PATTERN 2525 + 5252.
4193                  /
4194    5262  7301    TST102, CLA CLL IAC
4195    5263  4453            CLRALL                  /DCLR
4196    5264  4444            ENMAN1                  /ENTER MAINTENANCE MODE
4197    5265  1150            TAD     KCDF
4198    5266  3310            DCA     TOFLD3          /START FIELD 0
4199    5267  1176            TAD     FLDMAX
4200    5270  3156            DCA     TCNTR1          /FIELDS TO TEST -1
4201    5271  1433            TAD I   THSFLD
4202    5272  3312            DCA     RTFLD3          /RETURN FIELD CDF
4203    5273  1153            TAD     REG1
4204    5274  7110            CLL RAR
4205    5275  7630            SZL CLA                 /USE DATA 5252 IF LINK IS SET
4206    5276  1120            TAD     K2525
4207    5277  1120            TAD     K2525
4208    5300  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
4209    5301  4451    T102R,  LDCUR                   /SET CURRENT ADDRESS TO 0000
4210    5302  1310            TAD     TOFLD3
4211    5303  7041            CIA
4212    5304  1312            TAD     RTFLD3
4213    5305  7650            SNA CLA                 /CURRENT FIELD
4214    5306  5325            JMP     NEXFL3          /YES, NOT THIS ONE
4215    5307  1163            TAD     GDREG2          /OUTBOUND DATA
4216    5310  7402    TOFLD3, HLT                     /MODIFIED CDF
4217    5311  3464            DCA I   K0000           /STORE DATA
4218    5312  7402    RTFLD3, HLT                     /HOME CDF
4219    5313  1310            TAD     TOFLD3
4220    5314  0114            AND     K0070
4221    5315  1106            TAD     K4000           /WRITE
4222    5316  4450            LDCMD                   /LOAD COMMAND REGISTER
4223    5317  1076            TAD     K0040           /ENABLE WRITE BREAK
4224    5320  4455            LDMAN                   /GO
4225    5321  4456            RDBUF                   /GET RESULTS
4226    5322  4440            ACCMP1                  /CHECK RESULTS
4227    5323  7610            SKP CLA                 /O.K, TRY NEXT
4228    5324  5335            JMP     T102E           /ERROR
4229    5325  2156    NEXFL3, ISZ     TCNTR1
4230    5326  7610            SKP CLA
4231    5327  5334            JMP     T102D           /DONE WITH ALL
4232    5330  1310            TAD     TOFLD3
4233    5331  1073            TAD     K0010
4234    5332  3310            DCA     TOFLD3          /SET TO NEXT FIELD
4235    5333  5301            JMP     T102R           /TRY IT
4236    5334  4435    T102D,  NERROR                  /O.K 4096 LOOPS
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4237    5335  4436    T102E,  ERROR                   /ERROR, DATA BREAK
4238    5336  5262            TST102                  /SCOPE LOOP POINTER
4239    5337  4263            4263                    /TEXT POINTER
4240    5340  5741            JMP I   .+1
4241    5341  5400            TST103
4242          5400    PAGE
4243                  /
4244                  /VERIFY THAT DATA BREAK WORKS WITH A WRITE FROM
4245                  /LOCATION 7777 IN ALL EXISTING EXTENDED FIELDS.
4246                  /USE DATA PATTERN 0000 + 7777.
4247                  /
4248    5400  7301    TST103, CLA CLL IAC
4249    5401  4453            CLRALL                  /DCLR
4250    5402  4444            ENMAN1                  /ENTER MAINTENANCE MODE
4251    5403  1150            TAD     KCDF
4252    5404  3226            DCA     TOFLD4          /START FIELD 0
4253    5405  1176            TAD     FLDMAX
4254    5406  3156            DCA     TCNTR1          /FIELDS TO TEST -1
4255    5407  1433            TAD I   THSFLD
4256    5410  3230            DCA     RTFLD4          /RETURN FIELD CDF
4257    5411  1153            TAD     REG1
4258    5412  7110            CLL RAR
4259    5413  7630            SZL CLA                 /USE DATA 7777 IF LINK IS SET
4260    5414  7240            CLA CMA
4261    5415  3163            DCA     GDREG2          /SETUP COMPARE REGISTER
4262    5416  7240    T103R,  CLA CMA
4263    5417  4451            LDCUR                   /SET CURRENT ADDRESS TO 7777
4264    5420  1226            TAD     TOFLD4
4265    5421  7041            CIA
4266    5422  1230            TAD     RTFLD4
4267    5423  7650            SNA CLA                 /CURRENT FIELD
4268    5424  5243            JMP     NEXFL4          /YES, NOT THIS ONE
4269    5425  1163            TAD     GDREG2          /OUTBOUND DATA
4270    5426  7402    TOFLD4, HLT                     /MODIFIED CDF
4271    5427  3532            DCA I   K7777           /STORE DATA
4272    5430  7402    RTFLD4, HLT                     /HOME CDF
4273    5431  1226            TAD     TOFLD4
4274    5432  0114            AND     K0070
4275    5433  1106            TAD     K4000           /WRITE
4276    5434  4450            LDCMD                   /LOAD COMMAND REGISTER
4277    5435  1076            TAD     K0040           /ENABLE WRITE BREAK
4278    5436  4455            LDMAN                   /GO
4279    5437  4456            RDBUF                   /GET RESULTS
4280    5440  4440            ACCMP1                  /CHECK RESULTS
4281    5441  7610            SKP CLA                 /O.K, TRY NEXT
4282    5442  5253            JMP     T103E           /ERROR
4283    5443  2156    NEXFL4, ISZ     TCNTR1
4284    5444  7610            SKP CLA
4285    5445  5252            JMP     T103D           /DONE WITH ALL
4286    5446  1226            TAD     TOFLD4
4287    5447  1073            TAD     K0010
4288    5450  3226            DCA     TOFLD4          /SET TO NEXT FIELD
4289    5451  5216            JMP     T103R           /TRY IT
4290    5452  4435    T103D,  NERROR                  /O.K 4096 LOOPS
4291    5453  4436    T103E,  ERROR                   /ERROR, DATA BREAK
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4292    5454   5400             TST103              /SCOPE LOOP POINTER
4293    5455   4263             4263                /TEXT POINTER
4294                    /
4295                    /
4296                    /
4297                    /VERIFY THAT DATA BREAK WORKS WITH A WRITE FROM
4298                    /LOCATION 7777 IN ALL EXISTING EXTENDED FIELDS.
4299                    /USE DATA PATTERN 2525 + 5252.
4300                    /
4301    5456   7301     TST104,  CLA CLL IAC
4302    5457   4453             CLRALL              /DCLR
4303    5460   4444             ENMAN1              /ENTER MAINTENANCE MODE
4304    5461   1150             TAD      KCDF
4305    5462   3305             DCA      TOFLD5      /START FIELD 0
4306    5463   1176             TAD      FLDMAX
4307    5464   3156             DCA      TCNTR1      /FIELDS TO TEST -1
4308    5465   1433             TAD I    THSFLD
4309    5466   3307             DCA      RTFLD5      /RETURN FIELD CDF
4310    5467   1153             TAD      REG1
4311    5470   7110             CLL RAR
4312    5471   7630             SZL CLA              /USE DATA 5252 IF LINK IS SET
4313    5472   1120             TAD      K2525
4314    5473   1120             TAD      K2525
4315    5474   3163             DCA      GDREG2      /SETUP COMPARE REGISTER
4316    5475   7240     T104R,   CLA CMA
4317    5476   4451             LDCUR               /SET CURRENT ADDRESS TO 7777
4318    5477   1305             TAD      TOFLD5
4319    5500   7041             CIA
4320    5501   1307             TAD      RTFLD5
4321    5502   7650             SNA CLA              /CURRENT FIELD
4322    5503   5322             JMP      NEXFL5      /YES, NOT THIS ONE
4323    5504   1163             TAD      GDREG2      /OUTBOUND DATA
4324    5505   7402     TOFLD5,  HLT                 /MODIFIED CDF
4325    5506   3532             DCA I    K7777       /STORE DATA
4326    5507   7402     RTFLD5,  HLT                 /HOME CDF
4327    5510   1305             TAD      TOFLD5
4328    5511   0114             AND      K0070
4329    5512   1106             TAD      K4000       /WRITE
4330    5513   4450             LDCMD               /LOAD COMMAND REGISTER
4331    5514   1076             TAD      K0040       /ENABLE WRITE BREAK
4332    5515   4455             LDMAN               /GO
4333    5516   4456             RDBUF               /GET RESULTS
4334    5517   4440             ACCMP1              /CHECK RESULTS
4335    5520   7610             SKP CLA              /O.K. TRY NEXT
4336    5521   5332             JMP      T104E       /ERROR
4337    5522   2156     NEXFL5,  ISZ     TCNTR1
4338    5523   7610             SKP CLA
4339    5524   5331             JMP      T104D       /DONE WITH ALL
4340    5525   1305             TAD      TOFLD5
4341    5526   1073             TAD      K0010
4342    5527   3305             DCA      TOFLD5      /SET TO NEXT FIELD
4343    5530   5275             JMP      T104R       /TRY IT
4344    5531   4435     T104D,   NERROR              /O.K 4096 LOOPS
4345    5532   4436     T104E,   ERROR               /ERROR, DATA BREAK
4346    5533   5456             TST104              /SCOPE LOOP POINTER
```

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4347    5534   4263             4263                /TEXT POINTER
4348    5535   5736             JMP I    .+1
4349    5536   5600             TST105
4350           5600     PAGE
4351                    /
4352                    /VERIFY THAT DATA BREAK WORKS FROM ALL LOCATIONS
4353                    /IN ALL EXISTING EXTENDED FIELDS.
4354                    /USE DATA PATTERN ALL COMBINATIONS
4355                    /
4356    5600   1150     TST105,  TAD     KCDF
4357    5601   3221             DCA      TOFLD1
4358    5602   1176             TAD      FLDMAX
4359    5603   3156             DCA      TCNTR1
4360    5604   1433             TAD I    THSFLD
4361    5605   3245             DCA      RTFLD1
4362    5606   1153             TAD      REG1
4363    5607   3163             DCA      GDREG2      /SETUP COMPARE REGISTER
4364    5610   7301     T105R,   CLA CLL IAC
4365    5611   4453             CLRALL              /DCLR
4366    5612   4444             ENMAN1              /ENTER MAINTENANCE MODE
4367    5613   1221             TAD      TOFLD1
4368    5614   7041             CIA
4369    5615   1245             TAD      RTFLD1
4370    5616   7650             SNA CLA              /IS IT CURRENT FIELD
4371    5617   5255             JMP      NEXFL1      /YES, BYPASS
4372    5620   1163             TAD      GDREG2
4373    5621   0000     TOFLD1,  0                   /MODIFIED CDF
4374    5622   3554             DCA I    REG2        /STORE DATA WORD
4375    5623   1221             TAD      TOFLD1
4376    5624   0114             AND      K0070       /MASK DF BITS
4377    5625   1106             TAD      K4000
4378    5626   4450             LDCMD               /LOAD COMMAND REGISTER
4379    5627   1154             TAD      REG2
4380    5630   4451             LDCUR               /LOAD CURRENT ADDRESS
4381    5631   1076             TAD      K0040       /ENABLE BREAK
4382    5632   4455             LDMAN               /GO
4383    5633   7301             CLA CLL IAC
4384    5634   1154             TAD      REG2
4385    5635   3172             DCA      ADREG       /SETUP BREAK TO ADDRESS
4386    5636   1221             TAD      TOFLD1
4387    5637   0114             AND      K0070       /MASK FIELD BITS
4388    5640   4450             LDCMD               /LOAD COMMAND
4389    5641   1076             TAD      K0040
4390    5642   4455             LDMAN               /LOAD MAINTENANCE
4391    5643   7300             CLA CLL
4392    5644   1572             TAD I    ADREG       /GET DATA READ
4393    5645   0000     RTFLD1,  0                   /CURRENT FIELD CDF
4394    5646   3173             DCA      DTREG       /STORE FOR PRINTER
4395    5647   1173             TAD      DTREG
4396    5650   4440             ACCMP1              /CHECK RESULTS
4397    5651   7610             SKP CLA              /THIS FIELD O.K.
4398    5652   5265             JMP      T105E       /ERROR
4399    5653   2163             ISZ      GDREG2      /UPDATE WORD
4400    5654   7000             NOP
4401    5655   2156     NEXFL1,  ISZ     TCNTR1
```

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4402    5656    7610            SKP CLA
4403    5657    5264            JMP     T105D           /ALL DONE
4404    5660    1221            TAD     TOFLD1
4405    5661    1073            TAD     K0010
4406    5662    3221            DCA     TOFLD1
4407    5663    5210            JMP     T105R           /TRY NEXT FIELD
4408    5664    4435    T105D,  NERROR                  /O.K. NEXT ADDRESS
4409    5665    4436    T105E,  ERROR                   /ERROR, DATA BREAK
4410    5666    5600            TST105                  /SCOPE LOOP POINTER
4411    5667    4263            4263                    /TEXT POINTER
4412                    /
4413    5670    4405    ENDTST, SET                     /SETUP FIELD 0
4414    5671    1007            TAD     SAVEND
4415    5672    3532            DCA I   K7777           /REPLACE BINARY
4416    5673    1022            TAD     22
4417    5674    0106            AND     K4000           /TEST FOR APT
4418    5675    7650            SNA CLA                 /APT??
4419    5676    5301            JMP     .+3             /NO, NORMAL RUN
4420    5677    2371            ISZ     PCOUNT
4421    5700    5317            JMP     ENDHLT+1        /LOOP PROGRAM
4422    5701    4406            CLASIC                  /CHECK FOR CONSOLE CLASSIC
4423    5702    4424            CRPASS                  /CHECK FOR PASS COMPLETE TYPEOUT.
4424    5703    7610            SKP CLA
4425    5704    5310            JMP     .+4             /BYPASS NORMAL TYPEOUT.
4426    5705    4462            CRLF
4427    5706    4457            PRNTER                  /PRINT END OF TEST MESSAGE
4428    5707    7562            TEXEND                  /POINTER
4429    5710    4404            LAS
4430    5711    7004            RAL
4431    5712    7710            SPA CLA
4432    5713    5317            JMP     .+4             /NO STOP.
4433    5714    4406            CLASIC                  /CHECK FOR CLASSIC.
4434    5715    4437            CRINQU                  /ROUTINE TO EXECUTE.
4435    5716    7402    ENDHLT, HLT                     /END OF TEST
4436    5717    7301            CLA CLL IAC
4437    5720    4453            CLRALL                  /DCLR
4438    5721    5722            JMP I   .+1             /LOOP ON PROGRAM
4439    5722    0766            TST4
4440                    /
4441                    /
4442                    /MANUAL TEST FOR 16 BIT COUNTER.
4443                    /SET SWITCH REGISTER TO 0201 AND PRESS
4444                    /LOAD ADDRESS. SET THE SWITCH REGISTER TO 0000.
4445                    /THEN PRESS CLEAR AND CONTINUE.
4446                    /SCOPE THE 16TH CARRY OUTPUT TEST POINT
4447                    /FOR A GROUND TO +3 VOLT SIGNAL.
4448                    /
4449    5723    7301    MANUL,  CLA CLL IAC
4450    5724    4453            CLRALL                  /FIRST, CLEAR CONTROL
4451    5725    4444            ENMAN1                  /ENTER MAINTENANCE MODE
4452    5726    1077            TAD     K0100           /ENABLE SHIFT PULSES
4453    5727    4455            LDMAN                   /ISSUE MAINTENANCE IOT AND
4454    5730    5327            JMP     .-1             /CAUSE HI MAIN SHIFTS TO THE
4455    5731    5327            JMP     .-2             /INPUT OF THE 16 BIT COUNTER.
4456                    /
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4457                    /THIS ROUTINE WILL BE A SKIP INSTRUCTION FOR SYSTEMS WITHOUT CLASSIC
4458                    /OTHERWISE IT WILL EXECUTE THE NEXT INSTRUCTION IN FIELD 0 AND THEN
4459                    /SKIP THE INSTRUCTION AFTER THAT ONE.
4460                    /
4461    5732    0000    CLASIK, 0
4462    5733    3363            DCA     SAVAC           /SAVE CURRENT AC.
4463    5734    1732            TAD I   CLASIK          /GET INSTRUCTION
4464    5735    3362            DCA     ROUTMP          /SAVE THE CLASSIC ROUTINE.
4465    5736    2332            ISZ     CLASIK          /BUMP AFTER THE CALL.
4466    5737    1022            TAD     OP2
4467    5740    0377            AND     (400)
4468    5741    7640            SZA CLA                 /IS THIS A CLASSIC SYSTEM?
4469    5742    5345            JMP     .+3             /YES.
4470    5743    1363            TAD     SAVAC           /NO THEN RETURN TO PROGRAM.
4471    5744    5732            JMP I   CLASIK
4472    5745    2332            ISZ     CLASIK
4473    5746    6211            CDF     10
4474    5747    1020            TAD     SWR
4475    5750    3776            DCA I   (SWR)           /MOVE POINTERS TO FIELD 1.
4476    5751    1021            TAD     OP1
4477    5752    3775            DCA I   (OP1)
4478    5753    1022            TAD     OP2
4479    5754    3774            DCA I   (OP2)
4480    5755    1362            TAD     ROUTMP
4481    5756    3773            DCA I   (ROUINS)        /SAVE ROUTINE IN FIELD 1.
4482    5757    1363            TAD     SAVAC
4483    5760    6212            CIF     10
4484    5761    5773            JMP I   (ROUINS)        /GO EXECUTE ROUTINE.
4485                    /
4486    5762    0000    ROUTMP, 0
4487    5763    0000    SAVAC,  0
4488                    /
4489                    /ROUTINE TO GET SWITCHES.
4490                    /
4491    5764    0000    MYLAS,  0
4492    5765    4406            CLASIC                  /CHECK IF CLASSIC.
4493    5766    4425            C0CKSW                  /GET SWITCHES.
4494    5767    7604            7604                    /NOP IF ON APT
4495    5770    5764            JMP I   MYLAS           /EXIT
4496                    /
4497    5771    0000    PCOUNT, 0
4498                    /
4499    5773    1302
4500    5774    0022
4501    5775    0021
4502    5776    0020
4503    5777    0400
                6000            PAGE
4504                    /
4505                    /SUBROUTINE TO WAIT FOR INTERRUPTS
4506                    /IF INTERRUPT OCCURES GO BACK +1
4507                    /
4508    6000    0000    IONWT,  0
4509    6001    7300            CLA CLL
4510    6002    1112            TAD     K7700
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4511    6003  3233            DCA     COMP1
4512    6004  6001            ION                             /TURN IT ON
4513    6005  2233            ISZ     COMP1
4514    6006  5205            JMP     .-1
4515    6007  6002            IOF                             /TURN IT OFF
4516    6010  5600            JMP I   IONWT                   /NO INT OCCURED
4517    6011  2000    INTADD, ISZ     IONWT
4518    6012  4447            DSKSKP                          /DISK SKIP IOT
4519    6013  7410            SKP                             /ERROR
4520    6014  5600            JMP I   IONWT                   /EXIT.
4521    6015  7240            CLA CMA
4522    6016  1200            TAD     IONWT
4523    6017  3200            DCA     IONWT                   /RESET RETURN ADDRESS.
4524    6020  1022            TAD     22
4525    6021  0102            AND     K0400                   /MASK CLASSIC.
4526    6022  7640            SZA CLA                         /ON CLASSIC?
4527    6023  6031            KSF                             /IF SO ALLOW KEY FLAG.
4528    6024  5227            JMP     .+3                     /NO KEY!
4529    6025  6032            KCC                             /WAS CLEAR FLAG.
4530    6026  5201            JMP     IONWT +1                /RETURN AND WAIT.
4531    6027  4406            CLASIC                          /CHECK FOR CLASSIC.
4532    6030  4436            C8ERR                           /ROUTINE TO EXECUTE.
4533    6031  7402    ERHLT1, HLT                             /ERROR, ILLEGAL INTERRUPT
4534    6032  5227            JMP     .-3                     /NON-RECOVERABLE ERROR.
4535                          /
4536                          /ROUTINE TO COMPARE AC TO GDREG2
4537                          /
4538    6033  0000    COMP1,  0
4539    6034  3174            DCA     ACREG
4540    6035  1174            TAD     ACREG                   /SAVE AC
4541    6036  7041            CIA
4542    6037  1163            TAD     GDREG2
4543    6040  7640            SZA CLA                         /SKIP IF O.K.
4544    6041  2233            ISZ     COMP1                   /ERROR, DON'T COMPARE
4545    6042  4424            TICK                            /GENERATE TIMING IF NEEDED
4546    6043  5633            JMP I   COMP1
4547                          /
4548                          /ROUTINE TO COMPARE CRREG1 AND CRREG2 TO
4549                          /GDREG1 AND GDREG2.
4550                          /
4551    6044  0000    COMP2,  0
4552    6045  7300            CLA CLL
4553    6046  1162            TAD     GDREG1
4554    6047  0145            AND     K0017
4555    6050  7041            CIA
4556    6051  1164            TAD     CRREG1
4557    6052  7640            SZA CLA
4558    6053  5260            JMP     CRERR                   /NOT THE SAME
4559    6054  1165            TAD     CRREG2
4560    6055  7041            CIA
4561    6056  1163            TAD     GDREG2
4562    6057  7640            SZA CLA
4563    6060  2244    CRERR,  ISZ     COMP2                   /ERROR, NOT THE SAME
4564    6061  4424            TICK                            /TIMING FOR APT IF NEEDED
4565    6062  5644            JMP I   COMP2
```

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4566                          /
4567                          /SUBROUTINE TO READ STATUS REGISTER
4568                          /
4569    6063  0000    RDST,   0
4570    6064  6745    IOT5,   DRST                            /READ STATUS IOT
4571    6065  5272            JMP     .+5                     /O.K. NO SKIP.
4572    6066  4406            CLASIC                          /CHECK FOR CLASSIC.
4573    6067  4436            C8ERR                           /ROUTINE TO EXECUTE.
4574    6070  7402    ERHLT5, HLT                             /SKIP TRAP
4575    6071  5266            JMP     .-3                     /NON-RECOVERABLE ERROR.
4576    6072  3166            DCA     STREG                   /SAVE RESULTS
4577    6073  1166            TAD     STREG
4578    6074  5663            JMP I   RDST                    /EXIT
4579                          /
4580                          /SUBROUTINE TO LOAD CURRENT ADDRESS REGISTER
4581                          /
4582    6075  0000    LDCA,   0
4583    6076  3172            DCA     ADREG                   /SAVE IN ADDRESS
4584    6077  1172            TAD     ADREG
4585    6100  6744    IOT4,   DLCA                            /LOAD CURRENT ADDRESS IOT
4586    6101  5675            JMP I   LDCA                    /EXIT
4587    6102  4406            CLASIC                          /CHECK FOR CLASSIC.
4588    6103  4436            C8ERR                           /ROUTINE TO EXECUTE.
4589    6104  7402    ERHLT4, HLT                             /SKIP TRAP ERROR
4590    6105  5302            JMP     .-3                     /NON-RECOVERABLE ERROR.
4591                          /
4592                          /
4593                          /SUBROUTINE TO LOAD DISK ADDRESS REGISTER
4594                          /
4595    6106  0000    LDAD,   0
4596    6107  3171            DCA     DAREG                   /SAVE OUTBOUND DATA
4597    6110  1171            TAD     DAREG
4598    6111  6743    IOT3,   DLAG                            /LOAD DISK ADDRESS REGISTER
4599    6112  5706            JMP I   LDAD                    /EXIT
4600    6113  4406            CLASIC                          /CHECK FOR CLASSIC.
4601    6114  4436            C8ERR                           /ROUTINE TO EXECUTE.
4602    6115  7402    ERHLT3, HLT                             /SKIP TRAP ERROR
4603    6116  5313            JMP     .-3                     /NON-RECOVERABLE ERROR.
4604                          /
4605                          /
4606                          /SUBROUTINE TO LOAD COMMAND REGISTER
4607                          /
4608    6117  0000    LDCM,   0
4609    6120  3170            DCA     CMREG                   /SAVE OUTBOUND DATA
4610    6121  1170            TAD     CMREG
4611    6122  6746    IOT6,   DLDC                            /LOAD COMMAND REGISTER
4612    6123  5717            JMP I   LDCM                    /EXIT
4613    6124  4406            CLASIC                          /CHECK FOR CLASSIC.
4614    6125  4436            C8ERR                           /ROUTINE TO EXECUTE.
4615    6126  7402    ERHLT6, HLT                             /SKIP TRAP ERROR.
4616    6127  5324            JMP     .-3                     /NON-RECOVERABLE ERROR.
4617                          /
4618                          /SUBROUTINE TO ISSUE "DSKP" DISK SKIP IOT
4619                          /
4620    6130  0000    SDKP,   0
```

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4621                      IOT1,   DSKP                            /DISK SKIP IOT
4622    6131  6741                SKP                             /DID NOT SKIP
        6132  7410
4623    6133  2330                ISZ     SDKP
4624    6134  5730                JMP I   SDKP                    /EXIT
4625                      /
4626                      /SUBROUTINE TO ISSUE "DCLR" CLEAR IOT
4627                      /
4628    6135  0000        CLDR,   0
4629    6136  6742        IOT2,   DCLR                            /DCLR "CLEAR IOT"
4630    6137  5735                JMP I   CLDR                    /EXIT
4631    6140  4406                CLASIC                          /CHECK FOR CLASSIC.
4632    6141  4436                C8ERR                           /ROUTINE TO EXECUTE.
4633    6142  7402        ERHLT2, HLT                             /SKIP TRAP ERROR
4634    6143  5340                JMP     .-3                     /NON-RECOVERABLE ERROR.
4635
4636                      /
4637                      /SUBROUTINE TO ISSUE "DMAN" MAINTENANCE IOT
4638                      /
4639    6144  0000        LDMN,   0000
4640    6145  6747        IOT7,   DMAN                            /"DMAN" MAINTENANCE IOT
4641    6146  5744                JMP I   LDMN                    /EXIT
4642    6147  4406                CLASIC                          /CHECK FOR CLASSIC.
4643    6150  4436                C8ERR                           /ROUTINE TO EXECUTE.
4644    6151  7402        ERHLT7, HLT                             /SKIP TRAP ERROR.
4645    6152  5347                JMP     .-3                     /NON-RECOVERABLE ERROR.
4646          6200        PAGE
4647                      /
4648                      /SUBROUTINE TO SHIFT, THEN READ DISK
4649                      /ADDRESS INTO DATA BUFFER, 12 SHIFTS
4650                      /
4651    6200  0000        RDAD,   0
4652    6201  4445                ENMAN2                          /ENTER MAINTENANCE MODE + DB4=1
4653    6202  1134                TAD     M5
4654    6203  3155                DCA     SBCNT1                  /SETUP COUNTER
4655    6204  1103                TAD     K1000                   /ENABLE SHIFT CRC
4656    6205  1100                TAD     K0200                   /ENABLE SHIFT SURFACE AND SECTOR
4657    6206  4455                LDMAN                           /LOAD MAINTENANCE
4658    6207  2155                ISZ     SBCNT1                  /FOUR SHIFTS
4659    6210  5206                JMP     .-2                     /MORE TO GO
4660    6211  7300                CLA CLL
4661    6212  1135                TAD     M7
4662    6213  3155                DCA     SBCNT1
4663    6214  1103                TAD     K1000                   /SHIFT CRC
4664    6215  4455                LDMAN                           /LOAD MAINTENANCE IOT
4665    6216  2155                ISZ     SBCNT1
4666    6217  5215                JMP     .-2                     /SHIFT 12 BITS
4667    6220  7300                CLA CLL
4668    6221  1074                TAD     K0020
4669    6222  4455                LDMAN                           /READ DATA BUFFER
4670    6223  3171                DCA     DAREG                   /SAVE RESULTS
4671
4672
4673    6224  1171                TAD     DAREG
4674    6225  5600                JMP I   RDAD                    /EXIT
4675                      /
```

```
4676                      /SUBROUTINE TO READ DATA BUFFER TO AC
4677                      /
4678    6226  0000        RDBF,   0
4679    6227  7330                CLA CLL CML RAR
4680    6230  4455                LDMAN                           /ENTER MAINTENANCE MODE
4681    6231  1074                TAD     K0020
4682    6232  4455                LDMAN                           /LOAD MAINTENANCE
4683    6233  3167                DCA     DBREG
4684    6234  1167                TAD     DBREG
4685    6235  3173                DCA     DTREG
4686    6236  1173                TAD     DTREG
4687    6237  5626                JMP I   RDBF                    /EXIT
4688                      /
4689                      /SUBROUTINE TO SHIFT COMMAND    REGISTER TO
4690                      /DATA BUFFER THEN READ DATA BUFFER
4691                      /
4692    6240  0000        RDCM,   0
4693    6241  4445                ENMAN2                          /ENTER MAINTENANCE MODE + DB4=1
4694    6242  1136                TAD     M12
4695    6243  3155                DCA     SBCNT1                  /12 BIT SHIFT
4696    6244  1102                TAD     K0400                   /ENABLE BIT FOR SHIFT COMMAND
4697    6245  4455                LDMAN                           /LOAD AND GO
4698    6246  2155                ISZ     SBCNT1
4699    6247  5245                JMP     .-2                     /SHIFT 12
4700    6250  7300                CLA CLL
4701    6251  1074                TAD     K0020                   /ENABLE READ BUFFER
4702    6252  4455                LDMAN                           /LOAD AND GO
4703    6253  3170                DCA     CMREG                   /SAVE IT
4704    6254  1170                TAD     CMREG
4705    6255  5640                JMP I   RDCM                    /EXIT
4706                      /
4707                      /ROUTINE TO ENTER MAINTENANCE MODE
4708                      /
4709    6256  0000        MAIN1,  0
4710    6257  7330                CLA CLL CML RAR                 /ENABLE MAINTENANCE BIT
4711    6260  4455                LDMAN                           /ENTER MAINTENANCE MODE
4712    6261  7300                CLA CLL
4713    6262  5656                JMP I   MAIN1
4714                      /
4715                      /
4716                      /
4717                      /
4718                      /SUBROUTINE TO SHIFT CRC REGISTER TO DATA
4719                      /BUFFER THEN READ IT.
4720                      /
4721    6263  0000        RDCR,   0
4722    6264  4445                ENMAN2                          /ENTER MAINTENANCE MODE + DB4=1
4723    6265  1136                TAD     M12
4724    6266  3155                DCA     SBCNT1                  /12 SHIFTER
4725    6267  1103                TAD     K1000                   /ENABLE SHIFT CRC
4726    6270  4455                LDMAN                           /LOAD AND GO
4727    6271  2155                ISZ     SBCNT1
4728    6272  5270                JMP     .-2                     /12 BIT SHIFT
4729    6273  7300                CLA CLL
4730    6274  1074                TAD     K0020                   /ENABLE READ BUFFER
```

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4731      6275   4455              LDMAN
4732      6276   3165              DCA      CRREG2                    /SAVE IT
4733      6277   4445              ENMAN2                             /ENTER MAINTENANCE MODE + DB4=1
4734      6300   1136              TAD      M12
4735      6301   3155              DCA      SBCNT1                    /12 BIT SHIFTER
4736      6302   1103              TAD      K1000                     /ENABLE SHIFT CRC
4737      6303   4455              LDMAN                              /LOAD AND GO
4738      6304   2155              ISZ      SBCNT1
4739      6305   5303              JMP      .-2                       /12 BIT SHIFT
4740
4741      6306   7300              CLA CLL
4742      6307   1074              TAD      K0020                     /ENABLE READ BUFFER
4743      6310   4455              LDMAN
4744      6311   0145              AND      K0017
4745      6312   3164              DCA      CRREG1                    /SAVE OTHER HALF
4746      6313   5663              JMP I    RDCR                      /EXIT
4747                      /
4748                      /
4749                      /SUBROUTINE TO PRINT TWO OCTAL
4750                      /
4751      6314   0000     TOCT,    0
4752      6315   3155              DCA      SBCNT1                    /SAVE AC
4753      6316   1155              TAD      SBCNT1
4754      6317   7010              RAR
4755      6320   7012              RTR
4756      6321   0072              AND      K0007
4757      6322   1063              TAD      K0260
4758      6323   4434              TYPE                               /PRINT FIRST BYTE
4759      6324   1155              TAD      SBCNT1
4760      6325   0072              AND      K0007
4761      6326   1063              TAD      K0260
4762      6327   4434              TYPE                               /PRINT SECOND BIT
4763      6330   5714              JMP I    TOCT                      /EXIT
4764                      /
4765                      /
4766                      /
4767                      /ROUTINE TO DO CRLF
4768                      /
4769      6331   0000     UPONE,   0
4770      6332   7300              CLA CLL
4771      6333   1146              TAD      K0215
4772      6334   4434              TYPE
4773      6335   1147              TAD      K0212
4774      6336   4434              TYPE
4775      6337   4434              TYPE                               /TYPE ONE NULL
4776      6340   5731              JMP I    UPONE
4777             6400     PAGE
4778                      /
4779                      /ROUTINE TO PRINT FOUR OCTAL
4780                      /
4781      6400   0000     FROCT,   0
4782      6401   7006              RTL
4783      6402   7006              RTL
4784      6403   3777'             DCA      UPONE
4785      6404   1130              TAD      K7774
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4786      6405   3776'             DCA      TOCT
4787      6406   1777'             TAD      UPONE
4788      6407   0072              AND      K0007
4789      6410   1063              TAD      K0260
4790      6411   4434              TYPE
4791      6412   1777'             TAD      UPONE
4792      6413   7006              RTL
4793      6414   7004              RAL
4794      6415   3777'             DCA      UPONE
4795      6416   2776'             ISZ      TOCT
4796      6417   5206              JMP      .-11
4797      6420   1261              TAD      K0240
4798      6421   4434              TYPE
4799      6422   5600              JMP I    FROCT
4800                      /
4801                      /SUBROUTINE TO PRINT TEXT
4802                      /
4803      6423   0000     PRN,     0
4804      6424   7300              CLA CLL
4805      6425   1623              TAD I    PRN                       /GET POINTER
4806
4807      6426   2223              ISZ      PRN
4808      6427   3200              DCA      FROCT
4809      6430   1600              TAD I    FROCT
4810      6431   0112              AND      K7700
4811      6432   7450              SNA
4812      6433   5257              JMP      EXIT
4813      6434   7500              SMA
4814      6435   7020              CML
4815      6436   7001              IAC
4816      6437   7012              RTR
4817      6440   7012              RTR
4818      6441   7012              RTR
4819      6442   4434              TYPE
4820      6443   1600              TAD I    FROCT
4821      6444   0115              AND      K0077
4822      6445   7450              SNA
4823      6446   5257              JMP      EXIT
4824      6447   1262              TAD      K3740
4825      6450   7500              SMA
4826      6451   1124              TAD      K4100
4827      6452   1261              TAD      K0240
4828      6453   4434              TYPE
4829      6454   2200              ISZ      FROCT
4830      6455   7300              CLA CLL
4831      6456   5230              JMP      PRN+5
4832      6457   7300     EXIT,    CLA CLL
4833      6460   5623              JMP I    PRN
4834                      /
4835      6461   0240     K0240,   0240
4836      6462   3740     K3740,   3740
4837                      /
4838                      /ROUTINE TO TYPE
4839                      /
4840      6463   0000     PRINT,   0
```

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4841   6464   4406            CLASIC                     /CHECK FOR CLASSIC.
4842   6465   4435            C8TYPE                     /ROUTINE TO EXECUTE.
4843   6466   7410            SKP
4844   6467   5663            JMP I     PRINT            /INHIBIT TYPE.
4845   6470   6046            TLS
4846   6471   6041            TSF
4847   6472   5271            JMP       .-1
4848   6473   6042            TCF
4849   6474   7200            CLA
4850   6475   5663            JMP I     PRINT
4851                  /
4852                  /ROUTINE TO GET ALL REGISTERS AFTER "ERHLT9"
4853                  /
4854   6476   0000   DUMP,    0
4855   6477   4404            LAS
4856   6500   0102            AND       K0400            /MASK SWITCH 3
4857   6501   7650            SNA CLA                    /WAS IT GET ALL
4858   6502   5676            JMP I     DUMP             /NO
4859   6503   4442            RDSTAT                     /GET STATUS
4860   6504   4456            RDBUF                      /READ BUFFER
4861   6505   7300            CLA CLL
4862   6506   1136            TAD       M12
4863   6507   3263            DCA       PRINT            /12 BIT COUNTER
4864   6510   1100            TAD       K0200            /ENABLE SHIFT SECTOR AND SURFACE
4865   6511   4455            LDMAN                      /LOAD MAINTENANCE
4866   6512   2263            ISZ       PRINT            /12 BIT SHIFT
4867   6513   5311            JMP       .-2
4868   6514   7300            CLA CLL
4869   6515   1074            TAD       K0020            /ENABLE READ BUFFER
4870   6516   4455            LDMAN                      /LOAD MAINTENANCE
4871   6517   3171            DCA       DAREG            /SAVE SURFACE AND SECTOR
4872   6520   4454            RDCRC                      /READ CRC
4873   6521   4443            RDCMD                      /READ COMMAND
4874   6522   4462            CRLF
4875   6523   1125            TAD       K7600
4876   6524   2276            ISZ       DUMP
4877   6525   5676            JMP I     DUMP             /REPORT
4878                  /
4879   6576   6314
4880   6577   6331
       6600            PAGE
4881                  /
4882                  /SUBROUTINE FOR "ERRORS," SCOPE LOOPS, AND
4883                  /ERROR TYPEOUTS.
4884                  /
4885   6600   0000   ERRO,    0
4886   6601   7300            CLA CLL
4887   6602   4425            AERRO                      /REPORT ERROR TO APT IF NEED BE.
4888   6603   1600            TAD I     ERRO             /GET SCOPE LOOP POINTER
4889   6604   3340            DCA       SERRO            /SAVE FOR RETURN
4890   6605   4404            LAS                        /GET SWR0
4891   6606   7700            SMA CLA                    /IS IT SCOPE LOOP
4892   6607   5217            JMP       .+10             /NO SCOPE
4893   6610   4404            LAS                        /GET SWITCH 2
4894   6611   7006            RTL
```

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4895   6612   7710            SPA CLA                    /INHIBIT ERROR BELL
4896   6613   5740            JMP I     SERRO            /YES
4897   6614   1101            TAD       K0207
4898   6615   4434            TYPE
4899   6616   5740            JMP I     SERRO            /NO
4900   6617   2200            ISZ       ERRO
4901   6620   4462            CRLF
4902   6621   4462            CRLF
4903   6622   1600            TAD I     ERRO             /GET TEXT POINTER
4904   6623   0145            AND       K0017            /MASK 8-11
4905   6624   1346            TAD       HEDTAD           /MAKE ERROR HEADER TAD
4906   6625   3226            DCA       .+1
4907   6626   7402            HLT                        /MODIFIED HEADER TAD
4908   6627   3231            DCA       .+2
4909   6630   4457            PRNTER                     /MODIFIED HEADER POINTER
4910   6631   7402            HLT
4911   6632   4462            CRLF
4912   6633   4457            PRNTER                     /PRINT PC:
4913   6634   7400            TEXPC
4914   6635   7340            CLA CLL CMA
4915   6636   1200            TAD       ERRO             /GET PC POINTER
4916   6637   4460            OCTEL                      /PRINT PC STORED
4917   6640   1600            TAD I     ERRO             /GET TEXT POINTER
4918   6641   7104            CLL RAL
4919   6642   7420            SNL
4920   6643   5257            JMP       NTGD             /NOT GD: REGISTER
4921
4922
4923   6644   3200            DCA       ERRO
4924   6645   4457            PRNTER                     /PRINT GD:
4925   6646   7402            TEXGD
4926   6647   1200            TAD       ERRO
4927   6650   7700            SMA CLA                    /WAS IT A 6 BIT OCTAL BYTE
4928   6651   5254            JMP       .+3              /NO
4929   6652   1162            TAD       GDREG1           /GET DATA
4930   6653   4461            TWOCT                      /PRINT TWO OCTAL
4931   6654   1163            TAD       GDREG2
4932   6655   4460            OCTEL                      /PRINT FOUR OCTAL
4933   6656   7610            SKP CLA
4934   6657   3200   NTGD,    DCA       ERRO
4935   6660   1200            TAD       ERRO             /GET TEXT POINTER
4936   6661   7104            CLL RAL
4937   6662   7420            SNL
4938   6663   5274            JMP       NTCRC
4939   6664   3200            DCA       ERRO
4940   6665   4457            PRNTER                     /PRINT CR:
4941   6666   7404            TEXCR
4942   6667   1164            TAD       CRREG1
4943   6670   4461            TWOCT                      /PRINT
4944   6671   1165            TAD       CRREG2
4945   6672   4460            OCTEL                      /PRINT FOUR OCTAL
4946   6673   7610            SKP CLA
4947   6674   3200   NTCRC,   DCA       ERRO
4948   6675   1342            TAD       XTEXT
4949   6676   3345            DCA       PCNTR2
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4950    6677  1343              TAD     XREG
4951    6700  3010              DCA     AUTO10
4952    6701  1131              TAD     K7771
4953    6702  3344              DCA     PCNTR1                          /COUNTER FOR    # OF HEADS
4954    6703  1200    STRAUT,   TAD     ERRO                            /GET TEXT POINTER
4955    6704  7500              SMA
4956    6705  5332              JMP     NOTEX                           /NOT THIS ONE
4957    6706  7104              CLL RAL
4958    6707  3200              DCA     ERRO
4959    6710  1345              TAD     PCNTR2                          /GET TEXT MESSAGE POINTER
4960    6711  2345              ISZ     PCNTR2
4961    6712  2345              ISZ     PCNTR2
4962    6713  3315              DCA     .+2                             /STORE FOR PRNTER
4963    6714  4457              PRNTER                                  /PRINT XX:
4964    6715  7402              HLT                                     /MODIFIED TEXT POINTER
4965    6716  1410              TAD I   AUTO10
4966    6717  4460              OCTEL                                   /PRINT FOUR OCTAL
4967    6720  2344    BAKPNT,   ISZ     PCNTR1
4968    6721  5303              JMP     STRAUT                          /CHECK FOR NEXT XX:
4969    6722  1007              TAD     SAVEND                          /GET CONSTANT SAVED
4970    6723  3532              DCA I   K7777                           /REPLACE LAST LOCATION
4971    6724  4406              CLASIC                                  /CHECK FOR CLASSIC.
4972    6725  4436              C8ERR                                   /ROUTINE TO EXECUTE!!!!
4973    6726  7402    ERHLT9,   HLT                                     /ALL RECOVERABLE ERROR HALTS
4974    6727  4741              JMS I   XDUMP                           /CHECK FOR GET ALL REGISTERS
4975    6730  5740              JMP I   SERRO                           /TRY SAME TEST AGAIN
4976    6731  5257              JMP     NTGD                            /GET ALL REGISTERS
4977    6732  7104    NOTEX,    CLL RAL
4978    6733  3200              DCA     ERRO
4979    6734  2345              ISZ     PCNTR2
4980    6735  2345              ISZ     PCNTR2
4981    6736  2010              ISZ     AUTO10
4982    6737  5320              JMP     BAKPNT
4983                            /
4984    6740  0000    SERRO,    0
4985    6741  6476    XDUMP,    DUMP
4986    6742  7426    XTEXT,    TEXST
4987    6743  0165    XREG,     CPREG2
4988    6744  0000    PCNTR1,   0
4989    6745  0000    PCNTR2,   0
4990    6746  1347    HEDTAD,   TAD     HEDLST
4991    6747  7424    HEDLST,   ERTX1
4992    6750  7437              ERTX2
4993    6751  7453              ERTX3
4994    6752  7471              ERTX4
4995    6753  7502              ERTX5
4996    6754  7514              ERTX6
4997    6755  7526              ERTX7
4998    6756  7536              ERTX8
4999    6757  7551              ERTX9
5000                            /
5001                            /
5002                            /ROUTINE TO ENTER MAINTENANCE MODE AND
5003                            /SET DB4=1 TO ENABLE SHIFT TO LOWER SILO
5004                            /
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5005    6760  0000    MAIN2,    0
5006    6761  7330              CLA CLL CML RAR                         /ENABLE SET MAINTENANCE MODE
5007    6762  4455              LDMAN                                   /LOAD MAINTENANCE
5008    6763  7010              RAR                                     /ENABLE SET DB4=1
5009    6764  4455              LDMAN                                   /LOAD MAINTENANCE
5010    6765  7300              CLA CLL
5011    6766  5760              JMP I   MAIN2
5012          7000    PAGE
5013                            /
5014                            /SUBROUTINE FOR "NO ERRORS" AND SCOPE
5015                            /LOOPS. UPDATE UP COUNTER "REG1" AND
5016                            /DOWN COUNT "REG2" ON EVERY ENTRY.
5017                            /
5018    7000  0000    NERRO,    0
5019    7001  4406              CLASIC                                  /CHECK FOR CLASSIC.
5020    7002  4440              C8CKPA                                  /ROUTINE TO EXECUTE.
5021    7003  7000              NOP
5022    7004  4404              LAS                                     /GET SWITCH 4
5023    7005  0100              AND     K0200                           /MASK
5024    7006  7650              SNA CLA                                 /WAS IT SET
5025    7007  5215              JMP     STPHLT +1                       /NO DON'T HALT
5026    7010  1007              TAD     SAVEND                          /GET BINARY END
5027    7011  3532              DCA I   K7777                           /REPLACE IT
5028    7012  4406              CLASIC                                  /CHECK FOR CLASSIC.
5029    7013  4437              CRINQU                                  /WAIT FOR OPERATOR.
5030    7014  7402    STPHLT,   HLT                                     /STOP PROGRAM HALT
5031    7015  2200              ISZ     NERRO                           /UPDATE PC STORE
5032    7016  1600              TAD I   NERRO                           /GET SCOPE LOOP POINTER
5033    7017  3237              DCA     SNERRO                          /STORE FOR RETURN
5034    7020  4404              LAS                                     /GET SWITCH 0
5035    7021  7710              SPA CLA                                 /ENTER SCOPE LOOP
5036    7022  5637              JMP I   SNERRO                          /YES
5037    7023  2153              ISZ     REG1                            /UPDATE UPCOUNTER
5038    7024  7610              SKP CLA
5039    7025  5233              JMP     NEXTST                          /END OF PARTICULAR TEST
5040    7026  1153              TAD     REG1
5041    7027  7140              CLL CMA
5042    7030  3154              DCA     REG2                            /SETUP DOWN COUNTER
5043    7031  4424    NEXT,     TICK                                   /REPLACED WITH TIMING IF ON APT
5044    7032  5637              JMP I   SNERRO                          /BACK TO SAME TEST
5045    7033  2200    NEXTST,   ISZ     NERRO                           /UPDATE       PC STORE
5046    7034  2200              ISZ     NERRO                           /UPDATE PC STORE
5047    7035  5620              JMP I   NERRO                           /TO NEXT SEQUENTIAL TEST
5048                            /
5049    7036  0000    TOTST,    0
5050    7037  0000    SNERRO,   0
5051                            /
5052                            /SUBROUTINE TO SETUP FIELD 0
5053                            /
5054    7040  0000    SETUP,    0
5055    7041  1433              TAD I   THSFLD                          /GET HOME OF
5056    7042  3752              DCA     BAKFLD
5057    7043  1151              TAD     KRMF                            /GET RMF FOR INT. RETURN
5058    7044  6201              CDF     0                               /SWITCH FIELD 0
5059    7045  3465              DCA I   K0001
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5060    7046  1254          TAD     K5403       /JMP I 3 FOR LOC. 2
5061    7047  3466          DCA I   K0002
5062    7050  1031          TAD     INTRQ       /GET ADDRESS RETURN
5063    7051  3467          DCA I   K0003
5064    7052  7402  BAKFLD, HLT                 /HOME DF
5065    7053  5640          JMP I   SETUP
5066                /
5067    7054  5403  K5403,  5403
5068                /
5069                /ROUTINE TO LOAD UPPER BUFFER
5070                /
5071    7055  0000  UPPER,  0
5072    7056  3236          DCA     TOTST       /SAVE DATA
5073    7057  7301          CLA CLL IAC
5074    7060  3237          DCA     SNERRO      /SETUP SHIFTER MASKER
5075    7061  1136          TAD     M12
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5076    7062  3200          DCA     NERRO       /SETUP COUNTER
5077    7063  4444          ENMAN1              /ENTER MAINTENANCE MODE
5078    7064  1236  UPPR1,  TAD     TOTST       /GET DATA
5079    7065  0237          AND     SNERRO      /MASK
5080    7066  7640          SZA CLA             /A ONE OR ZERO????
5081    7067  1066          TAD     K0002       /A ONE!!!!
5082    7070  1077          TAD     K0100       /ENABLE SHIFT
5083    7071  4455          LDMAN               /LOAD MAINTENANCE
5084    7072  7300          CLA CLL
5085    7073  1237          TAD     SNERRO
5086    7074  7104          CLL RAL
5087    7075  3237          DCA     SNERRO
5088    7076  2200          ISZ     NERRO       /COUNT BITS
5089    7077  5264          JMP     UPPR1       /MORE TO GO
5090    7100  5655          JMP I   UPPER       /UPPER BUFFER LOADED
5091                /
5092                /ROUTINE TO CHANGE PROGRAM DEVICE CODES
5093                /
5094    7101  4406  CHANG,  CLASIC              /CHECK FOR CLASSIC.
5095    7102  4431          CBSWIT              /ROUTINE TO EXECUTE.
5096    7103  7000          NOP
5097    7104  4404          LAS
5098    7105  0332          AND     A0770
5099    7106  3236          DCA     TOTST       /SAVE DESIRED
5100    7107  1334          TAD     CHNPOT
5101    7110  3255          DCA     UPPER
5102    7111  1333          TAD     CCNTR1
5103    7112  3237          DCA     SNERRO      /A FEW POINTERS
5104    7113  1655  CHANGR, TAD I   UPPER       /GET ADDRESS POINTER
5105    7114  3240          DCA     SETUP       /SAVE IT
5106    7115  1640          TAD I   SETUP       /GET OLD IOT CODE
5107    7116  0331          AND     A7007
5108    7117  1236          TAD     TOTST       /ADD IN DESIRED
5109    7120  3640          DCA I   SETUP       /CHANGE CODE
5110    7121  2255          ISZ     UPPER       /UPDATE POINTER
5111    7122  2237          ISZ     SNERRO      /UPDATE CHANGE COUNTER
5112    7123  5313          JMP     CHANGR
5113    7124  4406          CLASIC              /CHECK FOR CLASSIC.
5114    7125  4436          CBERR               /ROUTINE TO EXECUTE.
5115    7126  7402  CHNHLT, HLT                 /DEVICE CODES CHANGED. PRESS
5116    7127  5730          JMP I   XBGN        /CONTINUE OR IF ON CONSOLE
5117                                            /PACKAGE HIT CONTROL F.
5118                /
5119    7130  0200  XBGN,   BGN
5120                /
5121    7131  7007  A7007,  7007
5122    7132  0770  A0770,  0770
5123    7133  7771  CCNTR1, 7771
5124    7134  7135  CHNPOT, CHNPOT +1
5125    7135  6131          IOT1
5126    7136  6136          IOT2
5127    7137  6111          IOT3
5128    7140  6100          IOT4
5129    7141  6064          IOT5
5130    7142  6122          IOT6
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5131    7143  6145            IOT7
5132
5133          7200            PAGE
5134                 /THIS ROUTINE TEST FOR BEING ON THE APT OR ACT SYSTEMS.
5135                 /IF ON APT CONSOLE PACKAGE AND SWITCH REGISTER FUNCTIONS
5136                 /ARE NOP'S.
5137
5138                 /
5139    7200  0000   APT8,   0
5140    7201  1022            TAD  22                  /HARWARE CONFIGURATION
5141    7202  0106            AND      K4000
5142    7203  7650            SNA CLA                  /SKIP IF ON ACT OR APT
5143    7204  5600            JMP I    APT8            /RETURN TO MAIN PROGRAM
5144    7205  1022            TAD      22
5145    7206  0264            AND      K7377           /MAKE SURE CONSOLE DISABLED
5146    7207  3022            DCA 22
5147    7210  1107            TAD      K7000
5148    7211  3663            DCA I    XMYLAS           /NOP SWITCH REGISTER FUNCTIONS
5149    7212  1200            TAD      APT8
5150    7213  1070            TAD      K0004
5151    7214  3200            DCA      APT8
5152    7215  1021            TAD      21               /GET MEMORY SIZE
5153    7216  7012            RTR                       /SET UP MEMORY SIZE
5154    7217  5600            JMP I APT8               /NOW ON APT.  RETURN IS PLUS 4.
5155                 /
5156                 /THIS ROUTINE WILL GENERATE THE TIMING REQUIRED BY
5157                 /APT OR ACT.
5158                 /
5159    7220  0000   KTICK,  0
5160    7221  1022            TAD      22
5161    7222  0106            AND      K4000           /SEE IF ON APT
5162    7223  7650            SNA CLA
5163    7224  5620            JMP I    KTICK           /NOT ON APT
5164    7225  2266            ISZ CLKCNT               /INCREMENT COUNTER
5165    7226  5620            JMP I KTICK              /NO
5166    7227  6002            IOF                      /DISABLE INTERUPTS
5167    7230  6214            RDF                      /GET PRESENT DATA FIELD
5168    7231  1150            TAD KCDF
5169    7232  3233            DCA .+1                  /ESTABLISHES CURRENT DATA FIELD
5170    7233  7402            HLT                      /REPLACED WITH CURRENT DATA FIELD
5171    7234  6272            CIF 70                   /FIELD 7. LOCATION OF UV PROM
5172    7235  4777            JMS I (6500
5173    7236  1376            TAD (-2777               /ABOUT 1.5 SEC ON MOST TESTS
5174    7237  3266            DCA CLKCNT
5175    7240  5620            JMP I KTICK
5176                 /
5177                 /THIS ROUTINE WILL NOTIFY APT OF AN ERROR AND SEND PC TO
5178                 /APT SYSTEM
5179                 /
5180    7241  0000   WAERRO, 0
5181    7242  1022            TAD      22
5182    7243  0106            AND      K4000           /SEE IF ON APT
5183    7244  7650            SNA CLA
5184    7245  5641            JMP I    WAERRO          /NO
5185    7246  6002            IOF                      /DISABLE INTERUPTS
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5186    7247  7200            CLA
5187    7250  1775            TAD I (ERRO              /GET PC
5188    7251  3265            DCA SAVPC
5189    7252  6214            RDF                      /GET CURRENT DATA FIELD
5190    7253  1774            TAD I (KCDF
5191    7254  3256            DCA .+2
5192    7255  1265            TAD SAVPC
5193    7256  7402            HLT                      /REPLACED WILL CURRENT DATA FIELD
5194    7257  6272            CIF      70              /FIELD OF UVPROM
5195    7260  5773            JMP I (6520              /NOTIFIES APT OF ERROR
5196    7261  7200            CLA
5197    7262  5641            JMP I WAERRO
5198                 /
5199    7263  5767   XMYLAS, MYLAS+3
5200    7264  7377   K7377,  7377
5201    7265  0000   SAVPC,  0
5202    7266  5001   CLKCNT, -2777
5203    7373  6520
5204    7374  0150
5205    7375  6600
5206    7376  5001
5207    7377  6500
              7400            PAGE
5208    7400  2003   TEXPC,  TEXT     "PC:"
        7401  7200
5209    7402  0704   TEXGD,  TEXT     "GD:"
        7403  7200
5210    7404  0322   TEXCR,  TEXT     "CR:"
        7405  7200
5211    7406  2324   TEXST,  TEXT     "ST:"
        7407  7200
5212    7410  0402   TEXDB,  TEXT     "DB:"
        7411  7200
5213    7412  0315   TEXCM,  TEXT     "CM:"
        7413  7200
5214    7414  0401   TEXDA,  TEXT     "DA:"
        7415  7200
5215    7416  0104   TEXAD,  TEXT     "AD:"
        7417  7200
5216    7420  0424   TEXDT,  TEXT     "DT:"
        7421  7200
5217    7422  0103   TEXAC,  TEXT     "AC:"
        7423  7200
5218                 /
5219    7424  2324   ERTX1,  TEXT     "STATUS REGISTER ERROR"
        7425  0124
        7426  2523
        7427  4022
        7430  0507
        7431  1123
        7432  2405
        7433  2240
        7434  0522
        7435  2217
        7436  2200
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5220    7437    0317    ERTX2,    TEXT    "COMMAND REGISTER ERROR"
        7440    1515
        7441    0116
        7442    0440
        7443    2205
        7444    0711
        7445    2324
        7446    0522
        7447    4005
        7450    2222
        7451    1722
        7452    0000
5221    7453    0411    ERTX3,    TEXT    "DISK ADDRESS REGISTER ERROR"
        7454    2313
        7455    4001
        7456    0404
        7457    2205
        7460    2323
        7461    4022
        7462    0507
        7463    1123
        7464    2405
        7465    2240
        7466    0522
        7467    2217
        7470    2200
5222    7471    0401    ERTX4,    TEXT    "DATA BREAK ERROR"
        7472    2401
        7473    4002
        7474    2205
        7475    0113
        7476    4005
        7477    2222
        7500    1722
        7501    0000
5223    7502    0322    ERTX5,    TEXT    "CRC REGISTER ERROR"
        7503    0340
        7504    2205
        7505    0711
        7506    2324
        7507    0522
        7510    4005
        7511    2222
        7512    1722
        7513    0000
5224    7514    0401    ERTX6,    TEXT    "DATA REGISTER ERROR"
        7515    2401
        7516    4022
        7517    0507
        7520    1123
        7521    2405
        7522    2240
        7523    0522
        7524    2217
        7525    2200
```

```
5225    7526    0411    ERTX7,    TEXT    "DISK SKIP ERROR"
        7527    2313
        7530    4023
        7531    1311
        7532    2040
        7533    0522
        7534    2217
        7535    2200
5226    7536    0411    ERTX8,    TEXT    "DISK INTERRUPT ERROR"
        7537    2313
        7540    4011
        7541    1624
        7542    0522
        7543    2225
        7544    2024
        7545    4005
        7546    2222
        7547    1722
        7550    0000
5227    7551    0103    ERTX9,    TEXT    "AC REGISTER ERROR"
        7552    4022
        7553    0507
        7554    1123
        7555    2405
        7556    2240
        7557    0522
        7560    2217
        7561    2200
5228                    /
5229    7562    2213    TEXEND,   TEXT    "RK8E DISKLESS PASS COMPLETE"
        7563    7005
        7564    4004
        7565    1123
        7566    1314
        7567    0523
        7570    2340
        7571    2001
        7572    2323
        7573    4003
        7574    1715
        7575    2014
        7576    0524
        7577    0500
5230                    /
5231                            $$$
```

```
0000  11111111  10000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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  11111111  11111111  11111111  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


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

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11100000  00000000

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  10000000  00000000

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  10000000  00000000  00000000

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11000000  00000000  00000000  00000000  00000000  00000000

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111000  00000000  00000000  00000000

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  11111111  11111111  11111111
```

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

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000000

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111000  00000000  00000000

5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000000

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

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11011111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11100000  00000000  00000000

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  10000000  00000000  00000000  00000000

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111100  00000000  00000000  00000000  00000000  00000011

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000


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

7200  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000
7300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00011111

7400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

7600
7700
```

A0770	7132	CRTTYI	4426	ENMAN2	4445	IOT4	6100
A7007	7131	C8TYPE	4435	ERHLT1	6031	IOT5	6064
ACCMP1	4440	CAF	6007	ERHLT2	6142	IOT6	6122
ACCMP2	4461	CCNTR1	7133	ERHLT3	6115	IOT7	6145
ACL	7701	CHANG	7101	ERHLT4	6104	IOTCHN	5426
ACREG	0174	CHANGR	7113	ERHLT5	6070	K0000	0064
ACSAVE	1345	CHKCLA	1200	ERHLT6	6126	K0001	0065
ADREG	0172	CHNHLT	7126	ERHLT7	6151	K0002	0066
AERRO	4425	CHNPOT	7134	ERHLT9	6726	K0003	0067
APT8	7200	CKCOUT	0232	ERR1	0736	K0004	0070
APT8A	4423	CLASIC	4406	ERRMES	1320	K0006	0071
AUTO10	0010	CLASIK	5732	ERRO	6600	K0007	0072
BAKFLD	7052	CLDR	6135	ERROR	4436	K0010	0073
BAKPNT	6720	CLKCNT	7266	ERTX1	7424	K0017	0145
BGN	0200	CLRALL	4453	ERTX2	7437	K0020	0074
BYRETR	0506	CLRTRN	1315	ERTX3	7453	K0037	0075
C8BY1	0230	CMREG	0170	ERTX4	7471	K0040	0076
C8BY2	1300	CNTRLC	0551	ERTX5	7502	K0070	0114
C8BY3	1061	CNTRLD	0600	ERTX6	7514	K0077	0115
C8BY4	0515	CNTRLE	0545	ERTX7	7526	K0100	0077
C8BY5	1116	CNTRLL	0537	ERTX8	7536	K0177	0117
C8CHAR	1075	CNTRLQ	0500	ERTX9	7551	K0200	0100
C8CKP	1022	CNTRLR	0511	EXIT	6457	K0207	0101
C8CKPA	4440	CNTRLS	0521	EXITA	0440	K0212	0147
C8CK8W	4425	CNTVAL	0252	EXTFLD	5201	K0215	0146
C8CNTR	4427	COMP1	6033	F1OP1	0021	K0240	6461
C8CONT	1145	COMP2	6044	F1OP2	0022	K0260	0063
C8CRLF	4433	CONSOL	0000	F1SWR	0020	K0377	0116
C8DO1	0310	CRERR	6060	FILCNT	1040	K0400	0102
C8DO10	1262	CRLF	4462	FILLER	1037	K1000	0103
C8DO11	0607	CRREG1	0164	FLDMAX	0176	K2000	0104
C8DO2	1033	CRREG2	0165	FLSAVE	1347	K2525	0120
C8DO3	0350	DAREG	0171	FROCT	6400	K3737	0122
C8DO4	1006	DBREG	0167	GDREG1	0162	K3740	6462
C8DO7	0527	DCLR	6742	GDREG2	0163	K3777	0105
C8ECHO	4434	DLAG	6743	GETCH1	0703	K4000	0106
C8ERP	4436	DLCA	6744	GETDAT	0456	K4100	0124
C8GET	0624	DLDC	6746	GOITA	0443	K5000	0126
C8HANG	1122	DMAN	6747	GOTOA	0454	K5252	0121
C8INQU	4437	DOCNT	0247	GTF	6004	K5403	7054
C8OCTA	4432	DONEA	0426	HEDLST	6747	K5777	0127
C8PASS	4424	DOPACK	0212	HEDTAD	6746	K7000	0107
C8PAUS	4441	DOSET	0251	HOMEMA	0175	K7377	7264
C8PRNT	4430	DRST	6745	INDEXA	0455	K7600	0125
C8RDPS	0666	DSKP	6741	INMODE	1076	K7700	0112
C8RETD	0614	DSKSKP	4447	INTADD	6011	K7717	0123
C8REIR	0536	DTREG	0173	INTRQ	0031	K7740	0113
C8SETD	0613	DUMP	6476	IONWAT	4437	K7771	0131
C8SETS	0535	ENDHLT	5716	IONWT	6000	K7774	0130
C8SWIT	4431	ENDIT	0742	IOT1	6131	K7775	0111
C8SWST	0745	ENDTST	5670	IOT2	6136	K7776	0110
C8TMP1	1021	ENMAN1	4444	IOT3	6111	K7777	0132

KCDF	0150	NTCLAS	1270	SETUP2	0225	T71E	3041
KRMF	0151	NTCRC	6674	SNERRO	7037	T72E	3115
KTICK	7220	NTGD	6657	STCON	0177	T72R	3060
LAS	4484	OCTEL	4460	STPHLT	7014	T73E	3266
LDAD	6106	OP1	0021	STRAUT	6703	T73R1	3204
LDADD	4452	OP2	0022	STREG	0166	T73R2	3210
LDBUF	4427	PASCNT	0250	SWR	0020	T73R3	3233
LDCA	6075	PCLF	6662	T101D	5256	T74E	3340
LDCM	6117	PCNTR1	6744	T101E	5257	T74R1	3302
LDCMD	4450	PCNTR2	6745	T101R	5223	T74R1A	3303
LDCUR	4451	PCOUNT	5771	T102D	5334	T74R2	3305
LDMAN	4455	PCSAVE	1344	T102E	5335	T74R3	3322
LDMN	6144	PNTBUF	1120	T102R	5301	T75E	3434
M12	0136	PRINT	6463	T103D	5452	T75R	3411
M128	0141	PRN	6423	T103E	5453	T76E	3475
M16	0137	PRNTER	4457	T103R	5416	T76R	3452
M191	0142	PPSFLD	0210	T104D	5531	T77E	3525
M255	0143	PSIE	6665	T104E	5532	T78E	3556
M300	0144	PSKE	6663	T104R	5475	T79E	3607
M4	0133	PSKF	6661	T105D	5664	T80E	3641
M48	0140	PSTB	6664	T105E	5665	T81E	3672
M5	0134	PTSTOR	0336	T105R	5610	T82E	3724
M7	0135	RDAD	6200	T37R	1355	T83E	3771
MAIN1	6256	RDADD	4446	T38R	1412	T84E	4033
MAIN2	6760	RDBF	6226	T39R	1444	T85E	4106
MANTST	6030	RDBUF	4456	T40R	1501	T850K	4105
MANUAL	5430	RDCM	6240	T45E	1647	T85R1	4046
MANUL	5723	RDCMD	4443	T45R1	1623	T86E	4276
MESA	0747	RDCR	6263	T45R3	1636	T86R1	4204
MESAC	1333	RDCRC	4454	T46A1	1660	T86R2	4214
MESFL	1341	RDST	6063	T46A2	1703	T86R3	4236
MESHAN	1146	RDSTAT	4442	T46E	1716	T86R4	4260
MESMQ	1336	REALPC	1316	T47E	1742	T87E	4374
MESPAS	0253	REDOA	0415	T48E	1767	T87R1	4307
MESPC	1330	REG1	0153	T49E	2032	T87R2	4320
MQA	7501	REG2	0154	T50E	2074	T87R3	4340
MQL	7421	POUINS	1302	T51E	2114	T87R4	4356
MQSAVE	1346	ROUTMP	5762	T53E	2156	T92E	4641
MTS85	0152	RTFLD1	5645	T54E	2225	T92R1	4612
MYAC	1317	RTFLD2	5234	T55E	2252	T92R2	4630
MYLAS	5764	RTFLD3	5312	T57E	2305	T94E	4717
NERRO	7000	RTFLD4	5430	T58E	2320	T95E	4750
NERROR	4435	RTFLD5	5507	T59E	2333	T97E	5026
NEXFL1	5655	SAVAC	5763	T60E	2354	T98E	5060
NEXFL2	5247	SAVEND	0007	T61E	2420	T99E	5126
NEXFL3	5325	SAVPC	7265	T62E	2444	T99R1	5071
NEXFL4	5443	SRCNT1	0155	T63E	2504	T99R2	5106
NEXFL5	5522	SDKP	6130	T64E	2544	TABLA	0461
NEXT	7031	SERRO	6740	T65E	2633	TABLB	0471
NEXTST	7033	SFT	4405	T66E	2715	TCNTR1	0156
NOSET	0242	SFTUP	7040	T69E	2750	TCNTR2	0157
NOTEX	6732	SETUP1	1233	T70E	2774	TCNTR3	0160

Symbol	Val	Symbol	Val	Symbol	Val	Symbol	Val
TCNTR4	0161	TST30	1142	TST78	3530	XCLAS	0006
TEXAC	7422	TST31	1162	TST79	3561	XCLDR	0053
TEXAD	7416	TST32	1203	TST8	0333	XCOMP1	0040
TEXCM	7412	TST33	1217	TST80	3612	XCOMP2	0041
TEXCR	7404	TST34	1233	TST81	3644	XCRLF	0062
TEXDA	7414	TST35	1263	TST82	3675	XDOLPT	1112
TEXDB	7410	TST36	1311	TST83	3727	XDOSW	0520
TEXDT	7420	TST37	1343	TST84	3774	XDUMP	6741
TEXEND	7562	TST38	1400	TST85	4036	XEND	0032
TEXGD	7402	TST39	1430	TST86	4200	XERRO	0036
TEXPC	7400	TST4	0266	TST87	4303	XFROCT	0060
TEXST	7406	TST40	1470	TST88	4377	XIONWT	0037
THSFLD	0033	TST41	1526	TST89	4426	XLAS	0004
TICK	4424	TST42	1545	TST9	0344	XLDAD	0052
TMPCNT	0746	TST43	1565	TST90	4457	XLDCA	0051
TOCT	6314	TST44	1601	TST91	4507	XLDCM	0050
TOFLD1	5621	TST45	1615	TST92	4600	XLDMN	0055
TOFLD2	5232	TST46	1652	TST93	4646	XMAIN1	0044
TOFLD3	5310	TST47	1722	TST94	4672	XMAIN2	0045
TOFLD4	5426	TST48	1746	TST95	4722	XMYLAS	7263
TOFLD5	5505	TST49	2000	TST97	5000	XNERRO	0035
TOTST	7036	TST5	0302	TST98	5031	XPRINT	0034
TST0	0236	TST50	2035	TST99	5063	XPRN	0057
TST1	0245	TST51	2077	TSTCHA	0715	XRDAD	0046
TST10	0353	TST52	2117	TSTLAS	5200	XRDBF	0056
TST100	5131	TST53	2134	TTYLPT	1121	XRDCM	0043
TST101	5205	TST54	2200	TWOCT	4461	XRDCR	0054
TST102	5262	TST55	2230	TYPE	4434	XRDST	0042
TST103	5400	TST56	2255	UPAROW	0615	XREG	6743
TST104	5456	TST57	2272	UPONE	6331	XSDKP	0047
TST105	5600	TST58	2310	UPPER	7055	XSET	0005
TST11	0375	TST59	2323	UPPR1	7064	XTABLA	0457
TST12	0420	TST6	0315	WAERRO	7241	XTABLB	0460
TST13	0434	TST60	2336	WATMES	0651	XTEXT	6742
TST14	0452	TST61	2400	XAERRO	0025	XTICK	0024
TST15	0464	TST62	2423	XAPT8A	0023	XTOCT	0061
TST16	0517	TST63	2447	XBGN	7130	XUPPER	0027
TST17	0547	TST64	2507	XC8CKP	1041		
TST18	0571	TST65	2600	XC8CNT	0400		
TST19	0614	TST66	2636	XC8CRL	1023		
TST2	0252	TST67	2657	XC8ECH	1063		
TST20	0626	TST68	2677	XC8ERR	1207		
TST21	0643	TST69	2720	XC8INQ	0635		
TST22	0657	TST7	0324	XC8OCT	1000		
TST23	0703	TST70	2753	XC8PAS	0200		
TST24	0730	TST71	2777	XC8PAU	0337		
TST25	0752	TST72	3044	XC8PNT	0303		
TST26	0777	TST73	3200	XC9PSW	0656		
TST27	1040	TST74	3271	XC8SW	0262		
TST28	1057	TST75	3400	XC8TTY	0272		
TST29	1107	TST76	3437	XC8TYP	1077		
TST3	0260	TST77	3500	XCHANG	0026		

ERRORS DETECTED: 0

LINKS GENERATED: 115

RUN-TIME: 11 SECONDS

3K CORE USED

```
A0770    5098    5122#
A7007    5107    5121#
ACCMP1   1082#   1289    1339    1353    1365    1376    1389    1400    1423    1447    1464    1482    1530    1559
         1584    1610    1627    1645    1662    1829    1858    1890    1909    1930    1946    1962    1990    2017
         2221    2742    2260    2277    2304    2350    2372    2398    2425    2436    2443    2457    2469    2481
         2568    2576    2592    2601    2618    2754    2764    2776    2790    2800    2812    2831    2841    2851
         2872    2892    2934    2942    2999    3006    3037    3047    3056    3104    3117    3150    3165    3275
         3307    3337    3369    3395    3401    3430    3436    3464    3480    3512    3519    3560    3601    3623
         3636    3677    3706    3740    3772    3801    3831    3871    3906    3934    3963    3997    4027
         4063    4108    4173    4226    4280    4334    4396
ACCMP2   1083#   1690    1718    1743    1770    1810    2048    2088    2127    2166    2200
ACL        55#
ACREG    1236#   4539    4540
ACSAVE    363     366     569     800     946     979    1030#
ADREG    1234#   3470    3515    3558    3736    3895    4101    4385    4392    4583    4584
AERRO    1071#   4887
APT8     1124    5139#   5143    5149    5151    5154
APT8A    1072#   1264
AUTO10   1116#   4951    4965    4981
BAKFLD   5056    5064#
BAKPNT   4967#   4982
BGN       453    1249#   5119
BYRETR    436     439#
C8BY1     146     148     161#     173
C8BY2     993     995    1005#
C8BY3     806     809     815#
C8BY4     450#    631
C8BY5     868     873#    881
C8CHAR    234     235     378     387     395     397     399     553     642     652     662     666     670     672
          839     841#
C8CKP     729     738     742#
C8CKPA     96#    5020
C8CKSW     74#    4493
C8CNTR     78#
C8CONT    886     898#
C8CRLF     86#
C8D01     266#    287
C8D010    969     990#
C8D011    534     538#
C8D02     765#    767
C8D03     313     319#
C8D04     730#    739
C8D07     462     466#
C8ECHO     88#
C8ERR      92#    4532    4573    4588    4601    4614    4632    4643    4972    5114
C8GET     141     156     437     440     468     483     492     540     562#    570     599     811     815     833
          962     990     996    1003    1005
C8HANG    871     879#    885     891     897
C8INQU    94#    4434    5029
C8OCTA     84#
C8PASS     72#    4423
C8PAUS     98#
C8PRNT     80#
```

```
C8RDPS    633#    678
C8RETD    536     541     544#
C8RETR    441     465     473#
C8SETD    532     537     539     543#
C8SETS    434     439     447     468     466     472#
C8SWIT     82#    1266    5095
C8SWST    450     491     499     629     632     680     682#
C8TMP1    727     730     734     737     741#
C8TTYI     76#
C8TYPE     90#    4842
CAF        56#    502
CCNTR1   5102    5123#
CHANG    1127    5094#
CHANGR   5104#   5112
CHKCLA    139     312     364     593     625     807     924#    929     931     959
CHNHLT   1059    5115#
CHNPOT   5100    5124#
CKCOUT    147     163#     175     176
CLASIC   1074#   1265    4422    4433    4492    4531    4572    4587    4600    4613    4631    4642    4841    4971
         5019    5028    5094    5113
CLASIK    956    1014    1111    4461#   4463    4465    4471    4472
CLDR     1148    4628#   4630
CLKCNT   5164    5174    5202#
CLRALL   1092#   1335    1386    1399    1411    1434    1480    1496    1509    1541    1572    1597    1643    1660
         1676    1703    1768    1783    1820    1856    1869    1886    1888    1899    1902    1904    1919    1926
         1940    1956    1972    2001    2014    2028    2070    2109    2140    2176    2211    2232    2254    2271
         2287    2321    2342    2366    2391    2420    2441    2452    2490    2499    2510    2529    2558    2586
         2588    2599    2610    2628    2646    2661    2665    2679    2703    2726    2731    2739    2750    2762
         2769    2786    2798    2827    2839    2861    2864    2882    2889    2901    2907    2921    2924    2937
         2951    2956    2960    2963    2975    2978    3002    3020    3074    3088    3133    3185    3219    3257
         3288    3318    3349    3382    3415    3448    3468    3491    3531    3566    3607    3661    3723    3753
         3783    3812    3847    3892    3916    3944    3978    4007    4038    4082    4143    4195    4249    4302
         4365    4437    4450
CLRTPN   1015    1018    1020#
CMREG    1232#   4609    4610    4703    4704
CNTRLC    420     498#
CNTRLD    426     531#
CNTRLE    425     490#
CNTRLL    421     479#
CNTRLQ    422     433#
CNTRLR    423     446#
CNTRLS    424     460#     471
CNTVAL    168     180#
COMP1    1137    4511    4513    4538#   4544    4546
COMP2    1138    4551    4563    4565
CONSOL     48#     67
CRERR    4558    4563#
CRLF     1100#   4426    4874    4901    4902    4911
CPREG1   1228#   4556    4745    4942
CPREG2   1229#   4559    4732    4944    4987
DAREG    1233#   4517    4528    4529    4557    4558    4596    4597    4670    4673    4871
DBREG    1231#   1988    1989    2348    2349    4683    4684
DCLR     1062#   4629
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DLAG    1063#   4598
DLCA    1064#   4585
DLDC    1066#   4611
DMAN    1067#   4640
DOCNT   170     172     177#
DONEA   377     384#
DOPACK  140     147#
DOSET   164     171     174     179#
DRST    1065#   4570
DSKP    1061#   4621
DSKSKP  1089#   1299    1351    1800    1849    1879    2338    2495    2497    2500    2648    2650    2663    2666
        2685    2715    2727    2732    2735    2740    2902    2909    2911    2992    3198    3207    4518
DTREG   1235#   3399    3400    3434    3435    3738    3739    3770    3771    3799    3829    3830    3904    3905
        3932    3933    3961    3962    3995    3996    4025    4026    4061    4062    4106    4394    4395    4685
        4686
DUMP    4854#   4858    4876    4877    4985
ENDHLT  1057    4421    4435#
ENDIT   656     661     679#
ENDTST  1131    4126    4413#
ENMAN1  1077#   1900    1920    2039    2078    2117    2150    2183    2431    2462    2491    2513    2530    2562
        2708    2734    2757    2793    2834    2862    2883    2905    2922    2954    2976    3028    3079    3095
        3140    3190    3226    3258    3289    3319    3350    3383    3416    3449    3469    3498    3538    3589
        3615    3664    3848    4083    4144    4196    4250    4303    4366    4451    5077
ENMAN2  1078#   1520    1549    1979    2008    4652    4693    4722    4733
ERHLT1  1049    4533#
ERHLT2  1050    4633#
ERHLT3  1051    4602#
ERHLT4  1052    4589#
ERHLT5  1053    4574#
ERHLT6  1054    4615#
ERHLT7  1055    4644#
ERHLT9  1056    4973#
ERR1    665     669     675#
ERRMES  972     1024#
ERRO    1135    4885#   4888    4900    4903    4915    4917    4923    4926    4934    4935    4939    4947    4954
        4958    4978    5187
ERROR   1080#   1291    1301    1311    1324    1341    1355    1367    1378    1391    1402    1425    1449    1466
        1484    1500    1532    1561    1586    1612    1629    1647    1664    1692    1720    1745    1773    1812
        1831    1860    1892    1911    1932    1948    1964    1992    2019    2050    2091    2129    2168    2202
        2223    2244    2262    2279    2312    2356    2381    2407    2445    2483    2502    2519    2546    2578
        2603    2620    2638    2653    2668    2692    2718    2742    2778    2814    2853    2874    2894    2914
        2944    2967    3008    3058    3123    3171    3210    3246    3278    3309    3339    3371    3403    3438
        3482    3521    3570    3644    3714    3742    3774    3803    3833    3879    3908    3936    3965    3999
        4029    4072    4110    4184    4237    4291    4345    4409
ERTX1   4991    5219#
ERTX2   4992    5220#
ERTX3   4993    5221#
ERTX4   4994    5222#
ERTX5   4995    5223#
ERTX6   4996    5224#
ERTX7   4997    5225#
ERTX8   4998    5226#
ERTX9   4999    5227#
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EXIT    4812    4823    4832#
EXITA   386     394#
EXTFLD  4119    4127#
F10P1   63#
F10P2   64#
F1SWR   62#
FILCNT  763     766     770#
FILLER  761     769#
FLDMAX  1238#   1259    1271    4114    4147    4199    4253    4306    4358
FLSAVE  369     566     802     948     987     1032#
FROCT   1153    4781#   4799    4808    4809    4820    4829
GDREG1  1226#   1684    1685    1712    1713    1737    1738    1761    1762    1792    1793    2036    2075    2114
        2145    2178    4553    4929
GDREG2  1227#   1285    1320    1333    1349    1362    1416    1417    1420    1440    1441    1444    1460    1477
        1492    1519    1546    1577    1578    1581    1603    1604    1607    1623    1638    1656    1682    1687
        1710    1715    1735    1740    1759    1764    1790    1795    1821    1840    1871    1905    1922    1923
        1943    1944    1959    1960    1974    2003    2033    2034    2072    2073    2111    2112    2142    2177
        2217    2218    2238    2239    2256    2257    2273    2300    2307    2323    2326    2368    2394    2395
        2422    2430    2440    2454    2477    2561    2573    2590    2597    2614    2752    2760    2773    2788
        2796    2807    2829    2837    2847    2868    2887    2929    2939    2985    3004    3022    3052    3090
        3111    3141    3266    3267    3295    3296    3324    3325    3356    3357    3385    3386    3419    3420
        3451    3452    3475    3510    3517    3546    3547    3597    3614    3673    3688    3730    3731    3761
        3764    3791    3792    3822    3823    3869    3874    3897    3898    3918    3919    3921    3946    3947
        3949    3980    3981    3983    4009    4010    4012    4051    4067    4068    4104    4155    4162    4208
        4215    4261    4269    4315    4323    4363    4372    4399    4542    4561    4931
GETCH1  647#    655
GETDAT  374     375     382     408#
GOITA   380     397#
GOTOA   402     403     404     405     406#
GTF     54#     368     801     947
HEDLST  4990    4991#
HEDTAD  4905    4990#
HOMEMA  1237#   1253    1254    3259    3298    3331    3359    3389    3424    3456    3471    3500    3549    3590
        3618    3666    3724    3755    3784    3813    3853    3893    3925    3953    3987    4016    4054    4088
        4096
INDEXA  372     381     401     407#
INMODE  384     433     448     639     834     838     842#
INTADD  1130    4517#
INTRQ   1130#   5062
IONWAT  1081#   1309    2516    2533    2538    2543    2632    2636    2689    2711    2957    2961    2964    3234
        3243
IONWT   1136    4508#   4516    4517    4520    4522    4523    4530
IOT1    4621#   5125
IOT2    4629#   5126
IOT3    4598#   5127
IOT4    4585#   5128
IOT5    4570#   5129
IOT6    4611#   5130
IOT7    4640#   5131
IOTCHN  1075#   1251
K0000   1157#   4164    4217
K0001   1158#   5059
K0002   1159#   2042    2082    2121    2154    2187    2613    5061    5081
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K0003    1160#   5063
K0004    1161#   2429   2476   2560   2806   2928   2983   5150
K0006    1162#   2680   2713
K0007    1163#   1269   2687   2704   4756   4760   4788
K0010    1164#   4180   4233   4287   4341   4405
K0017    1212#   2035   2074   2113   2144   4554   4744   4904
K0020    1165#   1526   1555   1986   2002   2015   2346   4668   4681   4701   4730   4742   4869
K0037    1166#   1518   1545
K0040    1167#   3272   3334   3366   3392   3427   3461   3476   3504   3552   3598   3620   3633
                 3674   3690   3703   3733   3766   3795   3825   3859   3900   3928   3957   3991   4021   4057
                 4093   4098   4170   4223   4277   4331   4381   4389
K0070    1181#   4167   4220   4274   4328   4376   4387
K0077    1182#   4821
K0100    1168#   2463   2472   2772   2845   2866   2885   3031   3042   3053   3080   3098   3112   3134
                 3145   3160   3193   3203   3229   3239   3665   4452   5082
K0177    1184#
K0200    1169#   1521   1550   3534   3536   4656   4864   5023
K0207    1170#   4897
K0212    1214#   4773
K0215    1213#   4771
K0240    4797    4827   4835#
K0260    1156#   4757   4761   4789
K0377    1183#
K0400    1171#   1273   1980   2009   2511   2536   2629   2634   2682   2706   2952   3224   4128   4525
                 4696   4856
K1000    1172#   2043   2083   2122   2155   2188   2432   2492   2514   2531   2541   2563   2709   2808
                 2930   2979   3754   3954   4018   4655   4663   4725   4736
K2000    1173#   1824   3926   3955   3989   4019
K2525    1185#   1438   1439   1601   1602   1707   1708   1787   1788   2110   2236   2237   3293   3294
                 3354   3355   3789   3790   3820   3821   4206   4207   4313   4314
K3737    1187#   1942
K3740    4824    4836#
K3777    1174#   2335
K4000    1175#   2805   2927   2984   3260   3332   3390   3457   3550   3591   3667   3854   3988   4017
                 4091   4168   4221   4275   4329   4377   4417   5141   5161   5182
K4100    1189#   4826
K5000    1191#   3299   3360   3425   3472   3499   3617
K5252    1186#   2071
K5403    5060    5067#
K5777    1192#   1844
K7000    1176#   3628   3698   5147
K7377    5145    5200#
K7600    1190#   4875
K7700    1179#   4518   4810
K7717    1188#   1958
K7740    1180#   1681   1709   1734   1758   1789
K7771    1194#   4952
K7774    1193#   4785
K7775    1178#   1767
K7776    1177#   2768   3453
K7777    1195#   1262   3326   3358   3421   3433   3495   3769   3828   4087   4271   4325   4415   4970
         5027
KCDF     1215#   1255   4145   4197   4251   4304   4356   5168   5190
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KRMF     1216#   5057
KTICK    1125    5159#   5163   5165   5175
LAS      1073#   1268   4429   4855   4890   4893   5022   5034   5097
LDAD     1147    4595#   4599
LDADD    1088#   1388   1516   1548   1580   1582   1606   1608   1625   1640   1642   1658   1688   1716
                 1741   1765   1796   1823   1827   1842   1875   1924   1928   2198   2331   2611   2631   2647
                 2662   2684   2890   2994   3539   3682
LDBUF    1087#   1808   1853   1883   2219   2240   2258   2275   2293   2327   2370   2396   2996   3732
                 3765   3793   3824   3899   3920   3948   3982   4011   4044
LDCA     1146    4582#   4586
LDCM     1145    4608#   4612
LDCMD    1090#   1337   1375   1419   1421   1443   1445   1458   1462   1475   1479   1494   1686   1714
                 1739   1763   1794   1806   1825   1845   1873   1907   1976   2005   2336   2512   2537   2571
                 2630   2635   2683   2707   2869   2953   3135   3225   3261   3300   3333   3361   3391   3426
                 3458   3473   3501   3551   3592   3619   3668   3725   3756   3785   3814   3855   3894   3927
                 3956   3990   4020   4055   4092   4097   4169   4222   4276   4330   4378   4388
LDCUR    1091#   1364   1804   1847   1877   2333   2848   2908   2990   3270   3271   3302   3303   3328
                 3330   3363   3365   3388   3423   3460   3497   3537   3593   3616   3632   3669   3689   3702
                 3763   3794   3816   3856   3924   3952   3986   4015   4056   4085   4156   4209   4263   4317
                 4380
LDMAN    1094#   1522   1527   1551   1556   1945   1961   1981   1985   1987   2010   2016   2044   2084
                 2123   2156   2189   2347   2433   2464   2473   2493   2515   2532   2542   2564   2710   2809
                 2931   2980   3032   3043   3054   3081   3099   3113   3146   3161   3194   3204   3230   3240
                 3273   3305   3335   3367   3393   3428   3462   3477   3505   3553   3599   3621   3634   3675
                 3691   3704   3734   3767   3796   3826   3860   3901   3929   3958   3992   4022   4058   4094
                 4099   4171   4224   4278   4332   4382   4390   4453   4657   4664   4669   4680   4682   4697
                 4702   4711   4726   4731   4737   4743   4865   4870   5007   5009   5083
LDMN     1150    4639#   4641
M12      1202#   1510   1542   1977   2006   3024   3029   3077   3091   3096   3142   3157   3188   3191
                 3222   3227   4694   4723   4734   4862   5075
M128     1205#   3138   3155   3683
M16      1203#   2037   2076   2115   2148   2181
M191     1206#
M255     1207#   3026   3071   3093   3186   3220   3583   3609   3658
M300     1208#
M4       1199#   2290   2301   2324   2343   3849   3866   4041   4052
M48      1204#   2660
M5       1200#   4653
M7       1201#   4661
MAIN1    1141    4709#   4713
MAIN2    1142    5005#   5011
MANTST   1076    1129#
MANUAL   1076#   1250
MANUL    1129    4449#
MESA     634     685#
MESAC    978     1026#
MESFL    986     1028#
MESHAN   894     899#
MESMQ    982     1027#
MESPAS   152     181#
MESPC    974     1025#
MQA      58#     370    803    949
MQL      57#     565
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MQSAVE     371     564     804     950     983    1031#
MT805     1217#    3564
MYAC      1010     1016    1022#
MYLAS     1109     4491#   4495    5199
NERRO     1134     5018#   5031    5032    5045    5046    5047    5076    5088
NERROR    1079#    1290    1300    1310    1323    1340    1354    1366    1377    1390    1401    1424    1448    1465
          1483     1499    1531    1560    1585    1611    1628    1646    1663    1691    1719    1744    1772    1811
          1830     1859    1891    1910    1931    1947    1963    1991    2018    2049    2090    2128    2167    2201
          2222     2243    2261    2278    2311    2355    2380    2406    2444    2482    2501    2518    2545    2577
          2602     2619    2637    2652    2667    2691    2717    2741    2777    2813    2852    2873    2893    2913
          2943     2966    3007    3057    3122    3170    3209    3245    3276    3308    3338    3370    3402    3437
          3481     3520    3569    3643    3713    3741    3773    3802    3832    3878    3907    3935    3964    3998
          4028     4071    4109    4183    4236    4290    4344    4408
NEXFL1    4371     4401#
NEXFL2    4161     4176#
NEXFL3    4214     4229#
NEXFL4    4268     4283#
NEXFL5    4322     4337#
NEXT      5043#
NEXTST    5039     5045#
NOSET      167      172#
NOTEX     4956     4977#
NTCLAS     961      996#
NTCRC     4938     4947#
NTGD      4920     4934#   4976
OCTEL     1097#    4916    4932    4945    4966
OP1       1121#    4476    4477
OP2       1122#    4466    4478    4479
PASCNT     149      153     178#
PCLF        50#     870     872
PCNTR1    4953     4967    4988#
PCNTR2    4949     4959    4960    4961    4979    4980    4989#
PCOUNT    4420     4497#
PCSAVE     953     1002    1004    1029#
PNTBUF     859      863     869     875#    882     888
PRINT     1133     4840#   4844    4850    4863    4866
PRN       1152     4803#   4805    4807    4831    4833
PRNTER    1096#    4427    4909    4912    4924    4940    4963
PRSFLD    1132     1256    1257#
PSIE        53#
PSKE        51#
PSKF        49#     883
PSTB        52#     870
PTSTOR     264      266     277     286     288#
RDAD      1143     4651#   4674
RDADD     1086#    1583    1609    1626    1644    1661    1828    1857    1929
RDBF      1151     4678#   4687
RDBUF     1095#    1802    1954    1884    2220    2241    2259    2276    2303    2371    2397    2986    3035    3084
          3102     3149    3164    3197    3233    3274    3306    3336    3368    3394    3429    3463    3478    3511
          3518     3559    3600    3622    3635    3676    3692    3705    3870    4172    4225    4279    4333    4860
RDCM      1140     4692#   4705
RDCMD     1085#    1321    1422    1446    1463    1481    1497    1889    1908    4873
RDCR      1149     4721#   4746
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RDCRC     1093#    1689    1717    1742    1769    1809    2047    2087    2126    2165    2199    4872
RDST      1139     4569#   4578
RDSTAT    1084#    128R    1338    1798    1851    1881    2340    2424    2435    2442    2456    2468    2480    2567
          2575     2591    2600    2617    2753    2763    2775    2789    2799    2811    2830    2840    2850    2871
          2891     2933    2941    2988    2998    3005    3036    3046    3055    3103    3116    4859
REALPC     957      975    1021#
REDOA      375#     383
REG1      1218#    1283    1336    1348    1350    1363    1374    1398    1412    1435    1459    1461    1474
          1493     1512    1544    1547    1573    1598    1622    1624    1637    1641    1655    1657    1677    1704
          1730     1784    1807    1822    1839    1841    1870    1872    1906    1921    1941    1957    1973    1975
          2004     2029    2040    2141    2143    2151    2213    2233    2272    2274    2288    2299    2330    2332
          2334     2337    2423    2479    2574    2615    2767    2810    2932    2987    2991    2995    3018    3070
          3137     3183    3217    3262    3290    3320    3327    3351    3418    3450    3492    3516    3533    3582
          3657     3726    3757    3786    3817    3851    3868    3917    3979    4151    4203    4257    4310    4362
          5037     5040
REG2      1219#    1387    1457    1476    147R    1639    1754    1766    1797    1799    1803    1805    1826    1843
          1846     1848    1852    1874    1876    187R    1882    1927    2184    2255    2322    2455    2566    2774
          2849     2870    2940    2989    2997    3301    3362    3384    3454    3474    3494    3509    3896    3945
          4008     4039    4050    4086    4103    4374    4379    4384    5042
ROUINS    1008#    4481    4484
ROUTMP    4464     4480    4486#
RTFLD1    4361     4369    4393#
RTFLD2    4150     4159    4165#
RTFLD3    4202     4212    4218#
RTFLD4    4256     4266    4272#
RTFLD5    4309     4320    4326#
SAVAC     4462     4470    4482    4487#
SAVEND    1112#    1263    4414    4969    5026
SAVPC     5188     5192    5201#
SBCNT1    1220#    4654    4658    4662    4665    4695    4698    4724    4727    4735    4738    4752    4753    4759
SDKP      1144     4620#   4623    4624
SERRO     4889     4896    4899    4975    4984#
SET       1069#    1258    4413
SETUP     1110     5054#   5065    5105    5106    5109
SETUP1     965#
SETUP2     158#
SNERRO    5033     5036    5044    5050#   5074    5079    5085    5087    5103    5111
STCON     1239#    1284    1332    2421    2428    2439    2453    2475    2559    2572    2589    2596    2612    2751
          2759     2771    2787    2795    2804    2828    2834    2846    2867    2886    2926    2938    2982    3003
          3021     3051    3089    3110
STPHLT    1058     5025    5030#
STRAUT    4954#    4968
STREG     1230#    4576    4577
SWR       1012     1013    1120#   4474    4475
T101D     4178     4183#
T101E     4175     4184#
T101R     4156#    4182
T102D     4231     4236#
T102E     4228     4237#
T102R     4209#    4235
T103D     4285     4290#
T103E     4282     4291#
T103R     4262#    4289
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T104D     4339    4344#
T104E     4336    4345#
T104R     4316#   4343
T105D     4403    4408#
T105E     4398    4409#
T105R     4364#   4407
T37R      2079#   2086
T38R      2118#   2125
T39R      2151#   2164
T40R      2184#   2197
T45E      2306    2312#
T45R1     2292#   2298
T45R3     2303#   2310
T46A1     2326#   2329
T46A2     2345#   2354
T46E      2352    2356#
T47E      2374    2381#
T48E      2400    2407#
T49E      2427    2439    2445#
T50E      2459    2471    2483#
T51E      2496    2498    2502#
T53E      2535    2540    2546#
T54E      2570    2578#
T55E      2594    2603#
T57E      2633    2638#
T58E      2649    2651    2653#
T59E      2664    2668#
T60E      2681    2686    2688    2692#
T61E      2705    2712    2714    2718#
T62E      2729    2733    2737    2742#
T63E      2756    2766    2778#
T64E      2792    2802    2814#
T65E      2833    2843    2853#
T68E      2904    2910    2912    2914#
T69E      2936    2944#
T70E      2959    2962    2967#
T71E      3001    3008#
T72E      3039    3049    3058#
T72R      3029#   3041
T73E      3106    3119    3123#
T73R1     3073#   3121
T73R2     3077#   3086
T73R3     3096#   3108
T74E      3152    3167    3171#
T74R1     3141#   3154
T74R1A    3142#
T74R2     3144#
T74R3     3157#   3169
T75E      3200    3210#
T75R      3191#   3202
T76E      3236    3246#
T76R      3227#   3238
T77E      3278#
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T78E      3309#
T79E      3339#
T80E      3371#
T81E      3397    3403#
T82E      3432    3438#
T83E      3466    3482#
T84E      3514    3521#
T85E      3562    3570#
T85OK     3566    3569#
T85R1     3538#   3568
T86E      3603    3625    3638    3644#
T86R1     3585#   3642
T86R2     3593#   3605
T86R3     3611#   3627
T86R4     3630#   3640
T87E      3679    3695    3708    3714#
T87R1     3660#   3712
T87R2     3669#   3681
T87R3     3685#   3697
T87R4     3700#   3710
T92E      3873    3879#
T92R1     3956#   3865
T92R2     3870#   3877
T94E      3936#
T95E      3965#
T97E      3999#
T98E      4029#
T99E      4065    4072#
T99R1     4043#   4049
T99R2     4056#   4070
TABLA     409     411#
TABLB     410     420#
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TCNTR1  1221#   1511    1523    1543    1552    1978    1982    2007    2011    2038    2045    2077    2080    2085
        2116    2119    2124    2147    2152    2158    2160    2180    2185    2191    2193    2325    2328    2344
        2353    2364    2367    2369    2375    2379    2389    2392    2401    2405    2461    2465    3025    3044
        3076    3085    3092    3114    3139    3153    3156    3168    3187    3201    3221    3237    3503    3506
        3541    3555    3584    3587    3641    3659    3662    3711    3850    3864    3867    3876    4148    4176
        4200    4229    4254    4283    4307    4337    4359    4401
TCNTR2  1222#   2149    2163    2182    2196    3027    3040    3078    3082    3094    3107    3143    3147    3158
        3162    3189    3205    3223    3241    3535    3540    3542    3548    3556    3557    3563    3567    3588
        3604    3610    3626    3663    3680    3684    3696    3852    3857    3862
TCNTR3  1223#   2291    2297    2302    2308    3030    3033    3097    3100    3192    3195    3228    3231    3629
        3639    3699    3709    4042    4048    4053    4069
TCNTR4  1224#   2289    2292    2295    2296    3072    3075    3120    4040    4043    4046    4047
TEXAC   5217#
TEXAD   5215#
TEXCM   5213#
TEXCR   4941    5210#
TEXDA   5214#
TEXDB   5212#
TEXDT   5216#
TEXEND  4428    5229#
TEXGD   4925    5209#
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TEXST    4986   5211#
THSFLD   1132#   4149   4201   4255   4308   4368   5055
TICK     1070#   4545   4564   5043
TMPCNT    646    654    684#
TOCT     1154   4751#   4763   4786   4795
TOFLD1   4357   4367   4373#   4375   4386   4404   4406
TOFLD2   4146   4157   4163#   4166   4179   4181
TOFLD3   4198   4210   4216#   4219   4232   4234
TOFLD4   4252   4264   4270#   4273   4286   4288
TOFLD5   4305   4318   4324#   4327   4340   4342
TOTST    5049#   5072   5078   5099   5108
TST0     1287#   1293
TST1     1299#   1303
TST10    1410#   1426
TST100   4081#   4111
TST101   4136#   4185
TST102   4194#   4238
TST103   4241   4248#   4292
TST104   4301#   4346
TST105   4349   4356#   4410
TST11    1433#   1450
TST12    1457#   1468
TST13    1474#   1486
TST14    1493#   1502
TST15    1508#   1533
TST16    1540#   1562
TST17    1571#   1587
TST18    1596#   1613
TST19    1622#   1631
TST2     1309#   1313
TST20    1637#   1649
TST21    1655#   1666
TST22    1675#   1693
TST23    1702#   1721
TST24    1730#   1747
TST25    1754#   1775
TST26    1782#   1813
TST27    1819#   1832
TST28    1839#   1861
TST29    1868#   1893
TST3     1321#   1326
TST30    1898#   1912
TST31    1918#   1933
TST32    1939#   1949
TST33    1955#   1965
TST34    1971#   1993
TST35    2000#   2020
TST36    2027#   2051
TST37    2069#   2092
TST38    2096   2108#   2130
TST39    2139#   2169
TST4     1332#   1342   4439
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TST41    2210#   2224
TST42    2231#   2245
TST43    2253#   2263
TST44    2270#   2280
TST45    2286#   2313
TST46    2320#   2357
TST47    2365#   2382
TST48    2390#   2408
TST49    2412   2419#   2446
TST5     1348#   1356
TST50    2451#   2484
TST51    2489#   2503
TST52    2509#   2520
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TST54    2551   2557#   2579
TST55    2585#   2604
TST56    2609#   2621
TST57    2627#   2639
TST58    2645#   2654
TST59    2660#   2669
TST6     1363#   1368
TST60    2678#   2693
TST61    2697   2702#   2719
TST62    2725#   2743
TST63    2749#   2779
TST64    2785#   2815
TST65    2819   2826#   2854
TST66    2860#   2875
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TST69    2920#   2945
TST7     1374#   1379
TST70    2950#   2968
TST71    2974#   3009
TST72    3017#   3059
TST73    3063   3069#   3124
TST74    3132#   3172
TST75    3176   3182#   3211
TST76    3216#   3247
TST77    3256#   3279
TST78    3287#   3310
TST79    3317#   3340
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TST80    3348#   3372
TST81    3381#   3404
TST82    3414#   3439
TST83    3447#   3483
TST84    3490#   3522
TST85    1217   3530#   3571
TST86    3575   3581#   3645
TST87    3649   3656#   3715
TST88    3722#   3743
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TST90    3782#   3804
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TST92    3838    3946#   3880
TST93    3884    3891#   3909
TST94    3915#   3937
TST95    3943#   3966
TST97    3970    3977#   4000
TST98    4006#   4030
TST99    4037#   4073
TSTCHA   641     648     657#    674
TSTLAS   4126#   4130
TTYLPT   446     479     481     498     860    876#   892
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TYPE     1099#   4758    4762    4772    4774   4775   4790   4798   4819   4828   4898
UPAROW   449     482     490     500     531    550#   556
UPONE    1155    4769#   4776    4784    4787   4791   4794
UPPER    1128    5071#   5090    5101    5104   5110
UPPR1    5078#   5089
WAERRO   1126    5180#   5184    5197
WATMES   597     603#
XAERRO   1071    1126#
XAPT8A   1072    1124#
XBGN     5116    5119#
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XC0CNT   79      362#    367     392     393    394    396    438    464   469   484   493   535   600
         812     835     890
XC0CRL   87      150     155     391     555    677    679    757#   768   895   970   989
XC0ECH   89      640     647     831#    836    840
XC0ERR   93      944#    952     1000    1006
XC0INQ   95      160     591#    595     601    602    896    994
XC0OCT   85      154     636     724#    740    976    980    984   988
XC0PAS   73      137#    145     161     162
XC0PAU   99      310#    315     316     318    319
XC0PNT   81      151     261#    263     265    269    280    596    633   893   971   973   977   981
         985
XC0PSW   83      538     624#    627     681
XC0SW    75      142     157     204#    211    963    991    997
XC0TTY   77      228#    236     467     598    810    832
XC0TYP   91      276     285     388     390    552    554    638    676   733   760   765   837   858#
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XCHANG   1075    1127#
XCLA8    1074    1111#
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XCOMP2   1083    1138#
XCRLF    1100    1155#
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XDOSW    452     453#
XDUMP    4974    4985#
XEND     1131#   4116
XERRO    1080    1135#
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XLA8     1073    1109#
XLDAD    1088    1147#
XLDCA    1091    1146#
XLDCM    1090    1145#
XLDMN    1094    1150#
XMAIN1   1077    1141#
XMAIN2   1078    1142#
XMYLAS   5148    5199#
XNERRO   1079    1134#
XPRINT   1099    1133#
XPRN     1096    1152#
XRDAD    1086    1143#
XRDBF    1095    1151#
XRDCM    1085    1140#
XRDCR    1093    1149#
XRDST    1084    1139#
XREG     4950    4987#
XSDKP    1089    1144#
XSET     1069    1110#
XTABLA   373     409#
XTABLB   400     410#
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XTICK    1070    1125#
XTOCT    1098    1154#
XUPPER   1087    1128#
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.L1165     811     815     833     904#
.L1166     810     832     905#
.L1167     807     906#
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.L1172     800     909#
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.L1174     759     911#
.L1175     732     912#
.L1176     731     913#
.L1177     728     914#
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.L1366     1001    1035#
.L1367     994     1036#
.L1370     976     980     984     988     1037#
.L1371     971     973     977     981     985     1038#
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.L1375     962     990     996     1003    1005    1042#
.L1376     956     1014    1043#
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.L5777     4467    4503#
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.L7375     5187    5205#
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.V0021     4477    4501#
.V0022     4479    4500#
.V0040     637     696#
.V0077     278     326#
.V0100     283     324#    398     514#
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.V0177     232     331#
.V0200     233     330#
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.V0215     659     692#    759     911#
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.V0260     732     912#
.V0262     963     991     997     1041#
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.V0615     449     482     490     500     511#
.V0624     141     156     337#    437     440     468     483     492     513#    811     815     833     904#    962
           990     996     1003    1005    1042#
.V0635     160     333#    896     901#    994     1036#
.V0745     450     491     499     510#
.V1000     154     334#    636     697#    976     980     984     988     1037#
.V1023     150     155     335#    391     515#    555     677     679     705#    970     989     1039#
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.V1063     640     647     694#
.V1075     234     235     378     387     395     397     399     519#    553     642     652     662     666
           670     672     706#
.V1076     384     433     448     518#    639     695#
.V1077     276     285     327#    388     390     517#    552     554     638     676     707#
.V1121     446     479     481     498     512#
.V1200     139     312     338#    364     522#    593     625     701#    807     906#
.V1302     4481    4484    4499#
.V1345     363     366     523#    569     702#    800     909#
.V1346     371     520#    564     704#    804     907#
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,V5001   5173   5206#
,V5732   956    1014    1043#
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,V6331   4784   4787    4791    4794    4880#
,V6500   5172   5207#
,V6520   5195   5203#
,V6600   5187   5205#
,V7402   317    322#    1001    1035#
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,V7520   663    691#
,V7600   503    508#
,V7700   267    328#
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