IDENTIFICATION

PRODUCT CODE:	MAINDEC-8E-D1FB-D
PRODUCT NAME:	PDP-8E EXTENDED MEMORY ADDRESS TEST (EA8E)
DATE: CREATED:	JUNE 14, 1971
MAINTAINER:	DIAGNOSTIC GROUP
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1. ABSTRACT

The PDP-8E Extended Memory Address Test is designed to detect any location that cannot be uniquely addressed. This is performed by a series of four test routines which will test systems equipped with from 8K to 32K words of core memory. Automatic program relocation is provided in order to test all memory fields from each memory field. Teletype print-outs are provided for error identification, and the operator is given a degree of control over the program by various SR settings.

2. REQUIREMENTS

2.1 Equipment

A PDP-8E computer equipped with a minimum of 8K words of core memory.

2.2 Storage

The program occupies core locations ØØØØ to 3777.

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.

3. LOADING PROCEDURE

Load the program with the Binary Loader (BIN). The program may be loaded into any desired core stack by having BIN in that core stack.

4. OPERATING PROCEDURE

4.1 Program and Operator Action

A. Set the SR to the INSTRUCTION FIELD and DATA FIELD of the stack which contains the program.

B. Press key EXTD ADDR LOAD.

C. Set the SR for desired starting address according to the following table.

ADDRESS	TEST EXECUTION
Ø2ØØ	Run all tests
Ø2Ø1	Run only test 1
Ø2Ø2	Run only test 2
Ø2Ø3	Run only test 3
Ø2Ø4	Run only test 4

D. Press keys ADDR LOAD, CLEAR, and CONT. A setup SR message will be printed.

E. Set the SR for desired operation according to the following table.

SWITCH	Ø (down)	1 (up)
SRØØ	continue after error	halt after error
SRØ1	typeout errors	inhibit error typeouts
SRØ2	normal	TTY bell on error
SRØ3	relocate program	inhibit program relocation
SRØ4	normal	change stack limits
SRØ5	normal	halt after current test
SRØ6-Ø8	starting stack limit (Ø-7)	
SRØ9-11	ending stack limit (Ø-7)	

F. Press key CONT.

4.2 Detailed SR Explanation

SRØØ-Ø2 SRØ2, if set, will ring the TTY bell once for each error. SRØØ and SRØ1 have no effect with SRØ2 set.

SRØ3 SRØ3 may be set or reset at any time and the program will act accordingly

SRØ4 SRØ4 allows the operator to change the stack limits as defined by SRØ6-11.

SRØ5 SRØ5 is normal halt for program

SRØ6-Ø8 These switches define the starting stack limit (normally Ø).

SRØ9-11 These switches define the ending stack limit (normally 7)

4.3 Example of Selecting Stacks for Test

Example 1: SR = ØØØ7, 28K system

Stacks selected for testing are 6,5,4,3,2,1,Ø

Example 2: SR = ØØØ4, 28K System

Stacks selected for testing are 4,3,2,1,Ø

Example 3: SR = ØØ22 28K System

Stacks selected for testing are 2
(No relocation will occur)

Example 4: SR = ØØ41 28K System

Stacks selected for testing are 6,5,4,1,Ø

NOTE 1: Stacks not in the system are automatically de-selected as is Example 1. Stack 7 is not present therefore not selected.

NOTE 2: A single stack can be selected for testing providing the program is not in that stack as in Example 3.

NOTE 3: Any stack or group of stacks can be by-passed as in Example 4. Stacks 2 and 3 are not selected, stack 7 is not present.

5. ERRORS

The contents of a given memory test location should always be equal to its address or the complement of its address. If it is not, a test error will result. 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  ADDR   GOOD   BAD   TEST
```

PR LOC = the program address where the error JMS occurred. (Includes Field)

ADDR = the address of the location in error. (Includes Field)

GOOD = what the data should be.

BAD = what the data is.

TEST = the test (1-4) running when the failure occurred.

5.2 Relocation Error Typeouts

All relocation errors are in the following format:

```
XXXXX' RELOCATION ERROR AT LOCATION YYYYY
```

XXXXX = the program address where the error JMS occurred, (Includes Field)

YYYYY = 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.

6. RESTRICTIONS

6.1 Starting Restrictions

The program may be restarted at any time from location Ø2ØØ of the stack the program is presently in.

6.2 Operating Restrictions

None

7. EXECUTION TIME

The time to run all 4 tests in one core stack is approximately 1/2 second. During program execution a 5 will be typed on the TTY approximately every 5 minutes of program run time. This allows the operator to determine approximate run time before a failure occurred.

8. SCOPE LOOPS

Two special scope loops have been provided in this program.

8.1 Scope Loop 1

This scope loop writes the value equal to the address specified by the SR into the address specified by the SR. It then loops doing a write-read.

8.1 continued

The address being looped on canbe 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 34ØØ.

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 is the same as Scope Loop 1 except that a group of addresses may be specified. 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 36ØØ.

D. Press key ADDR LOAD

E. Set the SR equal to the first address of the group

F. Press keys CLEAR and CONT. A halt will occur at address 36Ø2.

G. Set the SR equal to the last address of the group.

H. Press key CONT.

NOTE 1: The address(s) specified will be looped unti stopped by the operator with key HALT. No error checking is done. To resume normal operation, restart program at address Ø2ØØ-Ø2Ø4 of the current instruction field.

9. PROGRAM DESCRIPTION

9.1 General

The PDP-8E Extended Memory Address Test is intended for use with a PDP-8E equipped with the extended memory option. A total of four tests are executed by the program. (See 9.2 thru 9.5). Each test writes a unique pattern into core memroy and the checks for error. The patterns were chosen to aid the operator in the event of addressing errors.

The program automatically relocates itself to each memory field under test to ensure that all fields may be correctly referenced from any field. Fields not present in the system will automatically be de-selected from testing. (See 9.6)

Control of the program is given to the operator by means of the SR. The operator may halt after error, inhibit error printouts, substitute TTY BELL for error indication, halt after test, change field test limits, select all or any one of four tests, inhibit program relocation, and at any time restart the program at location Ø2ØØ thru Ø2Ø4.

9.2 Test 1

Test 1 writes the value of each location into itself in the forward direction. Then each location is read and checked in the forward direction.

9.3 Test 2

Test 2 writes the complement value of each location into itself in the forward direction. Then each location is read and checked in the forward direction.

9.4 Test 3

Test 3 writes the value of each location into itself in the reverse direction. Then each location is read and checked in the reverse direction.

9.5 **Test 4**

Test 4 writes the complement value of each location into itself in the reverse direction. Then each location is read and checked in the reverse direction.

9.6 **Program Relocation**

Program relocation is governed by the status of SR bit 3 or by the fact that only one stack is selected for testing. With SR bit 3 down (Ø position) program relocation occurs each time the test pattern and its complement have been completely tested in each selected stack. The program first relocates to.the highest order 4K stack under test. The program keeps relocating to the next lower stack under test until it reaches the lowest order stack under test. The testing and relocation cycle is then repeated. The contents of the entire stack 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 stacks where errors occur. When a faulty stack is next in sequence to contain the program, the program willskip the faulty stack and relocate to the first lower order stack which is error free . If all other selected stacks are faulty, program relocation will not take place.

During relocation a comparison check is made to insure no program loss.

For further understanding of how the tests are performed, refer to the listing.

```
                /EXTENDED ADDRESS TEST FOR KM8-E EXTENDED MEMORY (VER A)
                /COPYRIGHT 1971, DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. Ø1754
                /PROGRAMMER, VERNON FREY
                /
                /
                /SWØ=1          HALT AFTER ERROR
                /SW1=1          INHIBIT ERROR TYPEOUT
                /SW2=1          BELL ON ERROR (USEFUL FOR MAINTENENCE)
                /SW3=1          INHIBIT PROGRAM RELOCATION
                /SW4=1          CHANGE STACK LIMITS
                /SW5=1          HALT AFTER CURRENT TEST
                /SW6-SW8        STARTING STACK LIMIT (Ø-7)
                /SW9-SW11       ENDING STACK LIMIT (Ø-7)
                /
                /
                /
                /PROGRAM STARTING ADDRESS
                /Ø2ØØ           RUN ALL TESTS
                /Ø2Ø1           RUN ONLY TEST 1
                /Ø2Ø2           RUN ONLY TEST 2
                /Ø2Ø3           RUN ONLY TEST 3
                /Ø2Ø4           RUN ONLY TEST 4
                /
                /
                /
                /

                /
                /IOT COMMANDS FOR THE MC8-E EXTENDED MEMORY & INTERRUPT
                /
        6ØØ4    GTF=6ØØ4        /GET INTERRUPT FLAGS
                                /ACØ     LINK
                                /AC1     GREATER THAN FLAG
                                /AC2     INTERRUPT BUS
                                /AC3     INTERRUPT INHIBIT FLIP-FLOP
                                /AC4     INTERRUPT ON
                                /AC5     USER FLAG
                                /AC6-8   INSTRUCTION FIELD
                                /AC9-11  DATA FIELD
        6ØØ5    RTF=6ØØ5        /RESTORE INTERRUPT FLAGS
                                /ACØ     LINK
                                /AC1     GREATER THAN FLAG
                                /1       INTERRUPT INHIBIT FLIP-FLOP
                                /1       INTERRUPT ON
                                /AC5     USER FLAG
                                /AC6-8   INSTRUCTION BUFFER
                                /AC9-11  DATA FIELD
        62Ø1    CDFØ=62Ø1       /CHANGE TO DATA FIELD Ø
        6211    CDF1=6211       /CHANGE TO DATA FIELD 1
        6221    CDF2=6221       /CHANGE TO DATA FIELD 2
        6231    CDF3=6231       /CHANGE TO DATA FIELD 3
        6241    CDF4=6241       /CHANGE TO DATA FIELD 4
        6251    CDF5=6251       /CHANGE TO DATA FIELD 5
        6261    CDF6=6261       /CHANGE TO DATA FIELD 6
```

```
        6271    CDF7=6271       /CHANGE TO DATA FIELD 7
        62Ø2    CIFØ=62Ø2       /CHANGE TO INSTRUCTION FIELD Ø
        6212    CIF1=6212       /CHANGE TO INSTRUCTION FIELD 1
        6222    CIF2=6222       /CHANGE TO INSTRUCTION FIELD 2
        6232    CIF3=6232       /CHANGE TO INSTRUCTION FIELD 3
        6242    CIF4=6242       /CHANGE TO INSTRUCTION FIELD 4
        6252    CIF5=6252       /CHANGE TO INSTRUCTION FIELD 5
        6262    CIF6=6262       /CHANGE TO INSTRUCTION FIELD 6
        6272    CIF7=6272       /CHANGE TO INSTRUCTION FIELD 7
        62Ø3    CBFØ=62Ø3       /CHANGE TO DATA AND INSTRUCTION FIELD Ø
        6213    CBF1=6213       /CHANGE TO DATA AND INSTRUCTION FIELD 1
        6223    CBF2=6223       /CHANGE TO DATA AND INSTRUCTION FIELD 2
        6233    CBF3=6233       /CHANGE TO DATA AND INSTRUCTION FIELD 3
        6243    CBF4=6243       /CHANGE TO DATA AND INSTRUCTION FIELD 4
        6253    CBF5=6253       /CHANGE TO DATA AND INSTRUCTION FIELD 5
        6263    CBF6=6263       /CHANGE TO DATA AND INSTRUCTION FIELD 6
        6273    CBF7=6273       /CHANGE TO DATA AND INSTRUCTION FIELD 7
        62Ø4    CINT=62Ø4       /CLEAR USER INTERRUPT (TIME SHARE)
        6214    RDF=6214        /READ DATA FIELD INTO AC BITS 6-8
        6224    RIF=6224        /READ INSTRUCTION FIELD INTO AC BITS 6-8
        6234    RIB=6234        /READ INTERRUPT BUFFER
                                /AC6-8 INSTRUCTION FIELD IN USE BEFORE LAST
                                /       PROGRAM INTERRUPT.
                                /AC9-11 DATA FIELD IN USE BEFORE LAST
                                /         PROGRAM INTERRUPT.
        6244    RMF=6244        /RESTORE MEMORY FIELD
                                /INSTRUCTION FIELD LOADED FROM SAVE FIELD Ø-2
                                /DATA FIELD LOADED FROM SAVE FIELD 3-5
        6254    SINT=6254       /SKIP ON USER INTERRUPT (TIME SHARE)
        6264    CUF=6264        /CLEAR USER FLAG (TIME SHARE)
        6274    SUF=6274        /SET USER FLAG (TIME SHARE)


        ØØ2Ø    *2Ø
                /
                /CONSTANTS AND POINTERS
                /
ØØ2Ø    4ØØØ    SWØ,    4ØØØ            /HALT AFTER ERROR
ØØ21    2ØØØ    SW1,    2ØØØ            /INHIBIT ERROR TYPEOUT
ØØ22    1ØØØ    SW2,    1ØØØ            /BELL ON ERROR
ØØ23    Ø4ØØ    SW3,    4ØØ             /INHIBIT PROGRAM RELOCATION
ØØ24    Ø2ØØ    SW4,    2ØØ             /CHANGE STACK LIMITS
ØØ25    Ø1ØØ    SW5,    1ØØ             /HALT AFTER CURRENT TEST
ØØ26    ØØ7Ø    SW68,   7Ø              /STARTING STACK LIMIT (Ø-7)
ØØ27    ØØØ7    SW911,  7               /ENDING STACK LIMIT (Ø-7)
ØØ3Ø    ØØØØ    STACKØ, Ø               /
ØØ31    ØØØØ    STACK1, Ø               /
ØØ32    ØØØØ    STACK2, Ø               /
ØØ33    ØØØØ    STACK3, Ø               /STACKS CONTAIN Ø IF SELECTED FOR TESTING
ØØ34    ØØØØ    STACK4, Ø               /
ØØ35    ØØØØ    STACK5, Ø               /
ØØ36    ØØØØ    STACK6, Ø               /
ØØ37    ØØØØ    STACK7, Ø               /
ØØ4Ø    ØØØØ    STKØ,   Ø               /
```

```
ØØ41  ØØØØ    STK1,    Ø              /
ØØ42  ØØØØ    STK2,    Ø              /
ØØ43  ØØØØ    STK3,    Ø              /Ø IF RELOCATE
ØØ44  ØØØØ    STK4,    Ø              /
ØØ45  ØØØØ    STK5,    Ø              /
ØØ46  ØØØØ    STK6,    Ø              /
ØØ47  ØØØØ    STK7,    Ø              /
ØØ5Ø  ØØØØ    NORELO,  Ø              /PROG RELOCATION CONTROL (Ø=INH)
ØØ51  17Ø6    KABOVE,  ABOVE          /CONTROL UPPER STACKS NOT TESTED
ØØ52  1725    KBELOW,  BELOW          /CONTROL LOWER STACKS NOT TESTED
ØØ53  ØØØØ    HEAD1,   Ø              /ERROR HEADING CONTROL
ØØ54  ØØØØ    INSAME,  Ø              /PROG IN SEL STACK
ØØ55  ØØØØ    LEGALØ,  Ø              /LEGAL STACK SELECTION
ØØ56  ØØØØ    RUNTST,  Ø              /6ØØ3=ALL, ØØØ1=1, ØØØ2=2, 2ØØØ=3, 4ØØØ=4
ØØ57  ØØØØ    TESTAD,  Ø              /TEST ADDRESS COUNTER
ØØ6Ø  ØØØØ    KBINT,   Ø              /HIGHEST ACTUAL STACK IN SYSTEM
ØØ61  ØØØØ    SSL,     Ø              /STARTING STACK LIMIT ØØXØ
ØØ62  ØØØØ    ESL,     Ø              /ENDING STACK LIMIT ØØØX
ØØ63  ØØØØ    STKPIN,  Ø              /STACK PROG IS IN ØØXØ
ØØ64  ØØØØ    STKTST,  Ø              /STACK SEL FOR TEST ØØXØ
ØØ65  ØØØØ    BDATA,   Ø              /BAD DATA
ØØ66  ØØØØ    GDATA,   Ø              /GOOD DATA
ØØ67  ØØØØ    MOVE,    Ø              /RELOCATION ADDRESS
ØØ7Ø  1736    KDOWN,   DOWN           /CONTROL LOWER STACKS TESTED
ØØ71  ØØØØ    TEMP,    Ø              /INDIRECT ADDRESS TEMP STORAGE - CHEXM
ØØ72  ØØØØ    COUNT,   Ø              /CHECKERBOARD ERROR COUNTER
ØØ73  ØØØØ    ERRLOC,  Ø              /CODERR
ØØ74  7777    M1,      -1             /CODERR - TEST 3 & 4
ØØ75  7776    M2,      -2             /MESAGE - LEGAL
ØØ76  7775    M3,      -3             /MESAGE
ØØ77  7774    M4,      -4             /MESAGE - 4 WORDS
Ø1ØØ  7744    M34,     -34            /MESAGE
Ø1Ø1  ØØØ7    K7,      7              /CODERR - ERRC - STACKS
Ø1Ø2  ØØ1Ø    K1Ø,     1Ø             /CHEXN
Ø1Ø3  ØØ2Ø    K2Ø,     2Ø             /CHEXN
Ø1Ø4  ØØ3Ø    K3Ø,     3Ø             /CHEXN
Ø1Ø5  ØØ4Ø    K4Ø,     4Ø             /CHEXN
Ø1Ø6  ØØ5Ø    K5Ø,     5Ø             /CHEXN
Ø1Ø7  ØØ6Ø    K6Ø,     6Ø             /CHEXN
Ø11Ø  ØØ7Ø    K7Ø,     7Ø             /CHEXN
Ø111  ØØ77    K77,     77             /SIXTY - MESAGE
Ø112  Ø2Ø7    K2Ø7,    2Ø7            /MESAGE - CODERR
Ø113  Ø212    K212,    212            /MESAGE
Ø114  Ø215    K215,    215            /MESAGE
Ø115  Ø24Ø    K24Ø,    24Ø            /TOSEL
Ø116  Ø245    K245,    245            /MESAGE
Ø117  Ø26Ø    K26Ø,    "Ø             /TOSEL - MAKE SEL Ø-7
Ø12Ø  Ø261    K261,    "1             /TOSEL
Ø121  Ø262    K262,    "2             /TOSEL
Ø122  Ø263    K263,    "3             /TOSEL
Ø123  Ø264    K264,    "4             /TOSEL
Ø124  Ø265    K265,    "5             /TOSEL
Ø125  Ø266    K266,    "6             /TOSEL
Ø126  Ø267    K267,    "7             /TOSEL
Ø127  Ø34Ø    K34Ø,    34Ø            /MESAGE
```

```
Ø13Ø  Ø7Ø7    K7Ø7,    7Ø7            /SIXTY
Ø131  4Ø6Ø    K4Ø6Ø,   4Ø6Ø           /CODERR - ERRC
Ø132  6ØØØ    K6ØØØ,   6ØØØ           /LINK IS A Ø - PROG FIELD TYPEOUT
Ø133  6ØØ3    K6ØØ3,   6ØØ3           /ALL TESTS
Ø134  6Ø6Ø    K6Ø6Ø,   6Ø6Ø           /SIXTY
Ø135  61ØØ    K61ØØ,   61ØØ           /TEST 1
Ø136  62ØØ    K62ØØ,   62ØØ           /TEST 2
Ø137  63ØØ    K63ØØ,   63ØØ           /TEST 3
Ø14Ø  64ØØ    K64ØØ,   64ØØ           /TEST 4
Ø141  62Ø1    K62Ø1,   62Ø1           /CDF Ø
Ø142  62Ø3    K62Ø3,   62Ø3           /CBF Ø
Ø143  2Ø42    XTYPE,   TYPE           /TYPEOUT AC ROUTINE POINTER
Ø144  2Ø5Ø    XMESAG,  MESAGE         /TTY ROUTINE POINTER
Ø145  2ØØØ    XSIXTY,  SIXTY          /SIXTY ROUTINE POINTER
Ø146  22Ø1    XCODER,  CODERR         /ERROR ROUTINE POINTER
Ø147  22ØØ    XRETUR,  RETURN         /ERROR RETURN POINTER
Ø15Ø  2242    XSTOP,   STOP           /STOP ROUTINE POINTER
Ø151  2241    XADDER,  ADDER          /ADDRESS OF ERROR TYPEOUT POINTER
Ø152  ØØØØ    FIVE,    Ø              /FIVE MINUTE TIMER
Ø153  ØØØØ    MIN5,    Ø              /FIVE MINUTE CONTROL
Ø154  71ØØ    MIN5Ø,   -7ØØ           /ALL TESTS FIVE MIN
Ø155  35ØØ    MIN51,   -43ØØ          /TEST 1 FIVE MIN
Ø156  35ØØ    MIN52,   -43ØØ          /TEST 2 FIVE MIN
Ø157  6ØØØ    MIN53,   -2ØØØ          /TEST 3 FIVE MIN
Ø16Ø  6ØØØ    MIN54,   -2ØØØ          /TEST 4 FIVE MIN

      ØØØØ    *Ø
ØØØØ  ØØØØ             Ø
ØØØ1  5ØØ1             JMP
ØØØ2  ØØØ2             2
ØØØ3  ØØØ3             3
      Ø2ØØ    *2ØØ
              /
              /KM8-E EXTENDED MEMORY ADDRESS TEST (EA8E)
              /
Ø2ØØ  5777'   EXTAD,   JMP      RUNØ            /ALL TESTS
Ø2Ø1  5776'            JMP      RUN1            /TEST 1
Ø2Ø2  5775'            JMP      RUN2            /TEST 2
Ø2Ø3  5774'            JMP      RUN3            /TEST 3
Ø2Ø4  5773'            JMP      RUN4            /TEST 4
Ø2Ø5  3Ø56    EXTADØ,  DCA      RUNTST          /TEST CONTROL
Ø2Ø6  6ØØ2             IOF
Ø2Ø7  6224             RIF
Ø21Ø  1141             TAD      K62Ø1
Ø211  3212             DCA      .+1
Ø212  62Ø1             CDF Ø                    /MAKE DATA FIELD=INST FIELD
Ø213  4772'            JMS      TITLE           /TYPEOUT PROGRAM TITLE
Ø214  4771'   CHEXA,   JMS      SETSW           /TYPEOUT TO SETUP SWITCHES
Ø215  724Ø             STA
Ø216  3Ø5Ø             DCA      NORELO          /CLEAR INH RELOCATION
Ø217  3Ø57             DCA      TESTAD          /CLEAR TEST ADDR COUNTER
Ø22Ø  724Ø             STA
Ø221  3Ø53             DCA      HEAD1           /RESET ERROR HEADING
Ø222  1153             TAD      MIN5
Ø223  3152             DCA      FIVE            /SETUP COUNTER
```

```
Ø224  477Ø'          JMS     DOWN+2          /CLEAR STACK SELECTION CONTROLS
Ø225  76Ø4           LAS
Ø226  ØØ26           AND     SW68
Ø227  3Ø61           DCA     SSL             /STARTING STACK LIMIT
Ø23Ø  76Ø4           LAS
Ø231  ØØ27           AND     SW911
Ø232  3Ø62           DCA     ESL             /ENDING STACK LIMIT
Ø233  4767'          JMS     MSSL            /OBTAIN -SSL IN AC BITS 9-11
Ø234  1Ø62           TAD     ESL
Ø235  764Ø           SZA CLA                 /SKIP IF SSL EQUALS ESL
Ø236  5262           JMP     CHEXC           /CONTINUE CHECK
Ø237  6224           RIF                     /READ INSTRUCTION FIELD
Ø24Ø  7Ø41           CIA
Ø241  1Ø61           TAD     SSL
Ø242  765Ø           SNA CLA
Ø243  5766'          JMP     PINF            /PROGRAM IS IN THE SELECTED FIELD
Ø244  3Ø5Ø           DCA     NORELO          /INHIBIT PROGRAM RELOCATION
Ø245  1365           TAD     (CHEXB
Ø246  3764'          DCA     ABOVE-1         /STORE RETURN ADDRESS
Ø247  1Ø62           TAD     ESL
Ø25Ø  1Ø51           TAD     KABOVE
Ø251  3Ø71           DCA     TEMP
Ø252  5471           JMP I   TEMP            /INCREMENT UPPER FIELDS NOT TESTED
Ø253  1363    CHEXB, TAD     (CHEXE
Ø254  3762'          DCA     BELOW+1         /STORE RETURN ADDRESS
Ø255  1Ø62           TAD     ESL
Ø256  7Ø41           CIA
Ø257  1Ø52           TAD     KBELOW
Ø26Ø  3Ø71           DCA     TEMP
Ø261  5471           JMP I   TEMP            /INCREMENT LOWER FIELDS NOT TESTED
Ø262  4767'   CHEXC, JMS     MSSL            /OBTAIN -SSL IN AC BITS 9-11
Ø263  1Ø62           TAD     ESL
Ø264  771Ø           SPA CLA
Ø265  53Ø2           JMP     CHEXD           /STARTING FIELD IS GREATER THAN ENDING FIELD
Ø266  1361           TAD     (CHEXC1
Ø267  3764'          DCA     ABOVE-1         /STORE RETURN ADDRESS
Ø27Ø  1Ø62           TAD     ESL
Ø271  1Ø51           TAD     KABOVE
Ø272  3Ø71           DCA     TEMP
Ø273  5471           JMP I   TEMP            /INCREMENT UPPER FIELDS NOT TESTED
Ø274  1363    CHEXC1, TAD    (CHEXE
Ø275  3762'          DCA     BELOW+1         /STORE RETURN ADDRESS
Ø276  4767'          JMS     MSSL            /OBTAIN -SSL IN AC BITS 9-11
Ø277  1Ø52           TAD     KBELOW
Ø3ØØ  3Ø71           DCA     TEMP
Ø3Ø1  5471           JMP I   TEMP            /INCREMENT LOWER FIELDS NOT TESTED
Ø3Ø2  136Ø    CHEXD, TAD     (CHEXD1
Ø3Ø3  3762'          DCA     BELOW+1         /STORE RETURN ADDRESS
Ø3Ø4  4767'          JMS     MSSL            /OBTAIN -SSL IN AC BITS 9-11
Ø3Ø5  1Ø52           TAD     KBELOW
Ø3Ø6  3Ø71           DCA     TEMP
Ø3Ø7  5471           JMP I   TEMP            /INCREMENT ALL LOWER FIELDS
Ø31Ø  1363    CHEXD1, TAD    (CHEXE
Ø311  377Ø'          DCA     DOWN+2          /STORE RETURN ADDRESS
Ø312  1Ø62           TAD     ESL
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```
Ø313  7Ø41           CIA
Ø314  1Ø7Ø           TAD     KDOWN
Ø315  3Ø71           DCA     TEMP
Ø316  5471           JMP I   TEMP            /RESTORE LOWER FIELDS TESTED
Ø317  4757'   CHEXE, JMS     HIGHST          /FIND SYSTEMS HIGHEST STACK
Ø32Ø  1Ø6Ø           TAD     KBINT
Ø321  1117           TAD     K26Ø
Ø322  3Ø6Ø           DCA     KBINT           /MAKE HIGHEST STACK Ø-7 FOR TYPEOUT
Ø323  4756'          JMS     TSTSYS          /TYPEOUT # OF STACKS IN SYSTEM
Ø324  1355           TAD     (CHEXE2
Ø325  3764'          DCA     ABOVE-1         /STORE RETURN ADDRESS
Ø326  1Ø6Ø           TAD     KBINT
Ø327  Ø1Ø1           AND     K7
Ø33Ø  1Ø51           TAD     KABOVE
Ø331  3Ø71           DCA     TEMP
Ø332  5471           JMP I   TEMP            /INCREMENT UPPER STACKS NOT IN SYSTEM
Ø355  Ø4ØØ
Ø356  3Ø17
Ø357  2737
Ø36Ø  Ø31Ø
Ø361  Ø274
Ø362  1726
Ø363  Ø317
Ø364  17Ø5
Ø365  Ø253
Ø366  2712
Ø367  1742
Ø37Ø  174Ø
Ø371  2621
Ø372  263Ø
Ø373  1624
Ø374  1617
Ø375  1612
Ø376  16Ø5
Ø377  16ØØ
      Ø4ØØ           PAGE
Ø4ØØ  4777'   CHEXE2, JMS    TOSEL           /TYPEOUT STACK TEST SELECTION
Ø4Ø1  421Ø           JMS     LEGAL
Ø4Ø2  1Ø5Ø           TAD     NORELO
Ø4Ø3  765Ø           SNA CLA
Ø4Ø4  5276           JMP     CHEXM
Ø4Ø5  4776'          JMS     CHKSW3          /CHECK PROG RELO SW
Ø4Ø6  5775'          JMP     CHEXO           /RELOCATE PROGRAM
Ø4Ø7  5327           JMP     CHEXN           /INHIBIT PROGRAM RELOCATION

              /
              /CHECK FOR LEGAL STACK SELECTION
              /
Ø41Ø  ØØØØ    LEGAL, Ø
Ø411  73ØØ           CLA CLL
Ø412  3Ø54           DCA     INSAME          /CLEAR SAME CONTROL
Ø413  1Ø75           TAD     M2
Ø414  3Ø55           DCA     LEGALØ          /SETUP LEGAL CONTROL
Ø415  3Ø64           DCA     STKTST
```

```
Ø416  1Ø3Ø              TAD     STACKØ
Ø417  4263              JMS     LEGALA
Ø42Ø  11Ø2              TAD     K1Ø
Ø421  3Ø64              DCA     STKTST
Ø422  1Ø31              TAD     STACK1
Ø423  4263              JMS     LEGALA
Ø424  11Ø3              TAD     K2Ø
Ø425  3Ø64              DCA     STKTST
Ø426  1Ø32              TAD     STACK2
Ø427  4263              JMS     LEGALA
Ø43Ø  11Ø4              TAD     K3Ø
Ø431  3Ø64              DCA     STKTST
Ø432  1Ø33              TAD     STACK3
Ø433  4263              JMS     LEGALA
Ø434  11Ø5              TAD     K4Ø
Ø435  3Ø64              DCA     STKTST
Ø436  1Ø34              TAD     STACK4
Ø437  4263              JMS     LEGALA
Ø44Ø  11Ø6              TAD     K5Ø
Ø441  3Ø64              DCA     STKTST
Ø442  1Ø35              TAD     STACK5
Ø443  4263              JMS     LEGALA
Ø444  11Ø7              TAD     K6Ø
Ø445  3Ø64              DCA     STKTST
Ø446  1Ø36              TAD     STACK6
Ø447  4263              JMS     LEGALA
Ø45Ø  111Ø              TAD     K7Ø
Ø451  3Ø64              DCA     STKTST
Ø452  1Ø37              TAD     STACK7
Ø453  4263              JMS     LEGALA
Ø454  2Ø55              ISZ     LEGALØ
Ø455  5774'             JMP     NOSTK           /NO STACK SELECTION
Ø456  1Ø54              TAD     INSAME
Ø457  764Ø              SZA CLA
Ø46Ø  5773'             JMP     PINF            /PROG IN SELECTED FIELD
Ø461  3Ø5Ø              DCA     NORELO          /ONLY 1 STACK SELECTED
Ø462  561Ø              JMP I   LEGAL
                /
                /LEGAL STACK SELECTION SUBROUTINE
                /
Ø463  ØØØØ      LEGALA, Ø
Ø464  764Ø              SZA CLA
Ø465  5663              JMP I   LEGALA          /NOT SELECTED
Ø466  2Ø55              ISZ     LEGALØ
Ø467  741Ø              SKP
Ø47Ø  561Ø              JMP I   LEGAL
Ø471  6224              RIF
Ø472  3Ø63              DCA     STKPIN
Ø473  4772'             JMS     SAME            /PROG IN SEL STACK
Ø474  2Ø54              ISZ     INSAME          /YES
Ø475  5663              JMP I   LEGALA

                /
                /NO PROGRAM RELOCATION AND TEST ONLY 1 STACK
                /
```

```
Ø476  6224      CHEXM,  RIF
Ø477  3Ø63              DCA     STKPIN          /STACK PROGRAM IS IN
Ø5ØØ  1371              TAD     (STACKØ-1
Ø5Ø1  3Ø17              DCA     17
Ø5Ø2  3Ø71              DCA     TEMP
Ø5Ø3  1417      CHEXM1, TAD I   17              /FIND STACK SEL FOR TEST
Ø5Ø4  765Ø              SNA CLA
Ø5Ø5  531Ø              JMP     CHEXM2
Ø5Ø6  2Ø71              ISZ     TEMP
Ø5Ø7  53Ø3              JMP     CHEXM1
Ø51Ø  1Ø71      CHEXM2, TAD     TEMP
Ø511  71Ø4              CLL RAL
Ø512  7ØØ6              RTL
Ø513  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
Ø514  477Ø'             JMS     PNOREL          /TYPEOUT NO RELOCATION
Ø515  4767'     CHEXM3, JMS     TEST            /TEST THE SELECTED STACK
Ø516  76Ø4              LAS
Ø517  ØØ25              AND     SW5             /HALT AFTER TEST
Ø52Ø  764Ø              SZA CLA
Ø521  74Ø2              HLT
Ø522  76Ø4              LAS
Ø523  ØØ24              AND     SW4             /CHANGE STACK LIMITS?
Ø524  764Ø              SZA CLA
Ø525  5766'             JMP     CHEXA           /YES
Ø526  5315              JMP     CHEXM3          /NO

                /
                /NO PROGRAM RELOCATION BUT TEST ALL SELECTED STACKS
                /
Ø527  477Ø'     CHEXN,  JMS     PNOREL          /TYPEOUT NO RELOCATION
Ø53Ø  4755'     CHEXNØ, JMS     CHEXN1          /TEST SEL'D STACKS
Ø531  76Ø4              LAS
Ø532  ØØ25              AND     SW5             /HALT AFTER TEST
Ø533  764Ø              SZA CLA
Ø534  74Ø2              HLT
Ø535  76Ø4              LAS
Ø536  ØØ24              AND     SW4             /CHANGE STACK LIMITS?
Ø537  764Ø              SZA CLA
Ø54Ø  5766'             JMP     CHEXA           /YES
Ø541  4776'             JMS     CHKSW3          /NO
Ø542  5775'             JMP     CHEXO           /RELOCATE
Ø543  533Ø              JMP     CHEXNØ          /CONTINUE

Ø565  361Ø
Ø566  1214
Ø567  12ØØ
Ø57Ø  2636
Ø571  3Ø27
Ø572  1631
Ø573  2712
Ø574  2732
Ø575  1ØØØ
Ø576  164Ø
Ø577  3Ø74
```

```
            Ø6ØØ            PAGE
                      /
                      /TEST STACKS CONTROL
                      /
      Ø6ØØ  3ØØØ      CHEXN1, Ø
      Ø6Ø1  724Ø              CLA
      Ø6Ø2  6224              RIF
      Ø6Ø3  3Ø63              DCA     STKPIN          /STACK PROGRAM IS IN
      Ø6Ø4  1Ø37              TAD     STACK7
      Ø6Ø5  764Ø              SZA CLA
      Ø6Ø6  5222              JMP     CHEXN2
      Ø6Ø7  111Ø              TAD     K7Ø
      Ø61Ø  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø611  3Ø72              DCA     COUNT
      Ø612  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø613  5222              JMP     CHEXN2          /YES
      Ø614  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø615  1Ø72              TAD     COUNT
      Ø616  764Ø              SZA CLA
      Ø617  2Ø47              ISZ     STK7
      Ø62Ø  741Ø              SKP
      Ø621  5217              JMP     .-2
      Ø622  1Ø36      CHEXN2, TAD     STACK6
      Ø623  764Ø              SZA CLA
      Ø624  524Ø              JMP     CHEXN3
      Ø625  11Ø7              TAD     K6Ø
      Ø626  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø627  3Ø72              DCA     COUNT
      Ø63Ø  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø631  524Ø              JMP     CHEXN3          /YES
      Ø632  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø633  1Ø72              TAD     COUNT
      Ø634  764Ø              SZA CLA
      Ø635  2Ø46              ISZ     STK6
      Ø636  741Ø              SKP
      Ø637  5235              JMP     .-2
      Ø64Ø  1Ø35      CHEXN3, TAD     STACK5
      Ø641  764Ø              SZA CLA
      Ø642  5256              JMP     CHEXN4
      Ø643  11Ø6              TAD     K5Ø
      Ø644  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø645  3Ø72              DCA     COUNT
      Ø646  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø647  5256              JMP     CHEXN4          /YES
      Ø65Ø  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø651  1Ø72              TAD     COUNT
      Ø652  764Ø              SZA CLA
      Ø653  2Ø45              ISZ     STK5
      Ø654  741Ø              SKP
      Ø655  5253              JMP     .-2
      Ø656  1Ø34      CHEXN4, TAD     STACK4
      Ø657  764Ø              SZA CLA
      Ø66Ø  5274              JMP     CHEXN5
      Ø661  11Ø5              TAD     K4Ø
      Ø662  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
```

```
      Ø663  3Ø72              DCA     COUNT
      Ø664  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø665  5274              JMP     CHEXN5          /YES
      Ø666  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø667  1Ø72              TAD     COUNT
      Ø67Ø  764Ø              SZA CLA
      Ø671  2Ø44              ISZ     STK4
      Ø672  741Ø              SKP
      Ø673  5271              JMP     .-2
      Ø674  1Ø33      CHEXN5, TAD     STACK3
      Ø675  764Ø              SZA CLA
      Ø676  5312              JMP     CHEXN6
      Ø677  11Ø4              TAD     K3Ø
      Ø7ØØ  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø7Ø1  3Ø72              DCA     COUNT
      Ø7Ø2  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø7Ø3  5312              JMP     CHEXN6          /YES
      Ø7Ø4  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø7Ø5  1Ø72              TAD     COUNT
      Ø7Ø6  764Ø              SZA CLA
      Ø7Ø7  2Ø43              ISZ     STK3
      Ø71Ø  741Ø              SKP
      Ø711  53Ø7              JMP     .-2
      Ø712  1Ø32      CHEXN6, TAD     STACK2
      Ø713  764Ø              SZA CLA
      Ø714  533Ø              JMP     CHEXN7
      Ø715  11Ø3              TAD     K2Ø
      Ø716  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø717  3Ø72              DCA     COUNT
      Ø72Ø  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø721  533Ø              JMP     CHEXN7          /YES
      Ø722  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø723  1Ø72              TAD     COUNT
      Ø724  764Ø              SZA CLA
      Ø725  2Ø42              ISZ     STK2
      Ø726  741Ø              SKP
      Ø727  5325              JMP     .-2
      Ø73Ø  1Ø31      CHEXN7, TAD     STACK1
      Ø731  764Ø              SZA CLA
      Ø732  5346              JMP     CHEXN8
      Ø733  11Ø2              TAD     K1Ø
      Ø734  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
      Ø735  3Ø72              DCA     COUNT
      Ø736  4777'             JMS     SAME            /PROG IN SEL STACK?
      Ø737  5346              JMP     CHEXN8          /YES
      Ø74Ø  4776'             JMS     TEST            /NO - TEST THE SEL STACK
      Ø741  1Ø72              TAD     COUNT
      Ø742  764Ø              SZA CLA
      Ø743  2Ø41              ISZ     STK1
      Ø744  741Ø              SKP
      Ø745  5343              JMP     .-2
      Ø746  1Ø3Ø      CHEXN8, TAD     STACKØ
      Ø747  764Ø              SZA CLA
      Ø75Ø  5361              JMP     CHEXN9
      Ø751  3Ø64              DCA     STKTST          /STACK SEL FOR TEST
```

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Ø752  3Ø72            DCA    COUNT
Ø753  4777'           JMS    SAME          /PROG IN SEL STACK?
Ø754  5361            JMP    CHEXN9        /YES
Ø755  4776'           JMS    TEST          /NO - TEST THE SEL STACK
Ø756  1Ø72            TAD    COUNT
Ø757  764Ø            SZA CLA
Ø76Ø  2Ø4Ø            ISZ    STKØ
Ø761  56ØØ   CHEXN9,  JMP I  CHEXN1
Ø762  536Ø            JMP    .-2

Ø776  12ØØ
Ø777  1631
      1ØØØ            PAGE


             /
             /CHECK ALL SELECTED STACKS FROM EACH SELECTED STACK
             /
1ØØØ  4777'  CHEXO,   JMS    PREL          /TYPEOUT RELOCATION
1ØØ1  4776'           JMS    RESTK         /RESTORE STK(S)
1ØØ2  4775'           JMS    CHEXN1        /TEST FROM PRESENT STACK
1ØØ3  4774'           JMS    CHKSW3
1ØØ4  741Ø            SKP
1ØØ5  5773'           JMP    CHEXN
1ØØ6  6224   CHEXOA,  RIF
1ØØ7  3Ø63            DCA    STKPIN        /STACK PROGRAM IS IN
1Ø1Ø  1Ø47            TAD    STK7
1Ø11  764Ø            SZA CLA
1Ø12  5224            JMP    CHEXOØ
1Ø13  111Ø            TAD    K7Ø
1Ø14  3Ø64            DCA    STKTST        /STACK SEL FOR MOVE TO
1Ø15  4772'           JMS    SAME          /PROG IN MOVE STACK?
1Ø16  741Ø            SKP                  /YES
1Ø17  4771'           JMS    RELO          /NO - RELOCATE PROGRAM
1Ø2Ø  4775'           JMS    CHEXN1        /TEST ALL SEL STACKS
1Ø21  4774'           JMS    CHKSW3
1Ø22  741Ø            SKP
1Ø23  5773'           JMP    CHEXN
1Ø24  1Ø46   CHEXOØ,  TAD    STK6
1Ø25  764Ø            SZA CLA
1Ø26  524Ø            JMP    CHEXO1
1Ø27  11Ø7            TAD    K6Ø
1Ø3Ø  3Ø64            DCA    STKTST        /STACK SEL FOR MOVE TO
1Ø31  4772'           JMS    SAME          /PROG IN MOVE STACK?
1Ø32  741Ø            SKP                  /YES
1Ø33  4771'           JMS    RELO          /NO - RELOCATE PROGRAM
1Ø34  4775'           JMS    CHEXN1        /TEST ALL SEL STACKS
1Ø35  4774'           JMS    CHKSW3
1Ø36  741Ø            SKP
1Ø37  5773'           JMP    CHEXN
1Ø4Ø  1Ø45   CHEXO1,  TAD    STK5
1Ø41  764Ø            SZA CLA
1Ø42  5254            JMP    CHEXO2
1Ø43  11Ø6            TAD    K5Ø
1Ø44  3Ø64            DCA    STKTST
```

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1Ø45  4772'           JMS    SAME
1Ø46  741Ø            SKP
1Ø47  4771'           JMS    RELO
1Ø5Ø  4775'           JMS    CHEXN1
1Ø51  4774'           JMS    CHKSW3
1Ø52  741Ø            SKP
1Ø53  5773'           JMP    CHEXN
1Ø54  1Ø44   CHEXO2,  TAD    STK4
1Ø55  764Ø            SZA CLA
1Ø56  527Ø            JMP    CHEXO3
1Ø57  11Ø5            TAD    K4Ø
1Ø6Ø  3Ø54            DCA    STKTST
1Ø61  4772'           JMS    SAME
1Ø62  741Ø            SKP
1Ø63  4771'           JMS    RELO
1Ø64  4775'           JMS    CHEXN1
1Ø65  4774'           JMS    CHKSW3
1Ø66  741Ø            SKP
1Ø67  5773'           JMP    CHEXN
1Ø7Ø  1Ø43   CHEXO3,  TAD    STK3
1Ø71  764Ø            SZA CLA
1Ø72  53Ø4            JMP    CHEXO4
1Ø73  11Ø4            TAD    K3Ø
1Ø74  3Ø64            DCA    STKTST
1Ø75  4772'           JMS    SAME
1Ø76  741Ø            SKP
1Ø77  4771'           JMS    RELO
11ØØ  4775'           JMS    CHEXN1
11Ø1  4774'           JMS    CHKSW3
11Ø2  741Ø            SKP
11Ø3  5773'           JMP    CHEXN
11Ø4  1Ø42   CHEXO4,  TAD    STK2
11Ø5  764Ø            SZA CLA
11Ø6  532Ø            JMP    CHEXO5
11Ø7  11Ø3            TAD    K2Ø
111Ø  3Ø64            DCA    STKTST
1111  4772'           JMS    SAME
1112  741Ø            SKP
1113  4771'           JMS    RELO
1114  4775'           JMS    CHEXN1
1115  4774'           JMS    CHKSW3
1116  741Ø            SKP
1117  5773'           JMP    CHEXN
112Ø  1Ø41   CHEXO5,  TAD    STK1
1121  764Ø            SZA CLA
1122  5334            JMP    CHEXO6
1123  11Ø2            TAD    K1Ø
1124  3Ø64            DCA    STKTST
1125  4772'           JMS    SAME
1126  741Ø            SKP
1127  4771'           JMS    RELO
113Ø  4775'           JMS    CHEXN1
1131  4774'           JMS    CHKSW3
1132  741Ø            SKP
1133  5773'           JMP    CHEXN
```

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1134  1Ø4Ø    CHEXO6, TAD     STKØ
1135  764Ø            SZA CLA
1136  5344            JMP     CHEXO7
1137  3Ø64            DCA     STKTST
114Ø  4772'           JMS     SAME
1141  741Ø            SKP
1142  4771'           JMS     RELO
1143  4775'           JMS     CHEXN1
1144  76Ø4    CHEXO7, LAS
1145  ØØ25            AND     SW5            /HALT AFTER TEST
1146  764Ø            SZA CLA
1147  74Ø2            HLT
115Ø  76Ø4            LAS
1151  ØØ24            AND     SW4            /CHANGE STACK LIMITS?
1152  764Ø            SZA CLA
1153  577Ø'           JMP     CHEXA          /YES
1154  4774'           JMS     CHKSW3         /NO
1155  5236            JMP     CHEXOA         /RELOCATE THE PROGRAM
1156  5773'           JMP     CHEXN          /INHIBIT PROGRAM RELOCATION

117Ø  Ø214
1171  1646
1172  1631
1173  Ø527
1174  164Ø
1175  Ø63Ø
1176  3Ø51
1177  2672
      12ØØ            PAGE


              /
              /RUN THE SELECTED TEST(S) ON THE SELECTED FIELD (STKTST)
              /
12ØØ  ØØØØ    TEST,   Ø
12Ø1  73ØØ            CLA CLL
12Ø2  1Ø64            TAD     STKTST         /UPDATE CDF TEST DATA FIELDS
12Ø3  1141            TAD     K62Ø1
12Ø4  3252            DCA     TDF1
12Ø5  1252            TAD     TDF1
12Ø6  3777'           DCA     TDF2
12Ø7  1777'           TAD     TDF2
121Ø  3776'           DCA     TDF3
1211  1776'           TAD     TDF3
1212  3775'           DCA     TDF4
1213  3Ø72            DCA     COUNT          /CLEAR ERROR COUNT
1214  1Ø56            TAD     RUNTST
1215  7Ø1Ø            RAR
1216  763Ø            SZL CLA
1217  425Ø            JMS     TEST1          /EXECUTE TEST 1
122Ø  1Ø56            TAD     RUNTST
1221  7Ø12            RTR
1222  763Ø            SZL CLA
1223  4774'           JMS     TEST2          /EXECUTE TEST 2
1224  1Ø56            TAD     RUNTST
```

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1225  7ØØ6            RTL
1226  763Ø            SZL CLA
1227  4773'           JMS     TEST3          /EXECUTE TEST 3
123Ø  1Ø56            TAD     RUNTST
1231  7ØØ4            RAL
1232  763Ø            SZL CLA
1233  4772'           JMS     TEST4          /EXECUTE TEST 4
1234  76Ø4            LAS
1235  ØØ24            AND     SW4            /CHANGE STACK LIMITS?
1236  764Ø            SZA CLA
1237  5771'           JMP     CHEXA          /YES
124Ø  2152            ISZ     FIVE
1241  56ØØ            JMP I   TEST           /NOT 5 MINUTES YET
1242  1153            TAD     MIN5
1243  3152            DCA     FIVE           /RESTORE TIMER
1244  4544            JMS I   XMESAG
1245  4543            4543
1246  653Ø            653Ø
1247  56ØØ            JMP I   TEST

              /TEST 1
              /
              /WRITE THE VALUE OF EACH LOCATION INTO ITSELF AND CHECK
              /
125Ø  ØØØØ    TEST1,  Ø
1251  3Ø57            DCA     TESTAD         /CLEAR TEST ADDRESS COUNTER
1252  62Ø1    TDF1,   CDF3                   /CHANGE TO TEST DATA FIELD
1253  1Ø57    TEST1A, TAD     TESTAD
1254  3457            DCA I   TESTAD         /WRITE MEMORY
1255  2Ø57            ISZ     TESTAD
1256  5253            JMP     TEST1A         /4Ø96 TIMES
1257  1Ø57    TEST1B, TAD     TESTAD         /READ AND CHECK
126Ø  7Ø41            CIA
1261  1457            TAD I   TESTAD
1262  764Ø            SZA CLA
1263  5273            JMP     ADDER1         /ADDRESS ERROR
1264  2Ø57    ADDRT1, ISZ     TESTAD
1265  5257            JMP     TEST1B         /CONTINUE READ AND CHECK
1266  1Ø63            TAD     STKPIN
1267  1141            TAD     K62Ø1
127Ø  3271            DCA     .+1
1271  62Ø1            CDFØ                   /CHANGE TO PROGRAM DATA FIELD
1272  565Ø            JMP I   TEST1          /DONE

1273  1Ø57    ADDER1, TAD     TESTAD
1274  3Ø66            DCA     GDATA          /GOOD
1275  1457            TAD I   TESTAD
1276  3Ø65            DCA     BDATA          /BAD
1277  1Ø63            TAD     STKPIN
13ØØ  1141            TAD     K62Ø1
13Ø1  33Ø2            DCA     .+1
13Ø2  62Ø1            CDFØ                   /CHANGE TO PROGRAM DATA FIELD
13Ø3  477Ø'           JMS     ERR1           /ADDRESS ERROR TEST1
13Ø4  1Ø64            TAD     STKTST
```

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 13Ø5  1141              TAD      K62Ø1
 13Ø6  33Ø7              DCA      .+1
 13Ø7  62Ø1              CDFØ                       /CHANGE TO TEST DATA FIELD
 131Ø  5264              JMP      ADDRT1

 137Ø  2256
 1371  Ø214
 1372  1514
 1373  1443
 1374  14ØØ
 1375  1516
 1376  1445
 1377  14Ø2
       14ØØ              PAGE

                /TEST 2
                /
                /WRITE THE COMPLEMENT VALUE OF EACH LOCATION INTO ITSELF AND CHECK
                /
 14ØØ  ØØØØ     TEST2,   Ø
 14Ø1  3Ø57              DCA      TESTAD            /CLEAR TEST ADDRESS COUNTER
 14Ø2  62Ø1     TDF2,    CDFØ                       /CHANGE TO TEST DATA FIELD
 14Ø3  1Ø57     TEST2A,  TAD      TESTAD
 14Ø4  7Ø4Ø              CMA
 14Ø5  3457              DCA I    TESTAD            /WRITE MEMORY
 14Ø6  2Ø57              ISZ      TESTAD
 14Ø7  52Ø3              JMP      TEST2A            /4Ø96 TIMES
 141Ø  1Ø57     TEST2B,  TAD      TESTAD            /READ AND CHECK
 1411  7ØØ1              IAC
 1412  1457              TAD I    TESTAD
 1413  764Ø              SZA CLA
 1414  5224              JMP      ADDER2            /ADDRESS ERROR
 1415  2Ø57     ADDRT2,  ISZ      TESTAD
 1416  521Ø              JMP      TEST2B            /CONTINUE READ AND CHECK
 1417  1Ø63              TAD      STKPIN
 142Ø  1141              TAD      K62Ø1
 1421  3222              DCA      .+1
 1422  62Ø1              CDFØ                       /CHANGE TO PROGRAM DATA FIELD
 1423  56ØØ              JMP I    TEST2             /DONE

 1424  1Ø57     ADDER2,  TAD      TESTAD
 1425  7Ø4Ø              CMA
 1426  3Ø66              DCA      GDATA             /GOOD
 1427  1457              TAD I    TESTAD
 143Ø  3Ø65              DCA      BDATA             /BAD
 1431  1Ø63              TAD      STKPIN
 1432  1141              TAD      K62Ø1
 1433  3234              DCA      .+1
 1434  62Ø1              CDFØ                       /CHANGE TO PROGRAM DATA FIELD
 1435  4777'             JMS      ERR2              /ADDRESS ERROR TEST 2
 1436  1Ø64              TAD      STKTST
 1437  1141              TAD      K62Ø1
 144Ø  3241              DCA      .+1
 1441  62Ø1              CDFØ                       /CHANGE TO TEST DATA FIELD
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 1442  5215              JMP      ADDRT2

                /TEST 3
                /
                /WRITE THE VALUE OF EACH LOCATION INTO ITSELF AND CHECK BACKWARDS
                /
 1443  ØØØØ     TEST3,   Ø
 1444  3Ø57              DCA      TESTAD            /CLEAR TEST ADDRESS COUNTER
 1445  62Ø1     TDF3,    CDFØ                       /CHANGE TO TEST DATA FIELD
 1446  1Ø57     TEST3A,  TAD      TESTAD
 1447  1Ø74              TAD      M1
 145Ø  3Ø57              DCA      TESTAD
 1451  1Ø57              TAD      TESTAD
 1452  3457              DCA I    TESTAD            /WRITE MEMORY
 1453  1Ø57              TAD      TESTAD
 1454  764Ø              SZA CLA
 1455  5246              JMP      TEST3A            /4Ø96 TIMES
 1456  1Ø57     TEST3B,  TAD      TESTAD
 1457  1Ø74              TAD      M1
 146Ø  3Ø57              DCA      TESTAD
 1461  1Ø57              TAD      TESTAD            /READ AND CHECK
 1462  7Ø41              CIA
 1463  1457              TAD I    TESTAD
 1464  764Ø              SZA CLA
 1465  5276              JMP      ADDER3            /ADDRESS ERROR
 1466  1Ø57     ADDRT3,  TAD      TESTAD
 1467  764Ø              SZA CLA
 147Ø  5256              JMP      TEST3B            /CONTINUE READ AND CHECK
 1471  1Ø63              TAD      STKPIN
 1472  1141              TAD      K62Ø1
 1473  3274              DCA      .+1
 1474  62Ø1              CDFØ                       /CHANGE TO PROGRAM DATA FIELD
 1475  5643              JMP I    TEST3             /DONE

 1476  1Ø57     ADDER3,  TAD      TESTAD
 1477  3Ø66              DCA      GDATA             /GOOD
 15ØØ  1457              TAD I    TESTAD
 15Ø1  3Ø65              DCA      BDATA             /BAD
 15Ø2  1Ø63              TAD      STKPIN
 15Ø3  1141              TAD      K62Ø1
 15Ø4  33Ø5              DCA      .+1
 15Ø5  62Ø1              CDFØ                       /CHANGE TO PROGRAM DATA FIELD
 15Ø6  4776'             JMS      ERR3              /ADDRESS ERROR TEST 3
 15Ø7  1Ø64              TAD      STKTST
 151Ø  1141              TAD      K62Ø1
 1511  3312              DCA      .+1
 1512  62Ø1              CDFØ                       /CHANGE TO TEST DATA FIELD
 1513  5266              JMP      ADDRT3
                /TEST 4
                /
                /WRITE THE COMPLEMENT VALUE OF EACH LOCATION INTO ITSELF
                /AND CHECK BACKWARDS
                /
 1514  ØØØØ     TEST4,   Ø
 1515  3Ø57              DCA      TESTAD            /CLEAR TEST ADDRESS COUNTER
```

```
1516  62Ø1    TDF4,   CDFØ                      /CHANGE TO TEST DATA FIELD
1517  1Ø57    TEST4A, TAD     TESTAD
152Ø  1Ø74            TAD     M1
1521  3Ø57            DCA     TESTAD
1522  1Ø57            TAD     TESTAD
1523  7Ø4Ø            CMA
1524  3457            DCA I   TESTAD            /WRITE MEMORY
1525  1Ø57            TAD     TESTAD
1526  764Ø            SZA CLA
1527  5317            JMP     TEST4A            /4Ø96 TIMES
153Ø  1Ø57    TEST4B, TAD     TESTAD
1531  1Ø74            TAD     M1
1532  3Ø57            DCA     TESTAD
1533  1Ø57            TAD     TESTAD            /READ AND CHECK
1534  7ØØ1            IAC
1535  1457            TAD I   TESTAD
1536  764Ø            SZA CLA
1537  535Ø            JMP     ADDER4            /ADDRESS ERROR
154Ø  1Ø57    ADDRT4, TAD     TESTAD
1541  764Ø            SZA CLA
1542  533Ø            JMP     TEST4B            /CONTINUE READ AND CHECK
1543  1Ø63            TAD     STKPIN
1544  1141            TAD     K62Ø1
1545  3346            DCA     .+1
1546  62Ø1            CDFØ                      /CHANGE TO PROGRAM DATA FIELD
1547  5714            JMP I   TEST4             /DONE

155Ø  1Ø57    ADDER4, TAD     TESTAD
1551  7Ø4Ø            CMA
1552  3Ø66            DCA     GDATA             /GOOD
1553  1457            TAD I   TESTAD
1554  3Ø65            DCA     BDATA             /BAD
1555  1Ø63            TAD     STKPIN
1556  1141            TAD     K62Ø1
1557  336Ø            DCA     .+1
156Ø  62Ø1            CDFØ                      /CHANGE TO PROGRAM DATA FIELD
1561  4775'           JMS     ERR4              /ADDRESS ERROR TEST 4
1562  1Ø64            TAD     STKTST
1563  1141            TAD     K62Ø1
1564  3365            DCA     .+1
1565  62Ø1            CDFØ                      /CHANGE TO TEST DATA FIELD
1566  534Ø            JMP     ADDRT4

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1576  24ØØ
1577  2342
      16ØØ            PAGE


              /
              /SETUP 5 MINUTE TIMER & TEST SELECTED TO RUN
              /
16ØØ  72ØØ    RUNØ,   CLA                       /RUN ALL TESTS
16Ø1  1154            TAD     MIN5Ø
16Ø2  3153            DCA     MIN5
```

```
16Ø3  1133            TAD     K6ØØ3
16Ø4  5777'           JMP     EXTADØ
16Ø5  72ØØ    RUN1,   CLA                       /RUN ONLY TEST 1
16Ø6  1155            TAD     MIN51
16Ø7  3153            DCA     MIN5
161Ø  7ØØ1            IAC
1611  5777'           JMP     EXTADØ
1612  73ØØ    RUN2,   CLA CLL                   /RUN ONLY TEST 2
1613  1156            TAD     MIN52
1614  3153            DCA     MIN5
1615  7ØØ5            IAC RAL
1616  5777'           JMP     EXTADØ
1617  72ØØ    RUN3,   CLA                       /RUN ONLY TEST 3
162Ø  1157            TAD     MIN53
1621  3153            DCA     MIN5
1622  7132            STL RTR
1623  5777'           JMP     EXTADØ
1624  72ØØ    RUN4,   CLA                       /RUN ONLY TEST 4
1625  116Ø            TAD     MIN54
1626  3153            DCA     MIN5
1627  713Ø            STL RAR
163Ø  5777'           JMP     EXTADØ

              /
              /RETURN IF PROGRAM IS IN SELECTED STACK
              /RETURN+1 IF PROGRAM IS NOT IN SELECTED STACK
              /
1631  ØØØØ    SAME,   Ø
1632  1Ø63            TAD     STKPIN
1633  7Ø41            CIA
1634  1Ø64            TAD     STKTST
1635  764Ø            SZA CLA
1636  2231            ISZ     SAME              /PROG NOT IN SEL STACK
1637  5631            JMP I   SAME
              /
              /CHECK PROGRAM RELOCATION SWITCH
              /RETURN IF RELOCATE, RETURN+1 IF INHIBIT RELOCATION
              /
164Ø  ØØØØ    CHKSW3, Ø
1641  76Ø4            LAS
1642  Ø Ø23           AND     SW3
1643  764Ø            SZA CLA
1644  224Ø            ISZ     CHKSW3            /INHIBIT RELOCATION
1645  564Ø            JMP I   CHKSW3
              /
              /RELOCATE THE PROGRAM
              /
1646  ØØØØ    RELO,   Ø
1647  72ØØ            CLA
165Ø  3Ø72            DCA     COUNT             /CLEAR ERROR COUNTER
1651  3Ø67            DCA     MOVE
1652  1141            TAD     K62Ø1
1653  1Ø63            TAD     STKPIN
1654  3265            DCA     RELO2
1655  1141            TAD     K62Ø1
```

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1656  1Ø64              TAD      STKTST
1657  3267              DCA      RELO3
166Ø  1265              TAD      RELO2
1661  3272              DCA      RELO4
1662  1142              TAD      K62Ø3
1663  1Ø64              TAD      STKTST
1664  33Ø3              DCA      RELO5
1665  62Ø1     RELO2,   CDFØ                      /MOVE FROM DATA FIELD
1666  1467              TAD I    MOVE
1667  62Ø1     RELO3,   CDFØ                      /MOVE TO DATA FIELD
167Ø  3467              DCA I    MOVE
1671  1467              TAD I    MOVE
1672  62Ø1     RELO4,   CDFØ                      /MOVE FROM DATA FIELD
1673  7Ø41              CIA
1674  1467              TAD I    MOVE
1675  764Ø              SZA CLA
1676  4776'             JMS      ERRM             /MOVE ERROR
1677  2Ø67              ISZ      MOVE
17ØØ  5265              JMP      RELO2
17Ø1  1Ø72              TAD      COUNT
17Ø2  765Ø              SNA CLA                   /SKIP IF MOVE ERROR
17Ø3  62Ø3     RELO5,   CBFØ                      /CHANGE TO NEW PROG FIELD
17Ø4  5646              JMP I    RELO
               /
               /INCREMENT CONTROL OF UPPER STACKS NOT TESTED AND/OR
               /STACKS NOT IN THE SYSTEM
               /
17Ø5  ØØØØ              Ø                         /RETURN ADDRESS
17Ø6  2Ø31     ABOVE,   ISZ      STACK1
17Ø7  2Ø32              ISZ      STACK2
171Ø  2Ø33              ISZ      STACK3
1711  2Ø34              ISZ      STACK4
1712  2Ø35              ISZ      STACK5
1713  2Ø36              ISZ      STACK6
1714  2Ø37              ISZ      STACK7
1715  57Ø5              JMP I    ABOVE-1

               /
               /INCREMENT CONTROL OF LOWER STACKS NOT TESTED
               /
1716  2Ø36              ISZ      STACK6
1717  2Ø35              ISZ      STACK5
172Ø  2Ø34              ISZ      STACK4
1721  2Ø33              ISZ      STACK3
1722  2Ø32              ISZ      STACK2
1723  2Ø31              ISZ      STACK1
1724  2Ø33              ISZ      STACKØ
1725  5726     BELOW,   JMP I    .+1
1726  ØØØØ              Ø
               /
               /CLEAR ALL STACKS OR STACKS TO BE TESTED
               /
1727  3Ø37              DCA      STACK7
173Ø  3Ø36              DCA      STACK6
1731  3Ø35              DCA      STACK5
```

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1732  3Ø34              DCA      STACK4
1733  3Ø33              DCA      STACK3
1734  3Ø32              DCA      STACK2
1735  3Ø31              DCA      STACK1
1736  3Ø3Ø     DOWN,    DCA      STACKØ
1737  574Ø              JMP I    .+1
174Ø  ØØØØ              Ø                         /RETURN ADDRESS
1741  5327              JMP      .-12             /CLEAR ALL STACK SELECTION CONTROLS
               /
               /OBTAIN -SSL (MINUS STARTING STACK LIMIT)
               /
1742  ØØØØ     MSSL,    Ø
1743  1Ø61              TAD      SSL
1744  7112              CLL RTR
1745  7Ø1Ø              RAR
1746  7Ø41              CIA
1747  5742              JMP I    MSSL

1776  2434
1777  Ø2Ø5
      2ØØØ              PAGE

               /
               /CONVERT OCTAL NUMBERS FOR TYPEOUT
               /
2ØØØ  ØØØØ     SIXTY,   Ø
2ØØ1  73ØØ              CLA CLL
2ØØ2  163Ø              TAD I    SIXTY            /GET ADDRESS OF OPERAND
2ØØ3  3237              DCA      SIXTYØ
2ØØ4  223Ø              ISZ      SIXTY
2ØØ5  163Ø              TAD I    SIXTY            /GET STORAGE ADDRESS
2ØØ6  324Ø              DCA      SIXTY1
2ØØ7  223Ø              ISZ      SIXTY            /CORRECT RETURN ADDRESS
2Ø1Ø  1111              TAD      K77
2Ø11  7Ø4Ø              CMA                       /AC=77ØØ
2Ø12  Ø637              AND I    SIXTYØ           /AND OPERAND FIRST 2 DIGITS
2Ø13  7112              CLL RTR
2Ø14  7Ø12              RTR
2Ø15  7Ø12              RTR                       /POSITION FIRST 2 DIGITS
2Ø16  4224              JMS      CNV              /CONVERT DIGITS FOR TYPEOUT
2Ø17  224Ø              ISZ      SIXTY1           /INCREMENT STORAGE ADDRESS
2Ø2Ø  1111              TAD      K77
2Ø21  Ø637              AND I    SIXTYØ           /AND OPERAND SECOND 2 DIGITS
2Ø22  4224              JMS      CNV              /CONVERT DIGITS FOR TYPEOUT
2Ø23  56ØØ              JMP I    SIXTY
2Ø24  ØØØØ     CNV,     Ø
2Ø25  3241              DCA      SIXTY2           /SAVE DIGITS
2Ø26  1241              TAD      SIXTY2
2Ø27  71Ø6              CLL RTL
2Ø3Ø  7ØØ4              RAL
2Ø31  Ø13Ø              AND      K7Ø7             /AND LEFT DIGIT
2Ø32  1241              TAD      SIXTY2
2Ø33  Ø13Ø              AND      K7Ø7             /AND RIGHT DIGIT
2Ø34  1134              TAD      K6Ø6Ø
2Ø35  364Ø              DCA I    SIXTY1           /STORE CONVERTED DIGITS
```

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2Ø36  5624              JMP I   CNV

2Ø37  ØØØØ      SIXTYØ, Ø                       /ADDRESS OF OPERAND
2Ø4Ø  ØØØØ      SIXTY1, Ø                       /STORAGE ADDRESS
2Ø41  ØØØØ      SIXTY2, Ø                       /TEMPORARY STORAGE

                /
                /TYPEOUT CHARACTER IN AC AND RETURN
                /
2Ø42  ØØØØ      TYPE,   Ø
2Ø43  6Ø46              TLS                     /TRANSMIT CHARACTER
2Ø44  6Ø41              TSF
2Ø45  5244              JMP     .-1             /WAIT FOR FLAG
2Ø46  73ØØ              CLA CLL
2Ø47  5642              JMP I   TYPE

                /
                /TELETYPE OUTPUT ROUTINE WITH BELL
                /
2Ø5Ø  ØØØØ      MESAGE, Ø
2Ø51  724Ø              STA
2Ø52  125Ø              TAD     MESAGE          /FIRST WORD -1
2Ø53  3Ø1Ø              DCA     1Ø
2Ø54  141Ø              TAD I   1Ø
2Ø55  3266              DCA     MSRGHT
2Ø56  1266              TAD     MSRGHT
2Ø57  7112              CLL RTR
2Ø6Ø  7Ø12              RTR
2Ø61  7Ø12              RTR                     /POSITION FIRST CHARACTER
2Ø62  4267              JMS     TYPECH          /TYPEOUT FIRST CHARACTER
2Ø63  1266              TAD     MSRGHT
2Ø64  4267              JMS     TYPECH          /TYPEOUT SECOND CHARACTER
2Ø65  5254              JMP     MESAGE+4        /CONTINUE TYPING
2Ø66  ØØØØ      MSRGHT, Ø
2Ø67  ØØØØ      TYPECH, Ø
2Ø7Ø  Ø111              AND     K77
2Ø71  745Ø              SNA                     /IS IT END OF MESSAGE?
2Ø72  541Ø              JMP I   1Ø              /RETURN TO PROGRAM
2Ø73  11ØØ              TAD     M34             /SUBTRACT 34
2Ø74  744Ø              SZA
2Ø75  53ØØ              JMP     .+3
2Ø76  1112              TAD     K2Ø7            /CODE IS BELL
2Ø77  532Ø              JMP     MTP
21ØØ  1Ø77              TAD     M4              /SUBTRACT 4
21Ø1  75ØØ              SMA                     /CODE LESS THAN 4Ø?
21Ø2  53Ø5              JMP     .+3             /NO
21Ø3  1127              TAD     K34Ø            /YES, ADD 3ØØ, CODE IS ALPHA
21Ø4  532Ø              JMP     MTP
21Ø5  1Ø76              TAD     M3              /SUBTRACT 3
21Ø6  744Ø              SZA
21Ø7  5312              JMP     .+3
211Ø  1113              TAD     K212            /CODE IS LINE FEED
2111  532Ø              JMP     MTP
2112  1Ø75              TAD     M2              /SUBTRACT 2
2113  744Ø              SZA
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2114  5317              JMP     .+3
2115  1114              TAD     K215            /CODE IS CR
2116  741Ø              SKP
2117  1116              TAD     K245            /ADD 2ØØ TO OTHER CODES >4Ø
212Ø  4242      MTP,    JMS     TYPE            /TYPEOUT CHARACTER IN AC
2121  5667              JMP I   TYPECH
      22ØØ              PAGE

                /
                /ERROR ROUTINE (BELL ON ERROR HAS PRIORITY)
                /
22ØØ  ØØØØ      RETURN, Ø                       /PROGRAM RETURN ADDRESS
22Ø1  6ØØ2      CODERR, IOF
22Ø2  76Ø4              LAS                     /CHECK FOR BELL ON ERROR
22Ø3  ØØ22              AND     SW2
22Ø4  765Ø              SNA CLA
22Ø5  5211              JMP     .+4

22Ø6  1112      RBELL,  TAD     K2Ø7            /BELL CODE
22Ø7  4543              JMS I   XTYPE           /RING BELL
221Ø  56ØØ              JMP I   RETURN
2211  76Ø4              LAS                     /CHECK FOR INHIBIT TYPEOUT
2212  ØØ21              AND     SW1
2213  764Ø              SZA CLA
2214  5242              JMP     STOP            /INHIBIT TYPEOUT
2215  6224              RIF                     /READ INST FIELD
2216  7Ø12              RTR
2217  7Ø1Ø              RAR
222Ø  Ø1Ø1              AND     K7
2221  1131              TAD     K4Ø6Ø
2222  3233              DCA     ERRORØ
2223  12ØØ              TAD     RETURN
2224  1Ø74              TAD     M1
2225  3Ø73              DCA     ERRLOC
2226  4545              JMS I   XSIXTY
2227  ØØ73              ERRLOC
223Ø  2234              ERROR1
2231  4544              JMS I   XMESAG          /TYPEOUT ERROR LOCATION
2232  4543              4543
2233  ØØØØ      ERRORØ, Ø                       /FIELD
2234  ØØØØ      ERROR1, Ø
2235  ØØØØ              Ø                       /PROGRAM LOCATION OF ERROR JMS
2236  4Ø4Ø              4Ø4Ø
2237  ØØØØ              ØØ3Ø
224Ø  5641              JMP I   .+1             /TYPEOUT ERROR
2241  ØØØØ      ADDER,  Ø                       /ADDRESS OF ERROR TYPEOUT
2242  76Ø4      STOP,   LAS                     /HALT AFTER ERROR
2243  ØØ2Ø              AND     SWØ
2244  765Ø              SNA CLA
2245  5251              JMP     LIMIT           /INHIBIT ERROR HALT
2246  12ØØ              TAD     RETURN
2247  1Ø74              TAD     M1
225Ø  74Ø2              HLT                     /HALT WITH AC=ERROR LOC
2251  76Ø4      LIMIT,  LAS
2252  ØØ24              AND     SW4             /CHANGE STACK LIMITS?
```

```
2253  764Ø              SZA CLA
2254  5777'             JMP     CHEXA            /YES
2255  56ØØ              JMP I   RETURN           /NO


                /
                /ADDRESS ERROR TEST 1
                /
2256  ØØØØ      ERR1,   Ø
2257  2Ø72              ISZ     COUNT            /ADDRESS ERROR OCCURRED
226Ø  741Ø              SKP
2261  5257              JMP     .-2
2262  72ØØ              CLA
2263  1256              TAD     ERR1
2264  3547              DCA I   XRETUR           /STORE RETURN ADDRESS
2265  127Ø              TAD     .+3
2266  3551              DCA I   XADDER           /STORE ERROR TYPEOUT ADDRESS
2267  741Ø              SKP
227Ø  23Ø7              PERR1
2271  1135              TAD     K61ØØ
2272  334Ø              DCA     Z24              /TEST 1
2273  76Ø4      ERR1A,  LAS
2274  ØØ22              AND     SW2              /BELL ON ERROR?
2275  764Ø              SZA CLA
2276  52Ø6              JMP     RBELL            /YES
2277  76Ø4              LAS
23ØØ  ØØ21              AND     SW1              /INHIBIT ERROR TYPEOUT?
23Ø1  764Ø              SZA CLA
23Ø2  555Ø              JMP I   XSTOP            /YES
23Ø3  2Ø53              ISZ     HEAD1
23Ø4  741Ø              SKP
23Ø5  4776'             JMS     HEAD12           /TYPEOUT ERROR HEADING
23Ø6  5546              JMP I   XCODER           /GO TO ERROR ROUTINE

23Ø7  1Ø64      PERR1,  TAD     STKTST
231Ø  7112              CLL RTR
2311  7Ø1Ø              RAR
2312  1131              TAD     K4Ø6Ø
2313  3326              DCA     Z2Ø              /FIELD OF ERROR
2314  4545              JMS I   XSIXTY
2315  ØØ57              TESTAD
2316  2327              Z21                      /FAILING ADDRESS
2317  4545              JMS I   XSIXTY
232Ø  ØØ66              GDATA
2321  2332              Z22                      /GOOD
2322  4545              JMS I   XSIXTY
2323  ØØ65              BDATA
2324  2335              Z23                      /BAD
2325  4544              JMS I   XMESAG
2326  ØØØØ      Z2Ø,    Ø
2327  ØØØØ      Z21,    Ø
233Ø  ØØØØ              Ø                        /FAILING ADDRESS
2331  4Ø4Ø              4Ø4Ø
2332  ØØØØ      Z22,    Ø
2333  ØØØØ              Ø                        /GOOD
```

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2334  4Ø4Ø              4Ø4Ø
2335  ØØØØ      Z23,    Ø
2336  ØØØØ              Ø                        /BAD
2337  4Ø4Ø              4Ø4Ø
234Ø  ØØØØ      Z24,    Ø                        /TEST
2341  555Ø              JMP I   XSTOP

                /
                /ADDRESS ERROR TEST 2
```

```
                      /
2342  ØØØØ            ERR2,   Ø
2343  2Ø72                    ISZ     COUNT           /ADDRESS ERROR OCCURRED
2344  741Ø                    SKP
2345  5343                    JMP     .-2
2346  72ØØ                    CLA
2347  1342                    TAD     ERR2
235Ø  3547                    DCA I   XRETUR          /STORE RETURN ADDRESS
2351  1354                    TAD     .+3
2352  3551                    DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
2353  741Ø                    SKP
2354  23Ø7                    PERR1
2355  1136                    TAD     K62ØØ
2356  334Ø                    DCA     Z24             /TEST 2
2357  5273                    JMP     ERR1A

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                      /
                      /ADDRESS ERROR TEST 3
                      /
24ØØ  ØØØØ            ERR3,   Ø
24Ø1  2Ø72                    ISZ     COUNT           /ADDRESS ERROR OCCURRED
24Ø2  741Ø                    SKP
24Ø3  52Ø1                    JMP     .-2
24Ø4  72ØØ                    CLA
24Ø5  12ØØ                    TAD     ERR3
24Ø6  3547                    DCA I   XRETUR          /STORE RETURN ADDRESS
24Ø7  1212                    TAD     .+3
241Ø  3551                    DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
2411  741Ø                    SKP
2412  23Ø7                    PERR1
2413  1137                    TAD     K63ØØ
2414  3777'                   DCA     Z24             /TEST 3
2415  5776'                   JMP     ERR1A

                      /
                      /ADDRESS ERROR TEST 4
                      /
2416  ØØØØ            ERR4,   Ø
2417  2Ø72                    ISZ     COUNT           /ADDRESS ERROR OCCURRED
242Ø  741Ø                    SKP
2421  5217                    JMP     .-2
2422  72ØØ                    CLA
2423  1216                    TAD     ERR4
2424  3547                    DCA I   XRETUR          /STORE RETURN ADDRESS
2425  123Ø                    TAD     .+3
2426  3551                    DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
2427  741Ø                    SKP
243Ø  23Ø7                    PERR1
2431  114Ø                    TAD     K64ØØ
2432  3777'                   DCA     Z24             /TEST 4
2433  5776'                   JMP     ERR1A
```

```
                      /
                      /RELOCATION MOVE ERROR OCCURRED
                      /
2434  ØØØØ            ERRM,   Ø
2435  2Ø72                    ISZ     COUNT           /RELO ERROR OCCURRED
2436  741Ø                    SKP
2437  5235                    JMP     .-2
244Ø  72ØØ                    CLA
2441  1234                    TAD     ERRM
2442  3547                    DCA I   XRETUR          /STORE RETURN ADDRESS
2443  1246                    TAD     .+3
2444  3551                    DCA I   XADDER          /STORE ERROR TYPEOUT ADDRESS
2445  5546                    JMP I   XCODER
2446  2447                    PERRM

2447  1Ø64            PERRM,  TAD     STKTST
245Ø  7112                    CLL RTR
2451  7Ø1Ø                    RAR
2452  1131                    TAD     K4Ø6Ø
2453  327Ø                    DCA     Z1Ø
2454  4545                    JMS I   XSIXTY
2455  ØØ67                    MOVE
2456  2471                    Z11
2457  4544                    JMS I   XMESAG
246Ø  22Ø5                    TEXT                    "RELO ERR AT "
2461  1417
2462  4ØØ5
2463  2222
2464  4ØØ1
2465  244Ø
2466  ØØØØ
2467  4544                    JMS I   XMESAG
247Ø  ØØØØ            Z1Ø,    Ø
2471  ØØØØ            Z11,    Ø
2472  ØØØØ                    Ø
2473  ØØØØ                    Ø
2474  724Ø                    STA
2475  3Ø53                    DCA     HEAD1
2476  555Ø                    JMP I   XSTOP

                      /
                      /TYPEOUT TEST 1 OR 2 ERROR HEADING
                      /
2477  ØØØØ            HEAD12, Ø
25ØØ  4544                    JMS I   XMESAG
25Ø1  4543                    TEXT    "X#PR LOC   ADDR   GOOD  BAD  TEST"
25Ø2  2Ø22
25Ø3  4Ø14
25Ø4  17Ø3
25Ø5  4Ø4Ø
25Ø6  4ØØ1
25Ø7  Ø4Ø4
251Ø  224Ø
2511  4Ø4Ø
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        2512  Ø717
        2513  17Ø4
        2514  4Ø4Ø
        2515  Ø2Ø1
        2516  Ø44Ø
        2517  4Ø24
        252Ø  Ø523
        2521  24ØØ
        2522  5677              JMP I   HEAD12

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        2577  234Ø
              26ØØ              PAGE

                        /
                        /TYPEOUT PROGRAM TITLE
                        /
        26ØØ  ØØØØ      TITLE,  Ø
        26Ø1  4544              JMS I   XMESAG
        26Ø2  4543              TEXT            "%##EA8-E EXT MEM ADDR TEST#"
        26Ø3  43Ø5
        26Ø4  Ø17Ø
        26Ø5  55Ø5
        26Ø6  4ØØ5
        26Ø7  3Ø24
        261Ø  4Ø15
        2611  Ø515
        2612  4ØØ1
        2613  Ø4Ø4
        2614  224Ø
        2615  24Ø5
        2516  2324
        2617  43ØØ
        262Ø  56ØØ              JMP I   TITLE

                        /
                        /TYPEOUT TO SET SWITCHES
                        /
        2621  ØØØØ      SETSW,  Ø
        2622  4544              JMS I   XMESAG
        2623  4543              TEXT            "%#SETUP SR & CONT"
        2624  23Ø5
        2625  2425
        2626  2Ø4Ø
        2627  2322
        263Ø  4Ø46
        2631  4ØØ3
        2632  1716
        2633  24ØØ
        2634  74Ø2              HLT                     /WAIT FOR SWITCH SETTING
        2635  5621              JMP I   SETSW
                        /
                        /TYPEOUT 'NO PROGRAM RELOCATION WILL OCCUR'
                        /
        2636  ØØØØ      PNOREL, Ø
```

```
        2637  4544              JMS I   XMESAG
        264Ø  4543              TEXT            "%#NO RELOCATION, PROG IN STACK "
        2641  1617
        2642  4Ø22
        2643  Ø514
        2644  17Ø3
        2645  Ø124
        2646  1117
        2647  1654
        265Ø  4Ø2Ø
        2651  2217
        2652  Ø74Ø
        2653  1116
        2654  4Ø23
        2655  24Ø1
        2656  Ø313
        2657  4ØØØ
        266Ø  6224              RIF
        2661  71Ø6              CLL RTL
        2662  7ØØ4              RAL
        2663  1132              TAU     K6ØØØ
        2664  3266              DCA     Z8
        2665  4544              JMS I   XMESAG
        2666  ØØØØ      Z8,     Ø
        2657  724Ø              STA
        267Ø  3Ø53              DCA     HEAD1           /RESET ERROR HEADING
        2671  5636              JMP I   PNOREL
                        /
                        /PROGRAM RELOCATION WILL CCCUR
                        /
        2672  ØØØØ      PREL,   Ø
        2673  4544              JMS I   XMESAG
        2674  4543              TEXT            "%#PROG WILL RELOCATE"
        2675  2Ø22
        2676  17Ø7
        2677  4Ø27
        27ØØ  1114
        27Ø1  144Ø
        27Ø2  22Ø5
        27Ø3  1417
        27Ø4  Ø3Ø1
        27Ø5  24Ø5
        27Ø6  ØØØØ
        27Ø7  724Ø              STA
        271Ø  3Ø53              DCA     HEAD1           /RESET ERROR HEADING
        2711  5672              JMP I   PREL
                        /
                        /TYPEOUT 'PROGRAM IS IN SELECTED FIELD'
                        /
        2712  4544      PINF,   JMS I   XMESAG
        2713  4543              TEXT            "%#PROGRAM IN SELECTED FIELD"
        2714  2Ø22
        2715  17Ø7
        2716  22Ø1
        2717  154Ø
```

```
272Ø  1116
2721  4Ø23
2722  Ø514
2723  Ø5Ø3
2724  24Ø5
2725  Ø44Ø
2726  Ø611
2727  Ø514
273Ø  Ø4ØØ
2731  5777'          JMP     CHEXA           /SETUP SWITCHES AGAIN
               /
               /TYPEOUT 'NONE' FOR NO LEGAL STACK SELECTION
               /
2732  4544     NOSTK,  JMS I   XMESAG
2733  1617             TEXT    "NONE"
2734  16Ø5
2735  ØØØØ
2736  5777'            JMP     CHEXA



               /
               /FIND HIGHEST STACK NUMBER IN THIS SYSTEM
               /
2737  ØØØØ     HIGHST, Ø
274Ø  73ØØ             CLA CLL
2741  3Ø6Ø             DCA     KBINT           /CLEAR HIGH STACK COUNTER
2742  6211             CDF1
2743  4776'            JMS     CSS             /CHECK FOR FIELD 1
2744  6221             CDF2
2745  4776'            JMS     CSS             /CHECK FOR FIELD 2
2746  6231             CDF3
2747  4776'            JMS     CSS             /CHECK FOR FIELD 3
275Ø  6241             CDF4
2751  4776'            JMS     CSS             /CHECK FOR FIELD 4
2752  6251             CDF5
2753  4776'            JMS     CSS             /CHECK FOR FIELD 5
2754  6261             CDF6
2755  4776'            JMS     CSS             /CHECK FOR FIELD 6
2756  6271             CDF7
2757  4776'            JMS     CSS             /CHECK FOR FIELD 7
276Ø  5737     KHIGH,  JMP I   HIGHST
2776  3ØØØ
2777  Ø214
      3ØØØ             PAGE
               /
               /CHECK IF SELECTED STACK IS IN SYSTEM
               /
3ØØØ  ØØØØ     CSS,    Ø
3ØØ1  733Ø             CLA CLL
3ØØ2  6224             RIF
3ØØ3  1141             TAD     K62Ø1
3ØØ4  321Ø             DCA     CSSB
3ØØ5  1Ø74             TAD     H1
3ØØ6  3615             DCA I   CHECK
```

```
3ØØ7  1615             TAD I   CHECK
3Ø1Ø  62Ø1     CSSB,   CDF     ØØ              /PROGRAM DATA FIELD
3Ø11  765Ø             SNA CLA                 /SKIP IF STACK IS IN SYSTEM
3Ø12  5777'            JMP     KHIGH
3Ø13  2Ø6Ø             ISZ     KBINT           /INCREMENT STACK COUNTER
3Ø14  56ØØ             JMP I   CSS

3Ø15  3Ø16     CHECK,  CHECKØ
3Ø16  ØØØØ     CHECKØ, Ø



               /
               /TYPEOUT NUMBER OF STACKS IN SYSTEM
               /
3Ø17  ØØØØ     TSTSYS, Ø
3Ø2Ø  4544             JMS I XMESAG
3Ø21  4543             4543
3Ø22  ØØØØ             ØØØØ
3Ø23  1Ø6Ø             TAD     KBINT
3Ø24  7ØØ1             IAC
3Ø25  4543             JMS I   XTYPE           /TYPEOUT NUMBER
3Ø26  4544             JMS I   XMESAG
3Ø27  4Ø23             TEXT            " STACKS IN THIS SYSTEM"
3Ø3Ø  24Ø1
3Ø31  Ø313
3Ø32  234Ø
3Ø33  1116
3Ø34  4Ø24
3Ø35  1Ø11
3Ø36  234Ø
3Ø37  2331
3Ø4Ø  2324
3Ø41  Ø515
3Ø42  ØØØØ
3Ø43  5617             JMP I   TSTSYS

               /
               /TYPEOUT CHARACTER IN THE AC AND A SPACE
               /
3Ø44  ØØØØ     TYPESP, Ø
3Ø45  4543             JMS I   XTYPE           /TYPEOUT CHAR IN AC
3Ø46  1115             TAD     K24Ø
3Ø47  4543             JMS I   XTYPE           /TYPE A SPACE
3Ø5Ø  5644             JMP I   TYPESP
               /
               /RESTORE STACKS FOR RELOCATION
               /
3Ø51  ØØØØ     RESTK,  Ø
3Ø52  72ØØ             CLA
3Ø53  1Ø3Ø             TAD     STACKØ
3Ø54  3Ø4Ø             DCA     STKØ
3Ø55  1Ø31             TAD     STACK1
3Ø56  3Ø41             DCA     STK1
3Ø57  1Ø32             TAD     STACK2
```

```
 3Ø6Ø  3Ø42             DCA     STK2
 3Ø61  1Ø33             TAD     STACK3
 3Ø62  3Ø43             DCA     STK3
 3Ø63  1Ø34             TAD     STACK4
 3Ø64  3Ø44             DCA     STK4
 3Ø65  1Ø35             TAD     STACK5
 3Ø66  3Ø45             DCA     STK5
 3Ø67  1Ø36             TAD     STACK6
 3Ø7Ø  3Ø46             DCA     STK6
 3Ø71  1Ø37             TAD     STACK7
 3Ø72  3Ø47             DCA     STK7
 3Ø73  5651             JMP I   RESTK


                /
                /TYPEOUT STACKS SELECTED FOR TESTING
                /
 3Ø74  ØØØØ     TOSEL,  Ø
 3Ø75  4544             JMS I   XMESAG
 3Ø76  4543             TEXT            "%#STACKS SEL'D ARE "
 3Ø77  2324
 31ØØ  31Ø3
 31Ø1  1323
 31Ø2  4Ø23
 31Ø3  Ø514
 31Ø4  47Ø4
 31Ø5  4ØØ1
 31Ø6  22Ø5
 31Ø7  4ØØØ
 311Ø  1Ø37             TAD     STACK7
 3111  764Ø             SZA CLA
 3112  5315             JMP     .+3
 3113  1126             TAD     K267
 3114  4244             JMS     TYPESP          /STACK 7 IS SELECTED
 3115  1Ø36             TAD     STACK6
 3116  764Ø             SZA CLA
 3117  5322             JMP     .+3
 312Ø  1125             TAD     K266
 3121  4244             JMS     TYPESP          /STACK 6 IS SELECTED
 3122  1Ø35             TAD     STACK5
 3123  764Ø             SZA CLA
 3124  5327             JMP     .+3
 3125  1124             TAD     K265
 3126  4244             JMS     TYPESP          /STACK 5 IS SELECTED
 3127  1Ø34             TAD     STACK4
 313Ø  764Ø             SZA CLA
 3131  5334             JMP     .+3
 3132  1123             TAD     K264
 3133  4244             JMS     TYPESP          /STACK 4 IS SELECTED
 3134  1Ø33             TAD     STACK3
 3135  764Ø             SZA CLA
 3136  5341             JMP     .+3
 3137  1122             TAD     K263
 314Ø  4244             JMS     TYPESP          /STACK 3 IS SELECTED
 3141  1Ø32             TAD     STACK2
```

```
 3142  764Ø             SZA CLA
 3143  5346             JMP     .+3
 3144  1121             TAD     K262
 3145  4244             JMS     TYPESP          /STACK 2 IS SELECTED
 3146  1Ø31             TAD     STACK1
 3147  764Ø             SZA CLA
 315Ø  5353             JMP     .+3
 3151  112Ø             TAD     K261
 3152  4244             JMS     TYPESP          /STACK 1 IS SELECTED
 3153  1Ø3Ø             TAD     STACKØ
 3154  764Ø             SZA CLA
 3155  536Ø             JMP     .+3
 3156  1117             TAD     K26Ø
 3157  4244             JMS     TYPESP          /STACK Ø IS SELECTED
 316Ø  5674             JMP I   TOSEL


                /
                /TWO SPECIAL SCOPE LOOPS
                /

 3177  276Ø
       34ØØ     *34ØØ
 34ØØ  76Ø4     LOOP1,  LAS                     /SWITCH ADDRESS
 34Ø1  32Ø6             DCA     SWAD
 34Ø2  12Ø6             TAD     SWAD
 34Ø3  36Ø6             DCA I   SWAD
 34Ø4  16Ø6             TAD I   SWAD
 34Ø5  52ØØ             JMP     LOOP1

 34Ø6  ØØØØ     SWAD,   Ø

       36ØØ     *36ØØ
 36ØØ  76Ø4     LOOP2,  LAS                     /READ LOWER LIMIT
 36Ø1  3224             DCA     FIRST
 36Ø2  74Ø2             HLT
 36Ø3  76Ø4             LAS                     /READ UPPER LIMIT
 36Ø4  3225             DCA     LAST
 36Ø5  1224     LOOP2A, TAD     FIRST
 36Ø6  3226             DCA     SWADØ
 36Ø7  1226     LOOP2B, TAD     SWADØ
 361Ø  3626             DCA I   SWADØ
 3611  1626             TAD I   SWADØ
 3612  72ØØ             CLA
 3613  1226             TAD     SWADØ
 3614  7Ø41             CIA
 3615  1225             TAD     LAST
 3616  765Ø             SNA CLA
 3617  52Ø5             JMP     LOOP2A
 362Ø  2226             ISZ     SWADØ
 3621  52Ø7             JMP     LOOP2B
 3622  74Ø2             HLT                     /HALT RESULTED IN ILLEGAL LIMITS
 3623  52ØØ             JMP     LOOP2

 3624  ØØØØ     FIRST,  Ø
```

```
        3625  ØØØØ      LAST,   Ø
        3626  ØØØØ      SWADØ,  Ø

                        $
```

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ØØØØ  1111ØØØØ  ØØØØØØØØ  11111111  11111111  11111111  11111111  11111111  11111111
Ø1ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØØØ

Ø2ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø3ØØ  11111111  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØ111  11111111  11111111

Ø4ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
Ø5ØØ  11111111  11111111  11111111  11111111  1111ØØØØ  ØØØØØØØØ  ØØØØØ111  11111111

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Ø7ØØ  11111111  11111111  11111111  11111111  11111111  11111111  111ØØØØØ  ØØØØØØ11


1ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
11ØØ  11111111  11111111  11111111  11111111  11111111  1111111Ø  ØØØØØØØØ  11111111

12ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
13ØØ  11111111  1ØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  11111111

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15ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1111111Ø  ØØØØØ111

16ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
17ØØ  11111111  11111111  11111111  11111111  11111111  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØ11


2ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
21ØØ  11111111  11111111  11ØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ

22ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
23ØØ  11111111  11111111  11111111  11111111  11111111  11111111  ØØØØØØØØ  ØØØØØØ11

24ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
25ØØ  11111111  11111111  111ØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØ11

26ØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
27ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØ11


3ØØØ  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
31ØØ  11111111  11111111  11111111  11111111  11111111  11111111  1ØØØØØØØ  ØØØØØØØ1

32ØØ
33ØØ

34ØØ  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
35ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ

36ØØ  11111111  11111111  1111111Ø  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
37ØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ  ØØØØØØØØ
```

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4ØØØ
41ØØ

42ØØ
43ØØ

44ØØ
45ØØ

46ØØ
47ØØ


5ØØØ
51ØØ

52ØØ
53ØØ

54ØØ
55ØØ

56ØØ
57ØØ


6ØØØ
61ØØ

62ØØ
63ØØ

64ØØ
65ØØ

66ØØ
67ØØ


7ØØØ
71ØØ

72ØØ
73ØØ

74ØØ
75ØØ

76ØØ
77ØØ
```

```
        ABOVE    17Ø6          CHEXN9   Ø761          K215     Ø114          MIN51    Ø155
        ADDER    2241          CHEXO    1ØØØ          K24Ø     Ø115          MIN52    Ø156
        ADDER1   1273          CHEXOØ   1Ø24          K245     Ø116          MIN53    Ø157
        ADDER2   1424          CHEXO1   1Ø4Ø          K26Ø     Ø117          MIN54    Ø16Ø
        ADDER3   1476          CHEXO2   1Ø54          K261     Ø12Ø          MOVE     ØØ67
        ADDER4   155Ø          CHEXO3   1Ø7Ø          K262     Ø121          MSRGHT   2Ø66
        ADDRT1   1264          CHEXO4   11Ø4          K263     Ø122          MSSL     1742
        ADDRT2   1415          CHEXO5   112Ø          K264     Ø123          MTP      212Ø
        ADDRT3   1466          CHEXO6   1134          K265     Ø124          NORELO   ØØ5Ø
        ADDRT4   154Ø          CHEXO7   1144          K266     Ø125          NOSTK    2732
        BDATA    ØØ65          CHEXOA   1ØØ6          K267     Ø126          PERR1    23Ø7
        BELOW    1725          CHKSW3   164Ø          K3Ø      Ø1Ø4          PERRM    2447
        CBFØ     62Ø3          CIFØ     62Ø2          K34Ø     Ø127          PINF     2712
        CBF1     6213          CIF1     6212          K4Ø      Ø1Ø5          PNOREL   2636
        CBF2     6223          CIF2     6222          K4Ø6Ø    Ø131          PREL     2672
        CBF3     6233          CIF3     6232          K5Ø      Ø1Ø6          RBELL    22Ø6
        CBF4     6243          CIF4     6242          K6Ø      Ø1Ø7          RDF      6214
        CBF5     6253          CIF5     6252          K6ØØØ    Ø132          RELO     1646
        CBF6     6263          CIF6     6262          K6ØØ3    Ø133          RELO2    1665
        CBF7     6273          CIF7     6272          K6Ø6Ø    Ø134          RELO3    1667
        CDFØ     62Ø1          CINT     62Ø4          K61ØØ    Ø135          RELO4    1672
        CDF1     6211          CNV      2Ø24          K62ØØ    Ø136          RELO5    17Ø3
        CDF2     6221          CODERR   22Ø1          K62Ø1    Ø141          RESTK    3Ø51
        CDF3     6231          COUNT    ØØ72          K62Ø3    Ø142          RETURN   22ØØ
        CDF4     6241          CSS      3ØØØ          K63ØØ    Ø137          RIB      6234
        CDF5     6251          CSSB     3Ø1Ø          K64ØØ    Ø14Ø          RIF      6224
        CDF6     6261          CUF      6264          K7       Ø1Ø1          RMF      6244
        CDF7     6271          DOWN     1736          K7Ø      Ø11Ø          RTF      6ØØ5
        CHECK    3Ø15          ERR1     2256          K7Ø7     Ø13Ø          RUNØ     16ØØ
        CHECKB   3Ø16          ERR1A    2273          K77      Ø111          RUN1     16Ø5
        CHEXA    Ø214          ERR2     2342          KABOVE   ØØ51          RUN2     1612
        CHEXB    Ø253          ERR3     24ØØ          KBELOW   ØØ52          RUN3     1617
        CHEXC    Ø262          ERR4     2416          KBINT    ØØ5Ø          RUN4     1624
        CHEXC1   Ø274          ERRLOC   ØØ73          KDOWN    ØØ7Ø          RUNTST   ØØ56
        CHEXD    Ø3Ø2          ERRM     2434          KHIGH    276Ø          SAME     1631
        CHEXD1   Ø31Ø          ERRORØ   2233          LAST     3625          SETSW    2621
        CHEXE    Ø317          ERROR1   2234          LEGAL    Ø41Ø          SINT     6254
        CHEXE2   Ø4ØØ          ESL      ØØ62          LEGALØ   ØØ55          SIXTY    2ØØØ
        CHEXM    Ø476          EXTAD    Ø2ØØ          LEGALA   Ø463          SIXTYØ   2Ø37
        CHEXM1   Ø5Ø3          EXTADØ   Ø2Ø5          LIMIT    2251          SIXTY1   2Ø4Ø
        CHEXM2   Ø51Ø          FIRST    3624          LOOP1    34ØØ          SIXTY2   2Ø41
        CHEXM3   Ø515          FIVE     Ø152          LOOP2    36ØØ          SSL      ØØ61
        CHEXN    Ø527          GDATA    ØØ66          LOOP2A   36Ø5          STACKØ   ØØ3Ø
        CHEXNØ   Ø53Ø          GTF      6ØØ4          LOOP2B   36Ø7          STACK1   ØØ31
        CHEXN1   Ø6ØØ          HEAD1    ØØ53          M1       ØØ74          STACK2   ØØ32
        CHEXN2   Ø622          HEAD12   2477          M2       ØØ75          STACK3   ØØ33
        CHEXN3   Ø64Ø          HIGHST   2737          M3       ØØ76          STACK4   ØØ34
        CHEXN4   Ø656          INSAME   ØØ54          M34      Ø1ØØ          STACK5   ØØ35
        CHEXN5   Ø674          K1Ø      Ø1Ø2          M4       ØØ77          STACK6   ØØ36
        CHEXN6   Ø712          K2Ø      Ø1Ø3          MESAGE   2Ø5Ø          STACK7   ØØ37
        CHEXN7   Ø73Ø          K2Ø7     Ø112          MIN5     Ø153          STKØ     ØØ4Ø
        CHEXN8   Ø746          K212     Ø113          MIN5Ø    Ø154          STK1     ØØ41
        STK2     ØØ42           Z1Ø      247Ø
        STK3     ØØ43           Z11      2471
        STK4     ØØ44           Z2Ø      2326
        STK5     ØØ45           Z21      2327
        STK6     ØØ46           Z22      2332
        STK7     ØØ47           Z23      2335
        STKPIN   ØØ63           Z24      234Ø
        STKTST   ØØ64           Z8       2666
        STOP     2242
        SUF      6274
        SWØ      ØØ2Ø
        SW1      ØØ21
        SW2      ØØ22
        SW3      ØØ23
        SW4      ØØ24
        SW5      ØØ25
        SW68     ØØ26
        SW911    ØØ27
        SWAD     3416
        SWADØ    3626
        TDF1     1252
        TDF2     14Ø2
        TDF3     1445
        TDF4     1516
        TEMP     ØØ71
        TEST     12ØØ
        TEST1    125Ø
        TEST1A   1253
        TEST1B   1257
        TEST2    14ØØ
        TEST2A   14Ø3
        TEST2B   141Ø
        TEST3    1443
        TEST3A   1446
        TEST3B   1456
        TEST4    1514
        TEST4A   1517
        TEST4B   153Ø
        TESTAD   ØØ57
        TITLE    26ØØ
        TDSEL    3Ø74
        TSTSYS   3Ø17
        TYPE     2Ø42
        TYPECH   2Ø67
        TYPESP   3Ø44
        XADDER   Ø151
        XCODER   Ø146
        XMESAG   Ø144
        XRETUR   Ø147
        XSIXTY   Ø145
        XSTOP    Ø15Ø
        XTYPE    Ø143
```

```
ERRORS DETECTED: Ø

LINKS GENERATED: 133

RUN-TIME:  8 SECONDS

2K CORE USED
```