IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-D1HA-D-(D)

PRODUCT NAME: PDP8-E MEMORY EXTENSION
AND TIME SHARE CONTROL TEST

DATE CREATED: NOVEMBER 1,1970

MAINTAINER: DIAGNOSTIC PROGRAMMING GROUP

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1. ABSTRACT

THIS PROGRAM TESTS THE MEMORY EXTENSION AND TIME SHARE CONTROL LOGIC FOR PROPER OPERATION. THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH MEMORY EXTENSION AND TIME SHARE CONTROL.

ERRORS ENCOUNTERED DURING RUNNING WILL RESULT IN A PROGRAM "HALT" OR A "JUMP TO SELF", WHICH MAY OCCUR IN ANY FIELD DEPENDING ON THE PORTION OF THE TEST EXECUTED. ERRORS MAY BE IDENTIFIED BY REFERENCING THE PROGRAM LISTING.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP8-E COMPUTER WITH THE KM8-E OPTION INSTALLED AND AT LEAST 4K OF EXTENDED MEMORY.

2.2 STORAGE

THE PROGRAM REQUIRES 4200(8) LOCATIONS OF CORE MEMORY AND MUST RESIDE IN FIELD 0 ONLY.

2.3 PRELIMINARY PROGRAMS

ALL THE PROGRAMS FOR THE BASIC PDP8-E MUST HAVE BEEN RUN SUCCESSFULLY.

3. LOADING PROCEDURE

3.1 METHOD

THE PROGRAM IS LOADED INTO "FIELD 0" USING THE STANDARD BINARY LOADER TECHNIQUE.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SR 9, 10, AND 11 MUST CONTAIN AN OCTAL VALUE EQUAL TO THE NUMBER OF EXTENDED FIELDS AVAILABLE. NOTE THAT FIELD 0 IS NOT INCLUDED.

SR0=0 WILL RESULT IN COMPLETE PROGRAM EXECUTION OF THE MEMORY

EXTENSION AND TIME SHARE CONTROL.

SR0=1 WILL LOOP THE PROGRAM ON THE MEMORY EXTENSION PORTION AND TEST THAT THE TIME SHARE IS DISABLED.

SR1=1 WILL RESULT IN AN END OF TEST HALT AT LOCATION 1565(8).

4.2 STARTING ADDRESS

THE STARTING ADDRESS IS LOCATION 0200(8).

4.3 OPERATOR ACTION

4.3.1 MEMORY EXTENSION AND TIME SHARE CONTROL (TIME SHARE ENABLED)

WITH THE PROGRAM IN MEMORY, SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD RUN UNTIL A FAILURE OCCURS OR UNTIL STOPPED BY THE OPERATOR WITH SR1=1. NOTE THAT THE PROGRAM SHOULD ALWAYS BE STOPPED WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFUL TEST AT THE COMPLETION OF EVERY PASS.

4.3.2 MEMORY EXTENSION PORTION (TIME SHARE DISABLED)

WITH THE PROGRAM IN MEMORY, SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE SWITCH REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PLACE SR0=1 TO EXECUTE MEMORY EXTENSION ONLY.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD HALT AT LOCATION 3651(8). THIS WILL

VERIFY THAT THE TIME SHARE IS DISABLED, ALL OTHER ERRORS AT THIS TIME WILL BE CONSIDERED AS AN ILLEGAL CONDITION.

PRESS CONTINUE.

THE PROGRAM SHOULD LOOP UNTIL AN ERROR OCCURS OR UNTIL STOPPED BY THE OPERATOR WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFULL TEST AT THE END OF EVERY PASS.

5. OPERATING PROCEDURE

5.1 OPERATOR ACTION

5.1.1 MEMORY EXTENSION AND TIME SHARE CONTROL

VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "OUT" ON THE M837 MODULE AND FOLLOW THE OPERATOR ACTION IN 4.3.

5.1.2 MEMORY EXTENSION PORTION

VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "IN" ON THE M837 MODULE AND FOLLOW THE OPERATOR ACTION 4.3.

6. ERRORS

6.1 ERROR DESCRIPTION

BOTH "HALTS" AND "JUMP TO SELF" ARE USED TO INDICATE ERROR CONDITIONS, IN EITHER CASE REFER TO THE PROGRAM LISTING FOR MORE INFORMATION.

6.2 ERROR RECOVERY

ALL ERRORS ENCOUNTERED MUST BE CORRECTED BEFORE PROCEEDING ON IN THE PROGRAM.

7. RESTRICTIONS

7.1 OPERATING RESTRICTIONS

PDP8-E ONLY WITH THE KM8-E OPTION INSTALLED AND AT LEAST 4K OF EXTENDED MEMORY.

THE NUMBER OF EXTENDED AVAILABLE FIELDS MUST BE IN SR9-11.

IF MEMORY EXTENSION ONLY, THE TIME SHARE MUST BE DISABLED AND SR0=1.

IF MEMORY EXTENSION AND TIME SHARE CONTROL, THE TIME SHARE MUST BE ENABLED AND SR0=0.

IN ALL CASES SR1=1 MUST BE USED TO STOP PROGRAM.

THE PROGRAM MUST RESIDE IN FIELD 0 ONLY.

BOTH PORTIONS OF THE TEST MUST BE RUN, 4.3.1 AND 4.3.2, TO VERIFY THAT THE TIME SHARE CAN BE DISABLED AND ENABLED.

8. MISCELLANEOUS

8.1 EXECUTION TIME

EXECUTION TIME DEPENDS ON THE AMOUNT OF AVAILABLE EXTENDED FIELDS. EXECUTION TIME FOR 32K APPROXIMATIVELY 3.75 MINUTES.

9. PROGRAM DESCRIPTION

THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH THE MEMORY EXTENSION AND TIME SHARE CONTROL: THE ABILITY TO RUN WITH THE TIME SHARE DISABLED; THE ABILITY TO RUN "EXECUTIVE" AND "USER MODES" IN ALL AVAILABLE FIELDS WITH THE TIME SHARE ENABLED; THE ABILITY TO REFERENCE ALL MEMORY FIELDS FROM FIELD 0 AND VICE-VERSA; THE ABILITY TO READ AND WRITE DATA IN ALL AVAILABLE FIELDS AND THE ABILITY TO RUN PROGRAM INTERRUPTS AND INTERRUPT INHIBIT IN ALL FIELDS.

THE TIME SHARE OPTION DEVELOPES A NEW MODE OF OPERATION OR THE "USER MODE". ALL HLT, OSR, AND IOT INSTRUCTIONS ARE ILLEGAL IN USER MODE AND SHOULD "TRAP OUT". THE PROGRAM WILL THEN DETERMINE IF AN ERROR CONDITION DOES EXIST. IN SOME CASES, IN TIME SHARING, AN ERROR CONDITION CANNOT BE INDICATED WITH A "HLT" OR "TYPE OUT" BECAUSE THIS WOULD BE ILLEGAL. THEREFORE A "JUMP TO SELF" IS USED TO INDICATE ERRORS.

9.1 TEST 00

TEST CDF AND RDF FOR ALL COMBINATIONS 0 TO 7.

9.2 TEST 01

TEST INTERRUPT BUFFER BITS 9-11 WITH RIB, PI IS ENABLED AND TTY FLAG IS USED FOR INTERRUPTS, DO ALL COMBINATIONS 0 TO 7.

9.3 TEST 02

TEST DCA I AND TAD I TO ALL AVAILABLE FIELDS. EACH STACK WILL CONTAIN ITS DF# IN LOCATION 7000.

9.4 TEST 03

TEST CIF INSTRUCTION. CHECKS THE ABILITY OF A CIF-ION-NOP-JMP AND CIF-ION-NOP-JMS.

9.5 TEST 04

TEST GTF INSTRUCTION FOR TTY FLAG AND SAVE FIELD. GET SAVE FIELD AFTER INTERRUPT AND CHECK INTERRUPT INHIBIT. DO ALL COMBINATIONS 0 TO 7.

9.6 TEST 05

TEST ION AND LINK FROM RTF. TEST INTERRUPT INHIBIT BEFORE PI. GET THE FLAGS WITH GTF.

9.7 TEST 06

TEST READ AND WRITE DATA IN ALL AVAILABLE EXTENDED FIELDS.

9.8 TEST 07

CONFIDENCE CHECK ON ALL EXISTENT FIELDS. MAKE SURE ALL STACKS ARE ACCESSED CORRECTLY.

9.9 TEST 08

TEST DF AND IF FROM SAVE FIELD AFTER PI. USE RTF TO SET THE FLAGS AND GTF TO GET THE FLAGS. CHECK INTERRUPT INHIBIT. DO ALL SF COMBINATIONS 0 TO 77.

9.10 TEST 09

TEST PROGRAM INTERRUPT IN ALL AVAILABLE EXTENDED FIELDS. USE RTF, GTF, RDF, AND RIF FOR CHECK.

9.11 TEST 10

TEST INTERRUPT INHIBIT IN ALL AVAILABLE EXTENDED FIELDS. TEST CIF-ION-JMP COMBINATION.

9.12 TEST 11

TEST SAVE FIELD WITH RMF IOT.

9.13 TEST 12

TEST AUTO-INDEX IN ALL AVAILABLE EXTENDED FIELDS.

9.14 TEST 13

DYNAMIC RMF TEST. TEST ALL SF TO DF TRANSFERS AND SF TO IB TRANSFERS.

9.15 TEST 14

TEST NON-EXISTENT FIELDS FOR ALL Ø'S. IF 32K PRESENT BY-PASS TEST.

9.16 TEST 15

TEST TIME SHARE IN FIELD Ø.

9.17 TEST 16

TEST TIME SHARE IN ALL AVAILABLE EXTENDED FIELDS.

10. LISTING

```
                            /PDP8-E, MEMORY EXTENSION AND TIME SHARE CONTROL TEST,
                            /
                            /COPYRIGHT 1970, DIGITAL EQUIPMENT CORP.,MAYNARD,MASS,
                            /
                            /STARTING ADDRESS IS 0200,
                            /
                            /CONSTANTS
                            /
                    6201    CDF=6201
                    6202    CIF=6202
                    6214    RDF=6214
                    6224    RIF=6224
                    6244    RMF=6244
                    6234    RIB=6234
                    6274    SUF=6274
                    6264    CUF=6264
                    6254    SINT=6254
                    6204    CINT=6204
                    6007    CAF=6007
                    6005    RTF=6005
                    6004    GTF=6004
                    6001    ION=6001
                    6002    IOF=6002
                    6000    SKON=6000
                    6003    SRQ=6003
                    6040    SPF=6040
                    6041    TSF=6041
                    6032    KCC=6032
                    6002    IOF=6002
                    6036    KRB=6036
                    6000    IOT=6000
                            /
                    0000    *0
0000  0000          0000    0000
0001  5001          5001    5001
0002  0002          0002    0002
0003  0003          0003    0003
                            /
                    0020    *20
                            /
0020  5400          JMP10,  JMP I 0
0021  0000          ISZ0,   ISZ 0
0022  2443          XTFLG,  TFLG
0023  2435          XSTKS,  NSTKS
0024  1700          XRMF,   TRMF
0025  1321          XRANS,  TRANS
0026  1432          XAUTO,  TAUTO
0027  0000          LOOP,   0
0030  0000          NDF,    0
0031  0000          STKS,   0
0032  0000          DAT,    0
0033  0000          NOSTAK, 0
0034  0000          NOFLD,  0
0035  1132          KCAIM,  CAI-1
0036  1133          KCAI,   CAI
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                        /PDP8-E, MEMORY EXTENSION AND TIME SHARE CONTROL TEST, PAL10  V1+1  25-NOV-70  12:17  PAGE 1-1

    56    0037  7402    KHLT,   HLT
    57    0040  6201    KCDF,   6201
    58    0041  6202    KCIF,   6202
    59    0042  1316    XFD,    EXFD
    60    0043  0001    K1,     1
    61    0044  0007    K7,     7
    62    0045  0010    K10,    10
    63    0046  7777    K7777,  7777
    64    0047  7000    K7000,  7000
    65    0050  7707    K7707,  7707
    66    0051  7767    K7767,  7767
    67    0052  7757    K7757,  7757
    68    0053  7747    K7747,  7747
    69    0054  7737    K7737,  7737
    70    0055  7727    K7727,  7727
    71    0056  7717    K7717,  7717
    72    0057  7776    K7776,  7776
    73    0060  7775    K7775,  7775
    74    0061  7774    K7774,  7774
    75    0062  7773    K7773,  7773
    76    0063  7772    K7772,  7772
    77    0064  7771    K7771,  7771
    78    0065  0067    POINT,  .+2
    79
    80
    81    0066  0067    K7S,    .+1
    82    0067  7766    K7766,  7766
    83    0070  7755            7755
    84    0071  7744    K7744,  7744
    85    0072  7733            7733
    86    0073  7722            7722
    87    0074  7711            7711
    88    0075  7700            7700
    89    0076  1127    XTDF,   STDF
    90    0077  1130    XTDF1,  STDF+1
    91    0100  1302    KXFLD,  EXFLD
    92    0101  5402    KJMP,   JMP I 2
    93    0102  1200    KNTR,   ENTER
    94    0103  0020    K20,    20
    95    0104  5505    JMP2,   JMP I KFLD0
    96    0105  1427    KFLD0,  RTRN
    97    0106  1422    KRTN,   CAG+2
    98    0107  1400    XFIB,   SFIB
    99    0110  7770    K7770,  7770
   100    0111  0070    K0070,  0070
   101    0112  0000    XSAV,   0000
   102    0113  7770    XCOUNT, 7770
   103    0114  0000    XTOR,   0000
   104    0115  5200    K5200,  5200
   105    0116  1200    K1200,  1200
   106    0117  0077    K0077,  0077
   107    0120  0011    K0011,  0011
   108    0121  7700    K7700,  7700
   109    0122  0002    K0002,  0002
   110    0123  0004    K0004,  0004
```

```
                0124  7402    K7402,  7402
                0125  6000    K6000,  6000
                0126  0100    K0100,  0100
                0127  0203    PLACE,  BEGIN
                0130  1000    K1000,  1000
                0131  2600    TIME,   T1
                0132  0017    K0017,  0017
                0133  6001    K6001,  6001
                0134  5535    JMPIR,  JMP I XRET
                0135  2311    XRET,   RET
                0136  0000    XDATA,  0000
                0137  0000    K0000,  0000
                0140  0003    K0003,  0003
                0141  0001    K0001,  0001
                0142  1100    K1100,  1100
                0143  7745    SRQO,   7745
                0144  3577    K3577,  3577
                0145  7745    K7745,  7745
                0146  3333    XXSR0,  XSR0
                0147  1556    XELL,   BELL+1
                0150  1555    XBELL,  BELL
                0151  6046    TTS,    TLS
                0152  3643    XTRAP,  TRAP
                0153  5331    ATRAP,  JMP I TIME
                0154  0000    FCC,    0000
                0155  2647    XDATER, DATER
                0156  6211    KCDF1,  CDF 10
                0157  2525    KDATER, 2525


                        /TEST 00
                        /TEST CDF AND RDF, USE CDF TO SET THE DATA
                        /FIELD AND RDF TO READ THE DATA FIELD,
                        /DO ALL COMBINATIONS 0 TO 7,
                        /
                0200    *200
                        /
        0200    7604    BEGIN1, LAS
        0201    7510            SPA
        0202    5252            JMP I XTRAP
        0203    7300    BEGIN,  CLA CLL
        0204    6007            CAF
        0205    6264            CUF
        0206    1037            TAD KHLT        /STORE A HLT IN LOC, 1 AND
        0207    3001            DCA 1           /CHECK FOR STRAY INTERRUPT RQST,
        0210    6001            ION
                        /
        0211    6201    DF0,    CDF 00          /DF 0
        0212    6214            RDF
        0213    7450            SNA             /SHOULD NOT SKIP
        0214    5220            JMP DF7
        0215    7402            HLT             /ERROR, CDF OR RDF FAILED
        0216    7200            CLA
```

```
                                JMP DF0         /REPEAT
                        /
0220  1050  DF7,        TAD K7707       /7707
0221  6271              CDF 70          /DF 7
0222  6214              RDF
0223  7040              CMA             /AC = 0
0224  7450              SNA             /SHOULD NOT SKIP
0225  5231              JMP OK1
0226  7402              HLT             /CDF OR RDF FAILED
0227  7200              CLA
0230  5220              JMP DF7
                        /
0231  2027  OK1,        ISZ LOOP        /CHECK DONE
0232  5211              JMP DF0
                        /
0233  7200              CLA
0234  3027              DCA LOOP        /LOOP COUNTER
                        /
0235  1051  DF1,        TAD K7767       /7767
0236  6211              CDF 10          /DF 10
0237  6214              RDF
0240  7040              CMA             /AC=0
0241  7450              SNA
0242  5246              JMP DF2
0243  7402              HLT             /CDF1 OR RDF FAILED
0244  7200              CLA
0245  5235              JMP DF1
                        /
0246  1052  DF2,        TAD K7757       /7757
0247  6221              CDF 20          /DF2
0250  6214              RDF
0251  7040              CMA             /AC=0
0252  7450              SNA
0253  5257              JMP OK2


0254  7402              HLT             /CDF 2 OR RDF FAILED
0255  7200              CLA
0256  5246              JMP DF2
                        /
0257  2027  OK2,        ISZ LOOP        /DONE IF SKP
0260  5235              JMP DF1
0261  7200              CLA
0262  3027              DCA LOOP
                        /
0263  1053  DF3,        TAD K7747       /7747
0264  6231              CDF 30          /DF 3
0265  6214              RDF
0266  7040              CMA             /AC=0
0267  7450              SNA
0270  5274              JMP DF4
0271  7402              HLT             /CDF 3 OR RDF FAILED
0272  7200              CLA
0273  5263              JMP DF3
                        /
```

```
  221  0274  1054  DF4,   TAD K7737        /7737
  222  0275  6241         CDF 40           /DF 4
  223  0276  6214         RDF
  224  0277  7040         CMA              /AC=0
  225  0300  7450         SNA
  226  0301  5305         JMP OK3
  227  0302  7402         HLT              /CDF 4 OR RDF FAILED
  228  0303  7200         CLA
  229  0304  5274         JMP DF4
  230                /
  231  0305  2027  OK3,   ISZ LOOP         /DONE IF SKP
  232  0306  5263         JMP DF3
  233                /
  234  0307  7200         CLA
  235  0310  3027         DCA LOOP
  236                /
  237  0311  1055  DF5,   TAD K7727        /7727
  238  0312  6251         CDF 50           /DF5
  239  0313  6214         RDF
  240  0314  7040         CMA              /AC=0
  241  0315  7450         SNA
  242  0316  5322         JMP DF6
  243  0317  7402         HLT              /CDF 5 OR RDF FAILED,
  244  0320  7200         CLA
  245  0321  5311         JMP DF5
  246                /
  247  0322  1056  DF6,   TAD K7717        /7717
  248  0323  6261         CDF 60           /DF 6
  249  0324  6214         RDF
  250  0325  7040         CMA              /AC=0
  251  0326  7450         SNA
  252  0327  5333         JMP OK4
  253
  254  0330  7402         HLT              /CDF 6 OR RDF FAILED
  255  0331  7200         CLA
  256  0332  5322         JMP DF6
  257                /
  258  0333  2027  OK4,   ISZ LOOP         /DONE IF SKP
  259  0334  5311         JMP DF5
  260  0335  6000         SKON             /SKP IF ION
  261  0336  7402         HLT              /IS ION STILL ON
  262                /
  263                /TEST 01
  264                /NOW TEST INTERRUPT BUFFER (IB) BITS 9-11 WITH
  265                /RIB, PI IS ENABLED, TELEPRINTER FLAG IS
  266                /USED FOR INTERRUPT, DO ALL COMBINATIONS 0 TO 7,
  267                /
  268  0337  6201         CDF 00           /DF0
  269  0340  1320         TAD JMPI0        /JMPI0=JMP I 0
  270  0341  3001         DCA 1            /C(1)=JMP I 0
  271  0342  3027         DCA LOOP
  272  0343  6041         TSF              /TEST TTY FLAG
  273  0344  4422         JMS I XTFLG      /SET FLAG
  274                /
  275  0345  6001  IB0,   ION              /ENABLE PI
```

```
                                CLA
0347  6234                      RIB             /READ SF
0350  7450                      SNA
0351  5354                      JMP IB1
0352  7402                      HLT             /RIB FAILED
0353  5345                      JMP IB0
                        /
0354  6211              IB1,    CDF 10          /DF 1
0355  6001                      ION
0356  7200                      CLA
0357  6214                      RDF             /DF SHOULD BE 0 AFTER A PI
0360  7450                      SNA
0361  5364                      JMP .+3
0362  7402                      HLT
0363  5354                      JMP IB1         /DF NOT CLEARED, OR NO PI
                        /.
0364  1057                      TAD K7776
0365  6234                      RIB             /READ SF
0366  7040                      CMA             /AC=0
0367  7450                      SNA
0370  5373                      JMP OK5
0371  7402                      HLT             /RIB OR SF FAILED
0372  5354                      JMP IB1
0373  2027              OK5,    ISZ LOOP        /DONE IF SKP
0374  5345                      JMP IB0
0375  5776                      JMP I .+1
0376  0400                      IB2=2

                        *400
0400  7200                      CLA
0401  3027                      DCA LOOP

                        /
0402  6221              IB2,    CDF 20          /DF 2
0403  6001                      ION
0404  7200                      CLA
0405  6214                      RDF             /SHOULD BE 0 AFTER PI
0406  7450                      SNA
0407  5212                      JMP .+3
0410  7402                      HLT             /DF NOT CLEARED, OR NO PI
0411  5202                      JMP IB2
                        /
0412  1060                      TAD K7775
0413  6234                      RIB             /AC=7777
0414  7040                      CMA             /=0
0415  7450                      SNA
0416  5221                      JMP IB3
0417  7402                      HLT             /RIB OR SF FAILED
0420  5202                      JMP IB2
                        /
0421  6231              IB3,    CDF 30          /DF3
0422  6001                      ION
0423  7200                      CLA
0424  6214                      RDF             /DF SHOULD BE CLEARED
0425  7450                      SNA
```

```
                0426  5231            JMP .+3
                0427  7402            HLT             /DF NOT CLEARED
                0430  5221            JMP IB3
                                /
                0431  1061            TAD K7774
                0432  6234            RIB             /AC=7777
                0433  7040            CMA             /AC=0
                0434  7450            SNA
                0435  5240            JMP OK6
                0436  7402            HLT             /RIB OR SF FAILED
                0437  5221            JMP IB3
                                /
                0440  2027    OK6,    ISZ LOOP        /DONE IF SKP
                0441  5202            JMP IB2
                                /
                0442  7200            CLA
                0443  3027            DCA LOOP
                                /
                0444  6241    IB4,    CDF 40          /DF 3
                0445  6001            ION
                0446  7200            CLA
                0447  6214            RDF             /DF MUST BE 000 AFTER A PI
                0450  7450            SNA             /ERROR IF SKIP
                0451  5254            JMP .+3


                0452  7402            HLT             /DF NOT 0 AFTER PI
                0453  5244            JMP IB4
                                /
                0454  1062            TAD K7773       /AC=7773
                0455  6234            RIB             /AC=7777
                0456  7040            CMA             /AC=0
                0457  7450            SNA
                0460  5263            JMP IB5
                0461  7402            HLT             /RIB OR SF FAILED
                0462  5244            JMP IB4
                                /
                0463  6251    IB5,    CDF 50          /DF5
                0464  6001            ION
                0465  7200            CLA
                0466  6214            RDF             /DF SHOULD=000
                0467  7450            SNA
                0470  5273            JMP .+3
                0471  7402            HLT             /DF NOT 0 AFTER PI
                0472  5263            JMP IB5
                                /
                0473  1063            TAD K7772       /AC = 7772
                0474  6234            RIB             /AC = 7777
                0475  7040            CMA             /AC = 0000
                0476  7450            SNA
                0477  5302            JMP OK7
                0500  7402            HLT             /RIB OR SF FAILED
                0501  5263            JMP IB5
                                /
                0502  2027    OK7,    ISZ LOOP        /DONE IF 0 AND SKIP
```

```
0503  5244          JMP IB4
                    /
0504  7200          CLA
0505  3027          DCA LOOP
                    /
0506  6261  IB6,    CDF 60          /DF6
0507  6001          ION
0510  7200          CLA
0511  6214          RDF             /DF MUST=0 AFTER PI
0512  7450          SNA
0513  5316          JMP .+3
0514  7402          HLT             /DF NOT 0 AFTER PI
0515  5306          JMP IB6

                    /
0516  1064          TAD K7771       /7771
0517  6234          RIB             /AC=7777
0520  7040          CMA
0521  7450          SNA
0522  5325          JMP IB7
0523  7402          HLT             /RIB OR SF FAILED
0524  5306          JMP IB6
                    /
0525  6271  IB7,    CDF 70          /DF 7
0526  6001          ION
0527  7200          CLA
0530  6214          RDF             /DF MUST = 0 AFTER PI
0531  7450          SNA
0532  5335          JMP .+3
0533  7402          HLT             /DF NOT 0
0534  5325          JMP IB7
                    /
0535  1110          TAD K7770
0536  6234          RIB             /AC=7777
0537  7040          CMA
0540  7450          SNA
0541  5344          JMP OK8
0542  7402          HLT             /RIB OR SF FAILED
0543  5325          JMP IB7
                    /

0544  2027  OK8,    ISZ LOOP        /DONE IF SKP
0545  5306          JMP IB6
0546  5747          JMP I .+1       /NEW PAGE
0547  0600          600


0600          *600
              /TEST 02
              /NOW TEST DCA I AND TAD I TO ALL STACKS, NUMBER OF
              /EXTENDED STACKS SHOULD BE IN SR9 TO 11, EACH STACK WILL
              /CONTAIN ITS DF# IN LOCATION 7000,
              /
0600  3027          DCA LOOP
0601  4423  DCAI,   JMS I XSTKS     /READ SR 9-11
```

```
                0602  7001            IAC
                0603  3030            DCA NDF           /DF NUMBER = 1 TO START
                0604  1040            TAD KCDF          /6201
                0605  1045            TAD K10
                0606  3207            DCA .+1           /DF 001 TO START WITH
                0607  6201  DFLD,     CDF 00            /WILL BE INCREMENTED
                0610  1030            TAD NDF           /DF#
                0611  3447            DCA I K7000       /PUT IN 7000 OF STACK
                0612  2031            ISZ STKS          /ALL STACKS WHEN 0
                0613  7410            SKP
                0614  5222            JMP TADI          /TEST TAD I
                0615  1045            TAD K10
                0616  1207            TAD DFLD          /INCR. CDF IOT
                0617  3207            DCA DFLD
                0620  2030            ISZ NDF
                0621  5207            JMP DFLD
                                /
                0622  4423  TADI,     JMS I XSTKS       /SR9-11 AGAIN
                0623  7001            IAC
                0624  3030            DCA NDF           /DF#=1 AGAIN
                0625  1040            TAD KCDF          /6201
                0626  1045            TAD K10
                0627  3230            DCA .+1
                0630  6201  TFLD,     CDF 00
                0631  1447            TAD I K7000       /AC=DF CONTENTS NOW
                0632  3032            DCA DAT           /SAVE TEMP
                0633  1032            TAD DAT
                0634  7041            CIA               /2'S COMP
                0635  1030            TAD NDF           /BETTER BE EQUAL
                0636  7640            SZA CLA
                0637  5200            JMP CAA-1         /ERROR PATH
                0640  2031            ISZ STKS          /ALL WHEN 0
                0641  5245            JMP .+4
                0642  2027            ISZ LOOP          /DONE WHEN 0
                0643  5201            JMP DCAI
                0644  5256            JMP IBSF          /NEXT TEST
                0645  1045            TAD K10
                0646  1230            TAD TFLD          /CDF IOT + 10
                0647  3230            DCA TFLD
                0650  2030            ISZ NDF
                0651  5230            JMP TFLD
                                /
                0652  1032            TAD DAT           /DATA AS READ
                0653  7002  CAA,      HLT               /AC=DATA READ
                0654  7200            CLA
                0655  5230            JMP TFLD
                                /TEST 03


                                /CIF TEST, CHECKS THE ABILITY OF A CIF-ION-NOP-JMP OR
                                        /CIF-ION-NOP-JMS SEQUENCE TO DO THE FOLLOWING:
                                                /1,  CIF ENABLE MB TO IB TRANSFER,
                                                /2,  INHIBIT INTERRUPT TILL JMP OR JMS EXECUTED,
                                                /3,  INTERRUPT AFTER JMP OR JMS EXECUTED,
                                                /4,  JMP OR JMS ENABLES IB TO IF TRANSFER,
```

```
                                    /5,  INTERRUPT ENABLES IF TO SF TRANSFER,

                        /SET UP FOR CIF-ION-NOP-JMP CHECK,
0656  6201  IBSF,  CDF   00              /SET LOCS 1-2 TO ISZ 0,
0657  1021        TAD   ISZ0            /JMP I 0 RESPECTIVELY,
0660  3001        DCA   1
0661  1352        TAD   KNOP
0662  3002        DCA   2
0663  1020        TAD   JMPI0
0664  3003        DCA   3
                  /
                  /NOW STORE HALTS IN LOC1, CIFJMP+1,
                  /AND CIFJMS+1 OF ALL EXTENDED FIELDS,
                  /
0665  4423        JMS I XSTKS
0666  1040        TAD   KCDF
0667  1045        TAD   K10
0670  3271        DCA   .+1
0671  6211  HLTS,  CDF   10
0672  1037        TAD   KHLT
0673  3443        DCA I K1
0674  1037        TAD   KHLT
0675  3754        DCA I CA8
0676  1037        TAD   KHLT
0677  3755        DCA I CAC
0700  2031        ISZ   STKS
0701  7410        SKP
0702  5305        JMP   .+3
0703  1071        TAD   HLTS
0704  5307        JMP   HLTS+2
0705  6201        CDF   00
0706  6041        TSF                   /ENSURE TTO FLAG SET,
0707  4402        JMS I XTFLG
0710  3027        DCA   LOOP            /SET COUNTER FOR 4096 PASSES,
0711  1041  AGAIN1, TAD   KCIF           /INITIALIZE TO CIF 00,
0712  3323        DCA   CIFJMP
0713  3353        DCA   CIFCK           /INITIALIZE I.F. CHECK TO 0,
0714  4423        JMS I XSTKS           /READ SR9-11,
0715  1323  CIFJPL, TAD   CIFJMP
0716  1345        TAD   K10
0717  3323        DCA   CIFJMP
0720  1353        TAD   CIFCK
0721  1345        TAD   K10
0722  3353        DCA   CIFCK
0723  6202  CIFJMP, CIF   00              /MODIFIED TO CURRENT FIELD
                                          /UNDER TEST,


0724  6001        ION
0725  7000        NOP
0726  5327        JMP   .+1
0727  7402        HLT                   /ERROR,  NO PI OR INHIBIT PI,
0730  6234        RIB
0731  7041        CIA
0732  1353        TAD   CIFCK
```

```
                                SNA CLA
                                JMP     CAD+3
                                TAD     CIFCK
                                CLL RAR
                                RTR
                                RIB
                CAD,            HLT                     /ERROR, I.B. TO I.F. TRANSFER
                                CLA                     /FAILED AFTER CIF-JMP, BAD
                                JMP     CIFJMP          /I.F. IN AC6-8, GOOD I.F. IN
                                                        /AC9-11.  REPEAT UPON CONTINUE.
                                ISZ     STKS            /DONE?
                                JMP     CIFJPL          /NO, DO NEXT FIELD
                                ISZ     LOOP            /4096 TIMES?
                                JMP     AGAIN1          /NO.  DO IT ALL AGAIN.
                                JMP I   .+1             /YES.  GO TEST CIF-JMS.
                                IBSF1
                KNOP,           NOP
                CIFCK,          0
                CAB,            CIFJMP+1
                CAC,            CIFJMS+1


                        1000    *1000
        1000    7200    IBSF1,  CLA
        1001    6201            CDF     00
        1002    6041            TSF                     /ENSURE TTO FLAG SET.
        1003    4422            JMS I   XTFLG
        1004    3227            DCA     LOOP            /SET UP FOR 4096 PASSES.
        1005    1241    AGAIN2, TAD     KCIF            /INIT. TO CIF 00.
        1006    7217            DCA     CIFJMS
        1007    3246            DCA     CIFCK1          /INIT. I.F. CHECK TO 0.
        1010    4423            JMS I   XSTKS           /READ SR9-11.
        1011    1217    CIFJSL, TAD     CIFJMS
        1012    1245            TAD     K10
        1013    3217            DCA     CIFJMS
        1014    1246            TAD     CIFCK1
        1015    1245            TAD     K10
        1016    3246            DCA     CIFCK1
        1017    6202    CIFJMS, CIF     00              /MODIFIED TO CURRENT FIELD
                                                        /UNDER TEST.
        1020    6001            ION
        1021    7000            NOP
        1022    4223            JMS     .+1
        1023    0000            0
        1024    7402            HLT                     /ERROR, NO PI OR INHIBIT PI.
        1025    6234            RIB
        1026    7041            CIA
        1027    1246            TAD     CIFCK1
        1030    7650            SNA CLA
        1031    5241            JMP     CAE+3
        1032    1246            TAD     CIFCK1
        1033    7110            CLL RAR
        1034    7012            RTR
        1035    6234            RIB
```

```
0036  7402  CAE,    HLT                     /ERROR.  I.B. TO I.F. TRANSFER
0037  7200          CLA                     /FAILED AFTER CIF-JMS, BAD
0040  5217          JMP     CIFJMS          /I.F. IN AC6-8, GOOD I.F.
                                            /IN AC9-11.  REPEAT UPON CONTINUE
0041  2031          ISZ     STKS            /DONE?
0042  5211          JMP     CIFJSL          /NO.  DO NEXT FIELD.
0043  2027          ISZ     LOOP            /4096 TIMES?
0044  5205          JMP     AGAIN2          /NO.  DO IT ALL AGAIN.
0045  5647          JMP I   XGTF1           /YES.  GO ON TO NEXT TEST
0046  0000  CIFCK1,  0
0047  2271  XGTF1,  GTF1

                    /
                    /TEST 10
                    /TEST INTERRUPT INHIBIT
                    /FROM EACH FIELD, REFER TO HEADING TITLED "EXTENDED
                    /FIELD TEST ROUTINE".  THIS ROUTINE IS PLACED IN
                    /EACH TESTED FIELD AT THE ADDRESSES SPECIFIED.  THE
                    /INDICATED ERROR HALTS WILL BE IN THE EXTENDED
                    /FIELD.  PRESS CONT, TO RECOVER.  ONLY 1 FIELD WILL
                    /CONTAIN THE ROUTINE AT ANY ONE TIME.  OTHER FIELDS
                    /WILL CONTAIN ALL0'S.  THE ROUTINE IS REPLACED WITH
                    /HALTS AFTER COMPLETION.  THE PORTIONS OF THE FIELD
                    /WHICH DO NOT CONTAIN THE ROUTINE ARE SET TO 0000
                    /BEFOREHAND.
                    /
                    /
                    /SETUP FIELDS TO TEST, POINTERS, ETC.,
                    /
0055  4423  TRMF,   JMS I XSTKS           /READ SR9-11
0056  1040          TAD KCDF              /6201
0057  3254          DCA .+6
0060  1253          TAD .+5
0061  1045          TAD K10
0062  3253          DCA .+3
0063  7040          CMA
0064  3010          DCA 10
0065  6201          CDF 00
0066  3410          DCA I 10              /PLACE 0'S IN EACH FIELD FROM
0067  1410          TAD 10                /LOC. 0 TO 7777.
0070  7040          CMA
0071  7640          SZA CLA
0072  5261          JMP .-4
0073  2031          ISZ STKS
0074  5253          JMP TRMF+3


                    /
                    /NOW PUT A HLT IN EACH FIELD IN THE SAME
                    /LOCATION AS CAI, BELOW.
                    /
0075  4423          JMS I XSTKS           /READ SR 9-11
0076  1040          TAD KCDF
0077  1045          TAD K10
0100  3274          DCA .+1
```

```
1074  6201  CHDF,  CDF 00
1075  1036         TAD KCAI        /KCAI = ADDRESS OF CAI.
1076  3027         DCA LOOP        /SAVE TEMPORARILY
1077  1037         TAD KHLT        /KHLT = 7402 (HLT)
1100  3427         DCA I LOOP
1101  2031         ISZ STKS        /DONE ALL STACKS WHEN SKIP
1102  7410         SKP
1103  5306         JMP .+3
1104  1274         TAD CHDF
1105  5272         JMP CHDF-2
                /
1106  6201         CDF 00
1107  6041  STRMF, TSF             /CHECK TTY FLAG
1110  4422         JMS I XTFLG     /GO SET IT
1111  1050         TAD K7707
1112  3027         DCA LOOP
1113  1065         TAD POINT
1114  3066         DCA K7S         /POINTER FOR K7700 TO K7766
1115  4423         JMS I XSTKS     /READ SR 9-11
1116  1040         TAD KCDF        /6201
1117  1045         TAD K10         /10
1120  3327         DCA STDF
1121  1041         TAD KCIF        /6202
1122  1045         TAD K10         /10
1123  3330         DCA STDF+1
1124  1330         TAD STDF+1
1125  3442         DCA I XFD
1126  4425         JMS I XRANS     /PUT TEST ROUTINE INTO FIELD X
                /
1127  6211  STDF,  CDF 10          /FIELD 1 TO START WITH
1130  6212         CIF 10
1131  5332         JMP .+1         /SHOULD ENTER EXTENDED FIELD
                                   /AFTER THIS JMP. HLT IF NOT
1132  7000         NOP
1133  7402  CAI,   HLT             /ERROR. PI FAILED
                                   /C(AC) = C(I.B.)
1134  5327         JMP STDF        /REPEAT SAME TEST.
                /


                /ENTER HERE AFTER PI FROM EXTENDED BANK
      1200      *1200
                /
1200  6214  ENTER, RDF             /DF SHOULD BE 000
1201  7450         SNA             /ERROR IF SKIP
1202  5206         JMP .+4         /CHECK C(SF)
1203  7402         HLT             /AC=C(DF)
1204  7200         CLA
1205  5476         JMP I XTDF      /REPEAT TEST
1206  6212         CIF 10          /SET I.B. TO FIELD 1
1207  6244         RMF             /I.B. NOW EQUAL TO SF
1210  6234         RIB             /READ IB
1211  6202         CIF 00
1212  6201         CDF 00
1213  1466         TAD I K7S
```

```
                                CMA
                                SNA CLA         /ERROR IF SKIP
                                JMP CKPC
                                RMF
                                RIB
                                HLT             /ERROR RMF AND PI WORKED, BUT
                                                /I,B, NOT CORRECT AFTER RMF.
                                CLA             /AC=C(IB)
                                CDF 00
                                CIF 00
                                JMP I XTDF      /BACKUP A PAGE AND REPEAT
                        /
1226  1036  CKPC,        TAD KCAI        /KCAI=ADDRESS OF CAI
1227  7001                IAC             /MAKE CAI+1
1230  7041                CIA
1231  1000                TAD 0           /COMPARE TO C(0)
1232  7650                SNA CLA         /SHOULD NOT SKIP
1233  5243                JMP .+5         /ALL OK SETUP FOR NEXT FIELD
1234  1000                TAD 0
1235  7402                HLT             /ERROR, ALL WORKED, BUT
                                                /C(PC) WAS NOT=TO CAI+1
                                                /AFTER PI IN EXTENDED
                                                /FIELD, C(AC)=C(0),F0,
                                                /CHECK FOR PI NOT INHIBITED,
                                                /OR AUTO-INDEX REG.
                                                /12 FAILING IN THE EXTENDED FIELD,
1236  7200                CLA
1237  5476                JMP I XTDF      /BACKUP AND REPEAT
                        /
                        /SETUP FOR NEXT FIELD
                        /
1240  2001                ISZ STKS        /DONE ALL IF SKIP
1241  5246                JMP .+5
1242  2027                ISZ LOOP        /DONE LOOPING IF SKIP
1243  5645                JMP I .+2       /REPEAT ALL AGAIN
1244  5637                JMP I XFIB      /EXIT TO NEXT TEST
1245  1113                STRMF+4         /BACK TO LAST PAGE


                        /
                        /SET LAST TESTED FIELD TO ALL 0'S AND PUT A
                        /HLT IN RESPECTIVE ADDRESS OF CAI
                        /
1246  7240                CLA CMA
1247  3010                DCA 10
1250  1476                TAD I XTDF      /CDF X0 AT STDF
1251  3252                DCA .+1
1252  6211                CDF 10          /F1 TO START WITH
1253  3410                DCA I 10
1254  1010                TAD 10
1255  7040                CMA
1256  7640                SZA CLA         /CLEARD IF SKIP
1257  5253                JMP .-4
1260  6201                CDF 00
1261  1476                TAD I XTDF      /CDF X0 AT STDF
```

```
                                DCA .+1
                                CDF 10
                                TAD KHLT        /=7402 (HLT)
                                DCA I KCAI      /KCAI=ADDRESS OF CAI
                                CDF 00          /RESTORE DF
                        /
                        /INCREMENT CDF AND CIF IOT'S AT STDF, STDF+1
                        /TO NEXT FIELD.
                        /
                                TAD I XTDF      /CDF X0 AT STDF
                                TAD K10
                                DCA I XTDF
                                TAD I XTDF1     /CIF X0 AT STDF
                                TAD K10
                                DCA I XTDF1
                                TAD I XTDF1
                                DCA EXFD
                                ISZ K7S
                                JMS TRANS       /PUT ROUTINE IN NEW FIELD
                                JMP I XTDF      /TEST NEW FIELD

                                /EXTENDED FIELD TEST ROUTINE
                        /
                        /THE FOLLOWING INSTRUCTIONS ARE PLACED IN
                        /EACH EXTENDED FIELD TESTED. THE NUMBERS IN THE
                        /COMMENTS FIELD CORRESPOND TO THE
                        /MEMORY LOCATIONS IN THE TESTED FIELD. LOCATIONS
                        /0 THRU 11 ARE USED FOR AN ERROR ROUTINE
                        /IN CASE FIELD 0 IS NOT ENTERED AFTER AN
                        /INTERRUPT, THE EXTENDED FIELD SHOULD BE
                        /ENTERED AT LOCATION CAI-1 WHICH CORRESPONDS
                        /TO CAI-1 IN FIELD 0.
                        /
                        /EXTENDED FIELD INSTRUCTIONS:
                        /
1302  0000      EXFLD,  0               /0
1303  1000              TAD 0         /1
1304  7450              SNA           /IF LOC. 0 NOT =0 PI DIDN'T
                                      /ENTER FIELD 0
1305  5312              JMP .+5 /3
1306  7402              HLT           /4, INTERRUPTED TO THIS FIELD
                                      /INSTEAD OF FIELD 0,C(AC)=C(0)
                                      /WHICH SHOULD BE CAI+1
                                      /IF NOT, CHECK LOC. 7777,IT
                                      /MUST = 5412 (JMP I 12).
1307  7200              CLA           /5
1310  3000              DCA 0         /6
1311  5420              JMP I 20              /7, C(20) =CAI
1312  7402              HLT           /10, THE JMP I 12 AT LOC.
                                      /7777 WAS NOT EXECUTED,
                                      /OR INTERRUPT FAILED. IF
                                      /NO INTERRUPT, LOCATION 12
                                      /NOW CONTAINS 0 INSTEAD
                                      /OF ADDRESS CAI.
```

```
 826  1313  5307          JMP .-4 /11, REPEAT IN THIS FIELD
 827  1314  1133          CAI     /12, AUTO-INDEXS TO CAI+1
 828                       /IN F 0 IF THE JMP I 12
 829                       /WORKS,
 830                /LOCS, 13 TO 17 ARE ALL 0'S
 831                /
 832  1315  1133          CAI     /20, EQUALS CAI IN F0,
 833                /
 834                /LOCS, 21 TO CAI-2 ARE ALL 0'S
 835                /
 836  1316  6212    EXFD, CIF 10  /FIELD 1 TO START WITH
 837  1317  6001          ION     /LOC, CAI, SEE SYMBOL TABLE
 838                       /FOR CAI,
 839                /LOCS, CAI+1 TO 7776 ARE ALL 0'S
 840                /
 841  1320  5412      .   JMP I 12        /7777, PI SHOULD OCCUR,
 842                                      /AFTER THIS INSTRUCTION,
 843                                      /TO FIELD 0,
 844
 845
 846                /
 847                /ROUTINE TO TRANSFER TEST ROUTINE TO PROPER FIELD
 848                /
 849  1321  0000    TRANS, 0
 850  1322  1101          TAD KJMP        /KJMP=JMP I 2
 851  1323  3001          DCA 1           /IN FIELD 0
 852  1324  1102          TAD KNTR        /KNTR = LOC, ENTER
 853  1325  3002          DCA 2           /OF FIELD 0
 854  1326  1103          TAD KXFLD       /KXFLD = LOC, EXFLD
 855  1327  3010          DCA 10
 856  1330  3011          DCA 11
 857  1331  1007          TAD K7766       /1-10 DECIMAL
 858  1332  3000          DCA 0           /SAVE
 859  1333  1475          TAD I XTDF      /CDF X0 IN STDF
 860  1334  3337          DCA .+3
 861  1335  6201          CDF 00
 862  1336  1410          TAD I 10
 863  1337  6211    TRFLD, CDF 10         /F1 TO START WITH
 864  1340  3411          DCA I 11        /PUT IN EXTENDED FIELD
 865  1341  2010          ISZ 0           /DONE LOCS 1 TO 12 IF SKIP
 866  1342  5335          JMP .-5
 867  1343  1337          TAD TRFLD
 868  1344  3347          DCA .+3
 869  1345  6201          CDF 00
 870  1346  1410          TAD I 10
 871  1347  6211          CDF 10
 872  1350  3203          DCA I K20       /PUT 5400 IN LOC, 20
 873  1351  6201          CDF 00
 874  1352  1337          TAD TRFLD
 875  1353  3355          DCA .+2
 876  1354  1410          TAD I 10
 877  1355  6211          CDF 10
 878  1356  3465          DCA I KCAIM     /PUT CIF X0 IN CAI+1
 879  1357  6201          CDF 00
 880  1360  1337          TAD TRFLD
```

```
                1361  3363            DCA ,*2
                1362  1410            TAD I 10
                1363  6211            CDF 10
                1364  3466            DCA I KCAI      /ION IO LOC, CAI
                1365  6201            CDF 00
                1366  1367            TAD TRFLD
                1367  3371            DCA ,*2
                1370  1410            TAD I 10
                1371  6211            CDF 10
                1372  3446            DCA I K7777     /PUT JMP I 12 IN 7777
                1373  6201            CDF 00
                1374  5721            JMP I TRANS     /EXIT

                1400            *1400
                                /
                                /TEST 11
                                /TEST SF WITH AN RMF IOT, AN INTERRUPT IN FIELD 0 IS CREATED, AFTER
                                /WHICH, THE DF AND IB REGISTERS ARE SET TO FIELD 1,
                                /THE SF SHOULD CONTAIN FIELD 0, THE TEST
                                /THEN MAKES SURE THE IB IS CLEARED, THEN SET BY ISSUING AN RMF,
                                /FOLLOWED BY A JMP I K7000, IF THE IB IS CLEARED, THE JMP GOES TO 7000 IN FIELD 0,
                                /IF THE IB AND SF ARE INCLUSIVE OR'D, THE JMP GOES TO 7000 IN FIELD 1, AND
                                /A HALT OCCURS THERE, RESTART FROM 1400 AFTER AN ERROR, THE TEST IS LOOPED
                                /212 TIMES,
                                /
1400  6041  SFIB,   TSF             /SEE IF FLAG IS SET,
1401  4422          JMS I XTFLG     /SET IT
1402  1447          TAD K7000       /7000
1403  3427          DCA LOOP
1404  6211          CDF 10          /DF=FIELD 1
1405  1407          TAD KHLT        /HLT
1406  3447          DCA I K7000     /7000, FIELD 1=HLT
1407  6201          CDF 00          /DF=0
1410  1446          TAD JMP2        /JMP2=JMP I KFLD0
1411  3447          DCA I K7000     /7000, FIELD 0=JMP I KFLD0
                                    /KFLD0=LOC, RTRN
1412  1421          TAD KJMP        /KJMP=JMP I 2
1413  3401          DCA 1
1414  1406          TAD KRTN        /KRTN=LOC, CAG+2
1415  3402          DCA 2
                                /
                                /BEGIN TEST
                                /
1416  6001          ION             /ENABLE PI
1417  7000          NOP
1420  7402  CAG,    HLT             /ERROR NO PI
1421  5200          JMP SFIB        /REPEAT TEST
                                /
                                /RETURN HERE AFTER PI
                                /
1422  7200          CLA
1423  6211          CDF 10          /DF=FIELD1
1424  6212          CIF 10          /IB=FIELD1
1425  6244          RMF             /IB SHOULD=FIELD0
1426  5447          JMP I K7000     /IF SHOULD=FIELD0
```

```
                      /
1427  2027      RTRN, ISZ LOOP          /WORKED OK
1430  5216            JMP CAG-2         /LOOP
1431  5232            JMP TAUTO         /DONE, GO TO NEXT TEST



                      /
                      /
                      /TEST 12
                      /TEST ALL AUTO-INDEX REGISTERS IN EACH EXTENDED FIELD.
                      /IDENTICAL TEST ROUTINES ARE PERFORMED FROM EACH FIELD,
                      /AND ERROR HALTS OCCUR IN THE FIELD CURRENTLY RUNNING
                      /THE ROUTINE, PRESS CONT, TO RESUME TESTING, EACH
                      /FIELD CONTAINS ALL 0'S EXCEPT FOR THE AREA OCCUPIED
                      /BY THE TEST ROUTINE, FIELD 0 IS RE-ENTERED
                      /AFTER EACH TEST, AND THE NEXT SEQUENTIAL FIELD
                      /IS THEN ENTERED, REFER TO THE HEADING "AUTO-
                      /INDEX TEST" FOR THE SEQUENCE OF OPERATIONS,
                      /
1432  6201      TAUTO, CDF 00
1433  1[illegible]     TAD K7701
1434  3027            DCA LOOP          /LOOP COUNTER
1435  4[illegible]     JMS I XSTRS       /READ SR 9-11
1436  1[illegible]     TAD KCDF          /6201
1437  3246            DCA CFN
1440  1246      NEWDF, TAD CFN
1441  1[illegible]     TAD K10           /INCREMENT DF
1442  3246            DCA CFN
                      /
                      /CLEAR ONE FIELD TO 0
                      /
1443  7040            CMA
1444  3010            DCA 10
1445  3000            DCA 0             /USE LOC, 0 FOR A COUNTER
1446  6211      CFN,  CDF 10            /FIELD 1 TO START WITH
1447  3410            DCA I 10
1450  2000            ISZ 0
1451  5247            JMP .-2
1452  6201            CDF 00
                      /
                      /NOW PUT TEST ROUTINE IN THE EXTENDED FIELD
                      /
1453  1377            TAD QQAUTO        /1ST LOC. OF ROUTINE MINUS 1
1454  3010            DCA 10            /SOURCE
1455  1[illegible]     TAD K7744         /-28 DECIMAL
1456  3000            DCA 0             /USE LOC, 0 AS COUNTER
1457  1377            TAD QQAUTO
1460  3011            DCA 11            /DESTINATION
1461  1246            TAD CFN           /CDF X0
1462  3265            DCA .+3
1463  6201      MOVE, CDF 00
1464  1410            TAD I 10
1465  6211            CDF 10            /FIELD 1 TO START
1466  3411            DCA I 11
1467  2000            ISZ 0             /MOVE WHEN SKIP
```

```
1470  1400  JMP MOVE

                /
                /NOW SET AUTOTA REGS 10 TO 17 TO 7777,
                /
1471  1411      IAU K7770       /-8 DECIMAL
1472  6211      DCA 0
1473  1412      IAU K7          /
1474  6212      DCA 10
1475  7142      CMA             /7777
1476  3410      DCA I 10
1477  2010      ISZ 0           /10 TO 17 = 7777 WHEN SKIP
1500  5275      JMP .-3
1501  7140      CMA
1502  3446      DCA I K7777     /PUT 7777 IN LOC, 7777 OF EXTENDED FIELD
1503  6214      RDF             /READ D.F,
1504  1441      TAD K6IF        /6202
1505  3396      DCA .+1
1506  6212      CIF 10          /FIELD 1 TO START
1507  4716      JMS I FILDX     /ENTER EXTENDED FIELD
                                /515 OCTAL LOCS, BEFORE THE
                                /TAD I 10 INSTRUCTION,
                                /THIS IS A TEST OF THE
                                /DEFER BIT, 500 US DELAY
                /
                /ENTER FIELD 0 FROM EXTENDED FIELD HERE,
                /
1510  2061      GOTO0,  ISZ SIKS        /DONE ALL WHEN SKIP
1511  5240              JMP NEWDF       /SETUP FOR NEXT
1512  2057              ISZ LOOP        /ALL DONE IF SKIP
1513  5235              JMP NEWDF-3     /REPEAT ALL
1514  5775              JMP I LBTP
1515  1000      LBTP,   RMFTSI
                /
1516  1517      FILDX,  DOAUTO-515

                /
                /       AUTO-INDEX TEST
                /
                /THE ROUTINE WILL BE PLACED IN THE SAME RESPECTIVE
                /LOCATIONS IN EACH EXTENDED FIELD, ANY ERROR
                //HALTS WILL OCCUR IN THE EXTENDED FIELD, PRESS
                /CONTINUE TO PROCEED WITH TESTING, THE INDEX
                /REGISTERS 10 TO 17 INITIALLY CONTAIN 7777, AND
                /ARE AUTO-INDEXED TO 0000 BY A TAD I INSTRUCTION,
                /A HALT OCCURS IF THE REG, IS NOT INCREMENTED TO 0,
                /THE TAD I WOULD HAVE THEN REFERENCED LOC, 7777,
                /WHICH CONTAINS 7777,
                /
1517  1517      DOAUTO, .               /THIS LOC, IS NOT MOVED TO
                                        /THE EXTENDED FIELD,
1520  7200              CLA
1521  1410              TAD I 10
```

```
1040     1522  7440            SZA
1041     1523  7402            HLT             /ERROR, INDEX REG, 10 FAILED
1042     1524  1411            TAD I 11
1043     1525  7440            SZA
1044     1526  7402            HLT             /INDEX REG, 11 FAILED
1045     1527  1412            TAD I 12
1046     1530  7440            SZA
1047     1531  7402            HLT             /12 FAILED
1050     1532  1413            TAD I 13
1051     1533  7440            SZA
1052     1534  7402            HLT             /13 FAILED
1053     1535  1414            TAD I 14
1054     1536  7440            SZA
1055     1537  7402            HLT             /14 FAILED
1056     1540  1415            TAD I 15
1057     1541  7440            SZA
1060     1542  7402            HLT             /15 FAILED
1061     1543  1416            TAD I 16
1062     1544  7440            SZA
1063     1545  7402            HLT             /16 FAILED
1064     1546  1417            TAD I 17
1065     1547  7440            SZA
1066     1550  7402            HLT             /17 FAILED
1067     1551  6201            CDF 00          /SET DF TO FIELD 0
1070     1552  6202            CIF 00          /SET I,B, TO FIELD 0
1071     1553  5401            JMP GOTO0       /EXIT TO FIELD 0
1072                      /END OF TEST ROUTINE
1073                      /
1074                      /
1075
1076                      /
1077                      /RING BELL AT THE COMPLETION OF TEST
1100                      /CHECK SR1=1 FOR HLT AT END OF TEST
1101                      /
1102     1554  7007            AND 7
1103     1555  1354     BELL,  TAD .-1
1104     1556  6046            TLS             /RING BELL
1105     1557  6041            TSF
1106     1560  5357            JMP .-1
1107     1561  7604            LAS
1110     1562  7006            RAL
1111     1563  7500            SMA
1112     1564  5527            JMP I PLACE     /START  TEST OVER
1113     1565  7402            HLT             /END OF TEST
1114     1566  5527            JMP I PLACE     /HIT CONTINUE TO START TEST OVER
1115                      /
1116
1117                      /TEST 13
1120                      /DYNAMIC RMF TEST,
1121                      /TESTS ALL SF TO DF TRANSFERS AND THOSE SF TO IB TRANSFERS
1122                      /AS APPLICABLE TO THE NUMBER OF EXTENDED FIELDS PRESENT,
1123                      /THE GENERAL METHOD IS TO INTERRUPT FROM EACH EXTENDED FIELD
1124                      /WITH THE DF=FROM 0 THROUGH 7,  AN RMF INSTRUCTION IS THEN ISSUED
1125                      /AND CONTROL TRANSFERRED TO AN EXTENDED FIELD,  THE RMFDY ROUTINE
1126                      /IN THAT FIELD THEN CHECKS THAT THE IF AND DF ARE CORRECT,  IF NOT,
```

```
1101                    /THE FAILING IF OR DF IS IN THE IF OR DF REG, AND THE CORRECT FIELD
1102                    /NUMBER IS IN AC BITS 6 THRU 8,
1103                    /
1104                    /
1105                    /
1106            1600    *1600
1107                    /
1108                    /
1109    1600    7604    RMFTSI, LAS                     /CHECK HOW MANY EXTENDED FIELDS
1110    1601    7044            AND     K7              /ARE PRESENT
1111    1602    7041            CIA                     /NEGATE AND SAVE,
1112    1603    3205            DCA     IFCN
1113    1604    4703            JMS I   XFERP           /TRANSFER RMFDY ROUTINE TO ALL
1114    1605    0000    IFCN,   0                       /EXTENDED FIELDS,
1115    1606    7744            -34
1116    1607    1702            RMFDY-1
1117    1610    3275            DCA     LBTSTC          /SET RMFTST COUNTER FOR 4096 PASSES
1118    1611    1302            TAD     JMPI4           /SET INTERRUPT LINK,
1119    1612    3001            DCA     1
1120    1613    1274            TAD     INTEP
1121    1614    3004            DCA     4
1122    1615    6201    RMFL3,  CDF     00              /INITIALIZE IF TO 0,
1123    1616    3341            DCA     KIFSHB
1124    1617    1205            TAD     IFCN            /INITIALIZE TEST COUNTER
1125    1620    3276            DCA     RMFCN1
1126    1621    1341    RMFL2,  TAD     KIFSHB          /UPDATE CURRENT IF,
1127    1622    1345            TAD     K10
1128    1623    3341            DCA     KIFSHB
1129    1624    1341            TAD     KIFSHB
1130    1625    7041            CIA
1131    1626    3342            DCA     MIFSHB
1132    1627    1311            TAD     K7770           /INITIALIZE DF COUNTER TO -10,
1133    1630    3277            DCA     DFCN
1134    1631    1311            TAD     K7770           /INITIALIZE DF TO -10,
1135    1632    3337            DCA     KDFSHB
1136    1633    1337    RMFL1,  TAD     KDFSHB          /UPDATE DF,
1137    1634    1345            TAD     K10
1138    1635    3337            DCA     KDFSHB
1139    1636    1337            TAD     KDFSHB
1140    1637    7041            CIA
1141    1640    3340            DCA     MDFSHB
1142    1641    1205            TAD     IFCN            /TRANSFER DF AND IF INFORMATION
1143    1642    3244            DCA     .+2             /TO EXTENDED FIELDS,
1144    1643    4700            JMS I   XFERP
1145    1644    0000            0
1146    1645    7774            -4
1147    1646    1736            KDFSHB-1
1148    1647    6201            CDF     00
1149
1150
1151    1650    1040            TAD     KCDF            /UPDATE CDF INST,
1152    1651    1337            TAD     KDFSHB
1153    1652    3260            DCA     RMFI1
1154    1653    1041            TAD     KCIF            /UPDAT CIF INST,
1155    1654    1341            TAD     KIFSHB
```

```
1156    1655  3261            DCA     RMFI2
1157    1656  6041  RMFE2,    TSF                     /ENSURE TTO FLAG SET,
1158    1657  4422            JMS I   XTFLG
1159    1660  6201  RMFI1,    CDF                     /SET DF AND IF TO CURRENT FIELD,
1160    1661  6202  RMFI2,    CIF
1161    1662  5303            JMP     RMFDY           /GO TO RMFDY IN CURRENT IF,
1162    1663  6244  INTE,     RMF                     /ENTER FROM INTERRUPT FROM EX. FLD,
1163    1664  5310            JMP     RMFDY1          /GO BACK TO EXTENDED FIELD,
1164    1665  2277  RMFE1,    ISZ     DFCN            /ALL DF'S USED WITH CURRENT IF,
1165    1666  5233            JMP     RMFL1           /NO, DO NEXT DF,
1166    1667  2276            ISZ     RMFCN1          /ONE PASS OF RMFTST COMPLETE?
1167    1670  5221            JMP     RMFL2           /NO, DO NEXT IF,
1168    1671  2275            ISZ     LBTSTC          /RMFTST DONE?
1169    1672  5215            JMP     RMFL3           /NO,  DO AGAIN,
1170    1673  5701            JMP I   XMEM            /YES, GO TO NEXT TEST
1171    1674  1663  INTEP,    INTE
1172    1675  0000  LBTSTC,   0
1173    1676  0000  RMFCN1,   0
1174    1677  0000  DFCN,     0
1175    1700  2000  XFERP,    XFER
1176    1701  2200  XMEM,     NOMEM
1177    1702  5404  JMPI4,    JMP I 4
1178                /
1179                /
1180                /
1181                /
1182                /
1183
1184
1185                /ROUTINE TO CHECK CORRECT TRANSFERS FOR SAVE FIELD TO DATA FIELD AND
1186                        /SAVE FIELD TO INST. BUFFER TO INSTRUCTION FIELD AFTER
1187                        /RMF,
1188                /STORED IN ALL EXTENDED FIELDS,
1189
1190    1703  6001  RMFDY,   ION                     /THIS IS NOT TRANSFERRED,
1191    1704  7000            NOP
1192    1705  6002            IOF
1193    1706  7402            HLT                     /INTERRUPT FAILURE,
1194    1707  5333            JMP     REPEAT
1195    1710  7200  RMFDY1,   CLA
1196    1711  6214            RDF                     /CHECK FOR CORRECT DATA FIELD
1197    1712  1340            TAD     MDFSHB
1198    1713  7650            SNA CLA
1199    1714  5320            JMP     .+4
1200    1715  1337            TAD     KDFSHB          /DATA FIELD INCORRECT
1201    1716  7402            HLT                     /SF TO DF TRANSFER FAILED AFTER RMF,
1202    1717  5333            JMP     REPEAT          /REPEAT THIS TEST,
1203    1720  6224            RIF                     /CHECK FOR CORRECT INSTRUCTION FIELD,
1204    1721  1342            TAD     MIFSHB
1205    1722  7650            SNA CLA
1206    1723  5327            JMP     .+4
1207    1724  1341            TAD     KIFSHB          /INSTRUCTION FIELD INCORRECT,
1208    1725  7402            HLT                     /SF TO IB TRANSFER FAILED AFTER RMF
1209    1726  5333            JMP     REPEAT          /REPEAT THIS TEST,
1210    1727  6201            CDF     00              /GO BACK AND RUN NEXT TEST,
```

```
1211    1730  6202            CIF     00
1212    1731  5732            JMP I   .+1
1213    1732  1665            RMFE1
1214    1733  6201    REPEAT, CDF     00              /GO BACK AND REPEAT FAILING
1215    1734  6202            CIF     00              /TEST.
1216    1735  5736            JMP I   .+1
1217    1736  1656            RMFE2
1218    1737  0000    KDFSHB, 0                       /DATA FIELD SHOULD BE
1219    1740  0000    MDFSHB, 0                       /TWO'S COMPLEMENT OF ABOVE,
1220    1741  0000    KIFSHB, 0                       /INSTRUCTION FIELD SHOULD BE
1221    1742  0000    MIFSHB, 0                       /TWO'S COMPLEMENT OF ABOVE
1222                    /
1223                    /
1224                    /
1225                    /
1226                    /.
1227                    /
1228                    /ROUTINE TO TRANSFER N1 WORDS STARTING AT P IN FIELD 0 TO P IN THE
1229                            /NEXT N2 EXTENDED FIELDS.
1230                            /THE CALLING SEQUENCE IS:
1231                            /JMS I  XFERP
1232                            /-N2
1233                            /-N1
1234                            /P-1
1235
1236
1237
1238                    /
1239            2000    *2000
1240                    /
1241    2000    0000    XFER,   0
1242    2001    7300            CLA
1243    2002    1600            TAD I   XFER            /GET -N2
1244    2003    3242            DCA     N2
1245    2004    2200            ISZ     XFER            /GET -N1
1246    2005    1600            TAD I   XFER
1247    2006    3243            DCA     N1
1248    2007    2200            ISZ     XFER            /GET P-1
1249    2010    1600            TAD I   XFER
1250    2011    3244            DCA     P
1251    2012    2200            ISZ     XFER            /UPDATE TO RETURN ADDRESS.
1252    2013    1240            TAD     KCDF            /INITIALIZE CDF INST.
1253    2014    3232            DCA     XFERIN
1254    2015    1242            TAD     N2
1255    2016    3245            DCA     XFERC2
1256    2017    1244    XFERL2, TAD     P               /PUT POINTER IN AUTO 10 AND 11.
1257    2020    3010            DCA     10
1258    2021    1244            TAD     P
1259    2022    3011            DCA     11
1260    2023    1243            TAD     N1              /SET COUNTER 1 TO -N1
1261    2024    3246            DCA     XFERC1
1262    2025    1232            TAD     XFERIN          /UPDATE CDF INST.
1263    2026    1245            TAD     K10
1264    2027    3232            DCA     XFERIN
1265    2030    6201    XFERL1, CDF     00              /TRANSFER
```

```
1266    2031  1410            TAD I   10
1267    2032  6201    XFERIN, CDF
1268    2033  3411            DCA I   11
1269    2034  2246            ISZ     XFERC1          /DONE WITH CURRENT FIELD?
1270    2035  5233            JMP     XFERL1          /NO, CONTINUE.
1271    2036  2245            ISZ     XFERC2          /DONE WITH ALL FIELDS?
1272    2037  5217            JMP     XFERL2          /NO, DO NEXT FIELD
1273    2040  6201            CDF     00              /ALL DONE,  SET DF=0,
1274    2041  5640            JMP I   XFER            /EXIT.
1275    2042  0000    N2,     0
1276    2043  0000    N1,     0
1277    2044  0000    P,      0
1278    2045  0000    XFERC2, 0
1279    2046  0000    XFERC1, 0
1280                    /
1281                    /TEST 06
1282                    /NOW DO A READ AND WRITE DATA TEST IN
1283                    /ALL AVAILABLE EXTENDED FIELDS,
1284                    /IF A FAILURE OCCURS CHECK LOC, 10
1285                    /FOR BAD ADDRESS AREA AND LOC, RANA
1286                    /FOR THE MOST RECENT FIELD CHANGE,
1287                    /LOC, KDATER CONTAINS DATA PATTERN USED.
1288                    /
1289    2047  0000    DATER,  0000
1290    2050  7300            CLA CLL
1291    2051  4423            JMS I XSTKS
1292    2052  1040            TAD KCDF
1293    2053  1045            TAD K10
1294    2054  3257            DCA RANA        /MODIFIED UNDER TEST
1295    2055  7341            CLA CLL CMA
1296    2056  3410            DCA 10          /SET AUTO REGISTER
1297    2057  6201    RANA,   CDF
1298    2060  4276            JMS FILL        /LOAD UP FIELD WITH DATA
1299    2061  7341            CLA CMA CLL
1300    2062  3410            DCA 10
1301    2063  4412            JMS CHECK       /CHECK DATA IN FIELD
1302    2064  7300            CLA CLL
1303    2065  2051            ISZ STKS
1304    2066  7410            SKP
1305    2067  5274            JMP .+5
1306    2070  1257            TAD RANA
1307    2071  1045            TAD K10
1308    2072  3257            DCA RANA        /CHECK NEXT FIELD
1309    2073  5255            JMP RANA +2
1310    2074  6201            CDF
1311    2075  5647            JMP I DATER
1312                    /
1313                    /ROUTINE TO FILL FIELD WITH DATA
1314                    /
1315    2076  0000    FILL,   0000
1316    2077  7300            CLA CLL
1317    2100  1157            TAD KDATER
1318    2101  3410            DCA I 10
1319    2102  1157            TAD KDATER
1320    2103  7040            CMA
```

```
1321    2104  3410            DCA I 10
1322    2105  1010            TAD 10
1323    2106  7001            IAC
1324    2107  7640            SZA CLA
1325    2110  5277            JMP FILL +1
1326    2111  5676            JMP I FILL
1327                  /
1328                  /ROUTINE TO CHECK DATA IN FIELD
1329                  /
1330    2112  0000    CHECK,  0000
1331    2113  7300            CLA CLL
1332    2114  1410            TAD I 10
1333    2115  7001            IAC
1334    2116  1410            TAD I 10
1335    2117  7440            SZA             /AC CONTAINS BAD BITS
1336    2120  7402            HLT             /MEMORY CONTROL WORKED BUT
1337    2121  7300            CLA CLL         /DATA PATTERN FAILURE IN
1338    2122  1010            TAD 10          /EXTENDED MEMORY,
1339    2123  7001            IAC
1340    2124  7640            SZA CLA         /IS CHECK DONE
1341    2125  5313            JMP CHECK +1
1342    2126  5712            JMP I CHECK
1343                  /
1344                  /
1345
1346
1347
1348
1349                  /
1350          2200    *2200
1351                  /
1352                  /TEST 14
1353                  /REFERENCE ALL 4K FIELDS NOT PRESENT,
1354                  /IF 32K IS PRESENT, THE TEST IS BY-PASSED,
1355                  /EACH FIELD NOT PRESENT IS REFERENCED
1356                  /BY THE PROGRAM WITH JMP, DCA AND TAD,
1357                  /THE PROGRAM MUST CONTINUE IN SEQUENCE
1358                  /BELL WILL SIGNAL A SUCCESSFUL TEST
1359                  /
1360    2200  7200    NOMEM,  CLA
1361    2201  1110            TAD K7770
1362    2202  3337            DCA LOOP        /TEST LOOP COUNTER
1363    2203  7604            LAS             /READ SR9-11
1364    2204  0044            AND K7
1365    2205  7041            CIA
1366    2206  1044            TAD K7          /SUBTRACT MAX, POSSIBLE
1367    2207  7650            SNA
1368    2210  5546            JMP I XXSR0     /32K PRESENT, CAN'T TEST
1369    2211  3433            DCA NOSTAK      /SAVE NO, MISSING
1370    2212  3547            DCA I XELL      /CLEAR THE TLS IOT AT
1371                            /BELL+1 TO PROHIBIT
1372                            /FALSE INDICATION, TLS
1373                            /IS RESTORED LATER WRONG
1374                            /ENTRY FROM NON-EXISTENT
1375                            /MEMORY MAY CAUSE A
```

```
1376                                        /HANG-UP AT BELL+2 AND +3,
1377    2213  7604          LAS             /# OF FIELDS PRESENT
1378    2214  0044          AND K7
1379    2215  7001          IAC             /+1 TO GET 1ST MISSING
1380    2216  7100          CLL
1381    2217  7006          RTL             /POSITION TO AC 6-8,
1382    2220  7004          RAL
1383    2221  3034          DCA NOFLD       /1ST MISSING
1384    2222  1033          TAD NOSTAK      /# STACKS NOT HERE
1385    2223  7041          CIA
1386    2224  3033          DCA NOSTAK      /USED AS COUNTER
1387
1388
1389                  /
1390                  /
1391    2225  1040          TAD KCDF        /6201
1392    2226  1034          TAD NOFLD       /MISSING STACK
1393    2227  3245          DCA CDF0S
1394                  /
1395                  /NOW READ ALL 0'S FROM ALL NON-EXISTENT FIELDS
1396                  /IF CONTROL PORTION ONLY, RING BELL,
1397                  /IF NOT PROCEED TO TIME SHARE,
1398                  /
1399    2230  4244          JMS ALL0        /READ ALL 0 FROM 1ST
1400    2231  2033  CNSTK,  ISZ NOSTAK      /DONE ALL MISSING IF SKIP
1401    2232  5237          JMP POS
1402    2233  2027          ISZ LOOP        /DONE LOOPING IF SKIP
1403    2234  5636          JMP I XNOM      /REPEAT
1404    2235  5646          JMP I XXSR0
1405                  /
1406    2236  2243  XNOM,   NOMEM+3
1407                  /
1408    2237  1245  POS,    TAD CDF0S
1409    2240  1246          TAD K10         /DF PLUS 1
1410    2241  3245          DCA CDF0S
1411    2242  4244          JMS ALL0        /READ ALL 0'S
1412    2243  5231          JMP CNSTK       /CHECK DONE
1413
1414
1415
1416                  /
1417                  /ROUTINE TO READ ALL 0'S,
1418                  /
1419    2244  0000  ALL0,   0
1420    2245  6201  CDF0S,  CDF 00          /SET DF TO 1ST MISSING
1421    2246  7240          CLA CMA
1422    2247  3010          DCA 10          /10 AND 11 USED FOR ADDRESS
1423    2250  7040          CMA
1424    2251  3011          DCA 11
1425    2252  3002          DCA 2           /USE AS COUNTER
1426    2253  7040          CMA
1427    2254  3410          DCA I 10        /WRITE 1'S INTO NON-EXIS-
1428                                        /TENT FIELD,
1429    2255  2002          ISZ 2
1430    2256  5253          JMP .-3
```

```
1431  2257  1411          TAD I 11        /READ NON-EXIST, FIELD
1432  2260  7650          SNA CLA         /SHOULD = 0000
1433  2261  5264          JMP .+3
1434  2262  1011          TAD 11
1435  2263  7402  CAX,    HLT             /ERROR, AN EXISTING FIELD
1436                                      /WAS REFERENCED, C(AC)=
1437                                      /ADDRESS REFERENCED
1438  2264  2002          ISZ 2
1439  2265  5257          JMP CAX-4       /READ NEXT
1440                /
1441  2266  6201  DONE0,  CDF 00
1442  2267  6202          CIF 00
1443  2270  5644          JMP I ALL0      /EXIT
1444                /
1445
1446                /.
1447                /TEST 04
1448
1449                /TEST GTF FOR FLAG AND SAVE FIELDS
1450                /GET SAVE FIELDS  AFTER INTERRUPT
1451                /CHECK  INTERRUPT INHIBIT, DO ALL
1452                /COMBINATIONS 0 TO 7,
1453                /
1454  2271  7300  GTF1,   CLA CLL
1455  2272  1020          TAD JMPI0               /SET FOR RETURN
1456  2273  3001          DCA 1
1457  2274  1040          TAD KCDF
1458  2275  3304          DCA XSDF
1459  2276  1304  MGTF,   TAD XSDF               /GET FIRST FIELD
1460  2277  1071          AND K0070
1461  2300  7120          STL
1462  2301  7010          RAR
1463  2302  7012          RTR
1464  2303  3112          DCA XSAV
1465  2304  6201  XSDF,   CDF 00
1466  2305  6041          TSF                     /IS TTY FLAG SET
1467  2306  4422          JMS I XTFLG             /GET THE FLAG
1468  2307  6061          ION
1469  2310  7640          CLA CLL CMA             /CHECK FOR JAM ON GTF
1470  2311  6254          GTF                     /GET THE FLAGS
1471  2312  7041          CIA
1472  2313  1112          TAD XSAV                /TTY + CURRENT FIELD
1473  2314  7440          SZA
1474  2315  7402          HLT                     /FLAG + FIELD
1475  2316  2027          ISZ LOOP                /4096 TIMES
1476  2317  5276          JMP MGTF
1477  2320  1045          TAD K10
1478  2321  1304          TAD XSDF
1479  2322  3304          DCA XSDF
1480  2323  2113          ISZ XCOUNT              /MORE FIELDS TO CHECK
1481  2324  5276          JMP MGTF
1482  2325  1110          TAD K7770
1483  2326  3113          DCA XCOUNT
1484  2327  5730          JMP I XION1             /YES,  GO TO NEXT TEST
1485  2330  2331  XION1,  ION1
```

```
                        /
                        /TEST 05
                        /TEST ION AND LINK FROM RTF
                        /TEST INTERRUPT INHIBIT BEFORE PI
                        /GET THE FLAGS WITH GTF,
                        /
2331  7300      ION1,   CLA CLL
2332  1021              TAD IS#0
2333  3001              DCA 1
2334  1020              TAD JMPI0
2335  3002              DCA 2
2336  6005              RTF
2337  5340              JMP .+1
2340  7402              HLT                     /WAS INT, INH,
2341  7300              CLA CLL
2342  1115              TAD K5200
2343  6005              RTF
2344  7240              CLA CMA                 /CHECK FOR JAM ON GTF
2345  6004              GTF             /GET LINK,ION,TTY FLAG
2346  7041              CIA
2347  1115              TAD K5200       /EXPECTED BITS
2350  7440              SZA
2351  7402              HLT             /WAS LINK,ION,TTY FLAG SET
2352  7300              CLA CLL
2353  6005              RTF             /REPLACE ION,INT INH
2354  7300              CLA CLL
2355  6004              GTF
2356  7041              CIA
2357  1116              TAD K1200
2360  7440              SZA
2361  7402              HLT             /TTY FLAG,ION,NO LINK
2362  5363              JMP .+1
2363  7402              HLT             /WAS INT INH
2364  7300              CLA CLL
2365  2027              ISZ LOOP        /4096 TIMES
2366  5361              JMP ION1
2367  4555              JMS I XDATER    /GO TO NEXT TEST
2370  4773              JMS I XCON1     /GO TO NEXT TEST
2371  5772              JMP I XRTF1     /GO TO NEXT TEST
2372  2400      XRTF1,  RTF1
2373  4600      XCON1,  CON1
                        /
                        /TEST 08
                        /TEST DF00 * IF00 FROM SAVE FIELD AFTER PI
                        /USE RTF TO SET THE FLAGS AND GTF TO GET THE FLAGS
                        /CHECK INTERRUPT INHIBIT, DO ALL SAVE
                        /FIELD COMBINATIONS 0 TO 77,
                        /
          2400          *2400
                        /
2400  7300      RTF1,   CLA CLL
2401  4422              JMS I XTFLG     /SET TTY FLAG
2402  1021              TAD IS#0
2403  3001              DCA 1
2404  1020              TAD JMPI0
```

```
1541  2405  3002            DCA 2
1542  2406  3114            DCA XTOR
1543  2407  1114  XSRTF,    TAD XTOR
1544  2410  6005            RTF                 /MAKE DF 00 + IF 00
1545  2411  5212            JMP .+1
1546  2412  7402            HLT                 /WAS INT INH
1547  2413  7300            CLA CLL
1548  2414  6004            GTF                 /GET THE FLAGS
1549  2415  0117            AND K0077
1550  2416  7041            CIA
1551  2417  1114            TAD XTOR            /EXPECTED BITS
1552  2420  7440            SZA
1553  2421  7402            HLT                 /WAS DF + IF SET
1554  2422  2027            ISZ LOOP            /4096 TIMES
1555  2423  5207            JMP XSRTF
1556  2424  1114            TAD XTOR
1557  2425  1120            TAD K0011
1560  2426  3114            DCA XTOR
1561  2427  2113            ISZ XCOUNT
1562  2430  5207            JMP XSRTF                   /DO THE REST OF 00 + IF 00
1563  2431  1110            TAD K7770
1564  2432  3113            DCA XCOUNT
1565  2433  5664            JMP I XRIG1
1566  2434  2452  XRIG1,    RIG1
1567  2435  0000  NSTKS,    0
1570                        /
1571  2436  7004            LAS                 /READ SR 9-11
1572  2437  0044            AND K7
1573  2440  7041            CIA
1574  2441  3443            DCA STKS
1575  2442  5643            JMP I NSTKS
1576                        /
1577                        /SET ITY FLAG
1600                        /
1601  2443  0000  TFLG,     0
1602  2444  7300            CLA
1603  2445  6040            SPF
1604  2446  6041            TSF
1605  2447  5246            JMP .-1
1606  2450  7200            CLA
1607  2451  5643            JMP I TFLG          /EXIT
1610                        /
1611                        /TEST 09
1612                        /TEST PROGRAM INTERRUPT IN EXISTING FIELDS
1613                        /USE RTF, GTF, RDF AND RIF FOR CHECK
1614                        /CHECK PC, AC, SF AND FLAGS AFTER PI
1615                        /IF FAILURE OCCURS CHECK XDATA FOR AC DATA,
1616                        /LOC. 0 FIELD 0 FOR CORRECT PC AFTER PI,
1617                        /AND IFDF FOR CORRECT DF XX + IF XX,
1620                        /PROGRAM SHOULD INTERRUPT INHIBIT TILL JMP I ADRS
1621                        /IF PI FAILS TO INTERRUPT HLT IN THAT FIELD
1622                        /
1623  2452  7300  RIG1,     CLA CLL
1624  2453  4423            JMS I XSTKS
1625  2454  1120            TAD K0011
```

```
1596  2455  3260          DCA IFDF
1597  2456  1132          TAD K0017
1598  2457  3010          DCA 0010
1599  2460  0000  IFDF,   0000              /SET TO CURRENT FIELD UNDER TEST
1600  2461  7300          CLA CLL
1601  2462  1260          TAD IFDF
1602  2463  6005          RTF               /SET FIELDS AND TURN ION
1603  2464  6002          IOF
1604  2465  7300          CLA CLL
1605  2466  2537          ISZ I K0000
1606  2467  7000          NOP
1607  2470  1537          TAD I K0000
1608  2471  3136          DCA XDATA
1609  2472  1124          TAD K7402
1610  2473  3541          DCA I K0001       /STORE A HLT IN LOC 1 OF THAT FIELD
1611  2474  1133          TAD K6001
1612  2475  3410          DCA I 0010        /ION FOR THAT FIELD
1613  2476  1130          TAD K1000
1614  2477  3410          DCA I 0010        /TAD FOR THAT FIELD
1615  2500  1124          TAD K7402
1616  2501  3410          DCA I 0010        /HLT FOR FAILURE
1617  2502  1010          TAD 10
1618  2503  1057          TAD K7776
1619  2504  3610          DCA ADRS
1620  2505  1154          TAD JMPIR
1621  2506  3001          DCA 0001          /SET LOC 1 FOR RETURN AFTER PI
1622  2507  5710          JMP I .+1         /GO TO THAT FIELD
1623  2510  0000  ADRS,   0000
1624  2511  7041  RET,    CIA
1625  2512  1136          TAD XDATA
1626  2513  7640          SZA
1627  2514  7402          HLT               /AC DATA FAILED DURING PI
1628  2515  1000          TAD 0000
1629  2516  7041          CIA
1630  2517  1010          TAD 0010
1631  2520  7440          SZA
1632  2521  7402          HLT               /PC FAILED DURING PI
1633  2522  6214          RDF
1634  2523  6224          RIF
1635  2524  7640          SZA CLA
1636  2525  7402          HLT               /SHOULD BE 0 AFTER PI
1637  2526  6304          GTF
1638  2527  0117          AND K0077
1639  2530  7041          CIA
1640  2531  1260          TAD IFDF
1641  2532  7440          SZA
1642  2533  7402          HLT               /GTF OR RTF OR SF FAILED
1643  2534  1010          TAD 0010
1644  2535  7001          IAC
1645  2536  7640          SZA CLA
1646  2537  5261          JMP IFDF+1
1647  2540  2031          ISZ STKS
1648  2541  7410          SKP
1649  2542  5750          JMP I XTRMF
1650  2543  7300          CLA CLL
```

```
1651  2544  1120          TAD K0011
1652  2545  1260          TAD IFDF
1653  2546  3260          DCA IFDF        /SET FOR NEXT FIELD
1654  2547  5256          JMP IFDF -2
1655  2550  1950    XTRMF, TRMF
1656                      /
1657
1658
1659                      /TEST 15
1660                      /TEST TIME SHARE IN FIELD 0,
1661                      /ALL HLT, OSR, AND IOT INSTRUCTIONS
1662                      /SHOULD TRAP IN USER MODE.
1663                      /
1664        2600          *2600
1665                      /
1666  2600  7300    T1,   CLA CLL
1667  2601  6007          CAF
1668  2602  6264          CUF
1669  2603  6204          CINT
1670  2604  1021          TAD ISZ0
1671  2605  3001          DCA 1
1672  2606  1020          TAD JMP10
1673  2607  3002          DCA 2
1674  2610  6007          CAF
1675  2611  7410          SKP
1676  2612  5212          JMP ,           /CAF TRAPED
1677  2613  6001          ION
1678  2614  7410          SKP
1679  2615  5215          JMP ,           /ION TRAPED
1680  2616  6032          KCC
1681  2617  7410          SKP
1682  2620  5220          JMP ,           /KCC TRAPED
1683  2621  6002          IOF
1684  2622  7410          SKP
1685  2623  5223          JMP ,           /IOF TRAPED
1686  2624  6004          GTF
1687  2625  7410          SKP
1688  2626  5226          JMP ,           /GTF TRAPED
1689                      /THESE INSTRUCTIONS SHOULD TRAP
1690  2627  6001    T2,   ION
1691  2630  6274          CUF+10          /USER MODE
1692  2631  5232          JMP ,+1
1693  2632  7402          HLT
1694  2633  5233          JMP ,           /HLT DID NOT TRAP
1695                      /EXECUTIVE MODE
1696  2634  6254          SINT            /SKIP ON TRAP FLAG
1697  2635  5235          JMP ,           /FLAG NOT UP
1698  2636  6204          CINT            /CLEAR TRAP FLAG
1699  2637  6254          SINT            /SKIP ON TRAP FLAG
1700  2640  7410          SKP
1701  2641  5241          JMP ,           /TRAP FLAG STILL SET
1702  2642  7004          LAS             /SHOULD NOT TRAP
1703  2643  7410          SKP
1704  2644  5244          JMP ,           /LAS TRAPED IN EXECUTIVE MODE
1705  2645  6244          RMF             /RESTORE USER
```

```
1706  2646  6001          ION
1707  2647  5250          JMP .+1         /GO TO USER
1708                      /USER MODE
1709  2650  7404          OSR             /SHOULD TRAP ON OSR
1710  2651  5251          JMP .           /DID NOT TRAP
1711                      /EXECUTIVE MODE
1712  2652  6254          SINT            /SKIP ON TRAP FLAG
1713  2653  5253          JMP .           /DID NOT SKIP
1714  2654  6207          CAF             /CLEAR TRAP FLAG
1715  2655  6254          SINT            /TEST IF CLEARED
1716  2656  7410          SKP
1717  2657  7402          HLT             /TRAP FLAG NOT CLEARED
1718  2660  7404          OSR             /SHOULD NOT TRAP
1719  2661  7410          SKP
1720  2662  5262          JMP .           /ORS TRAPED IN EXECUTIVE MODE
1721  2663  6244          RMF             /RESTORE MODE
1722  2664  6001          ION
1723  2665  5266          JMP .+1         /GO TN USER
1724
1725                      /USER MODE
1726  2666  6005          RTF             /MAKE THE FLAGS
1727  2667  5267          JMP .           /RTF FAILED TO TRAP
1728                      /EXECUTIVE MODE
1729  2670  6254          SINT
1730  2671  5271          JMP .           /TRAP FLAG NOT SET
1731  2672  6204          CINT            /CLEAR TRAP FLAG
1732  2673  6254          SINT            /TEST IF CLEARED
1733  2674  7410          SKP
1734  2675  7402          HLT             /TRAP FLAG NOT CLEARED
1735  2676  6204          GTF             /SHOULD NOT TRAP
1736  2677  7410          SKP
1737  2700  5301          JMP .           /TRAPED IN EXECUTIVE MODE
1738  2701  6244          RMF             /RESTORE MODE
1739  2702  6001          ION
1740  2703  5304          JMP .+1         /GO TO USER
1741                      /USER MODE
1742
1743  2704  6001          ION
1744  2705  5305          JMP .           /ION DID NOT TRAP
1745
1746                      /EXECUTIVE MODE
1747  2706  6254          SINT            /SKIP ON TRAP FLAG
1748  2707  5307          JMP .           /TRAP FLAG NOT SET
1749  2710  7300          CLA CLL
1750  2711  6204          GTF
1751  2712  0126          AND K0100
1752  2713  7450          SNA
1753  2714  7402          HLT             /SUF NOT SET
1754  2715  6204          CINT            /CLEAR TRAP FLAG
1755  2716  6254          SINT            /TEST IF CLEARED
1756  2717  7410          SKP
1757  2720  7402          HLT             /FLAG NOT CLEARED
1758  2721  6002          IOF             /SHOULD NOT TRAP
1759  2722  7410          SKP
1760  2723  5323          JMP .           /IOF TRAPED IN EXECUTIVE MODE
```

```
1761    2724  6244            RMF             /RESTORE MODE
1762    2725  6001            ION
1763    2726  5327            JMP .+1         /GO TO USER
1764                  /USER MODE
1765                  /TEST CUF AND CUF+10
1766    2727  7604            LAS
1767    2730  5330            JMP .           /DID NOT TRAP
1768                  /EXECUTIVE MODE
1769    2731  6204            CINT
1770    2732  6244            RMF
1771    2733  6264            CUF             /STAY IN EXECUTIVE MODE
1772    2734  6001            ION
1773    2735  5336            JMP .+1
1774    2736  7404            OSR
1775    2737  7410            SKP
1776    2740  5340            JMP .           /CUF DID NOT WORK
1777                  /TEST THAT INSTRUCTION ARE INHIBITED WHILE IN USER MODE
1778    2741  6204            CINT
1779    2742  6274            CUF+10          /SET USER
1780    2743  6001            ION
1781    2744  5345            JMP .+1         /GO TO USER
1782                  /USER MODE
1783    2745  7240            CMA CLA         /AC=7777
1784    2746  7604            LAS             /SHOULD CLEAR AC
1785    2747  5347            JMP .           /DID LAS TRAP
1786                  /EXECUTIVE MODE
1787    2750  7440            SZA
1788    2751  7402            HLT             /LAS CHANGED AC
1789    2752  6204            CINT
1790    2753  6244            RMF
1791    2754  6001            ION
1792    2755  5356            JMP .+1
1793                  /USER MODE
1794    2756  7200            CLA
1795    2757  7404            OSR             /SHOULD NOT READ SR
1796    2760  5360            JMP .
1797                  /EXECUTIVE MODE
1798    2761  7440            SZA
1799    2762  7402            HLT             /OSR CHANGED AC
1800    2763  6204            CINT
1801    2764  6244            RMF
1802    2765  6001            ION
1803    2766  5367            JMP .+1
1804
1805                  /USER MODE
1806    2767  7240            CLA CMA
1807    2770  7602            HLT CLA         /SHOULD CLA
1808    2771  5371            JMP .           /DID HLT TRAP
1809                  /EXECUTIVE MODE
1810    2772  7440            SZA
1811    2773  7402            HLT             /(HLT CLA) DID NOT CLEAR
1812    2774  6204            CINT
1813    2775  6003            SRQ
1814    2776  7410            SKP
1815    2777  7402            HLT             /INTERRUPT REQUEST
```

```
1816    3000  7300          CLA CLL
1817    3001  1126          TAD K0100
1818    3002  6005          RTF             /ENABLE USER
1819
1820    3003  6001          ION
1821    3004  7000          NOP
1822    3005  5206          JMP .+1
1823                  /USER MODE
1824    3006  6032          KCC
1825    3007  5207          JMP .           /DID KCC TRAP
1826                  /EXECUTIVE MODE
1827    3010  6003          SRQ             /IS USER FLAG SET
1828
1829    3011  5210          JMP .-1
1830    3012  6204          CINT
1831    3013  7300          CLA CLL
1832    3014  1126          TAD K0100
1833    3015  6005          RTF
1834    3016  7300          CLA CLL
1835    3017  6001          ION
1836    3020  5221          JMP .+1         /ENTER USER
1837                  /USER MODE
1838    3021  6004          GTF
1839    3022  5222          JMP .           /DID GTF TRAP
1840                  /EXECUTIVE MODE
1841    3023  0126          AND K0100
1842    3024  7440          SZA             /DID GTF GET USER
1843    3025  7402          HLT
1844    3026  6003          SRQ             /IS USER FLAG SET
1845    3027  5225          JMP .-1
1846    3030  6204          CINT
1847    3031  6214          RMF
1848    3032  6001          ION
1849    3033  5234          JMP .+1
1850                  /USER MODE
1851    3034  6004          GTF
1852    3035  5235          JMP .           /GTF DID NOT TRAP
1853                  /EXECUTIVE MODE
1854    3036  6254          SINT            /SKIP ON TRAP FLAG
1855    3037  5237          JMP .           /FLAG NOT UP
1856    3040  6204          CINT            /CLEAR TRAP FLAG
1857    3041  6254          SINT            /SKIP ON TRAP FLAG
1858    3042  7410          SKP
1859    3043  5243          JMP .           /TRAP FLAG STILL SET
1860    3044  6001          ION
1861    3045  7410          SKP
1862    3046  5246          JMP .           /ION TRAPED IN EXECUTIVE MODE
1863    3047  6244          RMF             /RESTORE USER
1864    3050  5251          JMP .+1         /GO TO USER
1865                  /USER MODE
1866    3051  6202          CIF             /SHOULD TRAP ON CIF
1867    3052  5252          JMP .           /DID NOT TRAP
1868                  /EXECUTIVE MODE
1869    3053  6254          SINT            /SKIP ON TRAP FLAG
1870    3054  5254          JMP .           /DID NOT SKIP
```

```
1871    3055  6204            CINT            /CLEAR TRAP FLAG
1872    3056  6254            SINT            /TEST IF CLEARED
1873    3057  7410            SKP
1874    3060  7402            HLT             /TRAP FLAG NOT CLEARED
1875    3061  6202            CIF             /SHOULD NOT TRAP
1876    3062  7410            SKP
1877    3063  5263            JMP .           /CIF TRAPED IN EXECUTIVE MODE
1878    3064  6244            RMF             /RESTORE MODE
1879    3065  6001            ION
1880    3066  5267            JMP .+1         /GO TO USER
1881
1882
1883                    /USER MODE
1884    3067  6214            RDF             /READ DATA FIELD
1885    3070  5270            JMP .           /DID RDF TRAP
1886                    /EXECUTIVE MODE
1887    3071  6254            SINT
1888    3072  5272            JMP .           /TRAP FLAG NOT SET
1889    3073  6204            CINT            /CLEAR TRAP FLAG
1890
1891    3074  6254            SINT            /TEST IF CLEARED
1892    3075  7410            SKP
1893    3076  7402            HLT             /TRAP FLAG NOT CLEARED
1894    3077  6214            RDF             /SHOULD NOT TRAP
1895    3100  7410            SKP
1896    3101  5301            JMP .           /TRAPED IN EXECUTIVE MODE
1897                    /EXECUTIVE MODE
1898    3102  6040            SPF             /FLAG SHOULD WORK
1899
1900    3103  6041            TSF
1901    3104  5304            JMP .-1         /SHOULD SKP
1902    3105  6003            SRQ
1903    3106  5305            JMP .-1         /SHOULD SKP
1904    3107  6001            ION
1905    3110  7200            CLA CLL
1906    3111  5311            JMP .           /DID PI WORK
1907    3112  1126            TAD K0100
1908    3113  6005            RTF
1909    3114  6007            CAF
1910    3115  6001            ION
1911    3116  5317            JMP .+1
1912                    /USER MODE
1913    3117  6007            CAF
1914    3120  5320            JMP .           /DID CAF TRAP
1915                    /EXECUTIVE MODE
1916    3121  6003            SRQ
1917    3122  7402            HLT             /USER FLAG UP
1918    3123  6007            CAF
1919    3124  6254            SINT
1920    3125  7410            SKP
1921    3126  7402            HLT             /FLAG CLEARED
1922                    /TEST THAT TTI DOES NOT CHANGE AC
1923    3127  7240            CLA CMA         /AC=7777
1924    3130  7120            STL             /LINK=1
1925    3131  6274            CUF+10
```

```
1926    3132  6001            ION
1927    3133  5334            JMP .+1
1928                  /USER MODE
1929    3134  6036            KRB             /SHOUDLD NOT ZERO LINK OR SHIFT AC
1930    3135  5335            JMP .
1931                  /EXECUTIVE MODE
1932    3136  7040            CMA
1933    3137  7440            SZA             /AC SHOULD=0000
1934    3140  5340            JMP .           /AC WAS CHANGED
1935    3141  7420            SNL             /LINK SHOULD EQUAL 1
1936    3142  5342            JMP .           /LINK WAS CHANGE
1937    3143  6254            SINT            /SKIP ON TRAP FLAG
1938    3144  5344            JMP .           /TRAP FLAG NOT SET
1939    3145  6204            CINT
1940    3146  6244            RMF
1941    3147  6001            ION
1942    3150  5351            JMP .+1
1943                  /USER MODE
1944    3151  6040            SPF             /FLAG
1945    3152  5352            JMP .           /DID SPF TRAP
1946                  /EXECUTIVE MODE
1947    3153  6041            TSF
1948    3154  7410            SKP
1949    3155  7402            HLT             /TTY FLAG
1950    3156  6254            SINT
1951    3157  5357            JMP .           /TRAP FLAG NOT SET
1952    3160  6204            CINT            /CLEAR TRAP FLAG
1953    3161  6244            RMF
1954    3162  6001            ION
1955    3163  5764            JMP I .+1       /GO TO USER
1956    3164  3200            .177+1
1957
1958          3200    *.177+1
1959
1960                  /USER MODE
1961
1962    3200  6001            ION
1963    3201  5201            JMP .           /ION DID NOT TRAP
1964                  /EXECUTIVE MODE
1965    3202  6254            SINT            /SKIP ON TRAP FLAG
1966    3203  5203            JMP .           /TRAP FLAG NOT SET
1967    3204  6204            CINT            /CLEAR TRAP FLAG
1968    3205  6254            SINT            /TEST IF CLEARED
1969    3206  7410            SKP
1970    3207  7402            HLT             /FLAG NOT CLEARED
1971    3210  6002            IOF             /SHOULD NOT TRAP
1972    3211  7410            SKP
1973    3212  5212            JMP .           /IOF TRAPED IN EXECUTIVE MODE
1974    3213  6244            RMF             /RESTORE MODE
1975    3214  6001            ION
1976    3215  5216            JMP .+1         /GO TO USER
1977                  /USER MODE
1978                  /TEST CUF AND CUF+10
1979    3216  6224            RIF
1980    3217  5217            JMP .           /DID NOT TRAP
```

```
1981                    /EXECUTIVE MODE
1982    3220  6204              CINT
1983    3221  6244              RMF
1984    3222  6264              CUF             /STAY IN EXECUTIVE MODE
1985    3223  5224              JMP .+1
1986    3224  7404              OSR
1987    3225  7410              SKP
1988    3226  5226              JMP .           /CUF DID NOT WORK
1989                    /EXECUTIVE MODE
1990    3227  7240              CLA CMA
1991    3230  6274              CUF +10         /SET UP USER
1992    3231  6001              ION
1993    3232  5233              JMP .+1
1994                    /USER MODE
1995    3233  7402              HLT             /SHOULD TRAP
1996    3234  5234              JMP .           /DID HLT TRAP
1997                    /EXECUTIVE MODE
1998    3235  6203              CDF CIF
1999    3236  6264              CUF             /SETUP FOR EXECUTIVE
2000    3237  6204              CINT            /CLEAR INTERRUPT
2001    3240  6001              ION
2002    3241  5242              JMP .+1
2003    3242  7004              LAS             /SHOULD NOT TRAP
2004    3243  7410              SKP
2005    3244  5244              JMP .
2006    3245  7450              SNA             /SR AND AC SHOULD NOT EQUAL ZERO
2007    3246  5246              JMP .           /LAS WAS INHIBITED
2008
2009                    /TEST HLT AND SKIP
2010    3247  6274              CUF+10          /USER SETUP
2011    3250  6001              ION
2012    3251  5252              JMP .+1         /GO TO USER
2013                    /USER MODE
2014    3252  7412              SKP HLT         /SHOULD TRAP
2015    3253  5253              JMP .           /DID NOT TRAP
2016    3254  5254              JMP .           /SKP DID NOT INDEX PC,
2017                    /EXECUTIVE MODE
2018    3255  6254              SINT            /SKP ON TRAP FLAG
2019    3256  5256              JMP .
2020    3257  6204              CINT            /CLEAR FLAG
2021    3260  6254              SINT            /IS IT CLEAR
2022    3261  7410              SKP             /YES
2023    3262  5262              JMP .           /NO-FLAG NO CLEAR
2024
2025                    /LOOP PROGRAM
2026    3263  2266              ISZ .+3         /DO FIRST SECTION 4096
2027    3264  5661              JMP I TIME
2028    3265  7410              SKP
2029    3266  0000              0               /COUNT FOR LOOP
2030    3267  5670              JMP I .+1
2031    3270  3400              . 177+1
2032
2033
2034          3400    *. 177+1
2035
```

```
2036                    /TEST THAT ALL IOTS TRAP IN USER MODE
2037    3400    7200            CLA
2038    3401    1125            TAD K6000       /BASIC IOT
2039    3402    3207            DCA INST        /SET UP
2040    3403    6274    IOTST,  CUF+10          /SET FOR USER
2041    3404    6204            CINT            /CLEAR FLAG
2042    3405    6001            ION
2043    3406    5207            JMP ,+1         /GO TO USER MODE
2044                    /USER MODE
2045    3407    6000    INST,   6000            /IOT THAT FAILED
2046    3410    5210            JMP ,           /IOT DID NOT TRAP
2047                    /EXECUTIVE MODE
2048    3411    6254            SINT            /SKIP ON TRAP FLAG
2049    3412    5212            JMP ,           /TRAP FLAG NOT SET
2050    3413    6204            CINT            /CLEAR FLAG
2051    3414    6254            SINT
2052    3415    7610            SKP CLA
2053    3416    7402            HLT             /FLAG DID NOT CLEAR
2054    3417    2207            ISZ INST        /CREATE NEW INSTRUCTION
2055    3420    1207            TAD INST        /TESTED ALL IOT?
2056    3421    7130            AND K1000
2057    3422    7650            SNA CLA
2058    3423    5203            JMP IOTST       /NO -- TEST THE REST
2059
2060                    /TEST THAT ALL (HLT AND OSR) TRAP IN USER MODE
2061    3424    1124            TAD K7402       /BASIC HALT INST
2062    3425    3232            DCA INSTA       /SET UP
2063    3426    6274    HALTA,  CUF+10          /SET FOR USER
2064    3427    6204            CINT            /CLEAR FLAG
2065    3430    6001            ION
2066    3431    5232            JMP ,+1         /GO TO USER MODE
2067                    /USER MODE
2068    3432    7406    INSTA,  HLT OSR         /OPERATE TRAP INST
2069    3433    5233            JMP ,           /DID NOT TRAP
2070                    /EXECUTIVE MODE
2071    3434    7000            NOP             /FOR (HLT,SKP)(OSR,SKP)
2072    3435    6254            SINT            /SKIP ON TRAP FLAG
2073    3436    5236            JMP ,           /TRAP FLAG NOT SET
2074    3437    6204            CINT            /CLEAR FLAG
2075    3440    6254            SINT
2076    3441    7610            SKP CLA
2077    3442    7402            HLT             /FLAG DID NOT CLEAR
2078    3443    1232            TAD INSTA
2079    3444    1123            TAD K0004       /GENERATE ALL GROUPS OF
2080    3445    3232            DCA INSTA       /HALTS AND OSR
2081    3446    1232            TAD INSTA
2082    3447    1122            TAD K0002
2083    3450    7640            SZA CLA         /GENERATED ALL
2084    3451    5226            JMP HALTA       /NO - TEST THE REST
2085    3452    6244            RMF
2086    3453    6254            CUF
2087    3454    6001            ION
2088    3455    5256            JMP ,+1
2089    3456    6002            IOF             /SHOULD NOT TRAP
2090    3457    6254            SINT
```

```
2091  3460  7410          SKP
2092  3461  7402          HLT             /TRAP FLAG SET
2093  3462  6340          SPF
2094  3463  6041          TSF             /SHOULD SKP
2095  3464  5263          JMP .-1
2096  3465  6301          ION
2097  3466  7410          SKP
2098  3467  7402          HLT             /DID PI INTERRUPT
2099  3470  7402          HLT             /DID PC INCR,
2100
2101  3471  7300          CLA CLL
2102  3472  6004          GTF
2103  3473  0126          AND K0100
2104  3474  7440          SZA
2105  3475  7402          HLT             /SUF SET
2106  3476  7300          CLA CLL
2107  3477  6007          CAF
2108  3500  6264          CUF
2109  3501  7000          NOP
2110                /
2111                /TEST 16
2112                /TEST TIME SHARE IN EXTENDED MEMORY
2113                /NOW TEST USER MODE TRAP IN ALL EXTENDED FIELDS
2114                /IF TRAP ERROR OCCURS HLT IN THAT FIELD
2115                /USE RTF TO SET USER MODE AND GTF TO GET THE FLAGS
2116                /TEST ALL IOT'S FOR TRAP AND RETURN
2117                /
2118  3502  7300    RIG2,   CLA CLL
2119  3503  6007          CAF
2120  3504  4476          JMS I XSTKS     /CHECK NO, OF FIELDS PRESENT
2121  3505  1763          TAD KCDF
2122  3506  1345          TAD K10
2123  3507  3635          DCA SRD         /SET DF FOR FIRST FIELD
2124  3510  1761          TAD KCIF
2125  3511  1345          TAD K10
2126  3512  3647          DCA SRI         /SET IF FOR FIRST FIELD
2127  3513  1144    STAN,   TAD K5577       /GET START OF PROGRAM -1
2128  3514  3010          DCA 10
2129  3515  1145          TAD K7745       /NO. OF INSTRUCTIONS TO TRANSFER
2130  3516  3643          DCA SRCO
2131  3517  7040          CMA
2132  3520  3411          DCA 11          /START AT 0000
2133
2134  3521  1635          TAD SRD         /MAKE FLAGS FOR RETURN CHECK
2135  3522  0411          AND K0070
2136  3523  7110          RAR
2137  3524  7012          RTR
2138  3525  3112          DCA XSAV
2139  3526  1647          TAD SRI
2140  3527  0411          AND K0070
2141  3530  1112          TAD XSAV
2142  3531  1142          TAD K1100
2143  3532  3776          DCA I XFDCON
2144  3533  6201          CDF 00
2145  3534  1410          TAD I 10
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2146    3535  6201    SRD,    CDF 00
2147    3536  3411            DCA I 11        /STORE INSTRUCTIONS
2148    3537  2143            ISZ SRCO
2149    3540  5533            JMP SRD-2
2150    3541  1021            TAD ISZ0
2151    3542  3001            DCA 1           /SET FIELD 0 FOR RETURN
2152    3543  1347            TAD SRI
2153    3544  3002            DCA 2
2154    3545  1020            TAD JMPI0
2155    3546  3003            DCA 3
2156    3547  6202    SRI,    CIF 00
2157    3550  5002            JMP 2           /GO TO FIELD UNDER TEST
2158    3551  7300    SRRET,  CLA CLL
2159    3552  2031            ISZ STKS
2160    3553  7410            SKP             /MORE FIELDS
2161    3554  5364            JMP EXITT       /GO TO CONTROL
2162    3555  1335            TAD SRD         /SET UP FOR NEXT FIELD
2163    3556  1045            TAD K10
2164    3557  3335            DCA SRD
2165    3560  1347            TAD SRI
2166    3561  1045            TAD K10
2167    3562  3347            DCA SRI
2168    3563  5613            JMP STAN        /TEST THIS FIELD
2169    3564  7300    EXITT,  CLA CLL         /TEST DONE GO TO BEGIN
2170    3565  6007            CAF
2171    3566  6264            CUF
2172    3567  1151            TAD TTB
2173    3570  3547            DCA I XELL
2174    3571  7604            LAS
2175    3572  7700            SMA CLA
2176    3573  5557            JMP I XBELL
2177    3574  7402            HLT             /TIME SHARE ENABLED
2178                            /AN ERROR CONDITION  EXISTS,
2179    3575  5552            JMP I XTRAP     /HIT CONTINUE TRY AGAIN
2180    3576  3662    XFDCON, FDCON
2181                    /
2182                    /INSTRUCTIONS TO BE TRANSFERED TO FIELDS
2183                    /
2184            3600    *3600
2185                    /
2186    3600  7402            HLT             /SHOULD NOT HLT HERE
2187    3601  7402            HLT             /SHOULD NOT TRAP HERE
2188    3602  7300    FDGO,   CLA CLL
2189    3603  1232            TAD FDCON       /GET USER BIT
2190    3604  6005            RTF             /SET FOR USER
2191    3605  5206            JMP ,+1         /GO TO USER
2192                    /USER MODE
2193    3606  6000    IOTX,   IOT
2194    3607  5207            JMP ,           /DID IOT TRAP
2195                    /EXECUTIVE MODE
2196    3610  7300            CLA CLL
2197    3611  6004            GTF             /GET THE FLAGS
2198    3612  7041            CIA
2199    3613  1232            TAD FDCON       /FLAGS THAT SHOULD BE PRESENT
2200    3614  7640            SZA CLA
```

```
2201    3615  7402            HLT             /CHECK THE FLAGS
2202    3616  6003            SRQ
2203    3617  5216            JMP .-1         /IS TRAP FLAG SET
2204    3620  6204            CINT
2205    3621  2206            ISZ IOTX
2206    3622  1206            TAD IOTX
2207    3623  1231            TAD F1000
2208    3624  7640            SZA CLA
2209    3625  5202            JMP FDGO
2210    3626  6202            CIF
2211    3627  5630            JMP I FRET      /TEST DONE GO TO FIELD 0
2212    3630  3551    FRET,   SRRET
2213    3631  1000    F1000,  1000
2214    3632  0000    FDCON,  0000
2215                    /
2216                    /CHECK SR0=1 FOR MEMORY EXTENSION ONLY
2217                    /
2218    3633  7300    XSR0,   CLA CLL
2219    3634  7604            LAS
2220    3635  7700            SMA CLA
2221    3636  5631            JMP I TIME
2222    3637  6007            CAF
2223    3640  1151            TAD TTB
2224    3641  3547            DCA I XELL
2225    3642  5630            JMP I XBELL
2226                    /
2227    3643  7300    TRAP,   CLA CLL
2228    3644  1153            TAD ATRAP
2229    3645  3001            DCA 1           /SET FOR RETURN
2230    3646  6076            SUF             /SET FOR USER
2231    3647  6004            ION
2232    3650  5001            JMP .+1         /GO TO USER
2233    3651  7402            HLT             /TIME SHARE DISABLED, HIT
2234    3652  6034            SINT            /CONTINUE TO LOOP ON CONTROL,
2235    3653  7410            SKP
2236    3654  7402            HLT             /ERROR, TRAP INT, RQST, UP
2237    3655  6264            CUF
2238    3656  6007            CAF
2239    3657  5527            JMP I PLACE     /GO TO BEGIN
2240                    /
2241                    /TEST 07
2242                    /CONFIDENCE CHECK ON ALL EXISTENT FIELDS,
2243                    /MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK,
2244                    /MAKE SURE JUMP IS TO CORRECT STACK,
2245                    /CHECK ALL COMBINATIONS,
2246                    /FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC,0
2247                    /
2248            4000    *4000
2249                    /
2250    4000  0000    CON1,   0000            /FIRST FILL CORE, ALL STACKS
2251    4001  7300            CLA CLL         /DCA I FOR 32K
2252    4002  3323            DCA FDNUM
2253    4003  3324            DCA NUMX
2254    4004  1040            TAD KCDF
2255    4005  3232            DCA CONX
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2256  4006  1110          TAD K7770
2257  4007  3627          DCA MSTKS       /SET FOR MAX, 32K
2258  4010  1110          TAD K7770
2259  4011  3031          DCA STKS
2260  4012  1040          TAD KCDF
2261  4013  3214          DCA ,+1
2262  4014  6201  FDWRD,   CDF             /MODIFIED UNDER TEST
2263  4015  4307          JMS FILCOR
2264  4016  2031          ISZ STKS        /ARE ALL STACKS DONE
2265  4017  5222          JMP ,+3
2266  4020  4252          JMS CONCHK      /CHECK RESULTS
2267  4021  5227          JMP CON2
2268  4022  1045          TAD K10
2269  4023  1214          TAD FDWRD
2270  4024  3214          DCA FDWRD       /UPDATE FIELD CHANGE
2271  4025  2324          ISZ NUMX
2272  4026  5214          JMP FDWRD
2273                      /
2274  4027  7300  CON2,    CLA CLL         /DO ONE AT A TIME
2275  4030  1323          TAD FDNUM
2276  4031  3324          DCA NUMX
2277  4032  6201  CONX,    CDF
2278  4033  4307          JMS FILCOR
2279  4034  6203          CDF CIF
2280  4035  4252          JMS CONCHK
2281  4036  7300          CLA CLL
2282  4037  1232          TAD CONX
2283  4040  1045          TAD K10
2284  4041  3232          DCA CONX        /UPDATE FIELD CHANGE
2285  4042  2323          ISZ FDNUM
2286  4043  2027          ISZ MSTKS       /ARE ALL STACKS DONE
2287  4044  5227          JMP CON2
2288  4045  6203          CDF CIF
2289  4046  6007          CAF
2290  4047  2027          ISZ LOOP        /DO 4096 TIMES
2291  4050  5201          JMP CON1 +1
2292  4051  5600          JMP I CON1      /TEST COMPLETE
2293                      /
2294  4052  0000  CONCHK,  0000            /CHECK ALL AVAILABLE STACKS
2295  4053  7300          CLA CLL
2296  4054  3324          DCA NUMX
2297  4055  7604          LAS
2298  4056  0044          AND K7
2299  4057  7040          CMA
2300  4060  3031          DCA STKS        /STACKS PRESENT
2301  4061  1041          TAD KCIF
2302  4062  3263          DCA ,+1         /START WITH FIELD 0
2303  4063  6202  CONCH,   CIF             /MODIFIED UNDER TEST
2304  4064  5541          JMP I K0001
2305  4065  7041  RETADD,  CIA             /RETURN HERE FROM FIELDS
2306  4066  1324          TAD NUMX
2307  4067  7650          SNA
2308  4070  5276          JMP ,+6         /GOOD FIELD
2309  4071  3112          DCA XSAV
2310  4072  1263          TAD CONCH
```

```
2311    4073  0111          AND K0070
2312    4074  1112          TAD XSAV        /INCORRECT STACK REFERENCED,
2313    4075  7402          HLT             /AC BITS 6-8 GOOD FIELD,
2314    4076  7300          CLA CLL         /AC BITS 9-11 BAD FIELD,
2315    4077  2031          ISZ STKS
2316    4100  7410          SKP             /CHECK ALL AVAILABLE STACKS,
2317    4101  5652          JMP I CONCHK
2318    4102  1263          TAD CONCH
2319    4103  1045          TAD K10
2320    4104  3263          DCA CONCH       /UPDATE FIELD CHANGE
2321    4105  2324          ISZ NUMX
2322    4106  5263          JMP CONCH
2323                  /
2324    4107  0000    FILCOR, 0000          /INSTRUCTIONS FOR FIELDS
2325    4110  1324          TAD NUMX        /MODIFIED TO DF#
2326    4111  3537          DCA I K0000
2327    4112  1130          TAD K1000
2328    4113  3541          DCA I K0001
2329    4114  1041          TAD KCIF
2330    4115  3522          DCA I K0002
2331    4116  1326          TAD JMPRET
2332    4117  3540          DCA I K0003
2333    4120  1525          TAD XRETAD
2334    4121  3523          DCA I K0004
2335    4122  5747          JMP I FILCOR
2336                  /
2337    4123  0000    FDNUM,  0000
2338    4124  0000    NUMX,   0000
2339    4125  4165    XRETAD, RETADD
2340    4126  5404    JMPRET, JMP I 4
2341    4127  0000    MSTKS,  0000
2342                  $
```

```
0000  11110000  00000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110

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

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000000

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111000  00000000  00000000  00000000  00000000

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

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11100000  00000000  00000000  00000000

2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111110  00000000  00000000  00000000  00000000  00000000

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000

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

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

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000
3300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110

3600  11111111  11111111  11111111  11111111  11111111  11111111  00000000  00000000
3700  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  00000000  00000000  00000000  00000000  00000000
4200
4300
4400
4500
4600
4700

5000
5100
5200
5300
5400
5500
5600
5700

6000
6100
6200
6300
6400
6500
6600
6700

7000
7100
7200
7300
7400
7500
7600
7700
```

```
ADRS    2510    DONE0   2266    K0004   0123    KNTR    0102
AGAIN1  0711    ENTER   1200    K0011   0120    KRB     6036
AGAIN2  1005    EXFD    1316    K0017   0132    KRTN    0106
ALLO    2244    EXFLD   1302    K0070   0111    KXFLD   0100
ATRAP   0153    EXITT   3564    K0077   0117    LBTP    1515
BEGIN   0203    F1000   3631    K0100   0126    LBTSTC  1675
BEGIN1  0200    FCO     0154    K1      0043    LOOP    0027
BELL    1555    FDCON   3632    K10     0045    MDFSHB  1740
CAA     0653    FDGO    3602    K1000   0130    MGTF    2276
CAB     0754    FDNUM   4123    K1100   0142    MIFSHB  1742
CAC     0755    FDWRD   4014    K1200   0116    MOVE    1463
CAD     0741    FILCOR  4107    K20     0103    MSTKS   4127
CAE     1036    FILDX   1516    K3577   0144    N1      2043
CAF     6007    FILL    2076    K5200   0115    N2      2042
CAG     1420    FRET    3630    K6000   0125    NDF     0030
CAI     1133    GOTO0   1510    K6001   0133    NEWDF   1440
CAX     2263    GTF     6004    K7      0044    NOFLD   0034
CDF     6201    GTF1    2271    K7000   0047    NOMEM   2200
CDF0S   2245    HALTA   3426    K7402   0124    NOSTAK  0033
CHDF    1074    HLTS    0671    K7700   0121    NSTKS   2435
CHECK   0112    IB0     0345    K7707   0050    NUMX    4124
CIF     6202    IB1     0354    K7717   0056    OK1     0231
CIFCK   0753    IB2     0402    K7727   0055    OK2     0257
CIFCK1  1046    IB3     0421    K7737   0054    OK3     0305
CIFJMP  0723    IB4     0444    K7744   0071    OK4     0333
CIFJMS  1017    IB5     0463    K7745   0145    OK5     0373
CIFJPL  0715    IB6     0506    K7747   0053    OK6     0440
CIFJSL  1011    IB7     0525    K7757   0052    OK7     0502
CINT    6204    IBSF    0656    K7766   0067    OK8     0544
CKPC    1026    IBSF1   1000    K7767   0051    P       2044
CNSTK   2201    IFCN    1605    K7770   0110    PLACE   0127
CON1    0000    IFDF    2460    K7771   0064    POINT   0065
CON2    4007    INST    3407    K7772   0063    POS     2237
CONCH   0763    INSTA   3432    K7773   0062    RANA    2057
CONCHK  4002    INTE    1663    K7774   0061    RDF     6214
CONX    4002    INTEP   1674    K7775   0060    REPEAT  1733
CUF     6264    IOF     6002    K7776   0057    RET     2511
DAT     0032    ION     6001    K7777   0046    RETADD  4065
DATER   2047    ION1    2331    K7S     0066    RIB     6234
DCAI    0001    IOT     6000    KCAI    0036    RIF     6224
DF0     0211    IOTST   3403    KCAIM   0035    RIG1    2452
DF1     0230    IOTX    3606    KCC     6032    RIG2    3502
DF2     0246    ISZ0    0021    KCDF    0040    RMF     6244
DF3     0263    JMP2    0104    KCDF1   0156    RMFCN1  1676
DF4     0274    JMPI0   0020    KCIF    0041    RMFDY   1703
DF5     0611    JMPI4   1702    KDATER  0157    RMFDY1  1710
DF6     0622    JMPIR   0134    KDFSHB  1737    RMFE1   1665
DF7     0220    JMPRET  4126    KFLD0   0105    RMFE2   1656
DFCN    1077    K0000   0137    KHLT    0037    RMFI1   1660
DFLD    0607    K0001   0141    KIFSHB  1741    RMFI2   1661
DFN     1446    K0002   0122    KJMP    0101    RMFL1   1633
DOAUTO  1517    K0003   0140    KNOP    0752    RMFL2   1621
```

RMFL3	1615	XNOM	2236
RMFTST	16ØØ	XRANS	ØØ25
RTF	6ØØ5	XRET	Ø135
RTF1	24ØØ	XRETAD	4125
RTRN	1427	XRIG1	2434
SFIB	14ØØ	XRMF	ØØ24
SINT	6254	XRTF1	2372
SKON	6ØØØ	XSAV	Ø112
SPF	624Ø	XSDF	23Ø4
SRCO	Ø143	XSRØ	3633
SRD	3535	XSRTF	24Ø7
SRI	3547	XSTKS	ØØ23
SRQ	6ØØ3	XTDF	ØØ76
SRRET	3551	XTDF1	ØØ77
STAN	3513	XTFLG	ØØ22
STDF	1127	XTOR	Ø114
STKS	ØØ31	XTRAP	Ø152
STRMF	11Ø7	XTRMF	255Ø
SUF	6274	XXSRØ	Ø146
T1	26ØØ		
T2	2627		
TADI	Ø622		
TAUTO	1632		
TFLD	Ø63Ø		
TFLC	2Ø43		
TIME	Ø161		
TRANS	1621		
TRAP	3643		
TRFLD	1337		
TRMF	[illegible]		
TSF	[illegible]		
TTR	Ø151		
XAUTO	ØØ2Ø		
XBELL	Ø152		
XCON1	2Ø73		
XCOUNT	Ø113		
XDATA	Ø1Ø6		
XDATER	Ø155		
XELL	Ø147		
XFD	ØØ42		
XFDCON	3276		
XFER	2ØØØ		
XFERC1	2Ø46		
XFERC2	2Ø45		
XFERIN	2Ø32		
XFERL1	2Ø3Ø		
XFERL2	2Ø17		
XFERP	17ØØ		
XFIB	Ø1Ø7		
XGTF1	1Ø47		
XION1	253Ø		
XMEM	17Ø1		

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 20 SECONDS

3K CORE USED

```
ADRS        1619    1623#
AGAIN1       530#    564
AGAIN2       580#    613
ALL0        1399    1411    1419#   1443
ATRAP        134#   2228
BEGIN        114     153#
BEGIN1       150#
BELL         130     131    1081#
CAA          471     484#
CAB          518     569#
CAC          520     570#
CAD          552     557#
CAE          601     606#
CAF           19#    154    1667    1674    1714    1909    1913    1918    2107    2119    2170    2222    2238    2289
CAG           97     926#    938
CAI           54      55     695#    827     832
CAX         1435#   1439
CDF            9#    137     160     169     185     195     212     222     238     248     268     283     309     326
             349     368     391     409     446     464     499     514     526     576     643     661     672     690
             714     724     763     769     772     775     861     863     869     871     873     877     879     883
             885     889     891     910     913     932     955     970     974     986     988    1069    1122    1148
            1159    1210    1214    1265    1267    1273    1297    1310    1420    1441    1465    1998    2144    2146
            2262    2277    2279    2288
CDFRS       1393    1408    1410    1420#
CHDF         661#    669     670
CHECK       1301    1330#   1341    1342
CIF           10#    540     590     691     710     713     725     836     933    1010    1070    1160    1211    1215
            1642    1866    1875    1998    2156    2210    2279    2288    2303
CIFCK        532     537     539     550     553     568#
CIFCK1       582     587     589     599     602     615#
CIFJNP       531     534     536     540#    559     569
CIFJNS       579     581     584     586     590#    608
CIFJPL       544#    562
CIFJSL       744#    611
CINT          18#   1669    1698    1731    1754    1769    1778    1789    1800    1812    1830    1846    1856    1871
             1889    1939    1952    1967    1982    2000    2020    2041    2050    2064    2074    2204
CKPC         715     728#
CNSTK       1407*   1412
CON1        1526    2250#   2291    2292
CON2        2267    2274#   2287
CONCH       2303#   2310    2318    2320    2322
CONCHK      2266    2280    2294#   2317
CONX        2265    2277#   2282    2284
CUF           16#    155    1668    1691    1771    1779    1925    1984    1991    1999    2010    2040    2063    2086
            2108    2171    2237
DAT           51#    466     467     483
DATER        136    1269#   1311
DCAI         440#    475
DF0          164#    166     179
DF1          184#    192     207
DF2          189     194#    204
DF3          211#    219     232
DF4          216     221#    229
```

```
                /20
RIF              12#   1203    1634    1979
RIG1           1564    1593#
RIG2           2118#
RMF              13#    711     717     934    1162    1705    1721    1738    1761    1770    1790    1801    1847    1863
               1878    1940    1953    1974    1983    2085
RMFCN1         1125    1166    1173#
RMFDY          1116    1161    1190#
RMFDY1         1163    1195#
RMFE1          1164#   1213
RMFE2          1157#   1217
RMFI1          1153    1159#
RMFI2          1156    1160#
RMFL1          1136#   1165
RMFL2          1126#   1167
RMFL3          1122#   1169
RMFTST         1024    1169#
RTF              20#   1497    1502    1510    1544    1602    1720    1818    1833    1908    2190
RTF1           1525    1536#
RTRN             96     937#
SFIB             98     906#    927
SINT             17#   1696    1699    1712    1715    1729    1732    1747    1755    1854    1857    1869    1872    1887
               1891    1919    1937    1950    1965    1968    2018    2021    2048    2051    2072    2075    2090    2234
SKON             24#    260
SPF              26#   1977    1898    1944    2093
SRCO            126#   2130    2148
SRD            2123    2134    2146#   2149    2162    2164
SRI            2126    2139    2152    2156#   2165    2167
SRO              25#   1813    1827    1844    1902    1916    2202
SRRET          2158#   2212
STAN           2127#   2168
STDF             89      90     682     685     686     690#    697
STKS            549     449     472     521     561     610     649     666     747    1019    1303    1570    1647    2159
               2252    2264    2300    2315
STRMF           673#    752
SUF              13#   2239
T1              115    1660#
T2             1694#
TADI            451     458#
TAUTO            47     939     955#
TFLD            464#    478     479     481     486
TFLG             63    1575#   1581
TIME            119#    134    2027    2221
TRANS            16     789     849#    892
TRAP            133    2227#
TRFLD           863#    867     874     880     886
TRNF             45     635#    650    1655
TSF              27#    272     527     577     673     906    1083    1157    1466    1578    1900    1947    2094
TTB             132#   2172    2223
XAUTO            47#
XBELL           131#   2176    2225
XCON1          1523    1526#
XCOUNT          102#   1480    1483    1559    1562
```