IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHKMA-D-D

PRODUCT NAME: PDP-8E EXTENDED MEMORY DATA & CHECKERBOARD TEST

RELEASE DATE   MAY 1976

MAINTAINER: DIAGNOSTIC ENGINEERING

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1. ABSTRACT

MODIFIED TO RUN ON APT SYSTEMS. APRIL 1975.
SEE NOTES AT END OF DOCUMENT.

MODIFIED TO RUN ON CLASSIC 8 SYSTEMS (CONSOLE PACKAGE).
SEE SECTION 10.

MODIFIED TO RUN ON SYSTEMS WITH NO CONSOLE TERMINAL.
REFER TO SECTIONS STARTING AT SECTION 11 FOR PROGRAM INITIALIZATION,
OPERATING PROCEDURES, SWITCH REGISTER SETTINGS AND ERROR REPORTING.

THE DIAGNOSTIC HAS BEEN MODIFIED TO ACCOMODATE THE KT8-A
MEMORY MANAGEMENT OPTION WITH MEMORY ADDRESSING OF UP TO 128K
WORD OF READ WRITE MEMORY.

THE PDP-8E EXTENDED MEMORY DATA & CHECKERBOARD TEST IS
DESIGNED TO DETECT MEMORY FAILURE DUE TO SENSE-LINE
NOISE UNDER WORST CASE CONDITIONS. THE FOUR WORST CASE
PATTERNS PROVIDED WILL GENERATE WORST CASE
NOISE CONDITIONS IN ALL STANDARD AND SPECIALLY PURCHASED
PDP-8E CORE STACKS. AND WILL TEST SYSTEMS EQUIPPED WITH
FROM 8K TO 128K WORDS OF CORE MEMORY. THE ALL 0'S AND ALL
1'S PATTERNS ARE PROVIDED TO IDENTIFY BASIC MEMORY FAILURES.
AUTOMATIC PROGRAM RELOCATION IS PROVIDED IN ORDER TO TEST
ALL MEMORY FIELDS FROM EACH MEMORY FIELD. TELETYPE PRINTOUTS
ARE PROVIDED FOR ERROR IDENTIFICATION, AND THE OPERATOR
IS GIVEN A DEGREE OF CONTROL OVER THE PROGRAM BY VARIOUS
SWITCH REGISTER SETTINGS.

2. REQUIREMENTS

2.1 EQUIPMENT

A PDP-8E COMPUTER EQUIPPED WITH AT LEAST 8K OF CORE MEMORY.

2.2 STORAGE

THE PROGRAM OCCUPIES CORE LOCATIONS 0000 TO 7577 IN THE PRESENT FIELD.

2.3 PRELIMINARY PROGRAMS

THE BINARY LOADER MUST BE IN MEMORY. ALSO, ALL DIAGNOSTICS
FOR A BASIC 4K PDP-8E MUST HAVE BEEN PREVIOUSLY RUN
SUCCESSFULLY. IF A KT8-A IS AVAILABLE, THE KT8-A DIAGNOSTIC
MUST BE RUN SUCCESSFULLY.

3. LOADING PROCEDURE

LOAD THE PROGRAM WITH THE BINARY LOADER (BIN). THE PROGRAM
MAY BE LOADED INTO ANY FIELD.

4. OPERATING PROCEDURE

TO START THE PROGRAM:

A. SET THE SR TO 'F AND OF OF THE FIELD THAT CONTAINS
    THE PROGRAM.

B. PRESS KEY EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 0200.

D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT. THE FOLLOWING WILL BE
PRINT IF A TERMINAL IS AVAILABLE.

"PDP-8E/8A EXT MEM DATA & CHKBD"

KM8-E OR KM8-A DIALOGUE

"KM8 SELECTED FOR TESTING"
KT8-A DIALOGUE
"KT8 SELECTED FOR TESTING"

THE ABOVE INFORMATION TELLS THE OPERATOR WHICH OPTION WAS FOUND
FOR TESTING. IF A KT8-A IS AVAILABLE AND THE KM8 MESSAGE
IS PRINTED, THE KT8-A DIAGNSOTIC SHOULD BE RERUN.

THE PROGRAM WILL THEN PRINT:

        "SELECT FIELD PARAMETERS"

E.   SET THE SWITCH REGISTER FOR THE DESIRED FIELD PARAMETERS
        ACCORDING TO THE FOLLOWING TABLE

SR00-05   THESE SWITCHES DEFINE THE STARTING FIELD
                LIMIT.(USUALLY 0)
SR06-11   THESE SWITCHES DEFINE THE ENDING FIELD
                LIMIT.(USUALLY 37)

F.   PRESS CONTINUE. THE PROGRAM WILL THE. PRINT:
        "SELECT TEST PARAMETERS"

G. SE. THE SR FOR DESIRED OPERATION ACCORDING TO THE FOLLOWING
    TABLE.

SWITCH	0 (DOWN)	1 (UP)
SR00	CONTINUE AFTER ERROR	HALT AFTER ERROR
SR01	TYPEOUT ERRORS	INHIBIT ERROR TYPEOUTS
SR02	NORMAL	TTY BELL ON ERROR
SR03	F. LOCATE PROGRAM	INHIBIT PROGRAM RELOCATION
SR04	NORMAL	CHANGE FIELD LIMITS
SR05	NORMAL	HALT AFTER CURRENT TEST

F. PRESS KEY CONT.

4.1   DETAILED SR EXPLAINATION

        SR00-02 SR02, IF SET, WILL RING THE TTY BEL'. ONCE FOR EACH
                ERROR. SR00 AND SR01 HAVE NO EFFECT WITH SR02 SET.

SR03   SR03 MAY BE SET OR RESET AT ANY TIME AND THE PROGRAM
            WILL ACT ACCORDINGLY.
SR04   SR04 ALLOWS THE OPERATOR TO CHANGE THE FIELD LIMITS
            AS DEFINED BY SR06-11.
SR05   SR05 IS NORMAL HALT FOR PROGRAM.
SR06-08   THESE SWITCHES DEFINE THE STARTING FIELD LIMIT

4.2   EXAMPLE OF SELECTING FIELDS FOR TEST

       EXAMPLE 1:   SR = 0037, 28K SYSTEM
                        FIELDS SELECTED FOR TESTING ARE 0:6543210

       EXAMPLE 2:   SR = 0004, 28K SYSTEM
                        FIELDS SELECTED FOR TESTING ARE 0:43210

       EXAMPLE 3:   SR = 0202, 28K SYSTEM
                        FIELDS SELECTED FOR TESTING ARE 0:2 (NO RELOCATION
                        WILL OCCUR).

       EXAMPLE 4:   SR = 0401, 28K SYSTEM
                        FIELDS SELECTED FOR TESTING ARE 0:64310

       NOTE 1:   FIELDS NOT IN THE SYSTEM ARE AUTOMATICALLY
                        DESELECTED AS IN EXAMPLE 1. FIELD 7 IS NOT
                        PRESENT, THEREFORE, NOT SELECTED.

       NOTE 2:   DO NOT SELECT A FIELD THAT CONTAINS A ROM.

       NOTE 3:   A SINGLE FIELD CAN BE SELECTED FOR TESTING
                        PROVIDING THE PROGRAM IS NOT IN THAT FIELD
                        AS IN EXAMPLE 3.

       NOTE 4:   ANY FIELD OR GROUP OF FIELDS CAN BE BY-PASSED
                        AS IN EXAMPLE 4. FIELDS 2 AND 3 ARE NOT SELECTED,
                        FIELD 7 IS NOT PRESENT.

    NOTE 5: THE ABOVE INFORMATION ALSO APPLIES TO SYSTEMS WITH UPTO
            128K WORDS OF READ WRITE MEMORY. FOR EACH ADDITIONAL
            BANK OF MEMORY THE PROGRAM WILL PRINT THE FOLLOWING DEPENDING
            ON THE AMOUNT OF MEMORY AVAILABLE.

            "FIELDS SELECTED FOR TESTING 3:76543210 2:76543210 ':76543210 0:76543210"

5.   ERRORS

      A TEST ERROR WILL OCCUR ANYTIME THE DATA WRITTEN DOES NOT
      MATCH THE DATA READ. A RELOCATION ERROR WILL OCCUR IF THE
      RELOCATION COMPARISON CHECK FAILS.

5.1   TEST ERROR TYPEOUTS

       FOR THE FIRST ERROR ENCOUNTERED A HEADER WILL BE TYPED OUT
       FOLLOWED BY THE PERTINENT DATA. FOR ALL SUBSEQUENT ERRORS,
       ONLY THE PERTINENT DATA WILL BE TYPED. THE FORMAT IS AS
       FOLLOWS:

              PR.LOC.. FAIL. ADR..GOOD..BAD..PATTERN

PR L?? = THE PROGRAM ADDRESS WHERE THE ERROR JMS OCCURRED.
(INCLUDES FIELD).

FAIL ADR = THE ADDRESS OF THE LOCATION IN ERROR.
(INCLUDES FIELD).

GOOD = THE DATA THAT WAS WRITTEN.

BAD = THE DATA THAT WAS READ.

PATTERN= THE PRESENT TEST PATTERN AND THE NUMBER
OF TIMES IT WAS COMPLEMENTED.
NC (NOT COMPLEMENTED).
1C (ONE COMPLEMENT).
2C (TWO COMPLEMENTS).

5.2 RELOCATION ERROR TYPEOUTS

ALL RELOCATION ERRORS ARE IN THE FOLLOWING FORMAT:

XXXXXX RELOCATION ERROR AT LOCATION YYYYYY

XXXXXX = THE PROGRAM ADDRESS WHERE THE ERROR JMS OCCURRED.
(INCLUDES FIELD).

YYYYYY = THE ADDRESS OF THE LOCATION IN ERROR.
(INCLUDES FIELD).

NOTE: AFTER EACH ERROR PRINT-OUT THE PROGRAM CONTINUES
ON WITH THE NEXT SEQUENTIAL MEMORY LOCATION.

5.3 PARITY ERROR TYPEOUTS

IF THE 8E SYSTEM CONTAINS A PARITY OPTION THE INTERRUPT WILL
BE TURNED ON TO ALLOW PARITY ERRORS WHEN THE PROGRAM IS
EXECUTING FROM FIELD 0. THE FOLLOWING 3 TYPEOUTS CAN OCCUR
WITH A PARITY OPTION:

A. PARITY ERROR, LOC 0=XXXX   TSTAD=XXXXXX   (PRESENT PATTERN)

B. INTERRUPT FROM KEYBOARD

C. UNWANTED INTERRUPT OCCURRED

6. RESTRICTIONS

6.1 STARTING RESTRICTIONS

THE PROGRAM MAY BE RESTARTED AT ANY TIME FROM LOCATION 0200
OR 0202 OF THE FIELD THE PROGRAM IS PRESENTLY IN.

6.2 OPERATING RESTRICTIONS

THE PARITY ERROR TYPEOUT CAN NOT BE INHIBITED.

7. EXECUTION TIME

THE TIME TO WRITE AND READ ALL SIX PATTERNS IN ONE FIELD
IS APPROXIMATELY 6 SECONDS.

DURING PROGRAM EXECUTION A 15 WILL BE TYPED ON THE TTY
APPROXIMATELY EVERY 15 MINUTES OF PROGRAM RUN TIME. THIS
ALLOWS THE OPERATOR TO DETERMINE APPROXIMATE RUN TIME
BEFORE A FAILURE OCCURRED.

NOTE: IT SHOULD BE NOTED THAT IF THE PROGRAM IS RELOCATING THE DIAGNOSTIC
WILL PRINT AN END OF PASS MESSAGE AT THE COMPETION OF ALL FIELDS
SELECTED FOR RELOCATION. THE MESSAGE WILL BE AS FOLLOWS:

"END OF PASS XXXX"
WHERE XXXX= THE OCTAL VALUE OF THE NUMBER OF TIMES THE PROGRAM
HAS RELOCATED THROUGH ALL SELECTED FIELDS.

8. SCOPE LOOPS

8.1 SCOPE LOOP 1

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE ADDRESS
SPECIFIED BY THE SR. THE ADDRESS BEING LOOPED ON CAN BE
CHANGED SIMPLY BY CHANGING THE SWITCH SETTING. THE
PREVIOUS ADDRESS WILL BE LEFT WITH ITS ORIGINAL CONTENT.

A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS
   IN AND THE DATA FIELD WANTED TO TEST.

B. PRESS KEY EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 5200.

D. PRESS KEY ADDR LOAD.

E. SET THE SR EQUAL TO THE ADDRESS TO TEST.

F. PRESS KEYS CLEAR, AND CONT.

8.2 SCOPE LOOP 2

THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE TWO
ADDRESSES INPUT VIA THE SR. TO CHANGE THE ADDRESSES, THE
LOOP MUST BE RESTARTED.

A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS
   IN THE DATA FIELD WANTED TO TEST.

B. PRESS KEY EXTD ADDR LOAD.

C. SET THE SR EQUAL TO 5400.

D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.3 SCOPE LOOP 3

     THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE GROUP
     OF ADDRESSES INPUT VIA THE SR. THE STARTING ADDRESS SPECIFIED
     MUST BE LESS THAN THE ENDING ADDRESS SPECIFIED.

     A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS
         IN AND THE DATA FIELD WANTED TO TEST.

     B. PRESS KEY EXTD ADE . LOAD.

     C. SET THE SR EQUAL TO 5600.

     D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

     E. FOLLOW DIRECTIONS THAT ARE TYPED OUT.

8.4 SCOPE LOOP 4
     --------- -----

     THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE ADDRESS
     INPUT VIA THE SR USING THE DATA SPECIFIED BY THE SR. THE
     DATA CAN BE CHANGED SIMPLY BY CHANGING THE SWITCH SETTING.

     A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS
         IN AND THE DATA FIELD WANTED TO TEST.

     B. PRESS KEY EXTD ADDR LOAD.

     C. SET THE SR EQUAL TO 6000.

     D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

     E. A MESSAGE WILL BE TYPED OUT TO SET THE SR TO THE SELECTED
         ADDRESS.

     F. SET SR TO THE SELECTED ADDRESS AND DEPRESS CONT.

     G. SET S: TO SELECTED DATA (SCOPE LOOP IS CYCLING).

8.5 SCOPE LOOP 5

     THIS SCOPE LOOP DOES A READ, COMPLEMENT, WRITE ON THE GROUP
     OF ADDRESSES INPUT VIA THE SR USING THE DATA SPECIFIED BY THE
     SR. THE STARTING ADDRESS SPECIFIED MUST BE LESS THAN THE
     ENDING ADDRESS SPECIFIED.

     A. SET THE SR TO THE INSTRUCTION FIELD THAT THE PROGRAM IS IN
         AND THE DATA FIELD WANTED TO TEST.

     B. PRESS KEY EXTD ADDR LOAD.

     C. SET THE SR EQUAL TO 5700.

     D. PRESS KEYS ADDR LOAD, CLEAR, AND CONT.

E. FOLLOW THE TYPED OUT MESSAGE THAT INPUTS THE ADDRESS
    SELECTION.

F. SET SR TO SELECTED DATA (SCOPE LOOP IS CYCLING).

NOTE 1: THE ADDRESS(S) SPECIFIED WILL BE LOOPED UNTIL STOPPED
        BY THE OPERATOR WITH KEY HALT. NO ERROR CHECKING IS DONE.
        TO RESUME NORMAL OPERATION, RESTART PROGRAM AT
        ADDRESS 0200 OR 0202 OF THE CURRENT INSTRUCTION FIELD.

9. PROGRAM DESCRIPTION

9.1 TEST PATTERNS

THE FOLLOWING TEST PATTERNS ARE EMPLOYED BY THE PROGRAM:

A. BASIC ALL 0'S PATTERN.

B. BASIC ALL 1'S PATTERN.

C. 0000-7777 WORST CASE CHECKERBOARD PATTERN.

D. 7777-0000 WORST CASE CHECKERBOARD PATTERN.

E. 2525-5252 WORST CASE CHECKERBOARD PATTERN.

F. 5252-2525 WORST CASE CHECKERBOARD PATTERN.

9.2 PROGRAM RELOCATION

PROGRAM RELOCATION IS GOVERNED BY THE STATUS OF SR BIT 3 OR
BY THE FACT THAT ONLY ONE FIELD IS SELECTED FOR TESTING.
WITH SR BIT 3 DOWN (0 POSITION) PROGRAM RELOCATION OCCURS
EACH TIME THE TEST PATTERN AND ITS COMPLEMENT HAVE BEEN
COMPLETELY TESTED IN EACH SELECTED FIELD. THE PROGRAM FIRST
RELOCATES TO THE HIGHEST ORDER 4K FIELD UNDER TEST. THE
PROGRAM KEEPS RELOCATING TO THE NEXT LOWER FIELD UNDER TEST
UNTIL IT REACHES THE LOWEST ORDER FIELD UNDER TEST. THE
TESTING AND RELOCATION CYCLE IS THEN REPEATED. THE CONTENTS
OF THE ENTIRE FIELD ARE RELOCATED WHICH ENABLES ANY OTHER
INFORMATION (RIM-BIN) TO BE CARRIED WITH THE PROGRAM.

THE PROGRAM PROVIDES A DEGREE OF PROTECTION FOR ITSELF BY
REMEMBERING ALL FIELDS WHERE ERRORS OCCUR. WHEN A FAULTY
FIELD IS NEXT IN SEQUENCE TO CONTAIN THE PROGRAM, THE PROGRAM
WILL SKIP THE FAULTY FIELD AND RELOCATE TO THE FIRST LOWER
ORDER FIELD WHICH IS ERROR FREE. IF ALL OTHER SELECTED
FIELDS ARE FAULTY, PROGRAM RELOCATION WILL NOT TAKE PLACE.

DURING RELOCATION A COMPARISON CHECK IS MADE TO INSURE NO
PROGRAM LOSS.

9.3 TEST PROCEDURE

A. WRITE THE PATTERN IN ALL SELECTED FIELDS (EACH LOCATION IS
    THEN TREATED AS FOLLOWS):

B. READ-WRITE THE LOCATION 11 TIMES.
C. READ-WRITE-TEST THE LOCATION (NC).
D. READ-WRITE THE LOCATION 11 TIMES.
E. READ-COMPLEMENT-WRITE THE LOCATION.
F. READ-WRITE THE LOCATION 11 TIMES.
G. READ-WRITE-TEST THE LOCATION (1C).
H. READ-WRITE THE LOCATION 11 TIMES.
I. READ-COMPLEMENT-WRITE THE LOCATION.
J. READ-WRITE THE LOCATION 11 TIMES.
K. READ-WRITE-TEST THE LOCATION (2C).
L. GO ON TO NEXT LOCATION REPEATING B-K.
M. GO ON TO NEXT PATTERN REPEATING A-L WHEN ALL LOCATIONS
    OF ALL SELECTED FIELDS ARE COMPLETED.

FOR FURTHER UNDERSTANDING OF HOW THE TEST IS PERFORMED,
REFER TO THE LISTING.

THE WORST CASE CHECKERBOARD PATTERN CONSISTS OF ALTERNATING
4 MEMORY CORES CONTAINING 0000 AND 4 MEMORY CORES CONTAINING
1111 ON A MEMORY PLANE. THIS PATTERN IS REVERSED EVERY 400
OCTAL LOCATIONS. (THIS TEST PATTERN IS GENERATED ACCORDING
TO THE STRINGING OF THE STACK AND THE WIRING OF THE MEMORY
SYSTEM. IT IS THE SAME PATTERN FOR ALL 8E STACKS).

Y LINES (MA6L THRU MA11L)

	ADDRESS BIT 9 HIGH				ADDRESS BIT 9 LOW								
	00	01	02	03	04	05	06	07	10	11	->	76	77
00	1	1	1	1	0	0	0	0	1	1		0	0
01	1	1	1	1	0	0	0	0	1	1		0	0
02	1	1	1	1	0	0	0	0	1	1		0	0
03	1	1	1	1	0	0	0	0	1	1		0	0
04	0	0	0	0	1	1	1	1					
05	0	0	0	0	1	1	1	1					
06	0	0	0	0	1	1	1	1					
07	0	0	0	0	1	1	1	1					
10	1	1	1	1									
11	1	1	1	1									
76	0	0	0	0									
77	0	0	0	0									
176	0	0	0	0									
177	0	0	0	0									

ADDRESS BIT 3 HIGH (rows 00-03)
ADDRESS BIT 3 LOW (rows 04-07)

X LINES MA0L THRU MA5

EMA2L USED IF AN 8K MEMORY

THE ABOVE REPRESENTS ONE MEMORY PLANE.

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)   WHEN RUNNING THE CONSOLE PACKAGE SOME SUBTESTS MAY NOT
BE EXECUTED.

2)   THE CONSOLE PACKAGE WILL USE EITHER THE HARDWARE OR
       PSEUDOSWITCH REGISTER DPENDING UPON THE CONDITION OF BIT 0
       OF ADDRESS 21(HCW1). (SEE SECTION 10.8 FOR EXPLANATION)

3)   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 22 BIT3=1 TO INDICATE CONSOLE PACKAGE ACTIVE.

2.)   SET LOCATION 21 BIT0=0 TO INDICATE USE PSEUDO SWITCH
       REGISTER.

3.)   SET LOCATION 21 BIT0=1 TO INDICATE NOT TO USE PSEUDO
       SWITCH REGISTER, BUT TO USE HARDWARE SWITCHES.

10.4   CONTROL C..ARACTERS

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 RESTORES THE LOADER (PGS 37 OF FLD 0 & 1)
AND STARTS IT AT LOC 7600 OF FLD 0.

CONTROL S

THIS WILL STOP ANY OUTPUT TO A CONSOLE TERMINAL.
THE ONLY WAYS TO CONTINUE IS TO TYPE CONTROL Q
TO RESUME PRINTING OR CONTROL C TO ABORT THE
PROGRAM COMPLETELY. THIS IS A NONPRINTING CHARACTER.

CONTROL Q

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

CONTROL G

THE CONTROL G ALLOWS THE OPERATOR TO CHANGE THE
VALUE OF THE PSEUDO SWITCH REGISTER. UPON TYPING "CTRL"
AND A "G" SIMULTANEOUSLY THE KEYBOARD WILL RESPOND
WITH "^G" AND PRINT THE SWITCH REGISTER QUESTION.
(SEE SECTION 10.5 FOR DETAILS) AT THIS POINT THE OPERATOR
MAY CAHNGE THE ALUE OF THE PSEUDO SWITCHES OR TYPE A
TERMINATING CHARACTER. IN ANY EVENT ONLY THE PSEUDO
SWITCH REGISTER IS CHANGE. IT HAS NO EFFECT UPON THE
HARDWARE SWITCHES.

10.5   SWITCH REGISTER MESSAGE

          THIS MESSAGE IS USED TO SETUP THE PSEUDO SWITCH REGISTER
          BEFORE PROGRAM EXECUTION TAKES PLACE OR TYPING A CONTROL G.
          THE PSEUDO SWITCH REGISTER IS SET UP UPON TYPING A TERMINATOR
          THE TERMINATORS ARE AS FOLLOWS:

                  <CR> CARRIAGE RETURN: THIS CAUSES THE PROGRAM TO FESUME
                                             TESTING FORM WHERE IT LEFT OFF.

                  <LF> LINEFEED: THIS CAUSES THE PROGRAM TO RESTART
                                             THE TESTING FROM THE BEGINNING.

          ****
          SR=0000 4000<CR>   CARRIAGE RET 'N
                  --------   PROGRAM RESUMES TESTING FROM
                                             POINT OF INTERRUPTION.

          SR=0000 4000<LF>   LINEFEED
                  --------   CAUSES PROGRAM TO RESTART.

          UNDER SCORING INDICATES OPERATOR RESPONSE

10.6   ERRORS

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

10.7   SWITCH REGISTER SETTINGS

          THE STANDARD SWITCH SETTINGS AS DESCRIBED IN SECTION 5
          OF THIS DOCUMENT WILL BE USED.

10.8   PARAMETER CONTROL WORDS
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          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 002

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

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7-11                        8A MEMORY SIZE EX. 1K=00
                                               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

11.0. NON CONSOLE TERMINAL SYSTEM ADDENDUM

11.1. DESCRIPTION

THE PROGRAM HAS BEEN MODIFIED TO RUN WITHOUT A CONSOLE TERMINAL
BY MEANS OF A SPECIAL STARTING ADDRESS AND OPERATING PROCEDURES.
THIS ALLOWS THE DIAGNOSTIC TO BE RUN ON THOSE SYSTEMS WITHOUT A
CONSOLE TERMINAL. ALL ERRORS AND FIELD LIMIT CHANGES WILL RESULT
IN A HALT OR HALTS INSTEAD OF TYPEOUTS ON THE CONSOLE TERMINAL.

11.2. RESTRICTIONS

1.   IF THE CONSOLE PACKAGE WAS ENABLED, THE PROGRAM WILL DISABLE
        IT AT THE START OF THE PROGRAM.

2.   FIELD LIMITS MUST BE SET AT PROGRAM START. OTHERWISE, THE
        PROGRAM WILL HALT TO ALLOW THE OPERATOR TO SET THE FIELD

LIMITS IN THE SWITCH REGISTER.

3.   TO RUN THIS PROGRAM, A MINIMUM OF 8K OF MEMORY IS REQUIRED.

4.   MEMORIES TO BE TESTED MUST BE IN SEQUENTIAL ORDER STARTING AT
       FIELD 0.

11.3   INITIALIZATION

THE PROGRAM WHEN LOADED IS INITIALIZED TO USE THE HARDWARE SWITCH
REGISTER. IF NO HARDWARE SWITCH REGISTER IS AVAILABLE, DO THE FOLLOWING
TO DISABLE THE SWITCH REGISTER SELECTION FROM HARDWARE TO A
SOFTWARE PSEUDO SWITCH REGISTER (LOCATION 0020).

1.   SET BIT 0 EQUAL TO A 0 IN LOCATION 21 TO INDICATE TO
       THE PROGRAM THAT LOCATION 20 WILL BE USED AS THE PSEUDO
       SWITCH REGISTER. THE PROGRAM WHEN STARTED WILL THEN SET THE
       PSEUDO SWITCH REGISTER TO FIELD LIMITS FOR A NORMAL SYSTEM
       STARTUP. PSEUDO SWITCH REGISTER WILL EQUAL XX00 WHERE XX
       EQUALS SWITCH REGISTER BITS, PREVIOUSLY SET, 0 EQUALS STARTING
       FIELD LIMIT AND 7 EQUALS ENDING FIELD LIMITS.

       IF IT IS DESIRED TO INITIALIZE THE FIELD LIMITS TO OTHER
       THAN THE ABOVE DO THE NEXT STEP.

2.   SET LOCATION 0021 TO 00XX WHERE XX IS THE MEMORY
       SIZE IN 4K INCREMENTS.

11.4   OPERATING PROCEDURES

TO START THE PROGRAM:

A.   SET THE IF AND DF TO THE FIELD THAT CONTAINS THE PROGRAM

B.   LOAD ADDRESS TO 0201

C.   IF THE HARDWARE SWITCH REGISTER IS USED, SET THE SWITCH REGISTER
     TO 0037.

D.   PRESS "INIT" AND THEN "RUN".

E.   THE PROGRAM WILL AGAIN HALT. AT THIS TIME SELECT THE DESIRED
     TEST PARAMETERS.

F.   PRESS "INIT" AND "RUN".

G.   THE PROGRAM WIL NOW RUN UNTILL AN ERROR IS ENCOUNTERED OR A
     SWITCH REGISTER OPTION IS SELECTED TO CAUSE THE PROGRAM TO
     HALT   REFER TO LISTING FOR ALL HALTS.

H.   SETTING THE SWITCH REGISTER TO 0100, WILL CAUSE THE PROGRAM
     TO HALT AFTER THE CURRENT TEST-REFER TO LISTING FOR HALT.

I.   SETTING THE SWITCH REGISTER TO 0200 WILL CAUSE THE PROGRAM
     TO HALT FOR FIELD LIMIT CHANGES VIA THE SWITCH REGISTER.
     REFER TO LISTING FOR ADDRESS OF THE HALT.

11.5   SWITCH REGISTER SETTINGS

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SR0=1	HALT AFTER ERROR
SR1=1	INHIBIT ERROR HALTS EXCEPT HALT AFTER ERROR SWITCH
SR2=1	INHIBIT OPERATION OF SR0 AND SR1
SR3=1	INHIBIT PROGRAM RELOCATION
SR4=1	HALT PROGRAM FOR FIELD LIMIT CHANGES
SR5=1	HALT AFTER CURRENT TEST

11.6   ERRORS

ALL ERRORS ENCOUNTERED WILL RESULT IN A ERROR HALT WITH
ERROR INFORMATION IN THE AC. REFER TO THE LISTING FOR THE TYPE OF
ERROR HALT AND GO TO THE APPROPRIATE PARAGRAPH BELOW.

A TEST ERROR WILL OCCUR ANYTIME THE DATA WRITTEN DOES NOT
MATCH THE DATA READ. A RELOCATION ERROR WILL OCCUR IF
THE RELOCATION COMPARISON CHECK FAILS.

11.7   TEST ERROR HALTS

FOR ERRORS ENCOUNTERED TESTING MEMORIES, THE PROGRAM WILL
HALT WITH PERTINENT INFORMATION IN THE AC. REFER
TO THE STEPS BELOW FOR THE TEST ERROR INFORMATION

A. PRESS "CONT". THE PROGRAM WILL HALT AT 3115 WITH THE
    AC EQUAL TO THE PROGRAM ADDRESS OF THE ERROR JMS.

B. PRESS "CONT". THE PROGRAM WILL HALT AT 3121 WITH THE
    CONTENTS OF AC BITS 7,8,9,10 AND 11 EQUAL TO THE FIELD BEING TESTED.

C. PRESS "CONT". THE PROGRAM WILL HALT AT 3124 WITH THE AC
    EQUAL TO THE FAILING ADDRESS IN THE FIELD BEING TESTED.

D. PRESS "CONT". THE PROGRAM WILL HALT AT 3127 WITH THE AC
    EQUAL TO THE EXPECTED DATA THAT WAS PUT INTO THE FAILING
    ADDRESS.

E. PRESS "CONT". THE PROGRAM WILL HALT AT 3132 WITH THE
    AC EQUAL TO THE ACTUAL DATA THAT WAS READ FROM THE
    FAILING ADDRESS.

F. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3136
    WITH THE PATTERN NUMBER IN THE AC. THE PATTERN NUMBER
    CORRESPONDS TO THE PATTERNS BELOW.

    AC=0 - NO TEST PATTERN
    AC=1 - BASIC ALL 0'S PATTERN
    AC=2 - BASIC ALL 1'S PATTERN
    AC=3 - 0000-7777 WCP PATTERN
    AC=4 - 7777-0000 WCP PATTERN
    AC=5 - 2525-5252 WCP PATTERN
    AC=6 - 5252-2525 WCP PATTERN

H. PRESS "CONT" TO CONTINUE THE PROGRAM ON TO THE NEXT
    SEQUENTIAL TEST MEMORY ADDRESS.

I. ERROR HALTS MAY BE INHIBITED BY SETTING SR1 TO A 1

11.8   RELOCA..ON E'ROR HALTS

ALL RELOCATION ERRORS WILL RESULT IN A HALT WITH
PERTINENT INFORMATION IN THE AC. REFER TO THE STEPS
BELOW FOR THE ERROR INFORMATION.

A. THE PROGRAM WILL HALT AT ADDRESS 2735 WITH
    THE CONTENTS OF THE AC EQUAL TO THE PROGRAM LOCATION
    OF TI :. ERROR JMS.

B. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESSS 2741 WITH
    THE CONTENTS OF AC BITS 7,8,9,10, AND 11 EQUAL TO THE
    FIELD THAT PROGRAM TRIED TO PUT THE INSTRUCTION INTO.

C. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 2744 WITH
    THE CONTENTS OF AC EQUAL TO THE LOCATION IN THE FAILING
    FIELD IN ERROR.

D. PRESSING "CONTINUE" AGAIN WILL RESULT IN THE PROGRAM CONTINUING
    WITH THE NEXT SEQUENTIAL MEMORY LOCATION.

11.9   PARITY ERROR HALTS

IF THE SYSTEM CONTAINS A PARITY OPTION, THE INTERRUPT WILL BE
TURNED ON TO ALLOW PARITY ERRORS WHEN THE PROGRAM IS EXECUTING
FROM FIELD 0. THERE ARE 3 TYPES OF FAILURES UNDER THIS ERROR,
REFER TO THE APPROPRIATE PARAGRAPH BELOW FOR THE FAILING ADDRESS.

11.9.1   PARITY ERROR

A. THE PROGRAM WILL HALT AT ADDRESS 3355 WITH THE CONTENTS
    OF THE AC EQUAL TO THE INTERRUPTED PC.

B. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3361 WITH
    THE CONTENTS OF THE AC EQUAL TO THE DATA FIELD AT THE
    TIME OF THE PARITY ERROR.

C. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3364 WITH
    THE CONTENTS OF THE AC EQUAL TO THE ADDRESS IN THE TEST
    FIELD BEING TESTED.

D. PRESS "CONT". THE PROGRAM WILL HALT AT ADDRESS 3136 WITH
    THE CONTENTS OF THE AC EQUAL TO THE PATTERN NUMBER. REFER
    TO STEP G FOR PATTERN BEING EXECUTED IN SECTION 11.7.

E. PRESS "CONT". THE PROGRAM WILL CONTINUE UNTIL ANOTHER
    ERROR IS ENCOUNTERED OR THE PROGRAM IS STOPPED.

11.9.2   INTERRUPT FROM KEYBOARD

THE PROGRAM WILL HALT AT ADDRESS 3404. THIS SIGNIFIES THAT
THE PROGRAM DETECTED A PARITY OPTION AND TURNED THE
INTERRUPT ON. UPON TURNING THE INTERRUPT ON, A INTERRUPT
WAS RECEIVED FROM THE CONSOLE TERMINAL. TO _COVER FROM
THIS ERROR PRESS CONTINUE.

11.9.3 UNWANTED INTERRUPT OCCURRED

THE PROGRAM WILL HALT AT ADDRESS 3425 FOR THIS ERROR. THIS
ERROR SIGNIFIES THAT AN INTERRUPT OCCURED FROM SOME
OTHER DEVICE THAN THE PARITY OPTION OR THE CONSOLE
KEYBOARD. PRESS "CONTINUE" TO RECOVER FROM THIS ERROR.

12.0   APT HOOKS

12.1   DESCRIPTION

THE APT INTERFACES PROVIDES A MEANS OF COMMUNICATING WITH THE
APT MOTHER AND THE SYSTEM UNDER TEST. IT FURTHER PROVIDES A MEANS
OF LOADING DIAGNOSTICS.

TWO INTERFACES ARE PROVIDED FOR THIS COMMUNICATION. THEY ARE:

1.   TIMING
2.   ERROR REPORTING

EACH WILL BE DESCRIBED AT A LATER TIME.

12.2   APT INITIALIZATION
SHOULD BIT ZERO OF HCW2(ADDRESS 22) BE SET TO A ONE(1), APT IS
ASSUMED TO BE PRESENT. THE PROGRAM WILL SET THE PSEUDO-SWITCH
REGISTER TO 0037 AND THE NOTTY INDICATOR IS SET SO AS TO DISABLE
ALL TERMINAL COMMUNICATION. AT THIS POINT AN EXIT BACK TO MAIN
LINE C. E TO DETERMINE IF A KT8-A IS PRESENT IN THE SYSTEM.
AFTER DETERMINING THIS THE PROGRAM WILL AUTO-SIZE MEMORY AND
SET UP THE APPROPRIATE FIELD STATUS BITS. AFTER AUTO-
SIZING MEMORY THE CONTENTS OF FIELD 7, ADDRESSES 6000-7777
ARE MOVED TO FIELD ZERO.

SHOULD LESS THAN 32K OF MEMORY BE FOUND BANK ZERO FIELD 7
OF THE FIELD STATUS WORDS IS SET SO AS NOT TO ENABLE TESTING
FIELD 7 OF BANK ZERO.

FROM THIS POINT ON ALL APT INTERFACING IS DONE FROM THE PROGRAM
FIELD. THIS ALLOWS TEST OF A FULL 32 K SYSTEM. IT ALSO PROVIDES
A MEANS OF TESTING UPTO 128K OF MEMORY.

12.3   APT INTERFACES

12.3.1   TIMING

THE TIMING INTERFACE PROVIDES THE NECESSARY INFORMATION TO
THAT THE DIAGNOSTIC IS RUNNING ERROR FREE. THE TIME INTERVAL IS
BETWEEN 2 AND 5 SECONDS.

12.3.2 ERRORS

THE ERROR INFORMATION THAT IS PASSED TO THE APT HOST
CONSISTS OF THE FIELD THE PROGRAM IS CURRENTLY IN AND THE PC OF
THE ERROR CALL.

                    NOTE:
              IT SHOULD BE NOTED THAT THIS PROGRAM NO LONGER
              SUPPORTS THE APT PROM. THE NEW INTERFACE MUST
              BE USED. THE NEW INTERFACE CONSITS OF A BOOT ROM TO LOAD
              IN THE ACTUAL ROM CODE FOR APT
              INTO MEMORY. IF FIELD 7 IS NOT PRESENT THEN THE MS8-A
              MUST BE USED IN PLACE OF MEMORY.

```
     1                      /PDP-8E EXTENDED MEMORY DATA AND CHECKERBOARD TEST
     2                      /
     3                      /
     4                      /MAINDEC-08-DHMMA-C-D
     5                      /
     6                      /COPYRIGHT (C) 1972, 1975, 1976 DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. 01754
     7                      /PROGRAMMER, VERNON FREY
     8
     9
    10                      /
    11                      /
    12                      /SR00=1           HALT AFTER ERROR
    13                      /SR01=1           INHIBIT ERROR TYPEOUT
    14                      /SR02=1           BELL ON ERROR (USEFUL FOR MAINTENANCE)
    15                      /SR03=1           INHIBIT PROGRAM RELOCATION
    16                      /SR04=1           CHANGE FIELD LIMITS
    17                      /SR05=1           HALT AFTER CURRENT TEST
    18                      /
    19                      /
    20                      /PROGRAM STARTING ADDRESS
    21                      /0200
    22                      /
    23                      /
    24                      /V=CRO
    25                      /
    26
    27                      /DEFINE NPAGE
    28                      /<        JMP I   (.+200&7600>
    29                      /
    30                      /PDP-8E IOT COMMANDS & MICRO INSTRUCTIONS
    31                      /
    32                      /  EXPANDED MODE COMMANDS USED IN THIS TEST
    33          6264        CDF=6264
    34          6274        SDF=6274
    35          0001        KIBA=1
    36          8200        LAM=    8200                    /LOAD EXPANDED MODE REGISTER.
    37          8230        PEM=    8230
    38          8260        LLS=    8260
    39          8240        LRA=    8240
    40          8250        RRA=    8250
    41          8203        CDI=8203                        /CHANGE TO DF & IF 0
    42          6107        SPO=6107                        /SKIP ON PARITY OPTION
    43          8101        SMP=8101                        /SKIP IF NO PARITY ERROR
    44          8104        CVP=8104                        /CLEAR PARITY ERROR FLAG
    45          6004        GTF=6004                        /GET INTERRUPT FLAGS
    46          6005        RTF=6005                        /RESTORE INTERRUPT FLAGS
    47          7701        ACL=7701                        /LOAD MQ INTO AC
    48          7002        SWA=7002                        /SWAP BYTES IN AC
    49          7421        MQL=7421                        /LOAD MQ FROM AC THEN CLR AC
    50          7521        SWP=7521                        /SWAP AC AND MQ
    51          6000        SKON=6000                       /SKIP IF INTERRUPT ON, & TURN OFF
    52          6007        CAF=6007                        /CLEAR ALL FLAGS
    53
    54
    55          0000        *0
```

```
    56   0000  0204               *0                        /INTERRUPT ADDRESS
    57   0001  3074               DCA   SAC                  /SAVE AC
    58   0002  7701               ACL
    59   0003  3075               DCA   SMQ                  /SAVE MQ
    60   0004  5777'              JMP   INTRCU
    61
    62
    63   0005  5600     IAPTER, APTER                        /APT/
    64   0006  1652     IAPTCK, APTCK                        /APT/
    65
    66
    67         0020               *20
    68
    69
    70   0020  0007     PSR,      7                          /APT/
    71  .0021  4000     MCA1,     4000                       /APT/
    72   0022  0000     MCA2,     0                          /APT/
    73
    74   0023  0000     IWMODE,  0
    75                  /
    76                  /PAGE 0 CONSTANTS AND POINTERS
    77                  /
    78   0024  0000     BANK,    0
    79   0025  0000     EMFLAG, 0
    80   0026  4000     SR00,    4000                  /HALT AFTER ERROR
    81   0027  2000     SR01,    2000                  /INHIBIT ERROR TYPEOUT
    82   0030  1000     SR02,    1000                  /BELL ON ERROR
    83   0031  0400     SR03,    400                   /INHIBIT PROGRAM RELOCATION
    84   0032  0200     SR04,    200                   /CHANGE FIELD LIMITS
    85   0033  0100     SR05,    100                   /HALT AFTER CURRENT TEST
    86   0034  0070     SR98,    70                    /STARTING FIELD (0-7)
    87   0035  0007     SR911,   7                     /ENDING FIELD (0-7)
    88   0036  0000     CS,      0                     /COMPLEMENT STATUS
    89                                                 /0000=NO (NO COMPLEMENT)
    90                                                 /BIT 1=1C (ONE COMPLEMENT)
    91                                                 /BIT 2=2C (TWO COMPLEMENTS)
    92   0037  0000     TS,      0                     /TEST STATUS
    93                                                 /0000=NO TEST
    94                                                 /BIT 0=ALL ZEROS TEST
    95                                                 /BIT 1=ALL ONES TEST
    96                                                 /BIT 2 = 0000-7777 MCB TEST
    97                                                 /BIT 3 = 7777-0000 MCB TEST
    98                                                 /BIT 4 = 2525-5252 MCB TEST
    99                                                 /BIT 5 = 5252-2525 MCB TEST
   100                                                 /BIT 6= MARCH PATTERN
   101   0040  0000     FS,      0                     /FIELD STATUS BANK0
   102   0041  0000     FS1,     0                     /FIELD STATUS BANK 1
   103   0042  0000     FS2,     0                     /FIELD STATUS BANK 2
   104   0043  0000     FS3,     0                     /FIELD STATUS BANK 3
   105                                                 /BITS 0-7 COINCIDE WITH FIELDS
   106                                                 /0-7. FOR EACH FIELD NOT IN
   107                                                 /THE SYSTEM THE EQUIVALENT BIT
   108                                                 /IS SET.
   109   0044  0000     RS,      0                     /RELOCATION STATUS BANK 0
   110   0045  0000     RS1,     0                     /RELOCATION STATUS BANK1
```

```
111    0046  0000    RS2,    0               /RELOCATION STATUS BANK 2
112    0047  0000    RS3,    0               /RELOCATION STATUS BANK 3
113                                           /BITS 0-7 COINCIDE WITH FIELDS
114                                           /0-7. RS IS XFERRED INTO AS.
115                                           /EACH FIELD THAT FAILS SETS THE
116                                           /EQUIVALENT BIT SO THAT PROGRAM
117                                           /WILL NOT RELOCATE TO A FAILING FIELD.
118    0050  0000    CRELO,  0               /0 = INHIBIT PROGRAM RELOCATION
119    0051  0000    PROFLD, 0               /PROGRAM IN FIELD 00X0
120    0052  0000    TSTFLD  0               /TESTING FIELD 00X0
121    0053  0000    COUNT,  0               /MOVE ERROR COUNTER
122    0054  0000    MOVE,   0               /MOVE ADDRESS COUNTER
123    0055  0000    HEAD1,  0               /7777 MEANS TYPEOUT ERROR HEADING
124    0056  0000    TEMP,   0               /TEMP STORAGE LOCATION
125    0057  0000    TSTAD,  0               /TEST ADDRESS COUNTER
126    0060  0000    FCNT,   0               /COUNT # OF FIELDS PRESENT
127    0061  0000    RELCNT, 0               /END OF PASS COUNTER.
128    0062  0000    STARTF, 0               /STARTING FIELD 00X0
129    0063  0000    ENDF,   0               /ENDING FIELD 00X0
130    0064  0000    INSAME, 0               /PROGRAM IN SELECTED FIELD
131    0065  0000    LEGALD, 0               /LEGAL FIELD SELECTION CONTROL
132    0066  0000    A,      0               /A REG TO WRITE/READ
133    0067  0000    B,      0               /B REG TO WRITE/READ
134    0070  0000    P2,     0               /CONTROLS 2 PAGES
135    0071  0000    W4,     0               /CONTROLS 4 WORDS
136    0072  0000    GDATA,  0               /GOOD DATA = DATA WRITTEN
137    0073  0000    BDATA,  0               /BAD DATA = DATA READ
138    0074  0000    SAC,    0               /SAVE AC (INT)
139    0075  0000    SMQ,    0               /SAVE MQ (INT)
140    0076  0000    NOTTY,  0               /PROGRAM FLAG FOR NO TELETYPE TO ABORT PRINTOUTS
141    0077  0000    NUMFLO, 0               /NUMBER OF FIELDS BEING TESTED.
142    0100  0000    FIVE,   0               /THIS IS NOW 15 MINUTE COUNTER
143    0101  6570    MINS,   6570
144
145
146
147
148          4502    ENDHLT=JMS I    .
149    0102  0341            XENDHL
150          4502    PRINT=JMS I     .               /END OF TEST LAS
151    0103  5400            XPRINT
152          4504    GETSR=JMS I     .
153    0104  4747            XGETSR
154          4505    CBCAL=JMS I     .
155    0105  4723            XCBCAL
156          4506    SETFS=JMS I     .
157    0106  0522            XSETFS
158          4507    SETRS=JMS I     .
159    0107  0632            XSETRS
160          4510    RACA=JMS I      .
161    0110  5117            XRACA
162          4511    RACB=JMS I      .
163    0111  5142            XRACB
164
165          0200    *200
```

```
166
167
168    0200  5325            JMP     START+1
169    0201  5324            JMP     START         /APT/200 = START ADDRESS.
170                                                /STARTING ADDRESS IF NO TTY AVAILABLE
171    0202  4251            JMS     DFEIF
172    0203  7410            SKP                   /202 = RESTART ADDRESS
173
174    0204  4277'           JMS     TITLE         /TYPEOUT PROG TITLE
175    0205  6002    PATA,   IOF
176    0206  1376            TAD     (7200
177    0207  6200            LXM                   /LOAD EXPANDED MODE REGISTER
178    0210  7200            CLA                   /MAKE SURE AC CLEAR
179    0211  6230            REM
180    0212  7710            SPA CLA               /SKIP IF KT8A NOT ENABLED
181    0213  7340            CLL CLA CMA
182    0214  3025            DCA     EXMFLG        /SET KT8A ACTTV
183    0215  4775'           JMS     PNTOPT
184    0216  4774'           JMS     SETSW         /SETUP SR
185    0217  3036            DCA     CS
186    0220  3037            DCA     TS
187    0221  3040            DCA     FS
188    0222  3044            DCA     RS
189    0223  7240            STA
190    0224  3050            DCA     CRELO         /CLEAR INH RELO
191    0225  3057            DCA     TSTAD         /CLEAR TEST ADDRESS COUNTER
192    0226  1101            TAD     MINS          /SET UP COUNTER
193    0227  3100            DCA     FIVE
194    0230  7240            STA
195    0231  3055            DCA     HEAD1         /RESET ERROR HEADING
196    0232  4773'           JMS     FSSET         /SET FIELD STATUS & TYPE SELECTION
197    0233  4772'           JMS     APTFL
198    0234  7240            STA                   /AC=-1
199    0235  1060            TAD     FCNT          /-1 TO FIELDS IN SYSTEM
200    0236  3060            DCA     FCNT
201    0237  4771'           JMS     LEGAL         /CHECK FOR LEGAL FIELD SELECTION
202    0240  1077            TAD     NUMFLO        /SET UP PASS COUNTER
203    0241  7041            CIA                   /NEGATE IT
204    0242  3061            DCA     RELCNT        /SAVE IT.
205    0243  1050            TAD     CRELO
206    0244  7650            SNA CLA
207    0245  5261            JMP     PATM
208    0246  4770'           JMS     CSR03         /NO RELOCATE & TEST ONLY 1 FIELD
209    0247  5301            JMP     PATO          /RELOCATION PROGRAM
210    0250  5270            JMP     PATN          /INHIBIT PROGRAM RELOCATION
211
212
213                 /
214                 /MAKE OF = 1F
215                 /
216    0251  0000    DFEIF,  0
217    0252  6002            IOF
218    0253  7300            CLA CLL
219    0254  6224            RIF
220    0255  1176            TAD     (6201
```

```
221   0256  3257          DCA    .-1
222   0257  6201          CDF    0
223   0260  5851          JMP I  DFEIF
224
225
226                 /
227                 /NO PROGRAM RELOCATION AND TEST ONLY 1 FIELD
228                 /
229   0261  6224   PATM,   RIF
230   0262  3051           DCA    PROFLD
231
232   0263  4767'          JMS    PNOREL        /TYPEOUT NO RELOCATION
233   0264  4766'  PATMO,  JMS    TEST
234
235   0265  4502           ENDHLT               /TEST FOR END OF PASS INFORMATION
236   0266  5205           JMP    PATA          /YES
237
238
239   0267  5264           JMP    PATMO         /NO
240
241
242                 /
243                 /NO PROGRAM RELOCATION BUT TEST ALL SELECTED FIELDS
244                 /
245   0270  6224   PATN,   RIF
246   0271  3051           DCA    PROFLD
247
248   0272  4767'          JMS    PNOREL        /TYPEOUT NO RELOCATION
249   0273  4766'  PATNO,  JMS    TEST
250
251   0274  4502           ENDHLT               /TEST FOR END OF PASS INFORMATION
252   0275  5205           JMP    PATA          /YES
253
254   0276  4773'          JMS    CSR03         /NO
255   0277  5301           JMP    PATO          /RELOCATE PROGRAM
256   0300  5273           JMP    PATNO         /CONTINUE
257
258
259                 /
260                 /CHECK ALL SELECTED FIELDS FROM EACH SELECTED FIELD
261                 /
262   0301  6224   PATO,   RIF
263   0302  3051           DCA    PROFLD
264   0303  1040           TAD    FS
265   0304  3044           DCA    RS
266   0305  1041           TAD    FS1           /SETUP RELO STATUS
267   0306  3045           DCA    RS1
268   0307  1042           TAD    FS2
269   0310  3046           DCA    RS2
270   0311  1043           TAD    FS3
271   0312  3047           DCA    RS3
272
273   0313  4765'          JMS    PREL          /TYPEOUT RELOCATION
274   0314  4766'  PATOO,  JMS    TEST
275
```

```
276   0315  4502           ENDHLT               /TEST FOR END OF PASS INFORMATION
277   0316  5205           JMP    PATA          /YES
278
279   0317  4770'          JMS    CSR03         /NO
280   0320  7410           SKP
281   0321  5270           JMP    PATN          /INHIBIT PROGRAM RELOCATION
282   0322  4764'          JMS    SETREL        /GO TEST RELOCATION
283   0323  5314           JMP    PATOO         /CONTINUE
284
285
286   0324  5334   START,  JMP    .+10
287   0325  3076           DCA    NOTTY
288   0326  4763'          JMS    A9TI2         /GO SETUP MEMORY SIZE FROM PSR OR SR
289   0327  1076           TAD    NOTTY         /GET TTY FLAG
290   0330  7650           SNA    CLA           /TTY AVAILABLE
291   0331  5204           JMP    PATA-1        /YES GO PRINT TITLE
292   0332  6002           IOF                  /NO, TURN THE INTERRUPT OFF
293   0333  5205           JMP    PATA          /GO START WITHOUT TITLE
294   0334  1022           TAD    MCW2          /GET HARDWARE WORD 2
295   0335  0363           AND    (7377         /MASK OUT CLB BIT
296   0336  3022           DCA    MCW2
297   0337  7240           CLA    CMA
298   0340  5325           JMP    START+1       /GO SET FLAG FOR NO TELETYPE
299
300                 /
301                 /THIS ROUTINE DETERMINES IF HALT AFTER TEST SELECTED
302                 /AND/OR CHANGE FIELD LIMITS SELECTED
303                 /IF FIELD LIMITS ARE TO CHANGE RETURN CALL +1 IF THEY ARE NOT TO
304                 /CHANGE RETURN CALL +2.
305                 /
306   0341  0000   XENDHL, 0
307   0342  4504           GETSR                /GET CURRENT SWITCH VALUE
308   0343  0033           AND    SR05
309   0344  7650           SNA    CLA           /HALT AFTER TEST
310   0345  5350           JMP    .+3           /SKIP IF HALT AFTER TEST SELECTED
311   0346  4605           COCAL                /DON'T HALT
312   0347  7402           HLT                  /TEST FOR ACTIVE CONSOLE
313   0350  4504           GETSR                /NON ACTIVE CONSOLE, JUST HALT
314   0351  0032           AND    SR04          /GET SWITCHS AGAIN
315   0352  7650           SNA    CLA           /ISOLATE CHANGE FIELD LIMITS SWITCH
316   0353  2341           ISZ    XENDHL        /SKIP IF FIELD LIMITS ARE TO CHANGE
317   0354  5741           JMP I  XENDHL
318                 /
319   0362  7377
320   0363  5822
321   0364  0600
322   0365  4154
323   0366  6600
324   0367  4115
325   0370  1607
326   0371  1470
327   0372  5704
328   0373  1615
329   0374  4071
330   0375  1726
```

```
 331   0376  7200
 332   0377  4043
             0400              PAGE
 333                    /DETERMINE WHICH RELOCATION ROUTINE TO USE.
 334                    /
 335   0400  0000    SETREL.  0
 336   0401  1025             TAD    EXMFLG
 337   0402  7710             SZA CLA                 /SKIP IF EXPANDED MODE NOT ENABLED
 338   0403  5234             JMP    KTGREL
 339
 340
 341                    /
 342                    /SETUP TO RELOCATE THE PROGRAM
 343                    /
 344                    /THIS ROUTINE IS USED ONLY IF KM8E OR KM8A FUNCTIONS ARE TO BE TESTED
 345                    /
 346   0404  7200    KM8REL. CLA                     /MAKE SURE AC IS CLEAR
 347   0405  6224             RIF                     /GET INSTRUCITON FIELD OF PROGRAM
 348   0406  3051             DCA    PROFLD           /SAVE THE VALUE
 349   0407  1051             TAD    PROFLD
 350   0410  7112             CLL RTR
 351   0411  7010             RAR                     /MOVE INTO PROPER POSITION
 352   0412  3777*            DCA    FLOCNT
 353   0413  7240             STA
 354   0414  1777*            TAD    FLOCNT
 355   0415  0035             AND    SR011
 356   0416  3777*            DCA    FLOCNT
 357   0417  1777*            TAD    FLOCNT
 358   0420  1376             TAD    (TRSTAB           /ESTABLISH POINTER OF STATUS
 359                                                   /ROUTINE
 360   0421  3056             DCA    TEMP             /SAVE THE POINTER
 361   0422  1456             TAD I  TEMP             /GET ROUTINE TO EXECUTE
 362   0423  3272             DCA    TRS              /AND SAVE IT
 363   0424  4672             JMS I  TRS              /GO TEST STATUS
 364   0425  5213             JMP    KM8REL+7
 365   0426  1777*            TAD    FLOCNT           /SET UP FIELD TO CO
 366   0427  0035             AND    SR011            /ISOLATE  BITS 8-11
 367   0430  7106             CLL RTL
 368   0431  7004             RAL                     /SET UP FOR INSTRUCTION
 369   0432  5263             JMP    CSAME            /GO TEST FOR SAME FIELD
 370                    /
 371   0433  5213             JMP    KM8REL+7
 372                    /
 373                    /
 374                    /THIS ROUTINE WILL TEST THE KT8A FUNCTIONS.
 375                    /
 376   0434  7200    KTGREL. CLA                     /MAKE SURE AC IS CLEAR
 377   0435  6224             RIF                     /GET PROGRAM FIELD
 378   0436  3051             DCA    PROFLD           /AND SAVE IT
 379   0437  1051             TAD    PROFLD
 380   0440  4510             RACA
 381   0441  3777*            DCA    FLOCNT           /SAVE THE BINARY COUNT VALUE OF FIELD
 382   0442  7240             STA
 383   0443  1777*            TAD    FLOCNT
 384   0444  0375             AND    (37
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```
 385   0445  3777*            DCA    FLOCNT
 386   0446  1777*            TAD    FLOCNT           /ADD IN OFFSET
 387   0447  0035             AND    SR011
 388   0450  1376             TAD    (TRSTAB          /GET STARTING ADDRESS OF ROUTINE POINTER
 389   0451  3056             DCA    TEMP             /SAVE THE POINTER ADDRESS
 390   0452  1456             TAD I  TEMP             /GET ACTUAL ROUTINE ADDRESS
 391   0453  3272             DCA    TRS              /SAVE THE ROUTINE ADDRESS
 392   0454  4672             JMS I  TRS              /GO TEST FOR PROPER FIELD SELECTION
 393   0455  5242             JMP    KTGREL+8
 394   0456  1777*            TAD    FLOCNT           /DECREMENT FIELD VALUE
 395   0457  0375             AND    (37              /ISOLATE 5 BITS
 396   0460  4511             RACB                    /REARANGE INTO PROPER FORMAT
 397   0461  5263             JMP    CSAME            /GO TEST FOR VALID FIELD SELECTION
 398   0462  5242             JMP    KTGREL+8
 399                    /
 400   0463  3052    CSAME.   DCA    TSTFLD           /SAVE FIELD VALUE TO TEST
 401   0464  4774*            JMS    SAVE             /PROCFLD=TSTFLD
 402   0465  5600             JMP I  SETREL           /YES
 403   0466  4773*            JMS    RELO             /GO RELOCATE PROGRAM
 404   0467  6224             RIF                     /GET PROGRAM LOCATION
 405   0470  3051             DCA    PROFLD
 406   0471  5600             JMP I  SETREL           /EXIT RELOCATION ROUTINE
 407                    /
 408   0472  0000    TRS.     0                       /STORAGE FOR TEST STAUS ROUTINE
 409   0473  3703    TRSTAB.  TRS0
 410   0474  3712             TRS1
 411   0475  3722             TRS2
 412   0476  3732             TRS3
 413   0477  2743             TRS4
 414   0500  3754             TRS5
 415   0501  3705             TRS6
 416   0502  4000             TRS7
 417                    /
 418                    /
 419                    /TEST COMPLEMENT STATUS
 420                    /RETURN IF NC. RETURN+1 IF 1C. RETURN+2 IF 2C
 421                    /
 422   0503  0000    TCS.     0
 423   0504  7200             CLA
 424   0505  1036             TAD    CS
 425   0506  7450             SNA
 426   0507  5703             JMP I  TCS              /NC
 427   0510  2303             ISZ    TCS
 428   0511  7106             CLL RTL
 429   0512  7430             SZL
 430   0513  5703             JMP I  TCS              /1C
 431   0514  2303             ISZ    TCS
 432   0515  7710             SPA CLA
 433   0516  5703             JMP I  TCS              /2C
 434   0517  0000    APTEOB.  NOP                     /APT/
 435
 436   0520  7402             HLT                     /ERRONEOUS STATUS BITS SET
 437   0521  5320             JMP    .-1
 438                    /
 439                    /SET UP PROPER FIELD STATUS BITS
```

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440                     /
441   0522  0000   ASETFS, 0
442   0523  1777'         TAD    FLOCNT        /GET FIELD TO GO
443   0524  7112          CLL RTR
444   0525  7010          RAR                  /MOVE BANK SELECT INTO POSITION
445   0526  0272          AND    (3
446   0527  1371          TAD    (FS           /ESTABLISH POINTER TO ADDRESS OF STATUS
447   0530  3056          DCA    TEMP          /AND SAVE THE POINTER
448   0531  5722          JMP I  ASETFS        /AND EXIT
449                     /
450                       /ESTABLISH RELOCATION STATUS POINTER
451                     /
452   0532  0000   ASETRS, 0
453   0533  1777'         TAD    FLOCNT        /GET FIELD TO GO
454   0534  7112          CLL RTR
455   0535  7010          RAR
456   0536  0272          AND    (3
457   0537  1371          TAD    (FS
458   0540  3056          DCA    TEMP          /SAVE THE POINTER
459   0541  5732          JMP I  ASETRS
460                     /
461                     /
462   0571  0040
463   0572  0003
464   0573  4200
465   0574  1600
466   0575  C037
467   0576  0073
468   0577  : -6
            CLOO          PAGE
469
470
471                     /
472                       /TEST PATTERN CONTROL
473                     /
474   0800  0000   TEST,  0
475   0601  4777'         JMS    PAR
476   0602  7200          CLA
477   0603  3066          DCA    A
478   0604  3067          DCA    B
479   0605  4776'         JMS    STS0          /ALL ZEROS TEST
480   0606  4253          JMS    TESTO
481   0607  7240          STA
482   0610  3066          DCA    A
483   0611  7240          STA
484   0612  3067          DCA    B
485   0613  4775'         JMS    STS1          /ALL ONES TEST
486   0614  4253          JMS    TESTO
487   0615  7240          STA
488   0616  3067          DCA    B
489   0617  3066          DCA    A
490   0620  4774'         JMS    STS2          /0000-7777 WCP TEST
491   0621  4253          JMS    TESTO
492   0622  7240          STA
493   0623  3066          DCA    A
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494   0624  3067          DCA    B
495   0625  4773'         JMS    STS3          /7777-0000 WCP TEST
496   0626  4253          JMS    TESTO
497   0627  7200          CLA
498   0630  1175          TAD    (2925
499   0631  3066          DCA    A
500   0632  1174          TAD    (5252
501   0633  3067          DCA    B
502   0634  4772'         JMS    STS4          /2525-5252 WCP TEST
503   0635  4253          JMS    TESTO
504   0636  7200          CLA
505   0637  1174          TAD    (5252
506   0640  3066          DCA    A
507   0641  1175          TAD    (2525
508   0642  3067          DCA    B
509   0643  4771'         JMS    STS5          /5252-2525 WCP TEST
510   0644  4253          JMS    TESTO
511   0645  7200          CLA
512   0646  3037          DCA    TS            /CLEAR TEST STATUS
513   0647  6402          IOF
514   0650  4770'         JMS    SOSTST        /GO PERFORM MARCH PATTERN
515   0651  5800          JMP I  TEST
516
517                     /
518                       /TEST ALL FIELDS SELECTED FOR TEST
519                     /
520   0652  5653   KTEST, JMP I  TESTO
521   0653  0000   TESTO, 0
522   0654  3767'         DCA    FLOCNT        /CLEAR FIELD INDICATOR
523   0655  3024          DCA    BANK          /CLEAR BANK VALUE
524   0656  4307          JMS    NUFLD         /GO TEST FOR VALID SELECTION
525   0657  5261          JMP    TOUPD         /NO A VALID FIELD. UPDATE AND TRY AGAIN
526   0660  4766'         JMS    WRFLD         /GO WRITE SELECTED FIELD
527   0661  1767'  TOUPD, TAD    FLOCNT        /COMPLEMENT CURRENT VAALUE
528   0662  7041          CIA
529   0663  1060          TAD    FCNT          /SEE IF AT MAXIMUM FOUND
530   0664  7650          SNA CLA              /SKIP IF NOT AT MAX AVAILABLE
531   0665  5270          JMP    TEST1
532   0666  2767'         ISZ    FLOCNT        /UPDATE FIELD TO GO
533   0667  5256          JMP    TESTO+3       /GO BACK AND TRY NEXT FIELD
534                     /
535                     /
536
537
538   0670  3767'  TEST1, DCA    FLOCNT        /CLEAR FIELD INDICATOR
539   0671  3024          DCA    BANK          /CLEAR BANK INDICATOR
540   0672  4307          JMS    NUFLD
541   0673  5300          JMP    T1UPD
542   0674  4765'         JMS    RDFLD         /READ PATTERN WRITTEN
543   0675  1053          TAD    COUNT         /TEST FOR ANY READ ERRORS
544   0676  7640          SZA CLA
545   0677  4764'         JMS    SETERR        /GO SET UP PROPER ERROR ROUTINE
546   0700  1767'  T1UPD, TAD    FLOCNT        /SET UP TO TEST FOR MAX FIELDS
547   0701  7041          CIA
548   0702  1060          TAD    FCNT          /GET NUMBER OF FIELDS FOUND
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549    0703  7650              SNA CLA                      /SKIP IF NOT AT MAX
550    0704  5763'             JMP     TEST9                /GO ONTO NEXT TEST
551    0705  2767'             ISZ     FLDCNT
552    0706  5272              JMP     TEST1+2              /GO BACK AND DO NEXT VALUE
553                    /
554                    /
555                    /
556                    /
557                    /
558                    /
559                    /THIS ROUTINE DETERMINES IF A VALID FIELD IS SELECTED.
560                    /A VALID SELECTION RETURNS+2
561                    /NON-VALID SELECTION RETURNS +1
562                    /
563    0707  0000      NUFLD,  0
564    0710  1767'             TAD     FLDCNT               /GET FIELD TO TEST
565    0711  0035              AND     SR911                /ISOLATE FIELD
566    0712  1262              TAD     (TFSTA3              /GET TO POINTER OF FIELD STATUS
567    0713  3337              DCA     TFS                  /SAVE THE VALUE
568    0714  1737              TAD I   TFS                  /GET ROUTINE TO EXECUTE
569    0715  3337              DCA     TFS                  /AND SAVE IT
570    0716  4737              JMS I   TFS                  /GO TEST FOR VALID FIELD SELECTION
571    0717  5707              JMP I   NUFLD                /NOT A VALID FIELD
572    0720  1025              TAD     EXMFLG
573    0721  7650              SNA CLA                      /SKIP IF EXPANDED MODE ENABLED
574    0722  5332              JMP     NOEMM
575    0723  1767'             TAD     FLDCNT
576    0724  4511              RACB                         /REARANGE AC INTO PROPER FORMAT
577    0725  3052      SETFLD, DCA     TSTFLD
578    0726  4761'             JMS     SAVE                 /PROFLD=TSTFLD
579    0727  7410              SKP
580    0730  2307              ISZ     NUFLD
581    0731  5707              JMP I   NUFLD                /GOT A VALID FIELD
582                    /
583    0732  1767'     NOEMM,  TAD     FLDCNT
584    0733  0035              AND     SR911                /ISOLATE FIELD TO DO
585    0734  7106              CLL RTL
586    0735  7004              RAL                          /MOVE INTO BITS 6-8
587    0736  5325              JMP     SETFLD               /GO TEST FOR FIELD SELECTION
588                    /
589    0737  0000      TFS,    0
590                    /
591    0740  3600      TFSTAB, TFS0
592    0741  3607              TFS1
593    0742  3617              TFS2
594    0743  3627              TFS3
595    0744  3640              TFS4
596    0745  3651              TFS5
597    0746  3662              TFS6
598    0747  3672              TFS7
599                    /
600                    /
601    0761  1600
602    0762  0743
603    0763  1000
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604    0764  4510
605    0765  1200
606    0766  1005
607    0767  2346
608    0770  5200
609    0771  3262
610    0772  3255
611    0773  3250
612    0774  3243
613    0775  3237
614    0776  3233
615    0777  4267
       1000               PAGE
816                    /
817                    /
818    1000  4504      TEST8,  GETSR
819    1001  0032              AND     SR04
820    1002  7640              SZA CLA                      /CHANGE FIELD LIMITS?
821    1003  5777'             JMP     PATA                 /YES
822
823    1004  5776'             JMP     KTEST
824
825
826                    /
827                    /WRITE A & B REG PATTERN INTO SELECTED FIELD
828                    /
829    1005  0000      WRFLD,  0
830    1006  1173              TAD     (-40
831    1007  3070              DCA     P2                   /WRITE 2 PAGES
832    1010  4241              JMS     WRA                  /WRITE 4 WORDS FROM A REG
833    1011  4263              JMS     WRB                  /WRITE 4 WORDS FROM B REG
834    1012  2070              ISZ     P2
835    1013  5210              JMP     .-3
836    1014  1173              TAD     (-40
837    1015  3070              DCA     P2
838    1016  4263              JMS     WRB
839    1017  4241              JMS     WRA
840    1020  2070              ISZ     P2
841    1021  5216              JMP     .-3
842    1022  1057              TAD     TSTAD
843    1023  7640              SZA CLA
844    1024  5206              JMP     WRFLD+1
845
846    1025  2100              ISZ     FIVE                 /SEE IF READY TO PRINT IS YET
847    1026  5405              JMP I   WRFLD
848    1027  1076              TAD     NOTTY                /GET THE TELETYPE FLAG
849    1030  7710              SPA CLA                      /IS THERE ONE AVAILABLE
850    1031  5605              JMP I   WRFLD                /NO-ABORT THE FIVE MINUTE TYPEOUT
851    1032  1101              TAD     MINS                 /RESET FIFTEEN MINUTE COUNTER
852    1033  3100              DCA     FIVE
853
854    1034  4275'             JMS     MES
855    1035  4543              4543
856    1036  6165              6165                         /TYPE A 1S
857    1037  0000              0000
```

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658    1040   5605          JMP I   WRFLD       /END OF MEMORY REACHED
659    1041   0000   WRA,   0
680    1042   1172          TAD    [-4
681    1043   3071          DCA    N4                   //WRITE 4 WORDS FROM A REG
682    1044   1052          TAD    TSTFLD
683    1045   1176          TAD    [6201
684    1046   3247          DCA    .+1
685    1047   6201          CDF    0                    /TEST DF
686    1050   1136   WRA1,  TAD    A
687    1051   3457          DCA I  TSTAD
668    1052   2057          ISZ    TSTAD
669    1053   7000          NOP
870    1054   2071          ISZ    N4
671    1055   5250          JMP    WRA1
672    1056   1051          TAD    PROFLD               /4 WORDS ARE WRITTEN
673    1057   1176          TAD    [6201
674    1060   3261          DCA    .+1
675    1061   6201          CDF    0                    /PROGRAM DF
676    1062   5441          JMP I  WRA
677    1063   0000   WRB,   0
678    1064   1172          TAD    [-4
879    1065   3071          DCA    N4                   /WRITE 4 WORDS FROM B REG
680    1066   1052          TAD    TSTFLD
681    1067   1176          TAD    [6201
682    1070   3271          DCA    .+1
683    1071   6201          CDF    0                    /TEST DF
684    1072   1067   WRB1,  TAD    B
685    1073   3457          DCA I  TSTAD
686    1074   2057          ISZ    TSTAD
687    1075   7000          NOP
688    1076   2071          ISZ    N4
689    1077   5272          JMP    WRB1
690    1100   1051          TAD    PROFLD               /4 WORDS ARE WRITTEN
691    1101   1176          TAD    [6201
692    1102   3303          DCA    .+1
893    1103   6201          CDF    0                    /PROGRAM DF
694    1104   5663          JMP I  WRB
695
696          /
697          /TYPEOUT FIELDS SELECTED FOR TESTING
698          /
699    1105   0000   TOSEL, 0
700    1106   7346          CLL CLA CMA RTL              /AC=-3
701    1107   3024          DCA    BANK                 /SAVE BANK VALUE
702    1110   1024          TAD    BANK
703    1111   7041          CIA                         /MAKE BANK VALUE POSITIVE
704    1112   7106          CLL RTL
705    1113   7004          RAL                          /SHIFT OVER FOR OTHER ROUTINES
706    1114   3274          DCA    FLDCNT
707    1115   1024          TAD    BANK
708    1116   7041          CIA
709    1117   1171          TAD    [FS                  /ESTABLISH STATUS CONTROL WORD
710    1120   3056          DCA    TEMP
711    1121   1456          TAD I  TEMP                 /GET ADDRESS OF CONTROL WORD
712    1122   1170          TAD    [-7760               /SEE IF THERE IS A FIELD TO DO
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713    1123   7650          SNA CLA                      /IS THIS BANK TO BE TESTED
714    1124   5336          JMP    TOSEL1               /UPDATE BANK SELECT VALUE
715    1125   1024          TAD    BANK
716    1126   7041          CIA
717    1127   1167          TAD    [260                 /MAKE ASCII VALUE FOR BANK NUMBER
718    1130   4773          JMS    TYPE                 /TYPE IT
719    1131   1172          TAD    [*:
720    1132   4773          JMS    TYPE
721    1133   4771          JMS    FLDSEL               /PRINT A+:*
722    1134   1370          TAD    (240
723    1135   4773          JMS    TYPE
724    1136   2024   TOSEL1, ISZ   BANK                 /UPDATE BANK VALUE
725    1137   7000          NOP
726    1140   1024          TAD    BANK
727    1141   7740          SMA SZA CLA                  /SKIP IF LAST BANK NOT DONE
728    1142   5705          JMP I  TOSEL                /EXIT ROUTINE
729    1143   5310          JMP    TOSEL+3              /GO BACK AND TRY AGAIN
730          /
731    1170   0240
732    1171   2102
733    1172   0272
734    1173   5025
735    1174   2346
736    1175   2240
737    1176   0652
738    1177   0205
       1200          PAGE
739
740          /
741          /READ & TEST A & B REG PATTERN FROM SELECTED FIELD
742          /
743    1200   0000   RDFLD, 0
744
745    1201   4406          JMS I  IAPTOK               /APT/
746
747    1202   7200          CLA
748    1203   1052          TAD    TSTFLD
749    1204   1176          TAD    [6201
750    1205   3210          DCA    RDA2
751    1206   1210          TAD    RDA2
752    1207   3262          DCA    RD93
753    1210   6201   RDA2,  CDF    0                    /TEST DF
754    1211   1166          TAD    [-100
755    1212   3070          DCA    P2                   /READ & TEST 2 PAGES
756    1213   1172   RDFLDA, TAD   [-4
757    1214   3071          DCA    N4                   /READ & TEST 4 WORDS
758    1215   3036   RDAC,  DCA    CS                   /NO COMPLEMENT
759    1216   4327          JMS    READ
760    1217   7041          CIA
761    1220   1066          TAD    A
762    1221   7440          SZA
763
764    1222   4777          JMS    ERRA                 /A REG ERROR - NC
765    1223   4327          JMS    READ
766    1224   7040          CMA
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767   1225   3457           DCA I   TSTAD
768   1226   4776*          JMS     SCS1            /1 COMPLEMENT
769   1227   4327           JMS     READ
770   1230   7001           IAC
771   1231   1066           TAD     A
772   1232   7440           SZA
773
774   1233   4775*          JMS     ERRA1
775   1234   4327           JMS     READ
776   1235   7040           CMA
777   1236   3457           DCA I   TSTAD
778   1237   4774*          JMS     SCS2            /2 COMPLEMENTS
779   1240   4327           JMS     READ
780   1241   7041           CIA
781   1242   1066           TAD     A
782   1243   7440           SZA
783
784   1244   4777*          JMS     ERRA            /A REG ERROR - 2C
785   1245   3357           ISZ     TSTAD
786   1246   7200           NOP
787   1247   2371           ISZ     X4
788   1250   5215           JMP     RDAC            /COMPLETE 4 WORDS
789   1251   2370           ISZ     P2
790   1252   5266           JMP     RDFLDB          /COMPLETE CURRENT 2 PAGES
791   1253   1051           TAD     PRDFLD
792   1254   1176           TAD     (6201
793   1255   3256           DCA     .+1
794   1256   6*^1           CDF     *               /PROGRAM DF
795   1257   .57           TAD     TSTAD
796   1260   7640           SZA CLA
797   1261   5210           JMP     SC42            /READ ANOTHER 2 PAGES
798   1262   5600           JMP I   RDFLD           /END OF MEMORY REACHED
799
800   1263   6231   RDB2.   CDF     6               /TEST DF
801   1264   1168           TAD     (-100
802   1265   3070           DCA     P2              /READ & TEST 2 PAGES
803   1266   **72   RDFLDB. TAD     (-4             /READ & TEST 4 WORDS
804   1267   3071           DCA     X4
805   1270   2036   RDBC.   DCA     CS              /NO COMPLEMENT
806   1271   4327           JMS     READ
807   1272   7041           CIA
808   1273   1067           TAD     B
809   1274   7440           SZA
810
811   1275   4773*          JMS     ERRB            /B REG ERROR - NC
812   1276   4327           JMS     READ
813   1277   7040           CMA
814   1300   3457           DCA I   TSTAD
815   1301   4776*          JMS     SCS1            /1 COMPLEMENT
816   1302   4327           JMS     READ
817   1303   7001           IAC
818   1304   1067           TAD     B
819   1305   7440           SZA
820
821   1306   4772*          JMS     ERRB1           /B REG ERROR - 1C
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822   1307   4327           JMS     READ
823   1310   7040           CMA
824   1311   3457           DCA I   TSTAD
825   1312   4774*          JMS     SCS2            /2 COMPLEMENTS
826   1313   4327           JMS     READ
827   1314   7041           CIA
828   1315   1067           TAD     B
829   1316   7440           SZA
830
831   1317   4773*          JMS     ERRB            /B REG ERROR - 2C
832   1320   2257           ISZ     TSTAD
833   1321   7000           NOP
834   1322   2071           ISZ     X4
835   1323   5270           JMP     RDBC            /COMPLETE 4 WORDS
836   1324   2070           ISZ     P2
837   1325   5263           JMP     RDFLDA          /COMPLETE CURRENT 2 PAGES
838   1326   5263           JMP     RDB2
839          /
840          /READ TEST ADDRESS SUBROUTINE
841          /
842   1327   0000   READ.   0
843   1330   1457           TAD I   TSTAD
844   1331   1457           TAD I   TSTAD
845   1332   1457           TAD I   TSTAD
846   1333   1457           TAD I   TSTAD
847   1334   1457           TAD I   TSTAD
848   1335   1457           TAD I   TSTAD
849   1336   1457           TAD I   TSTAD
850   1337   1457           TAD I   TSTAD
851   1340   1457           TAD I   TSTAD
852   1341   1457           TAD I   TSTAD
853   1342   1457           TAD I   TSTAD
854   1343   7200           CLA
855   1344   1457           TAD I   TSTAD
856   1345   5727           JMP I   READ
857
858          /
859          /
860          /KEYBOARD INTERRUPT OCCURRED
861          /
862   1346   0000   KBINT.  0
863   1347   1076           TAD     KBTTY           /GET THE TELETYPE FLAG
864   1350   7700           SMA CLA                 /IS THERE A TELETYPE AVAILABLE
865   1351   5234           JMP     .+3             /YES GO PRINT THE ERROR
866   1352   7402           HLT                     /NO, HLT+ INTERRUPTED FROM THE KEY BOARD
867   1353   5164           JMP     KBINTC          /GO CLEAR FLAG AND CONTINUE
868   1354   4771*          JMS     YES
869   1355   4543           TEXT             "%-INT FROM KB"
      1356   1116
      1357   2440
      1360   0662
      1361   1115
      1362   4013
      1363   0200
870   1364   6032   KBINTC. KCC
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871    1365   7???              STA
872    1366   3?5?              DCA       -$4?1
873    1367   57?9              JMP I     KEINT
874
875    1371   224?
876    1372   ?437
877    1373   1426
878    1374   3272
879    1375   ?411
880    1376   3266
881    1377   ?350
              ?400              PAGE
882
883    1400   0000    ERRA.     0
884    1401   7041              CIA
885    1402   1268              TAD       A
886    1403   3073              DCA       GDATA                  /DATA READ
887    1404   1?88              TAD       A
888    1405   4254              JMS       GERRC                  /GO TO ERRC SETUP ROUTINE
889    1406   1?68              TAD       A
890    1407   3457              DCA I     TSTAD                  /RE-WRITE BAD LOCATION
891    1410   5??3              JMP I     ERRA
892    1411   3???    ERRA1.    0
893    1412   3056              DCA       TEMP
894    1413   1068              TAD       L
895    1414   7?40              CMA
896    1415   ?C56              TAD       TEMP
897    1416   3C73              DCA       GDATA                  /DATA READ
898    1417   1C66              TAD       A
899    1420   7C40              CMA
900    1421   4254              JMS       GERRC                  /GO TO ERRC SETUP ROUTINE
901    1422   1C66              TAD       A
902    1423   7C40              CMA
903    1424   3457              DCA I     TSTAD                  /RE-WRITE B'? LOCATION
904    1425   5811              JMP I     ERRA1
905    1426   0000    ERRB.     0
906    1427   7041              CIA
907    1430   1087              TAD       B
908    1431   3073              DCA       GDATA                  /DATA READ
909    1432   1087              TAD       B
910    1433   4254              JMS       GERRC                  /GO TO ERRC SETUP ROUTINE
911    1434   1?87              TAD       9
912    1435   3457              DCA I     TSTAD                  /RE-WRITE BAD LOCATION
913    1436   5626              JMP I     ERRB
914    1437   0300    ERRB1.    0
915    1440   3056              DCA       TEMP
916    1441   1087              TAD       B
917    1442   7?40              CMA
918    1443   ?6               TAD       TEMP
919    1444   ?C73              DCA       GDATA                  /DATA READ
920    1445   1087              TAD       B
921    1446   7C4?              CMA
922    1447   4254              JMS       GERRC                  /GO TO ERRC SETUP ROUTINE
923    1450   1C67              TAD       L
924    1451   7040              CMA
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925    1452   3457              DCA I     TSTAD
926    1453   5637              JMP I     ERRB1
927    1454   0000    GERRC.    0                                /GO TO ERRC
928    1455   3072              DCA       GDATA                  /DATA WRITTEN
929    1456   1051              TAD       PRGFLD
930    1457   1176              TAD       (6231
931    1460   3461              DCA       .+1
932    1461   6201              CDF       0
933    1462   4777?             JMS       ERRC                   /PROGRAM DF
934    1463   1052              TAD       TSTFLD                 /DATA OR CHKBD ERROR
935    1464   1176              TAD       (6231
936    1465   3288              DCA       .+1
937    1466   6201              CDF       0                      /TEST DF
938    1467   5634              JMP I     GERRC
939
940                    /
941                    /CHECK FOR LEGAL FIELD SELECTION
942                    /
943    1470   0CC0    LEGAL.    0
944    1471   72?C              CLA CLL
945    1472   3C64              DCA       INSAVE                 /SAVE FIELD CONTROL
946    1473   7344              CLL CLA CMA RAL                  /AC=-2
947    1474   3056              DCA       LEGALO                 /LEGAL SELECTION CONTROL
948    1475   3?52              DCA       TSTFLD
949    1476   1?26              TAD       E?V?LG                 /GET XTEA INDICATOR
950    1477   7650              SNA CLA                          /SKIP IF ACTIVE
951    1500   5??3              JMP       ?CEM3
952    1501   3?76'             DCA       F?D?N?                 /START WITH FIELD 0
953    1502   ??1              JMS       ??LFLD
954    1503   ?340              JMS       LEGALA                 /VALID FIELD SELECTION
955    1504   2?79'             ISZ       F?D?N?                 /UPDATE PATTERN
956    1505   1?78'             TAD       F?D?N?
957    1506   4611              JMS?      ??C3                   /REARRANGE INTO PROPER CONFIGURATION
958    1507   3C32              DCA       T?TFLD                 /AND THE TMP NEW VALUE
959    1510   1?76'             TAD       F?D?N?
960    1511   0?75              AND       137                    /ISOLATE FIELD
961    1512   7440              SZA CLA                          /SKIP IF RETURNED TO ZERO
962    1513   53?2              JMP       .-11
963    1514   2?85    ILEGAL.   ISZ       LEGALO                 /GO BACKA ND TRY AGAIN
964    1515   5?74'             JMP       ?CFLD                  /NO FIELD SELECTION
965    1516   1?64              TAD       INSAVE
966    1517   7?40              SZA CLA
967    1520   5?73'             JMP       ?I?F                   /PROG IN SELECTED FIELD
968    1521   3?56              DCA       CFELD                  /ONLY 1 FIELD SELECTED
969    1522   5?70              JMP I     LEGAL
970                    /
971                    /KTE3 FUNCTIONS
972                    /
973    1523   3?76'   ?CEM3.    DCA       F?D?N?                 /START WITH FIELD ZERO
974    1524   4?51              JMS       ??LFLD                 /GO TEST FOR VALID SELECTION
975    1525   4340              JMS       LEGALA
976    1526   2?78'             ISZ       F?D?N?                 /UPDATE FIELD NUMBER
977    1527   1?79'             TAD       F?D?N?                 /GET BACK FIELD SELECTION
978    1530   0?39              AND       $?9?1                  /ISOLATE FIELD
979    1531   7106              CLL RTL
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 980    1532  7204           RAL                  /MOVE INTO POSITION
 981    1533  3052           DCA      TSTFLD       /SAVE NEW VALUE
 982    1534  1052           TAD      TSTFLD
 983    1535  7640           SZA CLA               /COME BACK TO ZERO?
 984    1536  5324           JMP      NDEMB+1      /GO BACK AND TRY AGAIN
 985    1537  5314           JMP      ILEGAL       /INVALID SELECTIONS OR NOT ENOUGH
 986                 /
 987                 /
 988                 /
 989                 /LEGAL FIELD SELECTION SUBROUTINE
 990                 /
 991    1540  0000   LEGALA,  0
 992    1541  2065           ISZ      LEGALD       /FIELD SELECTED
 993    1542  7410           SKP
 994    1543  5675           JMP I    LEGAL        /AT LEAST 2 FIELDS SELECTED
 995    1544  6224           QIF
 996    1545  3251           DCA      PROFLD
 997    1546  4772*          JMS      SAME         /PROGRAM IN SELECTED FIELD?
 998    1547  2064           ISZ      INSAME       /YES
 999    1550  5740           JMP I    LEGALA
1000                 /SET UP FOR TESTING FIELD STATUS FOR LEGAL SELECTION
1001                 /
1002    1551  0000   LGFLD,  0
1003    1552  7200           CLA                   /MAKE SURE AC IS CLEAR
1004    1553  1776*          TAD      FLDCNT       /GET FIELD TO TEST
1005    1554  0036           AND      SR311        /ISOLATE FIELDS
1006    1555  1371           TAD      FFSTAB
1007    1556  3056           DCA      TEMP         /SAVE ROUTINE POINTER
1008    1557  1456           TAD I    TEMP         /GET POINTER
1009    1560  3056           DCA      TEMP
1010    1561  4456           JMS I    TEMP         /EXECUTE FS ROUTINE
1011    1562  2351           ISZ      LGLFLD       /INVALID FIELD
1012    1563  5751           JMP I    LGLFLD
1013                 /
1014                 /
1015    1571  0740
1016    1572  1600
1017    1573  5044
1018    1574  4600
1019    1575  0337
1020    1576  2246
1021    1577  2600
        1600                  PAGE
1022
1023
1024                 /
1025                 /RETURN IF PROGRAM IN SELECTED FIELD
1026                 /RETURN +1 IF PROGRAM NOT IN SELECTED FIELD
1027                 /
1028    1600  0000   SAME,   0
1029    1601  1051           TAD      PROFLD
1030    1602  7041           CIA
1031    1603  1052           TAD      TSTFLD
1032    1604  7640           SZA CLA
1033    1605  2200           ISZ      SAVE         /PROG NOT IN SEL FIELD
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1034    1606  5600           JMP I    SAVE
1035                 /
1036                 /RETURN IF SR03=0, RETURN +1 IF SR03=1
1037                 /
1038    1607  0000   CSR03,  0
1039    1610  4504           GETSR
1040    1611  0031           AND      SR03
1041    1612  7640           SZA CLA
1042    1613  2207           ISZ      CSR03        /INHIBIT PROGRAM RELOCATION
1043    1614  5607           JMP I    CSR03
1044                 /
1045                 /SETUP FIELD STATUS (FS)
1046                 /INC FIELDS NOT PRESENT OR NOT SELECTED
1047                 /STORE NUMBER OF FIELDS PRESENT IN FCNT
1048                 /
1049    1615  0000   FSSET,  0
1050    1616  7200           CLA
1051    1617  3060           DCA      FCNT
1052    1620  3077           DCA      NUXFLD       /CLEAR FIELD COUNT
1053    1621  1076           TAD      NOTTY
1054    1622  7700           SMA CLA               /SKIP IF NO TTY AVAILABLE
1055    1623  5233           JMP      .+10
1056    1624  1021           TAD      2I
1057    1625  7710           SPA CLA               /SKIP IF NO HARDWARE SWITCHES
1058    1626  5233           JMP      .+5
1059    1627  1020           TAD      PSR          /GET PSEUDO SWITCH REGISTER
1060    1630  0377           AND      137
1061    1631  3063           DCA      ENDF         /SET UP LAST FIELD TO 00
1062    1632  5247           JMP      .+15         /BYPASS SETUP
1063    1633  4505           CBCAL
1064    1634  7402           HLT
1065    1635  4504           GETSR                 /GET NEW SWITCH VALUE
1066    1636  0377           AND      137          /ISOLATE FIELD MIN
1067    1637  3063           DCA      ENDF         /SAVE THE STARTING FIELD
1068    1640  4504           GETSR                 /GET NEW SWITCH VALUE
1069    1641  7002           BSW
1070    1642  0377           AND      137
1071    1643  3062           DCA      STARTF       /SAVE END FIELD LIMIT
1072    1644  4776*          JMS      SETPAR       /PRINT "SELECT TES PARAMETER"
1073    1645  4505           CBCAL
1074    1646  7402           HLT
1075                 /
1076                 /NOW DETERMINE WHICH FIELDS TO TEST
1077                 /
1078    1647  3040           DCA      FS
1079    1650  3041           DCA      FS1
1080    1651  3042           DCA      FS2
1081    1652  3043           DCA      FS3
1082    1653  .25            TAD      EMFLG
1083    1654  7650           SNA CLA               /TEST TO SEE IF EXPANDED MODE FEATURES
1084                                               /ARE AVAILABLE TO BE USED.
1085    1655  5274           JMP      8AXAD        /NOT ENABLED, TEST AS THOUGH A KM8E/A
1086    1656  3775*          DCA      FLDCNT
1087    1657  1773*          TAD      FLDCNT       /GET BACK VALUE TO C0
1088    1660  4511           RACB                  /REARRANGE INTO PROPER FORMAT
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1089    1661    1176            TAD     (6201           /ESTABLISH DATA FIELD
1090    1662    3262            DCA     .+1
1091    1663    7402            HLT
1092    1664    4774*           JMS     CFP             /CHANGED TO DATA FIELD TO TEST
1093    1665    4214            JMS     ISFLD           /IS TEST FIELD FOR PRESENCE
1094    1666    2775*           ISZ     FLDCNT          /SET APPROPRIATE BIT
1095    1667    1775*           TAD     FLDCNT          /UPDATE PATTERN
1096    1670    0377            AND     (37
1097    1671    7640            SZA CLA                 /GONE BACK TO ZERO YET
1098    1672    5257            JMP     .-13            /SKIP IF BACK TO FIELD ZERO
1099    1673    5307            JMP     FSEND
1100    1674    1373    BANKO,  TAD     (7760
1101    1675    3041            DCA     FS1
1102    1676    1373            TAD     (7760
1103    1677    3042            DCA     FS2
1104    1700    1373            TAD     (7760
1105    1701    3043            DCA     FS3
1106    1702    7200    BANKOA, CLA
1107    1703    6240            LRR                     /CLEAR RELOCATION
1108    1704    6250            RER
1109    1705    3775*           DCA     FLDCNT
1110    1706    4772*           JMS     TESBNK          /TEST BANK ZERO
1111
1112    1707    1076    FSEND,  TAD     NOTTY           /GET TTY FLAG
1113    1710    7710            SPA     CLA
1114    1711    5615            JMP   I FSSET           /IS TTY AVAILABLE
1115    1712    4771*           JMS     PNTFLD          /NO, ABORT TTY MESAGE AND RETURN
1116    1713    5615            JMP   I FSSET
1117
1118                    /SET UP ROUTINE TO SET STATUS BIT
1119                    /
1120    1714    0000    SPFLD,  0
1121    1715    1775*           TAD     FLDCNT
1122    1716    0035            AND     SA911           /ISOLATE FIELD
1123    1717    1370            TAD     (SFSTAB
1124    1720    3056            DCA     TEMP            /SAVE POINTER
1125    1721    1456            TAD   I TEMP
1126    1722    3056            DCA     TEMP            /SAVE THE POINTER
1127    1723    4456            JMS   I TEMP            /GO PERFORM SET FUNCTION
1128    1724    7000            NOP
1129    1725    5714            JMP   I SPFLD
1130                    /
1131
1132                    /
1133                    /PRINT SELECTED OPTION FOR TESTING WHETHER KM8 OR KT8
1134                    /
1135    1726    0000    PNTOPT, 0
1136    1727    1076            TAD     NOTTY           /TEST FOR NOTTY TO USE
1137    1730    7640            SZA CLA
1138    1731    5726            JMP   I PNTOPT          /NO TTY AVAILABLE
1139    1732    1025            TAD     ESMFLG
1140    1733    7640            SZA CLA                 /SKIP IF KT NOT ENABLED
1141    1734    1367            TAD     (7
1142    1735    1366            TAD     (1315
1143    1736    3341            DCA     OPT             /SAVE OPTION VALUE
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1144    1737    4765*           JMS     MES
1145    1740    4542            4543                    /CRLF
1146    1741    0000    OPT,    0000
1147    1742    7040            TEXT    *B SELECTED FOR TESTING *
        1743    2305
        1744    1405
        1745    0324
        1746    0514
        1747    4706
        1750    1722
        1751    4024
        1752    0523
        1753    2411
        1754    1607
        1755    4000
1148    1756    5726            JMP   I PNTOPT          /EXIT ROUTINE
1149                    /
1150    1765    2240
1151    1766    1715
1152    1767    0007
1153    1770    3252
1154    1771    4654
1155    1772    2314
1156    1773    7760
1157    1774    2600
1158    1775    2246
1159    1776    5000
1160    1777    3037
        2000            PAGE
1161
1162
1163                    /
1164                    /RETURN+1 IF FIELD PRESENT IN SYSTEM & IS SELECTED
1165                    /
1166    2000    0000    CFP,    0
1167    2001    7300            CLA CLL
1168    2002    6224            RIF
1169    2003    1176            TAD     (6201
1170    2004    3212            DCA     CFPO
1171    2005    1145            TAD     (-1
1172    2006    3677            DCA   I CHECK
1173    2007    1677            TAD   I CHECK
1174    2010    7640            SZA CLA                 /SKIP IF NOT PRESENT
1175    2011    5214            JMP     .+3
1176    2012    6201    CFPO,   CDF     0               /PROGRAM DF
1177    2013    5600            JMP   I CFP
1178    2014    2060            ISZ     FSNT            /FIELD IS PRESENT
1179    2015    6214            RDF                     /START+ & END+
1180    2016    3301            DCA     CFPTMP          /SAVE TEST FIELD
1181    2017    1025            TAD     ESMFLG
1182    2020    7650            SNA CLA                 /SKIP IF EXPANDED MODE ACTIVE
1183    2021    5226            JMP     .+5
1184    2022    1301            TAD     CFPTMP          /GET BACK SELECTED FIELD
1185    2023    4910            RACA                    /CHANGE INT. BINARY COUNT
1186    2024    3301            DCA     CFPTMP          /RESTORE IT FOR TESTING
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1187    2025  3222              JMP    .-5
1188    2326  1231              TAD    CFPTMP          /GET BACK FIELD VALUE
1189    2027  7012              CLL    RTR
1150    2030  7010              RAR
1191    2031  3331              DCA    CFPTMP          /CHANGE TO BINARY COUNT NUMBER
1192    2032  1263              TAD    ENDF            /SAVE NUMBER FOR TESTING
1193    2033  7041              CIA
1194    2034  1262              TAD    STARTF
1195    2035  7440              SZA
1196    2036  5246              JMP    CFP2
1197    2037  1301              TAD    CFPTMP          /GET BACK NUMBER
1198    2040  7041              CIA
1199    2041  1062              TAD    STARTF
1200    2042  7650              SNA  CLA
1201    2043  2260       CFP1,  ISZ    CFP             /FIELD IS PRESENT & SELECTED
1202    2044  2277              ISZ    NUMFLD          /FIELD PRESENT AND SELECTED
1203    2045  5212              JMP    CFP0
1204    2046  7710       CFP2,  SPA  CLA
1205    2047  5267              JMP    CFP4            /STARTF < ENDF
1206    2050  1301              TAD    CFPTMP
1207    2051  7041              CIA
1208    2052  1062              TAD    STARTF
1209    2053  7450              SNA
1210    2054  5243              JMP    CFP1            /DF = STARTF (SELECTED)
1211    2055  7710              SPA  CLA
1212    2056  5243              JMP    CFP1            /DF > STARTF (SELECTED)
1213    2057  1301       CFP3,  TAD    CFPTMP               /DF < STARTF ...
1214    2060  7041              CIA
1215    2061  1063              TAD    ENDF
1216    2062  7450              SNA
1217    2063  5243              JMP    CFP1            /DF = ENDF (SELECTED)
1218    2064  7710              SPA  CLA
1219    2065  5212              JMP    CFP0            /DF > ENDF (NOT SELECTED)
1220    2066  5243              JMP    CFP1            /DF < ENDF (SELECTED)
1221    2067  1301       CFP4,  TAD    CFPTMP               /STARTF < ENDF
1222    2070  7041              CIA
1223    2071  1062              TAD    STARTF
1224    2072  7450              SNA
1225    2073  5243              JMP    CFP1            /DF = STARTF (SELECTED)
1226    2074  7710              SPA  CLA
1227    2075  5257              JMP    CFP3            /DF > STARTF THIS TIME ...
1228    2076  5212              JMP    CFP0            /DF < STARTF (NOT SELECTED)
1229    2077  2100       CHECK,  CHECK0
1230    2100  0000       CHECK0, 0
1231    2101  0000       CFPTMP, 0
1232
1233
1234                     /
1235                     /
1236                     /FIND OUT WHICH FIELDS HAVE BEEN SELECTED FOR TESTING
1237                     /
1238    2102  0000       FLDSEL, 0
1239    2103  4777'             JMS    TFS7
1240    2104  5307             JMP    . 3
1241    2105  1184             TAD    [267
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1242    2106  4776'             JMS    TYPE
1243    2107  4775'             JMS    TFS6            /FIELD 7
1244    2110  5313             JMP    .-3
1245    2111  1163             TAD    [266
1246    2112  4776'             JMS    TYPE
1247    2113  4774'             JMS    TFS5            /FIELD 6
1248    2114  5317             JMP    .-3
1249    2115  1162             TAD    [265
1250    2116  4776'             JMS    TYPE
1251    2117  4773'             JMS    TFS4            /FIELD 5
1252    2120  5323             JMP    .-3
1253    2121  1161             TAD    [264
1254    2122  4776'             JMS    TYPE
1255    2123  4772'             JMS    TFS3            /FIELD 4
1256    2124  5327             JMP    .-3
1257    2125  1160             TAD    [263
1258    2126  4776'             JMS    TYPE
1259    2127  4771'             JMS    TFS2            /FIELD 3
1260    2130  5333             JMP    .-3
1261    2131  1157             TAD    [262
1262    2132  4776'             JMS    TYPE
1263    2133  4770'             JMS    TFS1            /FIELD 2
1264    2134  5337             JMP    .-3
1265    2135  1156             TAD    [261
1266    2136  4776'             JMS    TYPE
1267    2137  4767'             JMS    TFS0            /FIELD 1
1268    2140  5343             JMP    .-3
1269    2141  1157             TAD    [260
1270    2142  4776'             JMS    TYPE            /FIELD 0
1271    2143  5702             JMP  I  FLDSEL
1272
1273
1274    2107  0000       /
1275    2170  0000
1276    2171  0000
1277    2172  0000
1278    2173  0000
1279    2174  0000
1280    2175  0000
1281    2176  0000
1282    2177  0000
         2200              PAGE
1283
1284
1285
1286                     /CONVERT OCTAL NUMBERS FOR TYPEOUT
1287                     /
1288    2200  0000       SIXTY, 0
1289    2201  7200              CLA  CLL
1290    2202  1600              TAD I   SIXTY          /ADDRESS OF OPERAND
1291    2203  3235              DCA    S0
1292    2204  2200              ISZ    SIXTY
1293    2205  1600              TAD I   SIXTY          /STORAGE ADDRESS
1294    2206  3236              DCA    S1
1295    2207  2200              ISZ    SIXTY
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1296   2210 1155          TAD     [77
1297   2211 7240          CMA                     /AC=7700
1298   2212 CE35          AND I   S0              /FIRST 2 DIGITS OF OPERAND
1299   2213 7002          BSW
1300   2214 4222          JMS     CNV             /CONVERT DIGITS FOR TYPEOUT
1301   2215 2236          ISZ     S1              /INC STORAGE ADDRESS
1302   2216 1155          TAD     [77
1302   2217 0F35          AND I   S2              /SECOND 2 DIGITS OF OPERAND
1304   2220 ..23          JMS     CNV
1305   2221 1600          JMP I   SIXTY           /DONE
1306   2222 0C00   CNV,   0
1307   2223 3237          DCA     S2
1308   2224 1237          TAD     S2
1309   2225 7106          CLL RTL
1310   2226 7004          RAL
1311   2227 0154          AND     [707            /LEFT DIGIT
1312   2230 1237          TAD     S2
1313   2231 0154          AND     [707            /RIGHT DIGIT
1314   2232 1153          TAD     [6060
1315   2233 3J36          DCA I   S1              /STORE CONVERTED DIGITS
1316   2234 5622          JMP I   CNV
1317   2235 0000   S0,    0
1318   2236 0000   S1,    0
1319   2237 0000   S2,    0
1320          /
1321          /TELETYPE OUTPUT WITH BELL
1322          /
1323   2240 0000   MES,   0
1324   2241 7240          STA
1325   2242 3023          DCA     INMODE          /SET PRINTER ACTIVE INDICATOR /=C8=/
1326   2243 7240          STA
1327   2244 1240          TAD     MES             /FIRST WORD -1
1328   2245 3010          DCA     10
1329
1330   2246 1410          TAD I   10
1331   2247 3313          DCA     M0
1332   2250 1313          TAD     M0
1333   2251 7002          BSW
1334   2252 4256          JMS     TYPCH           /TYPEOUT FIRST CHARACTER
1335   2253 1313          TAD     M0
1336   2254 4256          JMS     TYPCH           /TYPEOUT SECOND CHARACTER
1337   2255 5246          JMP     MES+6           /CONTINUE
1338
1339   2256 0000   TYPCH, 0
1340   2257 0155          AND     [77
1341   2260 7440          SZA
1342   2261 5264          JMP     .+3
1343   2262 3023          DCA     INMODE          /CLEAR MESSAGE ACTIVE INDICATOR /=C8=/
1344   2263 5410          JMP I   10              /END OF MESSAGE RETURN
1348   2264 1152          TAD     [-34
1346   2265 7440          SZA
1347   2266 5271          JMP     .+3
1348   2267 1151          TAD     [207            /CODE IS BELL
1349   2270 5311          JMP     MTP
1350   2271 1172          TAD     [-4
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1351   2272 7500          SMA                     /CODE LESS THAN 40?
1352   2273 5276          JMP     .+3             /NO
1353   2274 1150          TAD     [340            /YES, ADD 300. CODE IS ALPHA
1354   2275 5311          JMP     MTP
1355   2276 1147          TAD     [-3
1356   2277 7440          SZA
1357   2300 5303          JMP     .+3
1358   2301 1146          TAD     [212            /CODE IS LINE FEED
1359   2302 5311          JMP     MTP
1360   2303 1145          TAD     [-2
1361   2304 7440          SZA
1362   2305 5310          JMP     .+3
1363   2306 1144          TAD     [215            /CODE IS CR
1364   2307 7410          SKP
1365   2310 1143          TAD     [245            /ADD 200 TO OTHERS > 40
1366   2311 4777'  MTP,   JMS     TYPE
1367   2312 5656          JMP I   TYPCH
1368   2313 0000   M0,    0
1369          /
1370          /
1371          /TEST THE SELECTED BANK FOR FIELDS AVAILABLE
1372          /
1373   2314 0000   TESBNK, 0
1374   2315 6271          CDF     70
1375   2316 4776'         JMS     CFP             /CHECK FIELD PRESENT
1376   2317 4775'         JMS     SFS7            /SET FIELD STATUS BIT 7
1377   2320 6261          CDF     60
1378   2321 4776'         JMS     CFP
1379   2322 4774'         JMS     SFS6
1380   2323 6251          CDF     50
1381   2324 4776'         JMS     CFP
1382   2325 4773'         JMS     SFS5
1383   2326 6241          CDF     40
1384   2327 4776'         JMS     CFP
1385   2330 4772'         JMS     SFS4
1386   2331 6231          CDF     30
1387   2332 4776'         JMS     CFP
1388   2333 4771'         JMS     SFS3
1389   2334 6221          CDF     20
1390   2335 4776'         JMS     CFP
1391   2336 4770'         JMS     SFS2
1392   2337 6211          CDF     10
1393   2340 4776'         JMS     CFP
1394   2341 4767'         JMS     SFS1
1395   2342 620*'         CDF     00
1396   2343 4776'         JMS     CFP
1397   2344 4766'         JMS     SFS0
1398   2345 5714          JMP I   TESBNK
1399   2346 '.20   FLDCNT, 0
1400          /
1401          /MARCH TEST IN ERROR
1402          /
1403   2347 0C00   TMAR,  0
1404   2350 4240          JMS     TLS
1405   2351 1501          TEXT    "MARCH - "
```

```
              2352  2203
              2353  1042
              2354  5540
              2355  0000
       1406   2356  5747            JMP I  TMAR
       1407
       1408   2360  3277
       1409   2367  3317
       1410   2370  3340
       1411   2371  2412
       1412   2372  3432
       1413   2373  2452
       1414   2374  2472
       1415   2375  2512
       1416   2376  3300
       1417   2377  6025
              2400            PAGE
       1418
       1419        /TYPEOUT CHARACTER IN AC AND A SPACE
       1420        /
       1421   2400  0000   TYPSP,  0
       1422   2401  4777*           JMS    TYPE
       1423   2402  1142            TAD    (240
       1424   2403  4777*           JMS    TYPE
       1425   2404  5600            JMP I  TYPSP
       1426
       1427
       1428        /
       1429        /ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
       1430        /
       1431   2405  0000   RETURN,  0                  /PROGRAM RETURN ADDRESS
       1432   2406  4405   CODERR, JMS I  CAFTER
       1433   2407  4504           GETSR
       1434   2410  0036           AND    S-02           /BELL ON ERROR?
       1435   2411  7650           SNA CLA
       1436   2412  5221           JMP    .-7
       1437   2413  1076   RBELL,  TAD    NOTTY          /GET TTY FLAG
       1438   2414  7710           SPA    CLA
       1439   2415  5605           JMP I  RETURN         /NO TELETYPE AVILABLE DO NOT RING BELL
       1440   2416  1151           TAD    (207
       1441   2417  4777*          JMS    TYPE           /RING BELL
       1442   2420  5605           JMP I  RETURN
       1443   2421  4504           GETSR
       1444   2422  0027           AND    S001
       1445   2423  7640           SZA CLA
       1446   2424  5267           JMP    STOP           /INHIBIT TYPEOUT
       1447   2425  1029           TAD    EXMFLG         /TEST FOR K-8A
       1448   2426  7650           SNA CLA
       1449   2427  5234           JMP    .-5
       1450   2430  6224           RIF                   /GET PROGRAM FIELD
       1451   2431  4510           RACA                  /BINARY COUNT NUMBER
       1452   2432  3056           DCA    TEMP
       1453   2433  5240           JMP    .+5
       1454   2434  6224           RIF
       1455   2435  7112           CLL RTR
```

```
       1456   2436  7010           RAR                   /MAKE A BINARY NUMBER
       1457   2437  3056           DCA    TEMP           /SAVE CHARACTER
       1458   2440  4776*          JMS    SIXTY
       1459   2441  0056           TEMP
       1460   2442  2457           ERRORO-1
       1461   2443  1141           TAD    (4543
       1462   2444  3257           DCA    ERRORO-1
       1463   2445  1205           TAD    RETURN
       1464   2446  1165           TAD    (-1
       1465   2447  3056           DCA    TEMP
       1466   2450  4776*          JMS    SIXTY
       1467   2451  0056           TEMP
       1468   2452  2461           ERROR1
       1469   2453  1076           TAD    NOTTY          /GET TTY FLAG
       1470   2454  7710           SPA    CLA            /IS THERE A TTY ON SYSTEM
       1471   2455  5666           JMP I  ADDER          /NO. GO HALT ON ERRORS INSTEAD-INFO IN AC
       1472   2456  4775*          JMS    YES
       1473   2457  4543           4543
       1474   2460  0000   ERRORO,  0                    /FIELD
       1475   2461  0000   ERROR1,  0                    /PROGRAM LOCATION OF ERROR JMS
       1476   2462  0000           0
       1477   2463  4040           4040
       1478   2464  0000           0
       1479   2465  5666           JMP I  .+1            /TYPEOUT ERROR
       1480   2466  0000   ADDER,  0                     /ADDRESS OF ERROR TYPEOUT
       1481   2467  4504   STOP,   GETSR
       1482   2470  0026           AND    SR00           /HALT AFTER ERROR?
       1483   2471  7650           SNA CLA
       1484   2472  5276           JMP    LIMIT          /INHIBIT ERROR HALT
       1485   2473  1205           TAD    RETURN
       1486   2474  1165           TAD    (-1
       1487
       1488   2475  7402           HLT                   /HALT WITH AC = ERROR JMS
       1489   2476  4504   LIMIT,  GETSR
       1490   2477  0032           AND    S004           /CHANGE FIELD LIMITS?
       1491   2500  7640           SZA CLA
       1492   2501  5774*          JMP    RATA           /YES
       1493   2502  5605           JMP I  RETURN         /NO
       1494
       1495
       1496        /
       1497        /RELOCATION MOVE ERROR
       1498        /
       1499   2503  0000   ERM,    0
       1500
       1501   2504  2053           ISZ    COUNT          /MOVE ERROR OCCURRED
       1502   2505  7410           SKP
       1503   2506  5304           JMP    .-2
       1504   2507  7200           CLA
       1505   2510  1303           TAD    ERM
       1506   2511  3205           DCA    RETURN         /RETURN ADDRESS
       1507   2512  1373           TAD    (PERRM
       1508   2513  3266           DCA    ADDER          /ERROR TYPEOUT ADDRESS
       1509   2514  5206           JMP    CODERR
       1510   2515  4772*  PERRM,  JMS    FLOAT          /SET UP FIELD VALUE TO PRINT
```

```
1511    2516  2536          Z10
1512    2517  4776'         JMS     SIXTY           /WHERE TO PUT IT
1513    2520  0054          SDVZ
1514    2521  2537          Z11
1515    2522  1076          TAD     NOTTY           /GET TTY FLAG
1516    2523  7710          SPA     CLA             /IS THERE A TELETYPE AVAILABLE?
1517    2524  5345          JMP     ERRUS           /NO-HALT ON ERRORS INSTED-INFO IN AC
1518    2525  4775'         JMS     MES
1519    2526  2205          TEXT            *RELO ERR AT *
        2527  1417
        2530  4605
        2531  2222
        2532  4001
        2533  2440
        2534  0600
1520    2535  4775'         JMS     MES
1521    2536  0000   Z10.   0
1522    2537  0000   Z11.   0
1523    2540  0500          0
1524    2541  0000          0
1525    2542  7240          STA
1526    2543  3055          DCA     HEAD1
1527    2544  5267          JMP     STOP
1528
1529
1530                        //RELOCATION ERROR ROUTINE ON A SYSTEM WITHOUT A TELETYPE
1531
1532
1533    2545  7240   ERRUS. CLA     CMA
1534    2546  1205          TAD     RETURN
1535    2547  7402          HLT                     /
1536    2550  7200          CLA                     /AC=PROGRAM LOCATION OF ERROR JMS
1537    2551  1771'         TAD     FLOCNT          /GET TEST FIELD
1538    2552  0370          AND     137             /MASK TO FIELD BITS
1539    2553  7402          HLT                     /AC=FIELD BEING TESTED IN BITS 7-11
1540    2554  7200          CLA
1541    2555  1094          TAD     MOVE
1542    2556  7402          HLT                     /AC=ADDRESS OF LOCATION IN ERROR
1543    2557  7240          CLA     CMA
1544    2560  3055          DCA     HEAD1
1545    2561  5267          JMP     STOP            /GO CHECK FOR HALT AFTER ERROR SWITCH
1546
1547    2570  0037
1548    2571  2346
1549    2572  5067
1550    2573  2515
1551    2574  0205
1552    2575  2110
1553    2576  1000
1554    2577  5025
        2600          PAGE
1555
1556
1557                  /
1558                  /DATA OR CHECKERBOARD ERROR OCCURRED
```

```
1559                  /
1560    2600  0000   ERRC.  0
1561
1562    2601  2052          ISZ     COUNT           /ERROR OCCURRED
1563    2602  7410          SKP
1564    2603  5201          JMP     .-2
1565    2604  7200          CLA
1566    2605  1200          TAD     ERRC
1567    2606  3777'         DCA     RETURN          /RETURN ADDRESS
1568    2607  1376          TAD     (PERRC
1569    2610  3775'         DCA     ADDER           /ERROR TYPEOUT ADDRESS
1570    2611  4504          GETSR
1571    2612  0030          AND     SR02            /BELL ON ERROR
1572    2613  7640          SZA     CLA
1573    2614  5774'         JMP     RBELL           /RING BELL
1574    2615  4504          GETSR
1575    2616  0027          AND     SR01
1576    2617  7640          SZA     CLA
1577    2620  5773'         JMP     STOP            /INHIBIT TYPEOUT
1578    2621  2055          ISZ     HEAD1
1579    2622  7410          SKP
1580    2623  4772'         JMS     ERRHD           /TYPEOUT ERROR HEADING
1581    2624  5771'         JMP     CODERR
1582
1583    2625  4770'  PERRC. JMS     FLDDAT          /SET UP FIELD INFORMATION
1584    2626  2644          Z1                      /LOCATION TO PUT IT IN
1585    2627  4767'         JMS     SIXTY
1586    2630  0057          TSTAD
1587    2631  1045          Z2
1588    2632  4767'         JMS     SIXTY
1589    2633  0072          GDATA
1590    2634  2651          Z3
1591    2635  4767'         JMS     SIXTY
1592    2636  0073          BDATA
1593    2637  2654          Z4
1594    2640  1076          TAD     NOTTY           /GET TTY FLAG
1595    2641  7710          SPA     CLA             /IS THERE A TELETYPE AVAILABLE
1596    2642  5307          JMP     ERRCC           /NO GO HALT ON ERRORS INSTEAD
1597    2643  4766'         JMS     MES
1598    2644  0000   Z1.    0
1599    2645  0000   Z2.    0
1600    2646  0000          0                       /FAIL ADR
1601    2647  4040          4040
1602    2650  4040          4040
1603    2651  0000   Z3.    0
1604    2652  0000          0                       /GOOD
1605
1606
1607    2653  4040          4040
1608    2654  0000   Z4.    0
1609    2655  0000          0                       /BAD
1610    2656  4000          4000
1611    2657  4765'  PARORC. JMS    TTS
1612    2660  4335          JMS     TN              /NONE
1613    2661  5773'         JMP     STOP
```

```
1614   2662   4764'            JMS     TO        /ALL 0
1615   2663   5277             JMP     .+12      PERR00
1616   2664   4762'            JMS     .+        /ALL 1
1617   2665   5277             JMP     .         PERR00
1618   2666   4762'            JMS     .+7       /0000 - 7777 ACP
1619   2667   5277             JMS     PERR00
1620   2670   4761'            JMS     I70       /7777 - 0000 ACP
1621   2671   8177             JMP     .+6
1622   2672   4.60'            JMS     T25       /2525 - 5252 ACP
1623   2673   5277             JMP     .+4
1624   2674   4757'            JMS     T52       /5252 - 2525 ACP
1625   2675   7410             SNA
1626   2676   4756'            JMS     TMAR      /MARCH PATTERN FAILURE
1627   2677   4755'   PERR00,  JMS     T25
1628   2700   1142            TAD     I35       /NC
1629   2701   1165            TAD     .-1       /TC
1630   2702   1157            TAD     I282      /2C
1631   2703   4754            JMS     TYPE
1632   2704   1037            TAD     I303
1633   2705   4754'            JMS     TYPE
1634   2706   5773'            JMP     STOP
1635
1636
1637                           /DATA OR CHECKERBOARD ERROR ON A NON TTY SYSTEM- ERROR INFO IN AC FOR HALTS
1638
1639   2707   7240    ERROO,   CLA     CMA
1640   2710   1777'            TAD     RETURN    /GET JMS ERROR ADDRESS
1641   2711   7402             HLT               /AC=PROGRAM LOCATION OF ERROR JMS
1642   2712   7200             CLA
1643   2713   1753'            TAD     FLDCNT    /GET FIELD BEING TESTED
1644   2714   0352             AND     I37       /MASK OUT FIELD BITS
1645   2715   7402             HLT               /AC=FIELD BEING TESTED BITS 9-11
1646   2716   7200             CLA
1647   2717   1057'            TAD     TSTAD
1648   2720   7402             HLT               /AC=FAILING ADDRESS IN FIELD BEING TESTED
1649   2721   7200             CLA
1650   2722   1072'            TAD     GDATA     /GET THE GOOD DATA
1651   2723   7402             HLT               /AC=THE GOOD DATA
1652   2724   7200             CLA
1653   2725   1073'            TAD     BDATA     /GET THE DATA READ
1654   2726   7402             HLT               /AC=THE BAD DATA
1655   2727   7200             CLA
1656   2730   4765'            JMS     TTS       /GET THE PATTERN BEING TESTED
1657   2731   1751'   PATERR,  TAD     TSNUM     /GET THE PATTERN
1658   2732   7402             HLT               /AC=PATTERN NUMBER
1659   2733   7200             CLA
1660   2734   5773'            JMP     STOP      /GO CHECK FOR HALT AFTER ERROR
1661
1662
1663
1664                           /
1665                           /TYPEOUT TEST BEING EXECUTED
1666                           /
1667   2735   0000    TN,      0
1668   2736   4766'            JMS     MES
```

```
1669   2737   1617            TEXT    *NO PATTERN*
       2740   4020
       2741   0124
       2742   2405
       2743   2216
       2744   0000
1670   2745   5735            JMP I   TN
1671
1672
1673   2751   1555
1674   2752   0037
1675   2753   2346
1676   2754   5025
1677   2755   0903
1678   2756   2347
1679   2757   3064
1680   2760   2250
1681   2761   3234
1682   2762   3220
1683   2763   3115
1684   2764   3220
1685   2765   3332
1686   2766   2240
1687   2767   2255
1688   2770   6067
1689   2771   2446
1690   2772   4011
1691   2773   2467
1692   2774   2415
1693   2775   1468
1694   2776   2825
1695   2777   2405
       3000            PAGE
1696
1697
1698   3000   0000    TO,      0
1699   3001   4777'            JMS     MES
1700   3002   2014            TEXT    *ALL 0 = *
       3003   1443
       3004   6040
       3005   6540
       3006   2000
1701   3007   5000            JMP I   TO
1702
1703   3010   0000    TT,      0
1704   3011   4777'            JMS     MES
1705   3012   2014            TEXT    *ALL 1 = *
       3013   1443
       3014   6140
       3015   6540
       3016   2000
1706   3017   5010            JMP I   TT
1707
1708   3020   0000    TOT,     0
1709   3021   4777'            JMS     MES
```

```
1710    2022  6143           TEXT        "CC00-7777 MCP - "
        3023  2134
        3024  5567
        3025  6767
        3026  6740
        3027  7703
        3030  2040
        3031  5540
        3032  0000
1711    3033  5420           JMP I   TC7
1712    3034  0000   T70,    0
1713    3035  4777'          JMS     MES
1714    3036  6767           TEXT        "7777-C000 MCP - "
        3037  6767
        3040  5560
        3041  6760
        3042  6340
        3043  7703
        3044  2040
        3045  5540
        3046  0000
1715    3047  5634           JMP I   T70
1716
1717    3050  0000   T25,    0
1718    3051  4777'          JMS     MES
1719    3052  6265           TEXT        "2525-5252 MCP - "
        3053  6265
        3054  5542
        3055  7 45
        3056  6240
        3057  2703
        3060  2040
        3061  5540
        3062  0000
1720    3063  5650           JMP I   T25
1721
1722    3064  0000   T52,    0
1723    3065  4777'          JMS     MES
1724    3066  6562           TEXT        "5252-2525 MCP - "
        3067  6262
        3070  5562
        3071  6562
        3072  6540
        3073  2703
        3074  2040
        3075  5540
        3076  0000
1725    3077  5664           JMP I   T52
1726
1727
1728                 /
1729                 /PARITY ERROR
1730                 /
1731    3100  7200   PARINT, CLA
1732    3101  1376           TAD     (INTR
```

```
1733    3102  3775'          DCA     RETURN
1734    3103  4774'          JMS     SIXTY
1735    3104  0000           0
1736    3105  3131           DCA     Z20
1737    3106  4774'          JMS     SIXTY
1738    3107  6057           TSTAD
1739    3110  3145           Z21
1740    3111  1176           TAD     NOTTY       /GET TTY FLAG
1741    3112  7410           SPA     CLA         /IS THERE A TELETYPE AVAILABLE
1742    3113  5354           JMP     PARERR      /NO. GO HALT WITH ERROR INFO IN AC
1743    3114  4777'          JMS     MES         /PRINT HEADER
1744    3115  4543           TEXT        "X-PARITY ERR, LOC 0="
        3116  2001
        3117  3211
        3120  2431
        3121  4005
        3122  2022
        3123  5440
        3124  1417
        3125  6340
        3126  6075
        3127  0000
1745    3130  4777'          JMS     MES
1746    3131  0000   Z20,    0
1747    3132  0000           0                   /CONTENT OF LOC 0
1748    3133  4040           4040
1749    3134  2423           2423
1750    3135  2431           2431
1751    3136  6475           0475                /TSTAD-
1752    3137  0000           0000
1753    3140  6004           CTF
1754    3141  0136           AND     17
1755    3142  1167           TAD     (260
1756    3143  4773'          JMS     TYPE        /TYPE DATA FIELD
1757    3144  4777'          JMS     MES
1758    3145  0000   Z21,    0
1759    3146  0000           0                   /CONTENT OF TSTAD
1760    3147  4000           4000
1761    3150  6104           CMA
1762    3151  7240           STA
1763    3152  3055           DCA     HEAD1
1764    3153  5772'          JMP     PARERC      /TYPE PRESENT TEST
1765
1766
1767                 /PARITY ERROR ON A NON TTY SYSTEM- ERROR INFO IN THE AC FOR EACH HALT
1768
1769    3154  1000   PARERR, TAD     0           /GET THE INTERRUPTED PAC
1770    3155  7402           HLT                 /AC=INTERRUPTED PC (LOCATION 0)
1771    3156  7200           CLA
1772    3157  6004           GTF                 /GET THE FLAGS
1773    3160  0371           AND     17          /MASK TO DATA FIELD
1774    3161  7402           HLT                 /AC=DATA FIELD AT TIME OF PARITY ERROR
1775    3162  7200           CLA
1776    3163  1637           TAD     TSTAD
1777    3164  7402           HLT                 /AC=ADDRESS IN FIELD BEING TESTED
```

SEQ 0054

/PDP-8E EXTENDED MEMORY DATA AND CHECKERBOARD TEST   PAL10   V142A   17-JAN-78   9:53   PAGE 1-34

```
1778   3165  7200          CLA
1779   3166  6104          CUP                      /CLEAR MEMORY PARITY ERROR BIT
1780   3167  5772'         JMP     PARCRC           /GO GET PATTERN BEING TESTED
1781
1782   3171  6007
1783   3172  2657
1784   3173  5025
1785   3174  2200
1786   3175  3405
1787   3176  4296
1788   3177  2240
       3200          PAGE
1789
1790         /
1791         /UNWANTED INTERRUPT OCCURRED
1792         /
1793   3200  1377   BADINT. TAD     (BADINT
1794   3201  4405           JMS I   IAPTER           /GO TO APT IF NEED BE
1795   3202  1076           TAD     NOTTY            /GET THE TELETYPE FLAG
1796   3203  7700           SMA CLA                  /IS THERE A TELETYPE ON THE SYSTEM
1797   3204  5207           JMP     .+3              /YES GO PRINT THE MESSAGE
1798   3205  7402           HLT                      /UNWANTED INTERRUPT OCCURED
1799   3206  5237           JMP     BINTC            /GO CLEAR THE WORLD AND CONTINUE
1800   3207  4776'          JMS     MES
1801   3210  4543           TEXT    "%UNWANTED INTERRUPT OCCURRED"
       3211  2518
       3212  2701
       3213  1624
       3214  0504
       3215  4011
       3216  1624
       3217  0522
       3220  2225
       3221  2024
       3222  4017
       3223  0303
       3224  2522
       3225  2205
       3226  0400
1802   3227  6007   BINTC.  CAF
1803   3230  7240           STA
1804   3231  3035           DCA     MEA01
1805   3232  5775'          JMP     INTR
1806         /
1807         /SET ONLY STATUS BIT SPECIFIED
1808         /
1809   3233  0000   STS0,   0                        /SET TS0 (ALL 0 TEST)
1810   3234  7710           CLA STL RAR
1811   3235  3037           DCA     TS
1812   3236  5633           JMP I   STS0
1813   3237  0000   STS1,   0                        /SET TS1 (ALL 1 TEST)
1814   3240  7332           CLA STL RTR
1815   3241  3037           DCA     TS
1816   3242  5637           JMP I   STS1
1817   3243  0000   STS2,   0                        /SET TS2 (0000 - 7777 WCP TEST)
```

SEQ 0055

/PDP-8E EXTENDED MEMORY DATA AND CHECKERBOARD TEST   PAL10   V142A   17-JAN-78   9:53   PAGE 1-25

```
1818   3244  7332           CLA STL RTR
1819   3245  7010           RAR
1820   3246  3037           DCA     TS
1821   3247  5643           JMP I   STS2
1822
1823
1824   3250  0000   STS3,   0                        /SET TS3 (7777 - 0000 WCP TEST
1825   3251  7332           CLA STL RTR
1826   3252  7012           RTR
1827   3253  3037           DCA     TS
1828   3254  5650           JMP I   STS3
1829   3255  0000   STS4,   0                        /SET TS4 (2525 - 5252 WCP TEST)
1830   3256  7203           CLA IAC BSW
1831   3257  7104           CLL RAL
1832   3260  3037           DCA     TS
1833   3261  5655           JMP I   STS4
1834   3262  0000   STS5,   0                        /SET TS5 (5252 - 2525 WCP TEST)
1835   3263  7203           CLA IAC BSW
1836   3264  3037           DCA     TS
1837   3265  5662           JMP I   STS5
1838
1839   3266  0000   SCS1,   0                        /SET CS1 (1 COMPLEMENT)
1840   3267  7332           CLA STL RTR
1841   3270  3036           DCA     CS
1842   3271  5666           JMP I   SCS1
1843   3272  0000   SCS2,   0                        /SET CS2 (2 COMPLEMENTS)
1844   3273  7332           CLA STL RTR
1845   3274  7010           RAR
1846   3275  3036           DCA     CS
1847   3276  5672           JMP I   SCS2
1848         /
1849         /SET ALSO STATUS BIT SPECIFIED
1850         /
1851   3277  0000   SFS0,   0                        /SET FS0 (DON'T TEST FIELD 0)
1852   3300  7200           CLA
1853   3301  4506           SETFS                    /SETUP BANK POINTER
1854   3302  1456           TAD I   TEMP
1855   3303  7004           RAL
1856   3304  7130           STL RAR
1857   3305  3456           DCA I   TEMP             /SAVE STATUS WORD
1858   3306  5677           JMP I   SFS0
1859   3307  0000   SRS0,   0                        /SET RS0 (DON'T RELO TO FIELD 0)
1860   3310  7200           CLA
1861   3311  4507           SETRS                    /SETUP BANK POINTER
1862   3312  1456           TAD I   TEMP
1863   3313  7004           RAL
1864   3314  7130           STL RAR
1865   3315  3456           DCA I   TEMP             /SAVE NEW WORD
1866   3316  5707           JMP I   SRS0
1867   3317  0000   SFS1,   0                        /SET FS1 (DON'T TEST FIELD 1)
1868   3320  7200           CLA
1869   3321  4506           SETFS                    /SETUP BANK POINTER
1870   3322  1456           TAD I   TEMP
1871   3323  7006           RTL
1872   3324  7112           STL RTR
```

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1982    3507  1171            TAD   (43
1983    3510  3456            DCA I TEMP        /SAVE NEW WORD
1984    3511  5732            JMP I SRS8
1985    3512  0000    SFS7,   0                 /SET FS7 (DON'T TEST FIELD 7)
1986    3513  7200            CLA
1987    3514  4506            SETFS             /SETUP BANK POINTER
1988    3515  1456            TAD I TEMP
1989    3516  0173            AND   (7740
1990    3517  1170            TAD   (20
1991    3520  3456            DCA I TEMP        /SAVE NEW WORD
1992    3521  5712            JMP I SFS7        /SET RS7 (DON'T RELO TO FIELD 7)
1993    3522  0000    SRS7,   0
1994    3523  7200            CLA               /SETUP BANK POINTER
1995    3524  4507            SETRS
1996    3525  1456            TAD I TEMP
1997    3526  0173            AND   (7740
1998    3527  1170            TAD   (20         /SAVE NEW WORD
1999    3530  3456            DCA I TEMP
2000    3531  5722            JMP I SRS7
2001                  /
2002                  /TEST TEST STATUS
2003                  /RETURN IF NO TEST
2004                  /RETURN +2 IF ALL 0 TEST
2005                  /RETURN +4 IF ALL 1 TEST
2006                  /RETURN +6 IF 0000 - 7777 WCP
2007                  /RETURN +8 IF 7777 - 0000 WCP
2008                  /RETURN +10 IF 2525 - 5252 WCP
2009                  /RETURN +12 IF 5252 - 2525 WCP
2010                  /RETURN +14 IF MARCH PATTERN
2011                  /
2012    3532  0000    TTS,    0
2013    3533  7200            CLA
2014    3534  3355            DCA   TSNUM       /CLEAR PATTERN NUM FOR NON TTY SYSTEMS
2015    3535  1037            TAD   Ia
2016    3536  0125            AND   (7770
2017    3537  7450            SNA
2018    3540  5356            JMP   TTYCHK      /NO TEST
2019    3541  2355            ISZ   TSNUM
2020    3542  2132            ISZ   TTS
2021    3543  2132            ISZ   TTS
2022    3544  7104    TTS0,   CLL RAL
2023    3545  7421            MQL
2024    3546  7430            SZL               /CHECK THIS TEST BIT
2025    3547  5356            JMP   TTYCHK
2026    3550  2355            ISZ   TSNUM
2027    3551  2132            ISZ   TTS
2028    3552  2132            ISZ   TTS
2029    3553  7521            SWP
2030    3554  5344            JMP   TTS0         /CHECK NEXT TEST BIT
2031
2032
2033    3555  0000    TSNUM,  0
2034
2035    3556  7200    TTYCHK, CLA
2036    3557  1076            TAD   NOTTY        /GET PROGRAM FLAG
```

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2037    3560  7710            SPA   CLA         /WAS THERE A TELETYPE AVAILABLE
2038    3561  5777*           JMP   PATERR      /NO, GO HALT ON ERROR
2039    3562  5732            JMP I TTS         /RETURN TO ERROR PRINTOUT
2040
2041    3577  2731
              3600            PAGE

2042
2043
2044                  /
2045                  /TEST FIELD STATUS
2046                  /RETURN IF FIELD STATUS BIT SET (DON'T TEST FIELD)
2047                  /RETURN +1 IF FIELD STATUS BIT RESET (TEST THIS FIELD)
2048                  /
2049    3600  0000    TFS0,   0
2050    3601  7200            CLA
2051    3602  4506            SETFS             /SETUP BANK POINTER
2052    3603  1456            TAD I TEMP
2053    3604  7700            SMA CLA           /FIELD 0
2054    3605  2200            ISZ   TFS0
2055    3606  5600            JMP I TFS0
2056
2057    3607  0000    TFS1,   0
2058    3610  7200            CLA
2059    3611  4506            SETFS             /SETUP BANK POINTER
2060    3612  1456            TAD I TEMP
2061    3613  7004            RAL
2062    3614  7700            SMA CLA           /FIELD 1
2063    3615  2207            ISZ   TFS1
2064    3616  5607            JMP I TFS1
2065
2066    3617  0000    TFS2,   0
2067    3620  7200            CLA
2068    3621  4506            SETFS             /SETUP BANK POINTER
2069    3622  1456            TAD I TEMP
2070    3623  7006            RTL
2071    3624  7700            SMA CLA           /FIELD 2
2072    3625  2217            ISZ   TFS2
2073    3626  5617            JMP I TFS2
2074
2075    3627  0000    TFS3,   0
2076    3630  7200            CLA
2077    3631  4506            SETFS             /SETUP BANK POINTER
2078    3632  1456            TAD I TEMP
2079    3633  7006            RTL
2080    3634  7004            RAL
2081    3635  7700            SMA CLA           /FIELD 3
2082    3636  2227            ISZ   TFS3
2083    3637  5627            JMP I TFS3
2084
2085    3640  0000    TFS4,   0
2086    3641  7200            CLA
2087    3642  4506            SETFS             /SETUP BANK POINTER
2088    3643  1456            TAD I TEMP
2089    3644  7004            RAL
2090    3645  7006            RTL
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2091    3646    7700            SMA CLA                 /FIELD 4
2092    3647    2243            ISZ         TFS4
2093    3650    5643            JMP I       TFS4
2094    3651    0000    TFS5,   0
2095    3652    7200            CLA
2096    3653    4506            SETFS                   /SETUP BANK POINTER
2097    3654    1456            TAD I       TEMP
2098    3655    7002            BSW
2099    3656    7010            RAR
2100    3657    7620            SNL CLA                 /FIELD 5
2101    3660    2251            ISZ         TFS5
2102    3661    5651            JMP I       TFS5
2103
2104    3662    0000    TFS6,   0
2105    3663    7200            CLA
2106    3664    4506            SETFS                   /SETUP BANK POINTER
2107    3665    1456            TAD I       TEMP
2108    3666    7002            BSW
2109    3667    7700            SMA CLA                 /FIELD 6
2110    3670    2262            ISZ         TFS6
2111    3671    5662            JMP I       TFS6
2112
2113
2114    3672    0000    TFS7,   0
2115    3673    7200            CLA
2116    3674    4506            SETFS                   /SETUP BANK POINTER
2117    3675    1456            TAD I       TEMP
2118    3676    7002            BSW
2119    3677    7004            RAL
2120    3700    7700            SMA CLA                 /FIELD 7
2121    3701    2272            ISZ         TFS7
2122    3702    5672            JMP I       TFS7
2123
2124                    /
2125                    /TEST RELOCATION STATUS
2126                    /RETURN IF RELO STATUS BIT SET (DON'T RELO TO FIELD)
2127                    /RETURN+1 IF RELO STATUS BIT RESET (RELO TO THIS FIELD)
2128                    /
2129    3703    0000    TRS0,   0
2130    3704    7200            CLA
2131    3705    4507            SETRS                   /SETUP BANK POINTER
2132    3706    1456            TAD I       TEMP
2133    3707    7700            SMA CLA                 /FIELD 0
2134    3710    2303            ISZ         TRS0
2135    3711    5703            JMP I       TRS0
2136
2137    3712    0000    TRS1,   0
2138    3713    7200            CLA
2139    3714    4507            SETRS                   /SETUP BANK POINTER
2140    3715    1456            TAD I       TEMP
2141    3716    7004            RAL
2142    3717    7700            SMA CLA                 /FIELD 1
2143    3720    2312            ISZ         TRS1
2144    3721    5712            JMP I       TRS1
2145
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2146    3722    0000    TRS2,   0
2147    3723    7200            CLA
2148    3724    4507            SETRS                   /SETUP BANK POINTER
2149    3725    1456            TAD I       TEMP
2150    3726    7006            RTL
2151    3727    7700            SMA CLA                 /FIELD 2
2152    3730    2322            ISZ         TRS2
2153    3731    5722            JMP I       TRS2
2154
2155    3732    0000    TRS3,   0
2156    3733    7200            CLA
2157    3734    4507            SETRS                   /SETUP BANK POINTER
2158    3735    1456            TAD I       TEMP
2159    3736    7004            RAL
2160    3737    7006            RTL
2161    3740    7700            SMA CLA                 /FIELD 3
2162    3741    2332            ISZ         TRS3
2163    3742    5732            JMP I       TRS3
2164
2165    3743    0000    TRS4,   0
2166    3744    7200            CLA
2167    3745    4507            SETRS                   /SETUP BANK POINTER
2168    3746    1456            TAD I       TEMP
2169    3747    7006            RTL
2170    3750    7006            RTL
2171    3751    7700            SMA CLA                 /FIELD 4
2172    3752    2343            ISZ         TRS4
2173    3753    5743            JMP I       TRS4
2174
2175                    /*C8*/  PAGE
2176
2177
2178    3754    0000    TRS5,   0
2179    3755    7200            CLA
2180    3756    4507            SETRS                   /SETUP BANK POINTER
2181    3757    1456            TAD I       TEMP
2182    3760    7002            BSW
2183    3761    7010            RAR
2184    3762    7620            SNL CLA                 /FIELD 5
2185    3763    2354            ISZ         TRS5
2186    3764    5754            JMP I       TRS5
2187
2188    3765    0000    TRS6,   0
2189    3766    7200            CLA
2190    3767    4507            SETRS                   /SETUP BANK POINTER
2191    3770    1456            TAD I       TEMP
2192    3771    7002            BSW
2193    3772    7700            SMA CLA                 /FIELD 6
2194    3773    2365            ISZ         TRS6
2195    3774    5765            JMP I       TRS6
2196                    /
2197            4000    PAGE
2198                    /
2199
2200    4000    0000    TRS7,   0
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2201   4001  7200          CLA
2202   4002  4607          SETRS              /SETUP BANK POINTER
2203   4003  1456          TAD I   TEMP
2204   4004  7002          BSW
2205   4005  7004          RAL
2206   4006  7700          SMA CLA            /FIELD 7
2207   4007  2200          ISZ     TRS7
2208   4010  5600          JMP I   TRS7
2209
2210
2211
2212                   /
2213                   /TYPEOUT ERROR HEADING
2214                   /
2215   4011  0000  ERRHD,  0
2216   4012  1076          TAD     NOTTY      /GET TTY FLAG
2217   4013  7710          SPA  CLA
2218   4014  5611          JMP  I  ERRHD      /NO TELETYPE AVAILABLE DON'T PRINT
2219   4015  4777'         JMS     MES
2220   4016  4543          TEXT    "X*PR LOC  FAIL ADR  GOOD  BAD  PATTERN"
       4017  2022
       4020  4014
       4021  1703
       4022  4040
       4023  0601
       4024  1114
       4025  4001
       4026  0422
       4027  4040
       4030  0717
       4031  1704
       4032  4040
       4033  0201
       4034  0440
       4035  4020
       4036  0124
       4037  2405
       4040  2216
       4041  0000
2221   4042  5611          JMP  I  ERRHD
2222
2223                   /
2224                   /TYPEOUT PROGRAM TITLE
2225                   /
2226   4043  0000  TITLE,  0
2227   4044  1076          TAD     NOTTY      /GET TTY FLAG ?
2228   4045  7710          SPA  CLA           /TTY AVAILABLE ?
2229   4046  5643          JMP  I  TITLE      /NO. ABORT MESAGE
2230   4047  4777'         JMS     MES
2231   4050  4543          TEXT    "X##PDP-8E EXT MEM DATA & CHKBD#"
       4051  4220
       4052  0420
       4053  5570
       4054  0540
       4055  0520
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       4056  2440
       4057  1505
       4060  1540
       4061  0401
       4062  2401
       4063  4046
       4064  4003
       4065  1013
       4066  0204
       4067  4360
2232   4070  5643          JMP  I  TITLE
2233
2234                   /
2235                   /TYPEOUT TO SET SWITCHES
2236                   /
2237   4071  0000  SETSW,  0
2238   4072  1076          TAD     NOTTY      /GET TTY FLAG
2239   4073  7710          SPA  CLA           /IS THERE A TTY AVAILABE
2240   4074  5671          JMP  I  SETSW
2241   4075  4777'         JMS     MES
2242   4076  4543          TEXT    "X#SELECT FIELD PARAMETERSX#"
       4077  2305
       4100  1405
       4101  0324
       4102  4006
       4103  1105
       4104  1404
       4105  4020
       4106  0122
       4107  0115
       4110  0524
       4111  0522
       4112  2345
       4113  4200
2243   4114  5671          JMP  I  SETSW
2244
2245
2246
2247                   /
2248                   /TYPEOUT 'NO RELOCATION'
2249                   /
2250   4115  0000  PNOREL, 0
2251   4116  1076          TAD     NOTTY      /GET TTY FLAG
2252   4117  7710          SPA  CLA           /IS THERE A TTY ON SYSTEM
2253   4120  5715          JMP  I  PNOREL     /NO. GO RUN TEST
2254   4121  4777'         JMS     MES
2255   4122  4543          TEXT    "X#NO RELOCATION, PROG IN FIELD "
       4123  1617
       4124  ??22
       4125  C514
       4126  1703
       4127  0124
       4130  1117
       4131  1654
       4132  4020
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          4133  2217
          4134  0740
          4135  1110
          4136  4008
          4137  1105
          4140  1404
          4141  4000
2256      4142  6224              RIF
2257      4143  7108              CLL RTL
2258      4144  7004              RAL
2259      4145  1124              TAD     [6000
2260      4146  3350              DCA     ZB
2261      4147  4777'             JMS     MES
2262      4150  0000       ZB,    0
2263      4151  7240              STA
2264      4152  3055              DCA     HEAD1
2265      4153  5715              JMP I   PHOREL
2266                       /
2267                       /TYPEOUT 'RELOCATION'
2268                       /
2269
2270      4154  0000       PREL,  0
2271      4155  1076              TAD     NOTTY       /GET TELETYPE FLAG
2272      4156  7710              SPA     CLA         /PRINT MESAGE ?
2273      4157  5754              JMP I   PREL        /NO TTY - DO NOT PRINT
2274      4160  4777'             JMS     MES
2275      4161  4543              TEXT    "S+PRCG WILL RELOCATE"
          4162  2022
          4163  07
          4164  -027
          4165  1114
          4166  1440
          4167  2205
          4170  1417
          4171  0301
          4172  2405
          4173  0200
2276      4174  7240              STA
2277      4175  3055              DCA     HEAD1
2278      4176  5.54              JMP I   PREL
2279
2280
2281
2282                       /
2283      4177  2240
          4200  4200       PAGE
2284                       /
2285
2286                       /
2287
2288
2289
2290                       /
2291                       /RELOCATE THE PROGRAM
2292                       /
```

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2293      4200  0000       RELO,  0
2294      4201  7200              CLA
2295      4202  3053              DCA     CCUNT       /CLEAR ERROR COUNTER
2296      4203  3054              DCA     MOVE        /CLEAR MOVE COUNTER
2297      4204  2061              ISZ     RELCNT      /SEE IF ALL FIELDS DONE
2298      4205  5212              JMP     .+5
2299      4206  1077              TAD     NUMFLO
2300      4207  7111              CIA
2301      4210  3061              DCA     RELCNT
2302      4211  4777'             JMS     ENDPAS
2303      4212  1176              TAD     [6201
2304      4213  1051              TAD     PROFLD
2305      4214  3225              DCA     RELO2
2306      4215  1176              TAD     [6201
2307      4216  1052              TAD     TSTFLD
2308      4217  3227              DCA     RELO3
2309      4220  1225              TAD     RELO2
2310      4221  3232              DCA     RELO4
2311      4222  7705              CLL CLA IAC RAL      /AC=2
2312      4223  1227              TAD     RELO3
2313      4224  3244              DCA     RELO5
2314      4225  6201       RELO2, CDF     0           /MOVE FROM CF
2315      4226  1454              TAD I   MOVE
2316      4227  6201       RELO3, CDF     0           /MOVE TO DF
2317      4230  3454              DCA I   MOVE
2318      4231  1454              TAD I   MOVE
2319      4232  6201       RELO4, CDF     0           /MOVE FROM DF
2320      4233  7041              CIA
2321      4234  1454              TAD I   MOVE
2322      4235  7640              SZA CLA
2323      4236  4776'             JMS     ERRM        /MOVE ERROR
2324      4237  2054              ISZ     MOVE
2325      4240  5225              JMP     RELO2
2326      4241  1053              TAD     CCUNT
2327      4242  7640              SZA CLA              /SKIP IF MOVE ERROR
2328      4243  5600              JMP I   RELO
2329      4244  6203       RELO5, CDI     0           /NEW PROGRAM FIELD
2330      4245  5600              JMP I   RELO
2331
2332                       /
2333                       /INTERRUPT ROUTINE
2334                       /
2335      4246  4300       INTROU, JMS    SAVINT
2336      4247  6107              SPO                  /SKIP IF PARITY OPTION
2337      4250  5253              JMP     .+3
2338      4251  6101              SKP
2339      4252  5775'             JMP     PARINT       /PARITY ERROR
2340      4253  6031              KSF
2341      4254  5774'             JMP     EADINT       /UNWANTED INTERRUPT
2342      4255  4773'             JMS     KBINT        /KEYBOARD INTERRUPT
2343      4256  4772'      INTR,  JMS     RESINT
2344      4257  7200              CLA
2345      4260  1075              TAD     SMQ
2346      4261  7421              MQL                  /RESTORE MQ
2347      4262  6004              GTF
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2348    4263    6005            RTF
2349    4264    7200            CLA
2350    4265    1074            TAD     SAC             /RESTORE AC
2351    4266    5400            JMP I   C
2352
2353
2354                    /
2355                    /TURN INTERRUPT ON IF FIELD 0 AND PARITY OPTION INSTALLED
2356                    /
2357    4267    0000    PAR,    0
2358    4270    7300            CLA CLL
2359    4271    6207            CAF
2360    4272    6107            SPO                     /SKIP ON PARITY OPTION
2361    4273    5667            JMP I   PAR
2362    4274    6224            RIF
2363    4275    7650            SNA CLA                 /SKIP IF NOT FIELD 0
2364    4276    6001            ION
2365    4277    5667            JMP I   PAR
2366    4300    0000    SAVINT, 0
2367    4301    7200            CLA
2368    4302    1771'           TAD     SIXTY
2369    4303    3335            DCA     A1
2370    4304    1770'           TAD     CNV
2371    4305    3336            DCA     A2
2372    4306    1767'           TAD     S0
2373    4307    3337            DCA     A3
2374    4310    1766'           TAD     S1
2375    4311    3340            DCA     A4
2376    4312    1765'           TAD     S2
2377    4313    3341            DCA     A5
2378    4314    1764'           TAD     YES
2379    4315    3342            DCA     A6
2380    4316    1763'           TAD     TYPCM
2381    4317    3343            DCA     A7
2382    4320    1762'           TAD     #0
2383    4321    3344            DCA     A8
2384    4322    1761'           TAD     TYPE
2385    4323    3345            DCA     A9
2386    4324    1760'           TAD     TYPSP
2387    4325    3346            DCA     A10
2388    4326    1757'           TAD     RETURN
2389    4327    3347            DCA     A11
2390    4330    1756'           TAD     ERROR0
2391    4331    3350            DCA     A12
2392    4332    1755'           TAD     ERROR1
2393    4333    3351            DCA     A13
2394
2395    4334    5754'           JMP     C80000          /CB/
2396
2397    4335    0000    A1,     0                       /CB/
2398    4336    0000    A2,     0                       /CB/
2399    4337    0000    A3,     0                       /CB/
2400    4340    0000    A4,     0                       /CB/
2401    4341    0000    A5,     0                       /CB/
2402    4342    0000    A6,     0                       /CB/
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2403    4343    0000    A7,     0                       /CB/
2404    4344    0000    A8,     0                       /CB/
2405    4345    0000    A9,     0                       /CB/
2406    4346    0000    A10,    0                       /CB/
2407    4347    0000    A11,    0                       /CB/
2408    4350    0000    A12,    0                       /CB/
2409    4351    0000    A13,    0                       /CB/
2410
2411    4354    4400
2412    4355    2461
2413    4356    2460
2414    4357    2405
2415    4360    2400
2416    4361    3025
2417    4362    2313
2418    4363    2256
2419    4364    2240
2420    4365    2207
2421    4366    2236
2422    4367    2235
2423    4370    2222
2424    4371    2200
2425    4372    4435
2426    4373    1346
2427    4374    3200
2428    4375    3100
2429    4376    2503
2430    4377    5728
        ....40          PAGE                            /CB/
2431
2432                    C80000,                         /CB/
2433
2434
2435    4400    1777'           TAD     ERROR1+1
2436    4401    3315            DCA     A14
2437    4402    1770'           TAD     ADDER
2438    4403    3316            DCA     A15
2439    4404    1775'           TAD     TN
2440    4405    3317            DCA     A16
2441    4406    1774'           TAD     T0
2442    4407    3320            DCA     A17
2443    4410    1773'           TAD     T1
2444    4411    3321            DCA     A18
2445    4412    1772'           TAD     T0T
2446    4413    3322            DCA     A19
2447    4414    1771'           TAD     TT0
2448    4415    3323            DCA     A20
2449    4416    1770'           TAD     T25
2450    4417    3324            DCA     A21
2451    4420    1767'           TAD     T32
2452    4421    3325            DCA     A22
2453    4422    1766'           TAD     T35
2454    4423    3326            DCA     A23
2455    4424    1765'           TAD     T75
2456    4425    3327            DCA     A24
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2457
2458    4426   1784'            TAD    SAVINT          /CB/
2459    4427   3031             DCA    CBCOD1          /CB/
2460    4430   5831             JMP I  CBCOD1          /CB/
2461
2462    4431   0000   CBCOD1,  0                       /CB/
2463
2464
2465
2466
2467    4432   0000   RESINT,  0
2468    4433   7200             CLA
2469    4434   1763'            TAD    A1
2470    4435   3762'            DCA    SIXTY
2471    4436   1761'            TAD    A2
2472    4437   3760'            DCA    CNV
2473    4440   1757'            TAD    A3
2474    4441   3755'            DCA    SC
2475    4442   1755'            TAD    A4
2476    4443   3754'            DCA    S1
2477    4444   1753'            TAD    A5
2478    4445   3752'            DCA    S2
2479    4446   1751'            TAD    A6
2480    4447   3750'            DCA    MES
2481    4450   1747'            TAD    A7
2482    4451   3746'            DCA    T1PCH
2483    4452   1745'            TAD    A8
2484    4453   3744'            DCA    WC
2485    4454   1743'            TAD    A9
2486    4455   3742'            DCA    TYPE
2487    4456   1741'            TAD    A10
2488    4457   3740'            DCA    TYPSP
2489    4460   1737'            TAD    A11
2490    4461   3736'            DCA    RETURN
2491    4462   1739'            TAD    A12
2492    4463   3734'            DCA    ERRCRO
2493    4464   1733'            TAD    A13
2494    4465   3732'            DCA    ERROR1
2495    4466   1315             TAD    A14
2496    4467   3777'            DCA    ERROR1+1
2497    4470   1316             TAD    A15
2498    4471   3776'            DCA    ADDER
2499    4472   1317             TAD    A16
2500    4473   3775'            DCA    TN
2501    4474   1320             TAD    A17
2502    4475   3774'            DCA    T9
2503    4476   1321             TAD    A18
2504    4477   3773'            DCA    T1
2505    4500   1322             TAD    A19
2506    4501   3772'            DCA    T07
2507    4502   1323             TAD    A20
2508    4503   3771'            DCA    T79
2509    4504   1324             TAD    A21
2510    4505   3770'            DCA    T29
2511    4506   1325             TAD    A22
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2512    4507   3767'            DCA    T52
2513    4510   1326             TAD    A23
2514    4511   3766'            DCA    TCS
2515    4512   1327             TAD    A24
2516    4513   3765'            DCA    TTS
2517    4514   5632             JMP I  RESINT
2518
2519    4515   0000   A14,     0                       /CB/
2520    4516   0000   A15,     0                       /CB/
2521    4517   0000   A16,     0                       /CB/
2522    4520   0000   A17,     0                       /CB/
2523    4521   0000   A18,     0                       /CB/
2524    4522   0000   A19,     0                       /CB/
2525    4523   0000   A20,     0                       /CB/
2526    4524   0000   A21,     0                       /CB/
2527    4525   0000   A22,     0                       /CB/
2528    4526   0000   A23,     0                       /CB/
2529    4527   0000   A24,     0                       /CB/
2530
2531                           /
2532    4532   2461
2533    4533   4261
2534    4534   2469
2535    4535   4250
2536    4536   2405
2537    4537   4247
2538    4540   2400
2539    4541   4246
2540    4542   5025
2541    4543   4245
2542    4544   2313
2543    4545   4244
2544    4546   2256
2545    4547   4243
2546    4550   2245
2547    4551   4242
2548    4552   2237
2549    4553   4241
2550    4554   2226
2551    4555   4240
2552    4556   2235
2553    4557   4237
2554    4560   2222
2555    4561   4236
2556    4562   2203
2557    4563   4235
2558    4564   2250
2559    4565   4232
2560    4566   2213
2561    4567   2284
2562    4570   2152
2563    4571   2134
2564    4572   2122
2565    4573   2010
2566    4574   2100
```

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2567    4875   2735
2568    4876   2466
2569    4877   2402
               4600        PAGE
2570
2571                       /TYPEOUT 'NONE' FOR NO LEGAL FIELD SELECTION
2572                       /
2573    4600   1076        NOFLD,   TAD    NOTTY        /GET THE TTY FLAG
2574    4601   7710                 SPA    CLA          /WAS IT SET
2575    4602   5727'                JMP    PATA         /YES NO TELETYPE DO NOT PRINT
2576    4603   4776'                JMS    MES
2577    4604   1617                 TEXT   "NONE"
        4605   1605
        4606   0000
2578    4607   5727'                JMP    PATA         /SETUP SWITCHES AGAIN
2579                       /
2580                       /THIS ROUTINE ESTABLISHES THE PROPER ERROR ROUTINE TO GO TO
2581                       /
2582                       /
2583    4610   0000        SETERR,  0
2584    4611   7200                 CLA
2585    4612   1775'                TAD    FLDCNT
2586    4613   0035                 AND    SR911
2587    4614   1274                 TAD    (ERRTAB       /GET TO ERROR ROUTINE TO EXECUTE
2588    4615   3253                 DCA    SRS
2589    4616   1653                 TAD I  SRS          /GET ROUTINE TO EXECUTE
2590    4617   3253                 DCA    SRS          /SAVE IT
2591    4620   4653                 JMS I  SRS          /GO EXECUTE ROUTINE
2592    4621   7140                 STA                 /AC=-1
2593    4622   1060                 TAD    FCNT         /-1 TO NUMBER OF FIELDS TO DO
2594    4623   3060                 DCA    FCNT         /SAVE NEW VALUE
2595    4624   1060                 TAD    FCNT
2596    4625   7640                 SZA CLA             /ANY FIELDS LEFT TO DO
2597    4626   5610'                JMP I  SETERR       /YES CONTINUE TESTING
2598    4627   4776'                JMS    MES
2599    4630   4543                 TEXT   "%/DISCONNECTED"
        4631   0411
        4632   2303
        4633   1716
        4634   1005
        4635   0324
        4636   0504
        4637   0000
2600    4640   7402                 HLT
2601    4641   5240                 JMP    .-1          /DON'T CONTINUE
2602    4642   5610'                JMP I  SETERR
2603                       /
2604    4643   3307        ERRTAB,  SRS0
2605    4644   3327                 SRS1
2606    4645   3400                 SRS2
2607    4646   3422                 SRS3
2608    4647   3442                 SRS4
2609    4650   3462                 SRS5
2610    4651   3502                 SRS6
2611    4652   3522                 SRS7
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2612                       /
2613    4652   0000        SRS,     0
2614                       /
2615
2616    4654   0000        PNTFLD,  0
2617    4655   4776'                JMS    MES
2618    4656   4543                 4543
2619    4657   0000                 0
2620    4660   1060                 TAD    FCNT
2621    4661   0034                 AND    SR68         /ISOLATE BANK INFORMATION
2622    4662   7112                 CLL RTR
2623    4663   7010                 RAR                 /MOVE INTO POSITION
2624    4664   1107                 TAD    (260
2625    4665   4773'                JMS    TYPE         /TYPE BANK SELECTION
2626    4666   1060                 TAD    FCNT         /GET FLD CNT
2627    4667   0035                 AND    SR911
2628    4670   1107                 TAD    (260         /SET UP ASCII FOR FIELDS
2629    4671   4772'                JMS    TYPSP        /TYPEOUT # OF FIELDS IN THIS SYSTEM
2630    4672   4776'                JMS    MES
2631    4673   0611                 TEXT         "FIELDS IN THIS SYSTEM"
        4674   0514
        4675   0423
        4676   4011
        4677   1640
        4700   2410
        4701   1123
        4702   4023
        4703   3123
        4704   2405
        4705   1500
2632    4706   4776'                JMS    MES
2633    4707   4543                 TEXT         "%#FIELDS SEL'D ARE "
        4710   0611
        4711   0514
        4712   0423
        4713   4222
        4714   0514
        4715   4704
        4716   4001
        4717   2205
        4720   4000
2634    4721   4771'                JMS    TOSEL
2635    4722   5654                 JMP I  PNTFLD
2636                       /
2637                       /
2638                       /ROUTINE TO CHECK FOR CONSOLE PACKAGE ACTIVE
2639                       /
2640                       /IF CONSOLE PACKAGE ACTIVE, GO TO CONSOLE PACKAGE
2641                       /RETURN CALL + 2
2642                       /
2643                       /IF CONSOLE PACKAGE NOT ACTIVE, RETURN CALL + 1
2644                       /
2645    4723   0000        XCBCAL,  0
2646    4724   3246                 DCA    CHRTMP       /SAVE AC
2647    4725   1022                 TAD    22           /GET NCW2
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2648    4726  0345           AND    K400         /TEST FOR BIT 3-1 CONSOLE ACTIVE
2649    4727  7640           SZA CLA              /SKIP IF CONSOLE NOT ACTIVE
2650    4730  5333           JMP    .+3          /CONSOLE IS ACTIVE.
2651    4731  1346           TAD    CHRTMP       /GET BACK THE CHARACTER
2652    4732  5723           JMP I  XCBCAL       /AND EXIT.
2653    4733  6224           RIF                 /READ INSTRUCTION FIELD
2654    4734  1370           TAD    (OFFSET      /ADD CONSOLE PACKAGE FIELD OFFSET
2655    4735  1367           TAD    (CIF         /ADD CIF INSTRUCTION CODE
2656    4736  3337           DCA    .+1          /SAVE MODIFIED CIF FOR EXECUTION
2657    4737  7402           HLT                 /MODIFIED CIF TO CONSOLE PACKAGE FIELD
2658    4740  1346           TAD    CHRTMP       /RESTORE AC
2659    4741  4744           JMS I  CBLOC        /GO TO CONSOLE PACKAGE
2660    4742  2323           ISZ    XCBCAL       /INCREMENT RETURN ADDRESS
2661    4743  5723           JMP I  XCBCAL       /RETURN CALL + 2  CONSOLE WAS ACTIVE
2662                  /
2663    4744  7222   CBLOC.  CQENTR              /POINTER TO CONSOLE PACKAGE ENTRY
2664    4745  0400   K400.   0400                /CONSTANT
2665    4746  0000   CHRTMP. 0                   /TEMPORARY AC SAVE AREA
2666                  /
2667                  /THIS ROUTINE REPLACES THE LAS INSTRUCTION. IF CONSOLE ACTIVE
2668                  /THE PSEUDO SWITCH REGISTER WILL BE READ  INSTEAD OF
2669                  /DOING A LAS
2670                  /
2671    4747  0000   XGETSR. 0
2672    4750  7300           CLL CLA
2673    4751  1021           TAD    21
2674    4752  7710           SPA CLA              /SKIP IF PSEUDO SWITCH REGISTER TO BE USED
2675    4753  7614           CLA OSR SKP          /GET SWITCHES AND SKIP
2676    4754  1020           TAD    20            /THIS WILL BE ZERO IF CONSOLE NOT ACTIVE
2677    4755  5747           JMP I  XGETSR        /EXIT WITH VALUE IN THE AC
2678    4767  6202
2679    4770  0000
2680    4771  1105
2681    4772  2400
2682    4773  5025
2683    4774  4643
2684    4775  2346
2685    4776  2240
2686    4777  0205
        5000          PAGE
2687                  /
2688                  /PRINT "SELECT TEST PARAMETERS"
2689                  /
2690    5000  0000   SETPAR. 0
2691    5001  7200           CLA
2692    5002  1078           TAD    NOTTY
2693    5003  7710           SPA CLA
2694    5004  5400           JMP I  SETPAR        /SKIP IF TTY AVAILABLE
2695    5005  4777'          JMS    MES
2696    5006  4345           TEXT   "/XSELECT TEST PARAMETERS#X"
        5007  2305
        5010  1405
        5011  0324
        5012  4024
        5013  0523
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        5014  2440
        5015  2001
        5016  2201
        5017  1505
        5020  2405
        5021  2223
        5022  4345
        5023  0000
2697    5024  5600           JMP I  SETPAR
2698                  /
2699                  /
2700                  /TYPEOUT CHARACTER IN AC
2701                  /
2702    5025  0000   TYPE.   0
2703    5026  3056           DCA    TEMP          /SAVE THE CHARACTER
2704    5027  1022           TAD    22            /GET HCW2
2705    5030  7710           SPA CLA              /SKIP APT NOT ACTIVE
2706    5031  5625           JMP I  TYPE          /EXIT IF APT ACTIVE
2707    5032  1056           TAD    TEMP          /GET BACK CHARACTER
2708    5033  6000           SKON
2709    5034  5241           JMP    TYPOFF
2710    5035  4503           PRINT
2711    5036  6001           ION
2712    5037  7200           CLA
2713    5040  5625           JMP I  TYPE
2714    5041  4503   TYPOFF. PRINT
2715    5042  7200           CLA
2716    5043  5625           JMP I  TYPE
2717                  /
2718                  /TYPEOUT 'PROGRAM IN SELECTED FIELD'
2719                  /
2720                  /
2721    5044  1076   PINF.   TAD    NOTTY         /GET THE TELETYPE PROGRAM FLAG
2722    5045  7710           SPA    CLA           /IS THERE A TELETYPE AVAILABLE
2723    5046  5776'          JMP    PATA          /NO TTY- DO NOT PRINT
2724    5047  4777'          JMS    MES           /GO PRINT MESSAGE
2725    5050  4543           TEXT   "X#PROGRAM IN SELECTED FIELD"
        5051  2022
        5052  1707
        5053  2201
        5054  1540
        5055  1116
        5056  4023
        5057  0514
        5060  0503
        5061  2405
        5062  0440
        5063  0611
        5064  0514
        5065  0400
2726    5066  5776'          JMP    PATA          /GO SETUP SWITCHES AGAIN
2727
2728                  /SET UP THE FIELD IN ERROR FOR TYPEOUT
2729                  /LOCATION FOLLOWING CALL IS WHERE TO STORE INFORMATION
2730                  /
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2731   5067  0000   FLODAT, 0
2732   5070  1067          TAD I   FLODAT      /GET LOCATION TO STORE IT IN
2733   5071  3216          DCA     DATTMP      /SAVE IT
2734   5072  2067          ISZ     FLODAT      /UPDATE RETURN
2735   5073  1275          TAD     EMFFLG
2736   5074  7650          SNA CLA             /SKIP IF KTB ACTIVE
2737   5075  5302          JMP     .+5
2738   5076  1 2          TAD     TSTFLD      /GET FIELD BEING DONE
2739   5077  4110          RACA                /BINARY NUMBER
2740   5100  3056          DCA     TEMP        /SAVE IT
2741   5101  5306          JMP     .+5         /PROCESS IT
2742   5102  1062          TAD     TSTFLD
2743   5103  7112          CLL RTR
2744   5104  7010          RAR
2745   5105  3056          DCA     TEMP        /SAVE IT
2746   5106  4775'         JMS     SIXTY
2747   5107  0056          TEMP                /LOCATION TO DO
2748   5110  5114          00                  /WHERE TO PUT IT
2749   5111  1 15          TAD     YY          /GET DECODED VALUE
2750   5112  3716          DCA I   DATTMP
2751   5113  5067          JMP I   FLODAT      /AND EXIT
2752              /
2753              /
2754   5114  0000   DD.     0
2755   5115  0200   YY,     0
2756   5116  0000   DATTMP, 0
2757              /
2758
2759              /
2760              /MAKE A BINARY NUMBER OUT OF A FIELD CHANGE
2761              /
2762   5117  0000   XRACA,  0
2763   5120  3360          DCA     RTEMP
2764   5121  1360          TAD     RTEMP
2765   5122  0365          AND     K104
2766   5123  3361          DCA     RTEMP1      /SAVE BANK VALUE
2767   5124  1361          TAD     RTEMP1
2768   5125  7002          BSW                 /5 INTO 11
2769   5126  7106          CLL RTL             /MOVE INTO 9
2770   5127  7004          RAL                 /NOs 8
2771   5130  1361          TAD     RTEMP1
2772   5131  7004          RAL
2773   5132  0374          AND     K30         /ISOLATE BANK
2774   5133  3361          DCA     RTEMP1
2775   5134  1360          TAD     RTEMP
2776   5135  0373          AND     K70         /ISOLATE FIELD
2777   5136  7112          CLL RTR
2778   5137  7010          RAR                 /INTO BIT 9-11
2779   5140  1361          TAD     RTEMP1
2780   5141  5717          JMP I   XRACA       /EXIT WITH BINARY NUMBER IN THE AC
2781              /
2782              /MAKE A FIELD CHANGE OUT OF A BINARY NUMBER
2783              /
2784   5142  0000   XRACB,  0
2785   5143  3360          DCA     RTEMP
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2786   5144  1360          TAD     RTEMP
2787   5145  7112          CLL RTR
2788   5146  7010          RAR                 /BANK IN 10-11
2789   5147  0372          AND     (3
2790   5150  1371          TAD     (BANKR      /MAKE A POINTER
2791   5151  3217          DCA     XRACA       /SAVE THE POINTER
2792   5152  1360          TAD     RTEMP
2793   5153  0370          AND     (7          /ISOLATE FIELD
2794   5154  7106          CLL RTL
2795   5155  7004          RAL                 /MOVE INTO POSITION
2796   5156  1717          TAD I   XRACA
2797   5157  5742          JMP I   XRACB
2798              /
2799   5160  0000   RTEMP,  0
2800   5161  0000   RTEMP1, 0
2801   5162  0000   BANKR,  0
2802   5163  0004          4
2803   5164  0100          100
2804   5165  0104   K104,   104
2805              /
2806   5170  0007
2807   5171  5130
2808   5172  0003
2809   5173  0070
2810   5174  0030
2811   5175  0000
2812   5176  0200
2813   5177  0240
       5200   PAGE
2814              /
2815              /
2816              /
2817              /
2818              /THE FOLLOWING TEST IS A MARCH PATTERN DEVELOPED FOR TESTING
2819              /THE MS8-C MOS MEMORY.
2820              /
2821              /      THE TEST SELECTED FOR THE MOS MEMORY TESTING IS A TYPICAL MARCH
2822              /      PATTERN. THE TEST BEGINS BY LOADING THE ENTIRE MEMORY WITH
2823              /      A 2525 PATTERN. THEN STARTING AT ADDRESS ZERO OF LOWEST POSSIBLE
2824              /      FIELD THE TEST READS THE CONTENTS, COMPARES IT, AND THEN WRITES BACK
2825              /      THE COMPLIMENT VALUE. THE PROCESS IS REPEATED THROUGHOUT THE ENTIRE
2826              /      MEMORY.
2827              /
2828              /      NEXT THE PROCESS REPEATS FROM MAXIMUM TO MINIMUM, COMPLIMENTING
2829              /      AS IT IS BEING DONE.
2830              /
2831              /      THE ENTIRE SEQUENCE IS THEN REPEATED USING A BACKGROUND OF
2832              /      5252. THIS INSURES THAT A ONE AND A ZERO CAN BE WRITTEN INTO
2833              /      EACH MEMORY CELL.
2834              /
2835              /
2836              /
2837              /
2838   5200  0000   MOSTST, 0
2839   5201  7244          CLL CLA CMA RAL     /AC=-2
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2840    5202  3364           DCA    PATCNT
2841    5203  7344           CLL CLA CMA RAL          /AC=-2
2842    5204  3362           DCA    TSTCNT
2843    5205  7200           CLL CLA
2844    5206  2777'          DCA    FLOCNT
2845    5207  3C24           DCA    BANK               /CLEAR INDICATORS
2846    5210  7301           CLL CLA IAC
2847    5211  3360           DCA    ADDINC
2848    5212  7301           CLL CLA IAC
2849    5213  3361           DCA    FLDINC
2850    5214  4776*  WCSLOO, JMS    NUFLD              /TEST FOR VALID FIELD SELECTION
2851    5215  5232           JMP    WOUPD              /GO UPDATE FIELD VALUE
2852    5216  1051           TAD    PROFLD             /GET CURRENT FIELD
2853    5217  1176           TAD    (6201              /MAKE IT A CDF
2854    5220  3227           DCA    WCSFLD             /SAVE FOR RETURN
2855    5221  1052           TAD    TSTFLD
2856    5222  1176           TAD    (6201              /MAKE TEST FIELD A CDF
2857    5223  3225           DCA    .+2
2858    5224  1369   MEMLOO, TAD    PAT1               /FILL MEMORY WITH BACKGROUND
2859    5225  6201           CDF                       /CHANGED TO LOAD FIELD
2860    5226  3457           DCA I  TSTAD
2861    5227  6201   WOSFLD, CDF                       /MAKE DF=PROFLD
2862    5230  2057           ISZ    TSTAD              /SEE IF ALL DONE
2863    5231  5224           JMP    MEMLOO             /GO BACK AND TRY IT AGAIN
2864                 /UPDATE TEST FIELD VALUE AND TEST AGAIN
2865                 /
2866    5232  7200   WOUPD,  CLA
2867    5233  1777'          TAD    FLOCNT
2868    5234  7041           CIA
2869    5235  1060           TAD    FCNT               /TEST FOR MAX VALUE
2870    5236  7650           SNA CLA                   /SKIP IF NOT AT MAX
2871    5237  5242           JMP    .+3                /AT MAX START READING
2872    5240  2777'          ISZ    FLOCNT             /UPDATE FIELD TO DO
2873    5241  5214           JMP    WCSLOO             /GO BACK AND TEST THIS FIELD VALUE
2874                 /
2875                 /AT THIS POINT ALL MEMORY IS FILLED WITH BACKGROUND 2625
2876                 /
2877    5242  4406           JMS I  IAPTOK             /NOTIFY APT IF REQUIRED.
2878    5243  3777'          DCA    FLOCNT
2879    5244  3024           DCA    BANK               /CLEAR INDICATORS AGAIN FOR READ CYCLE
2880    5245  4776*  WOSRED, JMS    NUFLD
2881    5246  5300           JMP    W1UPD              /NOT A VALID SELECTION.
2882    5247  1365           TAD    PAT1               /SET UP COMPARISON
2883    5250  3072           DCA    GDATA
2884    5251  1051           TAD    PROFLD             /GET CURRENT FELD LOCATION
2885    5252  1176           TAD    (6201              /MAKE IT A CDF
2886    5253  3264           DCA    REDFLD             /SET UP RETURN
2887    5254  1052           TAD    TSTFLD             /GET FIELD TO READ
2888    5255  1176           TAD    (6201              /MAKE IT A CDF
2889    5256  3257           DCA    .+1                /AND SAVE IT FOR USE
2890    5257  6201   REDLUR, CDF                       /CHANGE TO TEST FIELD CDF
2891    5260  1457           TAD I  TSTAD              /GET VALUE IN SELECTED FIELD
2892    5261  3073           DCA    BDATA              /SAVE IT FOR COMPARISON
2893    5262  1366           TAD    PAT2               /NOW WRITE BACK COMPLIMENT VALUE
2894    5263  3457           DCA I  TSTAD              /BACK INTO SELECTED FIELD
```

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2895    5264  6201   REDFLD, CDF                       /CHANGED TO CURRENT CDF
2896    5265  1072           TAD    GDATA
2897    5266  7041           CIA
2898    5267  1073           TAD    BDATA              /SET UP COMPARISON
2899    5270  7640           SZA CLA                   /SKIP IF EQUAL
2900    5271  4775*          JMS    WOSERR             /GO REPORT ERROR
2901    5272  1057           TAD    TSTAD
2902    5273  1360           TAD    ADDINC             /ADD IN ADDRESS OFFSET.
2903    5274  3057           DCA    TSTAD              /AND RESTORE NEW VALUE
2904    5275  1057           TAD    TSTAD
2905    5276  7640           SZA CLA
2906    5277  5257           JMP    REDLUP             /GO BACK AND DO THE NEXT
2907    5300  1361   W1UPD,  TAD    FLDINC
2908    5301  7710           SPA CLA                   /SKIP IF READING LOW TO HIGH
2909    5302  5305           JMP    .+3                /BY PASS COMPARISON
2910    5303  1060           TAD    FCNT
2911    5304  7041           CIA
2912    5305  1777'          TAD    FLOCNT
2913    5306  7650           SNA CLA                   /SKIP IF NOT AT MAX
2914    5307  5214           JMP    .-5
2915    5310  1361           TAD    FLDINC             /ADD IN FIELD OFF SET VALUE
2916    5311  1777'          TAD    FLOCNT             /TO THE CURRENT FIELD POSITION
2917    5312  3777'          DCA    FLOCNT
2918    5313  5245           JMP    WOSRED             /GO BACK AND READ NEXT FIELD
2919                 /
2920                 /NOW UPDATE PATTERN TO LOAD AND READ BACK VALUE
2921                 /
2922    5314  1361           TAD    FLDINC
2923    5315  7041           CIA                       /NEGATE CURRENT FIELD INCREMENT VALUE
2924    5316  3361           DCA    FLDINC             /AND RESTORE IT
2925    5317  1360           TAD    ADDINC             /NOW DO SAME FOR THE ADDRESS OFFSET
2926    5320  7041           CIA
2927    5321  3360           DCA    ADDINC
2928    5322  1360           TAD    ADDINC
2929    5323  7700           SMA CLA                   /SKIP IF READING HIGH TO LOW
2930    5324  5331           JMP    .-5
2931    5325  7340           STA                       /AC TO -1
2932    5326  3057           DCA    TSTAD              /START AT ADDRESS 7777 OF HIGH FIELD
2933    5327  1063           TAD    FCNT               /START AT HIGHEST FIELD
2934    5330  3777'          DCA    FLOCNT
2935    5331  1365           TAD    PAT1
2936    5332  7040           CMA                       /COMPLIMENT PATTERN
2937    5333  3365           DCA    PAT1
2938    5334  1366           TAD    PAT2
2939    5335  7040           CMA
2940    5336  3366           DCA    PAT2
2941    5337  4406           JMS I  IAPTOK
2942    5340  2362           ISZ    TSTCNT             /ALL DONE ?
2943    5341  7410           SKP
2944    5342  5246           JMP    .-4
2945    5343  7332           CLL CLA CML RTR           /SET BIT ONE OF CS WORD
2946    5344  3034           DCA    CS                 /ONES COMPLIMENT
2947    5345  6245           JMP    WOSRED
2948    5346  2036           DCA    CS
2949    5347  1365           TAD    PAT1
```

```
2950   5350  7040          CMA
2951   5351  3305          DCA    PAT1
2952   5352  1306          TAD    PAT2
2953   5353  7040          CMA
2954   5354  3306          DCA    PAT2
2955   5355  2364          ISZ    PATCNT          /SEE IF ALL PATTERNS DONE
2956   5356  5203          JMP    MOSTST+3
2957   5357  5600          JMP I  MOSTST
2958                /
2959   5360  0000   ADDINC, 0
2960   5361  0000   FLDINC, 0
2961   5362  0000   TSTCNT, 0
2962   5363  0000   ADDCNT, 0
2963   5364  0000   PATCNT, 0
2964   5365  2525   PAT1,   2525
2965   5366  5252   PAT2,   5252
2966                /
2967   5375  5415
2968   5376  0707
2969   5377  2248
       5400         PAGE
2970                /
2971   5400  0000   XPRINT, 0
2972   5401  6046          TLS
2973   5402  6041          TSF
2974   5403  5202          JMP    .-1
2975   5404  6042          TCF
2976   5405  7200          CLA
2977   5406  6031          KSF                    /IS KEY BOARD WAITING
2978   5407  5600          JMP I  XPRINT
2979   5410  6036          KRB            /GET CHARACTER
2980   5411  4505          CBCAL                  /TEST FOR ACTIVE CONSOLE
2981   5412  7200          CLA                    /NOT ACTIVE JUST IGNORE CHARACTER
2982   5413  6032          KCC                    /CLEAR FLAG
2983   5414  5400          JMP I  XPRINT
2984
2985
2986                /
2987                /
2988
2989   5415  0000   MOSERR, 0
2990   5416  3053          ISZ    COUNT           /UPDATE ERROR COUNT
2991   5417  1377          TAD    (40
2992   5420  3037          DCA    TS              /SAVE TEST STATUS FOR PRINTOUT
2993   5421  3038          DCA    CS
2994   5422  1072          TAD    QDATA           /DATA WRITTEN
2995   5423  4776          JMS    QERRC
2996   5424  3053          DCA    COUNT
2997   5425  5415          JMP I  MOSERR
2998
2999
3000
3001                /
3002                /
3003                /PRINT END OF PASS MESSAGE
```

```
3004                /
3005   5426  0000   ENDPAS, 0
3006   5427  7200          CLA
3007   5430  1076          TAD    NOTTY
3008   5431  7710          SPA CLA                /SKIP IF TTY AVAILABLE
3009   5432  5626          JMP I  ENDPAS
3010   5433  2355          ISZ    PASSES
3011   5434  4775          JMS    SIXTY
3012   5435  5455          PASSES
3013   5436  5451          ENDMES
3014   5437  4774          JMS    MES
3015   5440  4345          TEXT   "/#END OF PASS "
       5441  0516
       5442  0440
       5443  1706
       5444  4020
       5445  0123
       5446  2340
       5447  0000
3016   5450  4774          JMS    MES
3017   5451  0000   ENDMES, 0
3018   5452  0000          0
3019   5453  0000          0
3020   5454  5626          JMP I  ENDPAS
3021                /
3022   5455  0000   PASSES, 0
3023   5456  0000          0
3024                /
3025   5574  1.40
3026   5575  2200
3027   5576  1454
3028   5577  0040
       5600         PAGE
3029                /
3030        /APT/   ROUTINE TO HANDLE ERRORS UNDER CONTROL OF APT
3031                /
3032   5600  0000   APTER,  0              /APT/
3033   5601  6002          IOF                    /APT/
3034   5602  3722          DCA    APTIZ           /SAVE ANYTHING IN THE AC
3035   5603  1.22          TAD    22              /GET MCM2
3036   5604  7700          SMA CLA                /SKIP IF APT ALIVE
3037   5605  5600          JMP I  APTER
3038   5606  6224          RIF                    /APT/
3039   5607  1123          TAD    (6203           /APT/CREATE A CDF INST.
3040   5610  3021          DCA I  APTER1          /APT CDF IN PROM CODE
3041   5611  1621          TAD I  APTER1
3042   5612  3216          DCA    .+4             /APT/MODIFY NEXT CDF INST.
3043   5613  1222          TAD    APTIZ           /SEE IF ANYTHING WAS IN AC
3044   5614  7450          SNA                    /SKIP IF THERE WAS
3045   5615  1777          TAD    ADDER           /APT/AC=ERROR PC.
3046   5616  6201          CDF                    /APT/(MODIFIED CDF) DF=IF.
3047   5617  7000          NOP
3048   5620  5776          JMP    6520            /APT/CALL APT - 'ERROR'.
3049                /
3050   5621  6523   APTER1, 6523
```

```
3051                            /
3052                            /APT/    THIS ROUTINE INITIALIZES PROGRAM FOR APT
3053                            /
3054    5622   0000    APTIZ,   0
3055    5623   6002             IOF                         /MAKE SURE INTERRUPT IS OFF
3056    5624   1022             TAD    -CW2                 /GET APT CONTROL WORD
3057    5625   7700             SMA CLA                      /SKIP IF APT ENABLED.
3058    5626   5254             JMP    NOTAPT
3059    5627   7240             STA                         /AC=-1
3060    5630   3076             DCA    NOTTY                /NOP CONSOLE TERMINAL
3061    5631   1375             TAD    137                  /SET UP FOR AUTO SIZE
3062    5632   3020             DCA    PSR
3063    5633   5251             JMP    APTEX                /APT ENABLED
3064    5634   1076    NOTAPT,  TAD    NOTTY
3065    5635   7700             SMA CLA                      /SKIP IF NO TTY ON SYSTEM
3066    5636   5250             JMP    .+12
3067    5637   1C21             TAD    HLW1                 /GET CONFIGURATION WORD 1
3068    5640   7710             SPA CLA                      /SKIP IF SOFTWARE SWITHES TO BE USED
3069    5641   5247             JMP    .+6
3070    5642   1020             TAD    PSR                  /GET PSEUDO SWITCH REGISTER
3071    5643   7640             SZA CLA                      /SKIP IF NO VALUE IN PSEUDO SWITCHES
3072    5644   5247             JMP    .+3
3073    5645   1375             TAD    137                  /SETUP DEFAULT FOR AUTO SIZING
3074    5646   3020             DCA    PSR
3075    5647   7610             SKP CLA                      /BYPASS SAVING OS/8 MONITOR
3076    5650   4774*            JMS    CBSW                 /SAVE OSB MONITOR IN FIELD 1
3077    5651   5622    APTEX,   JMP I  APTIZ                /AND EXIT
3078                            /
3079                            /
3080                            /
3081                            /
3082                            /
3083                            /APT/    ROUTINE TO 'NOTIFY' APT THAT  HE PROGRAM IS RUNNING OK.
3084                            /
3085    5652   0000    APTOK,   0                           /APT/
3086    5653   7200             CLA                         /APT/
3087    5654   1022             TAD    HCW2                 /APT/UNDER APT CONTROL?
3088    5655   7700             SMA CLA                      /APT/SKIP IF YES.
3089    5656   5274             JMP    APTOKO
3090    5657   6002             IOF                         /APT/
3091    5660   6224             RIF                         /APT/AC=IF.
3092    5661   1123             TAD    [6203               /APT/CREATE A CDF INST.
3093    5662   3073             DCA I  APTOK1               /SET UP APT CODE CDF
3094    5663   1673             TAD I  APTOK1               /GET BACK VALUE JUST MOVED
3095    5664   3265             DCA    .+1                  /APT/'MODIFY NEXT LOC.
3096    5665   6201             CDF                         /APT/1MODIFIED CDF1 OF=CURRENT IF.
3097    5666   7000             NOP
3098    5667   4773*            JMS    6500                 /APT/CALL APT - 'PROG CK'.
3099    5670   5652             JMP I  APTOK                /APT/RTN FROM APT - RTN TO CALL+1.
3100    5671   0000    APTCT,   0
3101    5672   0000    APTCTY,  0
3102    5673   6505    APTOK1,  6505                        /LOCATION TO OVERLAY FOR PROPER FIELD
3103                            /
3104                            /SEE IF KEY BOARD WAITING
3105                            /
```

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3106    5674   0000    APTOKO,  0
3107    5675   6031             KSF
3108    5676   5652             JMP I  APTOK
3109    5677   6036             KRB
3110    5700   4505             CBCAL                       /TEST FOR CONSOLE
3111    5701   7200             CLA                         /IGNORE CHARACTER
3112    5702   6032             KCC
3113    5703   5652             JMP I  APTOK                       /EXIT
3114                            /
3115                            /
3116                            /THIS ROUTINE DETERMINES IF MEMORY IS CONTIGUOUS IS LOWER 32K
3117                            /OF MEMORY. IF NOT FIELD 7 IS NOT TESTED.
3118                            /
3119    5704   0000    APTFL,   0                           /APT/
3120    5705   1022             TAD    HCW2                 /GET APT CONTROL WORD
3121    5706   7700             SMA CLA                      /SKIP IF APT ENABLED
3122    5707   5704             JMP I  APTFL                /EXIT IF NOT
3123    5710   7333             CLL CLA CML IAC RTR         /AC=6000
3124    5711   3237             DCA    APTMOV               /SET UP STARTING ADDRESS
3125    5712   6271    APTLUP,  CDF    70                   /POINTER TO PROM CODE
3126    5713   1737             TAD I  APTMOV               /GET AN ADDRESS
3127    5714   6201             CDF                         /FIELD ZERO
3128    5715   3737             DCA I  APTMOV               /SAVE THE VALUE
3129    5716   1737             TAD I  APTMOV               /GET BACK VALUE JUST MOVED
3130    5717   7041             CIA
3131    5720   6271             CDF    70                   /BACK TO FIELD 7 FOR COMPARE
3132    5721   1737             TAD I  APTMOV               /GET BACK ORIGINAL VALUE
3133    5722   6201             CDF                         /BACK TO FIELD ZERO
3134    5723   7640             SZA CLA                      /SKIP IF EQUAL
3135    5724   4340             JMS    MOVFAL               /MOVE FAILURE, SCVE BAD STUFF
3136    5725   2337             ISZ    APTMOV               /UP DATE ADDRESS POINTER
3137    5726   5312             JMP    APTLUP               /GO BACK AND TRY AGAIN
3138                            /
3139                            /AT THIS POINT THE APT PROM CODE IS SITTING IN THE PROGRAM
3140                            /FIELD. FORM THIS POINT OUT ALL APT PROCESSING WILL BE DONE
3141                            /IN THE FIELD BEING EXERCISED.
3142                            /
3143    5727   1040             TAD    FS                   /TEST TO SEE IF LOWER 32K CONTIGUOUS
3144    5730   7650             SNA CLA
3145    5731   5704             JMP I  APTFL                /ALL MEMORY CONTIGUOUS
3146    5732   1040             TAD    FS                   /GET SSCH FIELD STATUS
3147    5733   0372             AND    [7740               /MASK OUT 7
3148    5734   1371             TAD    120                  /NOP FIELD 7 TESTING
3149    5735   3040             DCA    FS                   /AND RESTORE FIELD STATUS WORD
3150    5736   5704             JMP I  APTFL                /AND EXIT.
3151                            /
3152    5737   0000    APTMOV,  0
3153                            /
3154    5740   00      MOVFAL,  0
3155    5741   7240             STA
3156    5742   1340             TAD    MOVFAL               /ERROR PC
3157    5743   6201             CDF                         /ERROR FIELD
3158    5744   6272             CIF    70                   /TO PROM CODE
3159    5745   5776*            JMP    6200                 /REPORT THE ERROR
3160
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3161                      /
3162                      /
3163                      /THE FOLLOWING LOCATIONS FROM 6000 TO 7777 ARE USED AS THE COMMUNICATIONS
3164                      /INTERFACES FOR APT SHOULD APT BE AVAILABLE.
3165                      /
3166    5771  0000
3167    5772  7740
3168    5773  6500
3169    5774  6036
3170    5775  0037
3171    5776  0620
3172    5777  2466
              6000        *6000                  /C8/
3173
3174    6000  4777*   LOOP1,  JMS     SAVOF
3175    6001  1076            TAD     .GTTY          /GET THE TELETYPE FLAG
3176    6002  7710            SPA     CLA            /IS THERE CH ON THE SYSTEM
3177    6003  0223            JMP     LOOP1A-1       /NO ABORT MESSAGE AND QALT
3178    6004  4776*           JMS     YES
3179    6005  4542            TEXT    "*%*LOOP ON ADDRESS SET IN SR*
        6006  1417
        6007  1720
        6010  4017
        6011  1640
        6012  0104
        6013  0422
        6014  0123
        6015  2340
        6016  ? 05
        6017  2440
        6020  1116
        6021  4023
        6022  2200
3180    6023  4779*           JMS     RLSDF
3181    6024  4504    LOOP1A. GETSR
3182    6025  3235            DCA     SR
3183    6026  1635            TAD I   SR
3184    6027  7040            CMA
3185    6030  3635            DCA I   SR
3186    6031  1235            TAD I   SR
3187    6032  7040            CMA
3188    6033  3635            DCA I   SR
3189    6034  5224            JMP     LOOP1A
3190    6035  0000    SR.     0
3191                  /
3192                  /C8/    ROUTINE  TO SAVE PAGE 37 OF FIELD 1
3193
3194    6036  0000    CBSV,   0
3195    6037  7200            CLA
3196    6040  6224            RIF                    /READ THE INSTRUCTION FIELD
3197    6041  1374            TAD     (6201          /ADD CDF 0 TO IT
3198    6042  3281            DCA     CBSM0          /MODIFY THE CDF INSTR AT LOC CBSM0
3199    6043  1373            TAD     (7577          /SET UP PAGE 37 POINTER -1
3200    6044  3010            DCA     10             /SAVE IN AUTO INDEX 10
3201    6045  1372            TAD     (CBSA-1        /GET ADDRESS -1 OF STORAGE AREA
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3202    6046  3011            DCA     11             /SAVE IN AUTO INDEX 11
3203    6047  6211    CBSM1.  CDF     10             /CHANGE DATA FIELD TO 1
3204    6050  1410            TAD I   10             /GET THE WORD
3205    6051  6201    CBSM0.  CDF                    /CHANGE DATA FIELD TO PRO FIELD
3206    6052  3411            DCA I   11             /SAVE IN STORE AREA
3207    6053  1010            TAD     10             /CHECK TO SEE IF PAGE DONE
3208    6054  7040            CMA
3209    6055  7  0            SZA     CLA            /DONE SAVING PAGE
3210    6056  5247            JMP     CBSM1          /NO-DO NEXT WORD
3211    6057  5636            JMP I   CBSV           /YES-RETURN TO CALL+1
3212
3213
3214
3215                  /C8/    ROUTINE TO RESTORE PAGES 37 OF FIELD 0 AND 1
3216
3217    6060  7200    CBRM.   CLA
3218    6061  6224            RIF                    /GET THE PRESENT DATA  FIELD
3219    6062  1374            TAD     (6201          /GET THE CDF INSTRUCTION
3220    6063  2 17            DCA     CBRM0          /SAVE THE NEW CDF INSTRUCTION
3221    6064  1207            TAD     CBRM0
3222    6065  3276            DCA     CBRM31
3223    6066  1373            TAD     (7577          /SET UP AUTO INDEX FOR RESTORE OF 0
3224    6067  3010            DCA     10             /SAVE IN AUTO INDEX 10
3225    6070  1372            TAD     (CBSA-1        /SETUP STORAGE  POINTER
3226    6071  3011            DCA     11             /SAVE IN AUTO INDEX 11
3227    6072  1373            TAD     (7577          /SEUP AUTO INDEX OF RESTORE OF FILD 1
3228    6073  3012            DCA     12             /SAVE IN AUTO INDEX 12
3229    6074  1373            TAD     (7577          /SETUP NEXT POINTER
3230    6075  3013            DCA     13             /SAVE IN AUTO INDEX 13
3231    6076  6201    CBRM01. CDF
3232    6077  1613            TAD I   13
3233    6100  7040            CMA
3234    6101  7650            SNA CLA                /ALL DONE
3235    6102  5307            JMP     CBRM0
3236    6103  1411            TAD I   11             /GET DATA TO RESTORE
3237    6104  6211            CDF     10             /CHANGE DATA FIELD TO 1
3238    6105  3412            DCA I   12             /PUT IT IN FIELD 1
3239    6106  5276            JMP     CBRM31         /GO DO NEXT WORD
3240    6107  6201    CBRM3.  CDF                    /MODIFIED CDF INSTRUCTION TO PRO FIELD
3241    6110  1010            TAD     10             /RESTORATION DONE
3242    6111  7040            CMA
3243    6112  7650            SNA CLA                /SKIP IF #0
3244    6113  5116            JMP     CBRM1          /DONE-GO TO MONITOR AT 7600
3245    6114  1410            TAD I   10             /GET DATA FROM PROGRAM FIELD
3246    6115  6201            CDF     00
3247    6116  3412            DCA I   12             /RESTORE 0
3248    6117  5107            JMP     CBRM0
3249    6120  6203    CBSM1,  CDF     CIF            /CHANGE DATA AND INSTR FIELD TO 0
3250    6121  5722            JMP I   .+1
3251    6122  7600            7600
3252                  /
3253    6123  6777
3254    6124  7577
3255    6125  6201
3256    6126  6670
```

```
3257    6176   2240
3258    6177   6664
        6200          +6200                        /C8/
3259
3260    6200   4777'   LCOP2,   JMS    SAVOF
3261    6201   1076             TAD    NOTTY        /GET TELETYPE STATUS
3262    6202   7710             SPA    CLA          /IS THERE ONE ON THE SYSTEM
3263    6203   5234             JMP    LCOP2A+2     /NO ABORT MESSAGE AND HALT FOR INFO
3264    6204   4776'            JMS    MES
3265    6205   4643             TEXT   "%#LOOP ONLY THE 2 ADDRESSES INPUT FROM THE SR"
        6206   1417
        6207   1720
        6210   4017
        6211   1614
        6212   3140
        6213   2410
        6214   0540
        6215   6243
        6216   0164
        6217   0422
        6220   0523
        6221   2205
        6222   2340
        6223   1116
        6224   2025
        6225   2440
        6226   0622
        6227   1715
        6230   4024
        6231   1005
        6232   4023
        6233   2200
3266    6234   4245             JMS    IN12
3267    6235   4775'            JMS    RESOF
3268    6236   1731   LCOP2A,   TAD I  FIRST
3269    6237   7040             CMA
3270    6240   3731             DCA I  FIRST
3271    6241   1732             TAD I  SECOND
3272    6242   7040             CMA
3273    6243   3732             DCA I  SECOND
3274    6244   5236             JMP    LCOP2A
3275    6245   0000   IN12,     0
3276    6246   1076             TAD    NOTTY        /GET TELETYPE FLAG
3277    6247   7710             SPA    CLA          /IS THERE ONE ON THE SYSTEM
3278    6250   5274             JMP    IN12A        /NO-ABORT MESSAGE AND HALT FOR INFO
3279    6251   4776'            JMS    MES
3280    6252   4543             TEXT   "%#SET SR TO FIRST ADDRESS & CONT"
        6253   2205
        6254   2440
        6255   2322
        6256   4024
        6257   1740
        6260   0611
        6261   2223
        6262   2440
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```
        6263   0104
        6264   0422
        6265   0523
        6266   2340
        6267   4646
        6270   0317
        6271   1624
        6272   0000
3281
3282    6273   4505             CBCAL
3283    6274   7402   IN12A,    HLT
3284    6275   4504             GETSR
3285    6276   3331             DCA    FIRST
3286    6277   1076             TAD    NOTTY        /GET FLAG STATUS AGAIN
3287    6300   7710             SPA    CLA          /TELETYPE AVAILABLE?
3288    6301   5225             JMP    FIRST-4      /NO-ABORT MESSAGE AND HALT FOR INFO
3289    6302   4776'            JMS    MES
3290    6303   4643             TEXT   "%#SET SR TO SECOND ADDRESS & CONT"
        6304   2329
        6305   2440
        6306   2322
        6307   4024
        6310   1740
        6311   2305
        6312   0317
        6313   1604
        6314   4031
        6315   0714
        6316   2205
        6317   2233
        6320   4646
        6321   4523
        6322   0716
        6323   2400
3291
3292    6324   4505             CBCAL
3293    6325   7402             HLT
3294    6326   4504             GETSR
3295    6327   3332             DCA    SECOND
3296    6330   5645             JMP I  IN12
3297    6331   0000   FIRST,    0
3298    6332   0000   SECOND,   0
3299    6375   0076
3300    6376   2240
3301    6377   6664
        6400          +6400                        /C8/
3302
3303                         /+C8+/+6400
3304    6400   4777'   LCOP3,   JMS    SAVOF
3305    6401   1076             TAD    NOTTY        /GET THE TELETYPE STATUS
3306    6402   7710             SPA    CLA          /IS THERE A TELETYPE AVAILABLE?
3307    6403   5234             JMP    LCOP3A-6     /NO-ABORT MESSAGE AND HALT FOR INFO
3308    6404   4776'            JMS    MES
3309    6405   4643             TEXT   "%#LOOP FROM FIRST ADDRESS THRU SECOND ADDRESS"
        6406   1417
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```
              6407  1720
              6410  4006
              6411  2217
              6412  1540
              6413  C611
              6414  2222
              6415  2440
              6416  0 14
              6417  4 22
              6420  0923
              6421  2340
              6422  2410
              6423  2225
              6424  4022
              6425  0503
              6426  1716
              6427  C440
              6430  0104
              6431  0122
              6432  0523
              6433  2206
       3310   6434  4775'              JMS     INI2
       3311   6435  1774'              TAD     FIRST
       3312   6436  3203               DCA     SRL1
       3313   6437  1773'              TAD     SECOND
       3314   6440  3204               DCA     SRL2
       3315   6441  4772'              JMS     RESDF
       3316   6442  1263   LOOP3A, TAD     SRL1
       3317   6443  3262           DCA     SRL
       3318   6444  1662   LOOP3B, TAD I   SRL
       3319   6445  7040               CMA
       3320   6446  3662               DCA I   SRL
       3321   6447  1662               TAD I   SRL
       3322   6450  7040               CMA
       3323   6451  3662               DCA I   SRL
       3324   6452  1262               TAD     SRL
       3325   6453  7041               CIA
       3326   6454  1264               TAD     SRL2
       3327   6455  7650               SNA CLA
       3328   6456  5242               JMP     LOOP3A
       3329   6457  2262               ISZ     SRL
       3330   6460  5244               JMP     LOOP3B
       3331
       3332
       3333   6461  5200               JMP     LOOP3
       3334   6462  0000   SRL,    0
       3335   6463  0000   SRL1,   0
       3336   6464  0000   SRL2,   0
       3337         6500   *6500                    /C8/
       3338
       3339   6500  4777'  LOOP5,  JMS     SAVDF
       3340   6501  1076           TAD     NOTTY           /GET TTY FLAG
       3341   6502  7710           SPA     CLA             /IS THERE A TELETYPE AVAILABLE
       3342   6503  5326           JMP     LOOP5A-6        /NO-ABORT MESSAGE AND HALT FOR INFO
       3343   6504  4776'          JMS     MES
```

```
       3344   6505  4643           TEXT    "%/LOOP DATA IN THE SR THRU THE ADDRESS SELECTION"
              6506  1417
              6507  1720
              6510  4004
              6511  0124
              6512  0140
              6513  1116
              6514  4024
              6515  1005
              6516  4023
              6517  2240
              6520  2410
              6521  2225
              6522  4024
              6523  1005
              6524  4C01
              6525  0404
              6526  2205
              6527  2323
              6530  4023
              6531  0514
              6532  0503
              6533  2411
              6534  1716
              6535  0000
       3345   6536  4775'          JMS     INI2
       3346   6537  1774'          TAD     FIRST
       3347   6540  3364           DCA     SR5A
       3348   6541  1773'          TAD     SECOND
       3349   6542  3365           DCA     SR5B
       3350   6543  4772'          JMS     RESDF
       3351   6544  1264   LOOP5A, TAD     SR5A
       3352   6545  3366           DCA     SR5C
       3353   6546  4904   LOOP5B, GETSR
       3354   6547  3766           DCA I   SR5C
       3355   6550  1766           TAD I   SR5C
       3356   6551  3766           DCA I   SR5C
       3357   6552  1366           TAD     SR5C
       3358   6553  7041           CIA
       3359   6554  1365           TAD     SR5B
       3360   6555  7650           SNA CLA
       3361   6556  5344           JMP     LOOP5A          /START AGAIN WITH FIRST ADDRESS
       3362   6557  2366           ISZ     SR5C
       3363   6560  5346           JMP     LOOP5B          /GO NEXT ADDRESS
       3364
       3365   6561  4505           CBCAL
       3366   6562  7402           HLT                     /HALT RESULTED FROM ILLEGAL LIMITS
       3367   6563  5500           JMP     LOOP5
       3368   6564  0000   SR5A,   0                       /FIRST ADDRESS OF GROUP
       3369   6565  0000   SR5B,   0                       /LAST ADDRESS OF GROUP
       3370   6566  0000   SR5C,   0                       /ADDRESS COUNTER
       3371
       3372   6572  6676
       3373   6573  6332
       3374   6574  6331
```

```
3375    6575   6245
3376    6576   2240
3377    6577   6664
               6600    *6600                                    /C8/
3378
3379    6600   4264    LQDP4,   JMS     SAVDF
3380    6601   1076             TAD     NOTTY               /GET TTY STATUS
3381    6602   7710             SPA     CLA                 /IS THERE ONE ON THE SYSTEM
3382    6603   5253             JMP     LQDP4A-4            /NO-ABORT MESSAGE AND HALT FOR INFO
3383    6604   4777'            JMS     MES
3384    6605   4543             TEXT    *%#LOOP DATA IN THE SR ON THE INPUT ADDRESS*
        6606   1417
        6607   1720
        6610   4004
        6611   0124
        6612   0140
        6613   1110
        6614   4024
        6615   1005
        6616   4023
        6617   2240
        6620   1718
        6621   4024
        6622   1005
        6623   4011
        6624   1620
        6625   2524
        6626   4001
        6627   0404
        6630   1209
        6631   2323
        6632   0000
3385    6633   4777'            JMS     MES
3386    6634   4543             TEXT    *%#SET SR TO ADDRESS & CONT*
        6635   2305
        6636   2440
        6637   2322
        6640   4024
        6641   1740
        6642   0104
        6643   0422
        6644   0523
        6645   2340
        6646   4640
        6647   0317
        6650   1624
        6651   0000
3387
3388    6652   4505             CBCAL
3389    6653   7402             HLT
3390    6654   4904             GETSR
3391    6655   3263             DCA     SR4
3392    6656   4276             JMS     RESDF           /RESTORE DATA FIELD TO NEW
3393    6657   4504    LQDP4A,  GETSR
3394    6660   3663             DCA I   SR4
```

```
3395    6661   1663             TAD I   SR4
3396    6662   5257             JMP     LQDP4A
3397    6663   0000    SR4,     0
3398    6664   0000    SAVDF,   0
3399    6665   7200             CLA
3400    6666   6214             RDF
3401    6667   3275             DCA     SAVE
3402    6670   6224             RIF
3403    6671   1276             TAD     (6201
3404    6672   3273             DCA     .+1
3405    6673   6201             CDF     00              /PROGRAM DF
3406    6674   5664             JMP I   SAVDP
3407    6675   0000    SAVE,    0
3408
3409    6676   0000    RESDF,   0
3410    6677   1275             TAD     SAVE
3411    6700   1276             TAD     (6201
3412    6701   3302             DCA     .+1
3413    6702   6201             CDF     00              /LOOP DF
3414    6703   5676             JMP I   RESDF
3415                    /
3416    6777   2240
               7000    PAGE
               7000    CBSA=.
3417
3418
3419                   /
3420                   /        C O N S O L E   P A C K A G E
3421                   /
3422                   /
3423                   /IF ENTERED WITH AC=0000 THE SWITCH REGISTER
3424                   /MODIFICATION ROUTINE IS ENTERED AUTOMATICALLY.
3425                   /IF ENTERED WITH AC NOT EQUAL TO 0000, THE
3426                   /KEYBOARD INPUT DECODER IS ENTERED AND IT IS ASSUMED
3427                   /THAT THE AC CONTAINS THE ASCII CODE TO BE
3428                   /CHECKED FOR A VALID CONTROL CHARACTER.
3429                   /
3430
3431
3432            0203    RSTART=DATA
3433            0000    OFFSET=0
3434                   /
3435                   /
3436            7200    *7200
3437                   /
3438    7200   0000    CBTEMP,  0               /TEMPORARY WORK AREA
3439    7201   6203    CBCDI,   CIF CDF         /USED TO CREATE CDI TO PROGRAM FIELD
3440    7202   6201    CBCDF,   CDF             /USED TO CREATE CDF TO CONSOLE FIELD
3441    7202   0000    CBSWR,   0               /SWITCH REGISTER SAVE AREA
3442    7204   0000    CBMODE,  0               /PRINT MODE SWITCH
3443    7205   0000    CBCNT,   0               /USED AS COUNTER
```

```
3444   7206   7775   C8V3.    -3              /CONSTANT
3445   7207   7774   C8V4.    -4              /CONSTANT
3446   7210   7773   C8V5.    -5              /CONSTANT
3447   7211   7770   C8-10.   -10             /CONSTANT
3448   7212   7520   C8V260.  -260            /CONSTANT
3449   7213   C037   C8V7.    0037            /CONSTANT
3450   7214   0240   C84240.  0240            /CONSTANT
3451   7215   0260   C84260.  0260            /CONSTANT
3452   7216   0275   C8V275.  0275            /CONSTANT
3453   7217   0277   C8V277.  0277            /CONSTANT
3454   7220   0322   C84322.  0322            /CONSTANT
3455   7221   0323   C8V323.  0323          . /CONSTANT
3456                          /
3457                          /
3458   7222   C000   C8ENTR.  0
3459   7223   3200            DCA     C8TEMP   /SAVE AC
3460   7224   6214            RDF              /READ PROGRAM FIELD
3461   7225   1201            TAD     C8CDI    /ADD CDI INSTRUCTION
3462   7226   3205            DCA     C8CNTR   /SAVE CDI TO PROGRAM FIELD TEMPORARILY
3463   7227   6224            RIF              /READ CONSOLE FIELD
3464   7230   1202            TAD     C2CDF    /ADD CDF INSTRUCTION
```

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3465   7231   3241            DCA     C8FLD    /SAVE CDF TO CONSOLE FIELD
3466   7232   1777            TAD  I  121      /GET MCWI FROM PROGRAM FIELD
3467   7233   7710            SFA CLA          /SKIP IF USING PSEUDO SWR
3468   7234   7614            LAS     INP      /GET HARDWARE SWR AND SKIP
3469   7235   1776            TAD  I  120      /GET PSEUDO SWR
3470   7236   3203            DCA     C8SWR    /SAVE SWITCH REGISTER
3471   7237   1775            TAD  I  (1MCODE  /GET MESSAGE ACTIVE FLAG
3472   7240   3204            DCA     C8MCODE  /SAVE MESSAGE ACTIVE FLAG
3473   7241   7402   C8FLD.   HLT              /MODIFIED CDF TO CONSOLE DATA FIELD
3474   7242   1222            TAD     C8ENTR   /GET RETURN ADDRESS
3475   7243   3774'           DCA     C8RTN    /SAVE FOR EXIT
3476   7244   1205            TAD     C8CNTR   /GET CDI TO PROGRAM FIELD
3477   7245   3773'           DCA     C8PFLD   /SAVE CDI TO PROGRAM FIELD FOR EXIT
3478   7246   1200            TAD     C8TEMP   /GET AC UPON ENTRY
3479   7247   7440            SZA              /SKIP IF IT WAS ZERO
3480   7250   3772'           JMP     C8CNTL   /AC NOT ZERO, GO CHECK CTRL CHAR
3481                          /
3482                          /PRINT OUT SR=XXXX WHERE XXXX IS THE CURRENT CONTENTS
3483                          /OF THE SWITCH REGISTER BEING USED (EITHER PSEUDO OR HARDWARE)
3484                          /
3485   7251   4771'   C8PSW.  JMS     C8CRLF   /DO A <CR> AND <LF>
3486   7252   1251            TAD     C84323   /GET ASCII CODE FOR "S"
3487   7253   4770'           JMS     C8TYP    /PRINT "S"
3488   7254   1220            TAD     C84322   /GET ASCII CODE FOR "R"
3489   7255   4770'           JMS     C8TYP    /PRINT "R"
3490   7256   1216            TAD     C84275   /GET ASCII CODE FOR "="
3491   7257   4770'           JMS     C8TYP    /PRINT "="
3492   7260   1207            TAD     C8V4     /AC=-4
3493   7261   3205            DCA     C8CNTR   /SET UP OCTAL DIGIT COUNTER
3494   7262   1203            TAD     C8SWR    /GET SWITCH REGISTER
3495   7263   7004            RAL              /EXTRA ROTATE FOR LINK
3496   7264   7004   C8LOPA.  RAL
3497   7265   7006            RTL              /ROTATE OCTAL DIGITS FOR PRINTING
3498   7266   3203            DCA     C8SWR    /SAVE ROTATED SWR
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3499    7267   1203            TAD     CBSAR           /GET ROTATED SWR
3500    7270   0213            AND     C3K7            /MASK OFF DIGIT TO PRINT
3501    7271   1215            TAD     C2K260          /ADD ASCII BASE CODE
3502    7272   4770'           JMS     CBTYP           /PRINT AN OCTAL DIGIT
3503    7273   1203            TAD     CBSAR           /GET SWR
3504    7274   2208            ISZ     CBCNTR          /INCREMENT LOOP COUNTER
3505    7275   5284            JMP     CBLOPA          /GO PRINT NEXT DIGIT
3506                   /
3507                   /ACCEPT KEYBOARD INPUT OF OCTAL DIGITS, <CR>, <LF>
3508                   /CTRL/C OR CTRL/G.  ALL OTHER CHARACTERS ARE INVALID
3509                   /AND WILL BE ECHOED, FOLLOWED BY A '?'.
3510                   /A CARRIAGE RETURN, LINE FEED, AND A RESTART OF
3511                   /THE SR-XXXX ROUTINE
3512                   /
3513
3514    7276   7300            CLA CLL
3515    7277   1210            TAD     C6/5            /AC=5
3516    7300   3208            DCA     CBCNTR          /SET UP TO ACCEPT 5 CHARACTERS
3517    7301   3767'           DCA     CBBLD           /CLEAR SWITCH REG. BUILD AREA
3518    7302   3766'           DCA     CBFLG           /CLEAR SWR CHANGE SWITCH
3519    7303   1214            TAD     CBK240          /GET ASCII CODE FOR SPACE
3520    7304   4770'           JMS     CBTYP           /SPACE OVER ONE POSITION
3521    7305   4765'   CBSRLP, JMS     CBTTY           /GO WAIT FOR KEYBOARD INPUT
3522    7306   3206            DCA     CBTEMP          /SAVE INPUT CHARACTER
3523    7307   1200            TAD     CBTEMP          /GET CHARACTER
3524    7310   1164            TAD     I-203
3525    7311   7450            SNA                     /SKIP IF NOT CTRL/C
3526    7312   5763'           JMP     CBCTLC          /GO TO CTRL/C ROUTINE
3527    7313   1207            TAD     CBK4            /AC=-4
3528    7314   7450            SNA                     /SKIP IF NOT CTRL/G
3529    7315   5762'           JMP     CBCTLG          /GO TO CTRL/G ROUTINE
3530    7316   1206            TAD     CBK3            /SUBTRACT 3
3531    7317   7450            SNA                     /SKIP IF NOT LINE FEED
3532    7320   5761'           JMP     CBEXT1          /GO TO LINE FEED EXIT
3533    7321   1206            TAD     CBK3            /SUBTRACT 3
3534    7322   7650            SNA CLA                 /SKIP IF NOT CARRIAGE RETURN
3535    7323   5760'           JMP     CBEXT2          /GO TO CARRIAGE RETURN EXIT
3536    7324   1200            TAD     CBTEMP          /GET CHARACTER
3537    7325   4770'           JMS     CBTYP           /ECHO IT
3538    7326   1200            TAD     CBTEMP          /GET CHARACTER
3539    7327   1212            TAD     C6K260          /
3540    7330   7510            SPA                     /SKIP IF >= TO ASCII CODE FOR ZERO
3541    7331   5351            JMP     CBERR           /INVALID CHARACTER NOT OCTAL DIGIT
3542    7332   1211            TAD     C2K10           /
3543    7333   7700            SMA CLA                 /SKIP IF <= ASCII CODE FOR SEVEN
3544    7334   5351            JMP     CBERR           /INVALID CHARACTER NOT OCTAL DIGIT
3545    7335   7240            STA                     /AC=7777
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3546    7336   3766'           DCA     CBFLG           /SET SWR CHANGE FLAG
3547    7337   1200            TAD     CBTEMP          /GET CHARACTER
3548    7340   0213            AND     C8K7            /MASK TO 3 BITS
3549    7341   3200            DCA     CBTEMP          /SAVE OCTAL DIGIT
3550    7342   1767'           TAD     CBBLD           /GET SWR BUILD AREA CONTENTS
3551    7343   7106            CLL RTL
3552    7344   7004            RAL                     /ROTATE TO BUILD SWR
3553    7345   1200            TAD     CBTEMP          /ADD NEXT OCTAL DIGIT
3554    7346   3767'           DCA     CBBLD           /SAVE NEW SWR
3555    7347   2205            ISZ     CBCNTR          /INCREMENT OCTAL DIGIT COUNTER
3556    7350   5305            JMP     CBSRLP          /CONTINUE ACCEPTING OCTAL DIGITS
3557                   /
3558    7351   7300    CBERR,  CLA CLL
3559    7352   1217            TAD     CBK277          /GET ASCII CODE FOR '?'
3560    7353   4770'           JMS     CBTYP           /PRINT '?'
3561    7354   4771'           JMS     CBCRLF          /DO A <CR> AND <LF>
3562    7355   6281            JMP     CBPSW           /GO START OVER
3563                   /
3564                   /
3565    7360   7336
3566    7361   7325
3567    7362   7457
3568    7363   7485
3569    7364   7576
3570    7365   7510
3571    7366   7503
3572    7367   7400
3573    7370   7476
3574    7371   7517
3575    7372   7420
3576    7373   7537
3577    7374   7482
3578    7375   6663
3579    7376   6623
3580    7377   6221
        7400           PAGE
                       /
3581
3582    7400   2200    CBBLD,  0                       /SWITCH REGISTER BUILD AREA
3583    7401   2205    CBSTRT, RSTART                  /ADDRESS OF START OF PROGRAM
3584    7402   0000    CBRTN,  0                       /STORAGE FOR RETURN ADDRESS
3585    7403   0000    CBFLG,  0                       /SWR CHANGE SWITCH
3586    7404   0000    CBSFLG, 0                       /CTRL/S ACTIVE FLAG
3587    7405   0177    C6K177, 0177                    /CONSTANT
3588    7406   0260    C6K260, 0260                    /CONSTANT
3589    7407   0277    C6K277, 0277                    /CONSTANT
3590    7410   7740    C2K40,  -40                     /CONSTANT
3591    7411   0100    C6K100, 0100                    /CONSTANT
3592    7412   6715    C6K215, 0215                    /CONSTANT
3593    7413   12      C8K12,  0212                    /CONSTANT
3594    7414   0203    C6K203, 0203                    /CONSTANT
3595    7415   0207    C6K207, 0207                    /CONSTANT
3596    7416   0338    C6K335, 0335                    /CONSTANT
3597    7417   7600    C6K7600, 7600                   /
3598                   /
3599                   /     C O N T R O L   C H A R A C T E R
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```
3600                    /
3601                    /       D E C O D E   R O U T I N E
3602                    /
3603    7420   1377     CBCNTL, TAD   (-203
3604    7421   7450             SNA                      /SKIP IF NOT CTRL/C
3605    7422   5265             JMP   CBCTLC             /CTRL/C TYPED  EXIT TO MONITOR
3606    7423   1376             TAD   (-4
3607    7424   7450             SNA                      /SKIP IF NOT CTRL/G
3608    7425   5257             JMP   CBCTLG             /CTRL/G TYPED  GO PRINT **G*
3609    7426   1375             TAD   (-12
3610    7427   7450             SNA                      /SKIP IF NOT CTRL/O
3611    7430   5255             JMP   CBCTLO             /CTRL/O TYPED
3612    7431   1374             TAD   (-2
3613    7432   7450             SNA                      /SKIP IF NOT CTRL/S
3614    7433   5237             JMP   CBCTLS             /CTRL/S TYPED
3615    7434   3773*            DCA   CBMCDE             /SET MESSAGE ACTIVE FLAG
3616    7435   2204             ISZ   CBSFLG             /TEST CTRL/S ACTIVE FLAG
3617    7436   5273             JMP   CBECHO             /GO ECHO CHARACTER AND RETURN TO PROGRAM
3618                    /
3619                    /CTRL/S HANDLER
3620                    /
3621    7437   7240     CBCTLS, STA                      /AC=7777
3622    7440   2204             DCA   CBSFLG             /SET CTRL/S ACTIVE FLAG
3623    7441   1773*            TAD   CBMCDE             /GET MESSAGE ACTIVE FLAG
3624    7442   7650             SNA CLA                  /SKIP IF CTRL/S TYPED WHILE MESSAGE ACTIVE
3625    7443   5337             JMP   CBPFLD             /RETURN TO PROGRAM
3626                    /
3627    7444   7240     CBWAIT, STA
3628    7445   3204             DCA   CBSFLG             /SET CONTROL S ACTIVE INDICATOR
3629    7446   4310             JMS   CBTTY              /WAIT FOR KEYBOARD INPUT
3630    7447   1377             TAD   (-203
3631    7450   7450             SNA                      /SKIP IF NOT CTRL/C
3632    7451   5265             JMP   CBCTLC             /CTRL/C TYPED  EXIT TO MONITOR
3633    7452   1372             TAD   (-16
3634    7453   7640             SZA CLA                  /SKIP IF CTRL/O
3635    7454   5244             JMP   CBWAIT             /NOT CTRL/C OR CTRL/O  CONTINUE WAITING
3636    7455   3204     CBCTLO, DCA   CBSFLG             /CLEAR CTRL/S ACTIVE FLAG
3637    7456   5337             JMP   CBPFLD             /RETURN TO MAIN PROGRAM
3638                    /
3639                    /CONTROL G HANDLER
3640                    /
3641    7457   4317     CBCTLG, JMS   CBCRLF             /DO A <CR> AND <LF>
3642    7460   1216             TAD   CBK336             /GET ASCII CODE FOR UP ARROW
3643    7461   4276             JMS   CBTYP              /PRINT UP ARROW
3644    7462   1215             TAD   CBK307             /GET ASCII CODE FOR *G*
3645    7463   4276             JMS   CBTYP              /PRINT *G*
3646    7464   5771*            JMP   CBPSW              /GO TO *SR=XXXX* ROUTINE
3647                    /
3648                    /CONTROL C HANDLER
3649                    /
3650    7465   3204     CBCTLC, DCA   CBSFLG
3651    7466   1216             TAD   CBK336             /GET ASCII CODE FOR UP ARROW
3652    7467   4276             JMS   CBTYP              /PRINT UP ARROW
3653    7470   1214             TAD   CBK303             /GET ASCII CODE FOR *C*
3654    7471   4276             JMS   CBTYP              /PRINT *C*
```

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3655    7472   5770*            JMP   CBRM               /RESTORE MONITOR AND EXIT
3656                    /
3657    7473   1767*    CBECHO, TAD   CBTEMP             /GET CHARACTER
3658    7474   4276             JMS   CBTYP              /ECHO IT
3659    7475   5337             JMP   CBPFLD             /RETURN TO PROGRAM
3660                    /
3661                    /
3662                    /
3663                    /
3664                    /PRINT ONE CHARACTER
3665                    /
3666    7476   0000     CBTYP,  0
3667    7477   2204             ISZ   CBSFLG             /TEST CTRL/S ACTIVE FLAG
3668    7500   7410             SKP                      /SKIP IF CTRL/S NOT ACTIVE
3669    7501   5244             JMP   CBWAIT             /GO WAIT FOR CTRL/O OR CTRL/C
3670    7502   6046             TLS                      /TRANSMIT CHARACTER
3671    7503   6041             TSF                      /TEST TTY FLAG
3672    7504   5303             JMP   .-1                /WAIT FOR TTY FLAG
3673    7505   6042             TCF                      /CLEAR TTY FLAG
3674    7506   7200             CLA                      /CLEAR AC DO NOT CLEAR LINK
3675                    /
3676    7507   5676             JMP I CBTYP              /RETURN
3677                    /
3678                    /WAIT FOR KEYBOARD INPUT THEN EXIT WITH ASCII CODE IN AC
3679                    /
3680    7510   0000     CBTTY,  0
3681    7511   6031             KSF                      /SKIP IF KEYBOARD FLAG SET
3682    7512   5311             JMP   .-1                /WAIT FOR KEYBOARD INPUT
3683    7513   6036             KRB                      /READ KEYBOARD BUFFER  CLEAR FLAG
3684    7514   0205             AND   CBK177             /MASK TO 7 BITS
3685    7515   1206             TAD   CBK200             /SET BIT 4
3686    7516   5710             JMP I CBTTY              /RETURN
3687                    /
3688                    /EXECUTE A CARRIAGE RETURN AND LINE FEED
3689                    /
3690    7517   0000     CBCRLF, 0
3691    7520   1212             TAD   CBK215             /GET ASCII CODE FOR CARRIAGE RETURN
3692    7521   4276             JMS   CBTYP              /GO EXECUTE THE CARRIAGE RETURN
3693    7522   1213             TAD   CBK212             /GET ASCII CODE FOR LINE FEED
3694    7523   4276             JMS   CBTYP              /GO EXECUTE THE LINE FEED
3695    7524   5717             JMP I CBCRLF             /RETURN
3696                    /
3697                    /CONSOLE PACKAGE EXIT IF TERMINATED WITH LINE FEED
3698                    /
3699    7525   4317     CBEXT1, JMS   CBCRLF             /DO A <CR> AND <LF>
3700    7526   1337             TAD   CBPFLD             /GET MODIFIED CDI TO PROGRAM FIELD
3701    7527   3330             DCA   .+1                /SAVE FOR EXECUTION
3702    7530   7402             HLT                      /MODIFIED CDI TO PROGRAM FIELD
3703    7531   2203             ISZ   CBFLG              /TEST SWR CHANGE FLAG
3704    7532   5601             JMP I CBSTRT             /RESTART PROGRAM WITHOUT CHANGE OF SWR
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3705    7533  1200              TAD     C9ELD           /GET NEW SWITCH REGISTER
3706    7534  3766              DCA I   120             /SAVE IT IN PROGRAM FIELD
3707    7535  5601              JMP I   CESTRT          /RESTART PROGRAM WITH NEW PSEUDO SAR
3708                    /
3709                    /EXIT FROM CONSOLE PACKAGE IF TERMINATED WITH CARRIAGE RETURN
3710                    /
3711    7536  4317      C8EXT2, JMS     C9CRLF          /DO A NCRN AND NLFS
3712    7537  7402      C8PFLD, HLT                     /INCREMENTED BIT TO PROGRAM FIELD
3713    7540  7300              CLA CLL                 /CLEAR AC AND LINK FOR RETURN
3714    7541  2203              ISZ     C9FLG           /TEST SAR CHANGE FLAG
3716    7542  5602              JMP I   C9RTN           /RETURN TO PROGRAM WITHOUT CHANGE OF SWR
3716    7543  1200              TAD     C9ELD           /GET NEW SWITCH REGISTER
3717    7544  3766              DCA I   120             /SAVE IT IN PROGRAM FIELD
3718    7545  5602              JMP I   C9RTN           /RETURN TO PROGRAM
3719                    /
3720                    /
3721                    /
3722    7566  0030
3723    7567  7200
3724    7570  6060
3725    7571  7251
3726    7572  7762
3727    7573  7204
3728    7574  7776
3729    7575  7766
3730    7576  7774
3731    7577  7575
                7600      PAGE
3732                    /
3733                      $$$
3734    0123  6203
3735    0124  6006
3736    0125  7770
3737    0126  7720
3738    0127  0100
3739    0130  7653
3740    0131  6203
3741    0132  7960
3742    0133  0400
3743    0134  7360
3744    0135  4600
3745    0136  0007
3746    0137  0303
3747    0140  0035
3748    0141  4533
3749    0142  6340
3750    0143  0345
3751    0144  0003
3752    0145  0076
3753    0146  4212
3754    0147  7776
3755    0150  0343
3756    0151  0207
3757    0152  7744
3758    0153  6000
```

```
3759    0154  0707
3760    0155  0077
3761    0156  0261
3762    0157  0262
3763    0160  0263
3764    0161  0264
3765    0162  0265
3766    0163  0266
3767    0164  0267
3768    0165  7777
3769    0166  7700
3770    0167  0260
3771    0170  0020
3772    0171  0040
3773    0172  7774
3774    0173  7740
3775    0174  5252
3776    0175  2525
3777    0176  6201
3778    0177  4246
```

```
0000  11111110  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11000000  00011111  11111111  11111111  11111111  11111111  11111111

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111000  00111111  11111111

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

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  00000000  00111111  11111111

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11110000  00000000  00000000  11111111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  01111111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111110  00000111  11111111

2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11110000  00000000  00000001  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111110  00000011  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11000000  11111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111100  01111111  11111111  11111111

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  01111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00000111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  111  111  11111111  11111111  11111111  11100000  00000001

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000
```

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

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11001111  11111111  11111111

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

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111100  00000001  11111111

5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111111  11111100  11111111

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000111

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

5600  11111111  11111111  11111111  11111111  11111100  00000000  00000000  01111111
5700  11111111  11111111  11111111  11111111  11111100  00000000  00000000  01111111

6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11100000  00000000  00000000  00000000  00000000  00111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11100000  00000000  00000000  00000000  00000111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000
6500  11111111  11111111  11111111  11111111  11111  .  11111111  11111110  00111111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11110000  0000  00  00000000  00000000  00000000  00000000  00000000  00000001

7000
7100

7200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7300  11111111  11111111  11111111  11111111  11111111  11111100  11111111  11111111

7400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7500  11111111  11111111  11111111  11111111  11111100  00000000  00000011  11111111

7600
7700
```

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
A	0026	C80001	4431	C8S1	70C6	FCNT	0060
A1	4335	C87520	7417	C83FL3	7404	FIRST	6331
A10	4348	C85L0	7400	C8SM	6036	FIVE	3106
A11	4347	C8CAL	4805	C8SM0	6091	FLOCNT	2346
A12	4350	C6C0F	7202	C8SM1	8047	FLOAT	9087
A13	4351	C8C0I	7201	C8SRLP	7302	FLDINC	5361
A14	4515	C8C1TL	7020	C8STRT	7401	FLOSEL	2102
A15	4516	C8CKT3	7205	C8SWR	72C0	FS	0040
A16	4517	C8C3LF	7517	C81EM3	723C	FS1	0041
A17	4520	C8C1LC	7485	C81TY	7512	FS2	0042
A18	4521	C8CTL3	7457	C81TP	7476	FS3	0043
A19	4522	C8CTL0	7455	C84AE3	7444	FSEND	1707
A2	4336	C8CTL5	7437	CAF	6007	FSSET	1615
A20	4523	C8ECM3	7473	CD1	6205	GDATA	0372
A21	4524	C8EXT3	7233	CFP	203C	GERAC	1454
A22	4525	C8ERR	7291	CFP0	2012	GETSR	4504
A23	4526	C8EXT1	7825	CFP1	2043	GTF	6CC4
A24	4527	C8EXT2	7236	CFP2	2046	HCW1	0021
A3	4337	C8FL0	7241	CFP3	2057	HCW2	0032
A4	4340	C8FLG	7403	CFP4	2095	HEAD1	0059
A5	4341	C8K1C0	7411	CFPTMP	2101	IAPTER	0005
A6	4342	C8K177	7405	CHECK	2077	IAPTOX	0008
A7	4343	C84220	7408	CHECK0	2100	ILEGAL	1514
A8	4344	C84212	7413	CHRTMP	4746	IM12	6245
A9	4345	C84215	7412	CMP	6104	IM12A	6274
ACL	7701	C8A240	7214	CNV	3222	INMODE	0C23
ADDCNT	5363	C84163	7215	CODERQ	2496	INSAVE	0364
ADDER	2?18	C8K275	7216	COUNT	0953	INTR	4256
ADDINC	4460	C84277	7217	CRELO	0050	INTROU	4246
APTCFX	5671	C8K323	7414	CS	0036	K104	5165
APTCTY	5672	C8K307	7415	CSAME	0462	K400	4749
APTEOB	6517	C8K322	7220	CSR03	1607	KBINT	1346
APTER	6660	C8K323	7221	CUF	6204	KBINTC	1364
APTER1	5621	C8K336	7416	DATINP	5116	KMBREL	0404
APTEX	6691	C8K7	7213	OFEIF	025?	KT8A	0001
APTFL	5704	C8K77	7407	CNUFLD	0079	KT8REL	0424
APTIZ	5622	C8LCC	4744	ENOF	6063	KTEST	0392
APTLUP	5712	C8LOPA	7264	ENONLT	4902	LEGAL	1470
APTMOV	5737	C8M13	7211	ENOSES	945?	LEGAL0	0065
APTOX	5682	C8M350	7212	ENOPAS	9426	LEGALA	1540
APTOXO	5674	C8M3	7208	ERRA	1400	LGLFLO	1951
APTOX1	5673	C8M4	7207	ERRA1	141?	LIMIT	2476
B	0067	C8M40	7410	ERRB	1426	LOOP1	6000
BADINT	3200	C8MS	7210	ERRB1	1437	LOOP1A	6024
BANK	0024	C8MCDE	7204	ERRC	2690	LOOP2	6200
BANK0	1674	C8FFL0	7537	ERRCC	2767	LOOP2B	6336
BANK0A	1702	C8PSW	7291	ERRHD	401?	LOOP3	6400
BANKR	5162	C8RW0	6107	ERRM	2503	LOOP3A	6442
BDATA	0073	C8RW01	6076	ERRSW	2849	LOOP3B	6444
BINTC	3227	C8R11	6120	ERRORO	2460	LOOP4	6600
BSW	7002	C8RTN	7402	ERROR1	246?	LOOP4A	6657
C0B0000	4400			ERRTAB	4842	LOOP5	6500

Symbol	Value	Symbol	Value	Symbol	Value	Symbol	Value
LOOP5A	6544	PNTOPT	1728	SETPAR	5000	STS5	3262
LOOP5B	6546	PREL	4194	SETREL	0400	SUF	6274
LRR	6240	PRINT	4903	SETRS	4537	SWP	7521
LUSR	6260	PROFLO	035?	SETSW	4371	T0	3000
LXM	8200	PSR	0020	SFS0	3277	T07	3020
M0	2313	QQ	5114	SFS1	3317	T0UPD	0661
M0UPD	9232	RACA	4510	SFS2	3340	T1	3010
M1UPD	5?10	RACE	4911	SFS3	3412	T1UPD	0700
MEMLOD	5124	RBELL	2413	SFS4	3432	T25	3050
MES	2240	RDA2	1210	SFS5	3472	T82	3064
MINS	0101	RDAC	1215	SFS6	3472	T70	3034
M0SERR	5415	RDB2	1263	SFS7	3512	TCS	0503
M0SFL0	9227	RDBC	1770	SFSTAB	3292	TEMP	0056
M0SLCD	9214	RDFL3	1200	SIATY	2230	TE58NK	2314
M0SRED	9249	RDFLCA	1213	SK0N	8030	TEST	C800
M0STST	9200	RDFLC8	1768	S3P	610?	TEST0	0453
MOVE	CC54	READ	1327	S8Q	C076	TEST1	0670
MOVFAL	6740	REDFL3	5264	SPFLD	1714	TEST8	1000
MOL	7?71	REDLUP	5257	SPO	6107	TFS	0737
MTP	2311	RELCNT	C061	SR	6035	TFS0	3600
NCE?S	1523	REL3	4230	SRC0	0326	TFS1	3607
NCEW1	0732	REL02	4225	SRC1	0327	TFS2	3617
N0FLC	16CC	REL03	4227	SRC2	0330	TFS3	3627
N0TAFT	5634	REL04	4232	SRC3	003?	TFS4	3640
NOTTY	C?76	REL05	4244	SRC4	0032	TFS5	3651
NUFLD	0707	RER	6233	SRC5	0033	TFS6	3662
NU3FLD	0077	RESDF	6379	SR4	6603	TFS7	3672
OFFSET	0000	RESINT	4222	SR51	6584	TFSTAB	0740
OPT	1741	RETURN	2403	SR5B	6585	TITLE	4043
P2	0C70	RRR	6290	SR5C	6586	TMAR	2347
PAR	4287	RS	C543	SR56	003?	TN	3739
PARERR	3194	RS1	C549	SR911	0035	TOSEL	1105
PARINT	3?00	RS2	C546	SRL	5482	TOSEL1	1136
PAROMC	2697	RS3	C547	SRL1	6483	TRS	0472
PASSES	9455	RSTART	C229	SR12	6464	TRS0	3703
PAT1	9385	RTEYP	5193	SRS	4893	TRS1	3712
PAT2	9366	RTEXP1	5161	SRS0	330?	TRS2	3722
PATA	C?05	RTF	C227	SRS1	3327	TRS3	3732
PATCNT	9564	S0	2235	SRS2	3400	TRS4	3743
PATERR	2731	S1	2229	SRS3	3422	TRS5	3754
PATM	0261	S2	2237	SRS4	3442	TRS6	3765
PATMO	6264	SAC	C073	SRS5	3462	TRS7	4000
PATN	2279	SAVE	1603	SRS6	3502	TRSTAB	0473
PATNG	0273	SAVDF	6664	SRS7	3522	TS	0C37
PAT3	2301	SAVE	6675	START	0324	TSNUM	3555
PAT33	2314	SAV1A?	4230	STARTF	0C83	TSTAD	0057
PERIC	2605	SCS1	2233	STOP	246?	TSTCNT	9382
PERRC0	2577	SCS2	3272	STS0	3233	TSTFLO	0092
PERRK	2619	SCCCC?	6332	STS1	323?	TTS	3932
PINF	8644	SETC88	4C10	STS2	3243	TTS0	3944
PNCREL	4115	SETFL3	1723	STS3	3250	TTYCHK	3958
PNTFLD	4654	SETFS	49C6	STS4	3256	TYPCH	2256

```
TYPE    5025
TYPOFF  5041
TYPSP   2400
W4      0071
WRA     1041
WRA1    1055
WRB     1063
WRB1    1072
WRFLD   1605
XCBCAL  4723
XENDML  0341
XGETSR  4747
XPRINT  5400
XRACA   5117
XRACB   5142
XSETFS  0522
XSETAS  0532
YY      5115
Z1      2644
Z10     2538
Z11     2537
Z2      2645
Z20     3131
Z21     3145
Z3      2651
Z4      2654
Z8      4150
```

ERRORS DETECTED: 0

LINKS GENERATED: 249

RUN-TIME: 8 SECONDS

2K CORE USED

```
A        132#    477    482    489    493    499    506    680    761    771    781    885    887    889
         894     898    901
A1       2369    2397#  2469
A10      2387    2406#  2487
A11      2389    2407#  2489
A12      2391    2408#  2491
A13      2393    2409#  2493
A14      2436    2495   2519#
A15      2438    2497   2520#
A16      2440    2499   2521#
A17      2442    2501   2522#
A18      2444    2503   2523#
A19      2446    2505   2524#
A2       2371    2398#  2471
A20      2448    2507   2525#
A21      2450    2509   2526#
A22      2452    2511   2527#
A23      2454    2513   2528#
A24      2456    2515   2529#
A3       2373    2399#  2473
A4       2375    2400#  2475
A5       2377    24..#  2477
A6       2379    2402#  2479
A7       2381    2403#  2481
A8       2383    2404#  2483
A9       2385    2405#  2485
ACL      474#    58
ADDCNT   2962#
ADDER    1471    1480#  1508   1560   2437   2498   3045
ADDINC   2847    2902   2925   2927   2928   2939#
APTCTX   3100#
APTCTY   3101#
APTECB   434#
APTER    63      3032#  3037
APTER1   3040    3041   3050#
APTEX    3083    3077#
APTFL    197     3119#  3122   3145   3150
APTIZ    288     3034   3043   3094#  3077
APTLUP   3125#   3137
APTMOV   3124    3126   3128   3129   3132   3136   3152#
APTOK    64      3085#  3099   3108   3113
APTOKO   3089    3106#
APTCK1   3093    3094   3102#
B        133#    478    484    488    494    501    508    684    806    818    828    907    909    911
         916     926    923
BADINT   1793#   1793   2341
BANK     78#     523    539    701    702    707    719    724    726    2845   2879
BANK0    1085    1100#
BANKGA   1108#
BANKR    2790    2801#
BDATA    137#    886    897    900    919    1592   1853   2092   2098
BINTC    1799    1002#
BSW      46#     1069   1299   1333   1833   1835   2098   2108   2118   2182   2192   2204   2788
```

SEQ 0103

CB0000	2195	2433*							
CB0001	2459	24	2462*						
CB7600	3597*								
CBSLD	3517	3550	3554	3582*	3*05	3716			
CBCAL	194*	311	1063	1373	3380	3110	3282	3292	3365	3388
CBCOF	3440*	3464							
CBCDI	3439*	3461							
CBCNTL	3490	3603*							
CBCHTR	3443*	3462	3476	3493	3504	3518	3555		
CBCRLF	3485	3561	3641	3620*	3695	3699	3711		
CBCTLC	3526	3605	3632	3650*					
CBCTLG	3529	3608	3641*						
CBCTLO	3611	3636*							
CBCTLS	3614	3621*							
CBECHO	3617	3657*							
CBENTR	2663	2458*	3474						
CBERR	3541	3544	3558*						
CBEXT1	3532	3639*							
CBEXT2	3535	3711*							
CBFLD	3465	3473*							
CBFLG	3518	3546	3585*	3703	3714				
CBK100	3591*								
CBK177	3587*	3684							
CBK200	3560*	3685							
CBK212	3593*	3693							
CBK215	3522*	3691							
CBK240	3450*	3519							
CBK260	3451*	3501							
CBK275	3452*	3490							
CBK277	3453*	3559							
CBK303	3594*	3653							
CBK307	3595*	3644							
CBK322	3454*	3488							
CBK323	3455*	3486							
CBK336	3596*	3642	3651						
CBK7	3449*	3500	3548						
CBK77	3539*								
CBLCC	2699	2663*							
CBLOPA	3496*	3505							
CBM10	3447*	3542							
CBM260	3446*	3539							
CBM3	3444*	3830	3533						
CBM4	3445*	3492	3527						
CBM40	3590*								
CBM5	3448*	3615							
CBMODE	3442*	3472	3615	3623					
CBPFLD	3477	3625	3637	3659	3700	3712*			
CBPSW	3485*	3562	3646						
CBRM	3217*	3695							
CBRM0	3230	3221	3235	3240*	3248				
CBRM01	3232	3231*	3239						
CBRM1	3244	3249*							
CBRTN	3475	3584*	3715	3718					

CBSA	3201	3225	3417*										
CBSFLG	3586*	3616	3622	3628	3636	3650	3667						
CBSM	3076	3194*	3211										
CBSM0	3198	3209*											
CBSM1	3202*	3210											
CBSRLP	3521*	3556											
CBSTRT	3583*	3704	3707										
CBSWR	3441*	3470	3494	3498	3499	3533							
CBTEMP	3438*	3459	3478	3522	3523	3536	3538	3547	3549	3553	3657		
CBTTY	3521	3629	3680*	3636									
CBTYP	3407	3469	3431	3502	3530	3537	3560	3643	3645	3652	3654	3658	3666*	3676
	3692	3694											
CBWAIT	3627*	3638	3669										
CAF	52*	1802	2359										
CDI	41*	2329											
CFP	1092	1166*	1177	1201	1375	1378	1381	1384	1387	1390	1393	1396		
CFP0	1170	1176*	1203	1219	1228								
CFP1	1201*	1210	1212	1217	1220	1225							
CFP2	1196	1204*											
CFP3	1213*	1227											
CFP4	1205	1221*											
CFPTMP	1160	1184	1186	1168	1191	1197	1206	1213	1221	1231*			
CHECK	1172	1173	1229*										
CHECK0	1229	1230*											
CHRTMP	2646	2651	2656	2665*									
CMP	44*	1761	1779										
CNV	1260	1304	1306*	1316	2370	2472							
CODERR	1432*	1509	1531										
COUNT	121*	543	1501	1562	2295	2328	2990	2998					
CRELO	118*	190	205	968									
CS	88*	185	424	758	805	1841	1846	2948	2948	2993			
CSAVE	389	397	400*										
CSR03	233	254	279	1038*	1042	1043							
CUF	33*												
DATTMP	2733	2750	2756*										
DFE1F	171	216*	233										
EMZFLG	79*	182	335	572	949	1082	1139	1181	1447	2735			
ENDF	129*	1061	1067	1192	1215								
ENDMLT	148*	235	251	276									
ENDMES	3013	3017*											
ENDPAS	2302	3005*	3009	3020									
ERRA	764	7 1	883*	891									
ERRA1	774	892*	904										
ERRB	811	831	905*	913									
ERRB1	821	914*	926										
ERRC	933	1560*	1586										
ERRCC	1598	1639*											
ERRHD	1580	2215*	2218	2221									
ERRM	1499*	1505	2323										
ERRMM	1517	1533*											
ERRORB	1460	1462	1474*	2390	2492								
ERRORI	1468	1475*	2392	2494	2494	2486							
ERRTAB	2387	2604*											

```
FCNT     125*  159   233   429   548   1051  1178  2193  2594  2599  2620  2628  2869  2910
         2933
FIRST    3263  3270  3235  3254  3297* 3311  3246
FIVE     142*  193   646   652
FLOCNT   351   354   356   317   365   381   333   185   386   394   442   483   522   527
         532   533   546   551   554   575   933   166   952   955   956   959   973   976
         977   1004  1006  1087  1034  1055  1139  1121  1399* 1537  1643  2585  2644  2867
         2872  2878  2912  2916  2917  2934
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FLDING   2849  2927  2915  2922  2924  2960*
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FS       121*  187   264   446   457   709   1078  3143  3146  3149
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FS2      123*  268   1060  1103
FS3      104*  270   1081  1105
FSEND    1099  1112*
FSSET    196   1049* 1114  1116
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IAPTCK   64*   745   2877  2941
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IN12     3266  3275* 3296  3310  3345
IN12A    3278  3293*
INMODE   74*   1325  1343  3471
INSANE   130*  945   965   992
INTR     1732  1805  2343*
INTROU   60    2325*
X104     2765  2504*
K400     2648  2604*
KBINT    862*  873   2342
KBINTC   867   870*
KWBREL   346*  354   371
KTBA     39*
KTBREL   338   376*  393   398
KTEST    520*  623
LEGAL    201   943*  989   994
LEGALD   131*  947   963   992
LEGALA   954   975   991*  999
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LIMIT    1484  1489*
LCOP1    3174*
LOOP1A   3177  3181* 3189
LOOP2    3260*
LOOP2A   3263  3269* 3274
LOOP3    3304* 3333
LOOP3A   3307  3316* 3328

                                                                      SEQ 0106


LOOP3B   3318* 3330
LOOP4    3379*
LOOP4A   3382  3391* 3396
LOOP5    3339* 3367
LOOP5A   3342  3351* 3361
LOOP5B   3353* 3363
LRR      39*   1107
LUSR     38*
LXM      36*   177
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N1UPD    2881  2867*
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MINS     143*  192   651
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MOSFLO   2654  2851*
MOSLOD   2850* 2673
MOSRED   2850* 2918  2942
MOSTST   514   2636* 2958  2957
MOVE     122*  1513  1541  2296  2315  2317  2318  2321  2324
MOVFAL   3135  3154* 1156
MOL      49*   2223  2346
MTP      1343  1354  1359  1366*
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NOEMM    574   392*
NOFLO    902   2573*
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PAR      473   2357* 2361  2385
PARSER   1742  1769*
PARINT   1751* 2339
PARGRC   1611* 1774  1730
PASSES   3010  3012  3322*
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PAT2     2893  2938  2940  2952  2954  2965*
PATA     175*  236   252   277   291   293   621   1492  2576  2578  2723  2726  3432
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PATCGR   1657* 2339
PATH     237   239*
PATH0    233*  239
PATN     210   243*  28
PATN0    249*  256

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PERRM	1507	1510*											
PINF	987	2721*											
PNOREL	232	248	2259*	2253	2265								
PNTFLD	1115	2016*	2625										
PNTOPT	183	1135*	1139	1148									
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RBELL	1437*	1573											
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RDB2	752	800*	830										
RDBC	805*	835											
RDFLD	542	743*	798										
RDFLCA	756*	837											
RDFLCB	790	803*											
READ	759	765	769	775	779	806	812	816	822	826	842*	850	
REDFLD	2886	2895*											
REDLUP	2890*	2908											
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RELO	403	2293*	2328	2330									
RELO2	2305	2309	2314*	2325									
RELO3	2306	2312	2317*										
RELO4	2310	2319*											
RELO5	2313	2329*											
REM	37*	179											
RESOF	3180	3287	3315	3350	3392	3409*	3414						
RESINT	2343	2467*	2517										
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RRR	40*	1108											
RS	109*	188	205	1679									
RS1	110*	267											
RS2	111*	2·1											
RS3	112*	271											
RSTART	3422*	3502											
RTEMP	2763	2764	2775	2785	2786	2791	2799*						
RTEMP1	2766	2767	2771	2774	2779	2800*							
RTF	46*	2348											
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S1	1294	1301	1318	1318*	2374	2476							
S2	1307	1308	1312	1319*	2376	2478							
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SAVINT	2328	2366*	2458										
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SCS2	778	825	1043*	1047									
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SETREL	232	335*	402	406									
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SFS5	1382	1900	1953*	1960									
SFS6	1379	1901	1969*	1974									
SFS7	1376	19··	1985*	1992									
SFSTAB	1123	1895*											
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SKP	42*	2338											
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SR01	81*	1444	1573										
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SR03	93*	1043											
SR04	84*	314	819	1413									
SR05	85*	358											
SR4	3391	3394	3398	3407*									
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SRSB	3243	3353	3359*										
SRSC	3352	3354	3355	3356	3357	3362	3370*						
SRSB	85*	2621											
SRSS11	87*	355	356	387	565	524	978	1005	1122	2586	2627		
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SRS4	1945*	1952	2653										
SRS5	1961*	1968	2609										

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SRS7    1993*  20..   2611
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STS1     485   1813*  1816
STS2     490   1817*  1821
STS3     495   1824*  1828
STS4     502   1829*  1833
STS5     509   1834*  1837
SUf       34*
SWP       50*  2029
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T07     1610   1708*  1711   2445   2508
T0UPD    525    527*
T1      1616   1703*  1706   2443   2504
T1UPD    541    546*
T25     1622   1717*  1720   2449   2510
T52     1624   1722*  1725   2451   2512
T70     1620   1712*  1715   2447   2508
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TEMP     124*   360    361    389    390    447    458    716    711    893    836    915    918   1007
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        1937   1940   1948   1951   1956   1954   1964   1967   1972   1975   1980   1983   1988   1991
        1996   1999   2052   2060   2059   2078   2088   2097   2107   2117   2132   2140   2149   2159
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TEST1    531    538*   552
TESTB    550    618*
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TFS1     592   1263   2057*  2063   2064
TFS2     593   1259   2066*  2072   2073
TFS3     594   1255   2075*  2082   2083
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TFS5     596   1247   2094*  -2101  2102
TFS6     597   1243   2104*  2110   2111
TFS7     598   1239   2114*  2121   2122
TFSTAB   566    591*  1006
TITLE    174   2226*  2229   2232
TMAR    1403*  1406   1626
TN      1612   1667*  1870   2439   2500
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TOSEL1   714    724*
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TRS1     410   2137*  2143   2144
TRS2     411   2149*  215:   2193
TRS3     412   2155*  2162   2163
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TRS6     415   2188*  2194   2195
TRS7     416   2200*  2207   2208
TRSTAB   358    388    409*
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TTS0    2022*  2030
TTYCNK  2018   2025   2035*
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TYPOFF  2709   2714*
TYPSP   1421*  1425   2386   2488   2629
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WRA1     666*   671
WRB      633    638    677*   694
WRB1     684*   689
WRFLD    520    629*   644    647    650    658
XCBCAL   155   2645*  2652   2660   2661
XENOHL   149    306*   316    317
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XPRINT   151   2971*  2976   2983
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XRACB    163   2784*  2797
XSETFS   157    441*   448
XSETRS   159    452*   459
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Z11     1514   1522*
Z2      1507   1599*
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