IDENTIFICATION

PRODUCT CODE: MAINDEC-12-D0CB

PRODUCT NAME: PDP-12 CP TEST III

DATE: NOVEMBER 1, 1971

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: RAYMOND SHOOP

CPTST3

RMODE
START 400
PRINTS NULL AFTER 7 SECONDS,
BEL EVERY 10 SECONDS

SET 7777 = 3301 for EMULATOR
(that should be the only corrupted location after running CPTST2)

1. ABSTRACT

PDP-12 CP TEST III, TESTS LINC MODE INSTRUCTIONS INCLUDING SPECIAL FUNCTION REGISTER, DJR, MUL, LDF, LIF INTERRUPT INHIBIT. THE PROGRAM, ONCE STARTED, WILL RUN CONTINUOUSLY AND RING THE TTY BELL ONCE EVERY PASS.

2. REQUIREMENTS

2.1 EQUIPMENT

A. STANDARD PDP-12 COMPUTER.
B. ASR-33 OR EQUIVALENT.

2.2 STORAGE

THIS PROGRAM OCCUPIES MEMORY LOCATION 0001 THRU 5777.

2.3 PRELIMINARY PROGRAMS

ALL PDP-12 DIAGNOSTIC PROGRAMS SHOULD HAVE BEEN SUCCESSFULLY RUN.

3. LOADING PROCEDURE

3.1 METHOD

LOAD THIS PROGRAM USING THE STANDARD METHOD OF LOADING A BINARY PROGRAM.

4. STARTING PROCEDURE

A. PLACE MODE SWITCH IN PDP-8 MODE.
B. DEPRESS I/O PRESET.
C. DEPRESS START 400, MACHINE WILL RUN CONTINUOUSLY AND RING THE TTY BELL EVERY 10 SECONDS.

5, OPERATING PROCEDURE

A, RSW 5 (0)="A" SYSTEM
RSW 5 (1)="B OR C" SYSTEM

6, ERRORS

ANY HALT IS AN ERROR, ALL ERRORS ARE EXPLAINED IN THE LISTING AS THE EXPECTED VALUES OF THE NEED REGISTERS,

7, RESTRICTIONS

A, PROGRAM MUST BE EXECUTED IN FIELD 0,
B, STANDARD PDP-12,

8, EXECUTION TIME

UPON COMPLETION OF A PASS THE TTY BELL WILL RING EVERY 10 SECONDS,

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                /PDP-12 CP TEST III MAINDEC-12-D0CB
                /COPYRIGHT 1970,1971 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

                /LINC-8 INSTRUCTION DEFINITIONS
                /MISCELLANEOUS
                EXPUNGE
0000            HLT=0000                /HALT
0002            PDP=0002                /CHANGE TO PDP-8 MODE
0004            ESF=0004                /AC TO SPECIAL FUNCTION REGISTER
0005            DAC=0005                /ZI TO AI-J(11 BITS) I EQUALS I TO 11
0006            DJR=0006                /DISABLE JMP RETURN SAVE
0011            CLR=0011                /CLEAR ACCUMULATOR LINK, AND Z REGISTER
0014            ATR=0014                /(A6-A11)>R REGISTER
0015            RTA=0015                /R REGISTER>(A6-A11)
0016            NOP=0016                /NO OPERATION
0017            COM=0017                /C(AC)>C(A)
0024            SFA=0024                /SPECIAL FUNCTION REGISTER TO AC
0040            SET=0040                /C(P+1)>BETA REGISTER (OR INDIRECT)
0200            XSK=0200                /SKIP ON 1777

                /SHIFT
0240            ROL=0240                /ROTATE LEFT
0300            ROR=0300                /ROTATE RIGHT ALSO SHIFT RIGHT INTO MQ REGISTER
0340            SCR=0340                /SCALE RIGHT ALSO SHIFT RIGHT INTO MQ REGISTER

                /SKIP
0400            SXL=0400                /SKIP IF EXTERNAL LEVEL IS -1
0415            KST=0415                /SKIP IF KEY HAS BEEN STRUCK
0440            SNS=0440                /SKIP IF SENSE SWITCH IS UP
0456            SKP=0456                /SKIP UNCONDITIONALLY
0450            AZE=0450                /SKIP IF ACCUMULATOR ZERO
0451            APO=0451                /SKIP IF ACCUMULATOR POSITIVE
0452            LZE=0452                /SKIP IF LINK ZERO
0453            IBZ=0453                /SKIP IF BETWEEN TAPE BLOCKS
0454            FLO=0454                /SKIP IF ADD OVERFLOW FLAG IS SET
0455            QLC=0455                /SKIP IF BIT 11 OF MQ REGISTER IS 0

                /OPERATE
0500            IOB=0500                /EXECUTE THE FOLLOWING IOT INSTRUCTION IN PDP-8 MODE
0517            LSW=0517                /LEFT SWITCHES TO AC
0516            RSW=0516                /RIGHT SWITCHES TO AC

                /MEMORY BANK
0600            LIF=0600                /CHANGE CONTENTS OF LOWER MEMORY BANK SELECTOR
0640            LDF=0640                /CHANGE CONTENTS OF UPPER MEMORY BANK SELECTOR

                /ARITHMETIC
1000            LDA=1000                /LOAD ACCUMULATOR
1040            STA=1040                /STORE CONTENTS OF ACCUMULATOR
1100            ADA=1100                /ADD TO CONTENTS OF ACCUMULATOR
1140            ADM=1140                /ADD TO CONTENTS OF MEMORY REGISTER
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1200    LAM=1200                /ADD CONTENTS OF LINK AND ACCUMULATOR
                                /TO CONTENTS OF MEMORY REGISTER
1240    MUL=1240                /MULTIPLY

        /HALF WORD OPERATIONS

1300    LDH=1300                /TRANSFER HALF WORD FROM MEMORY INTO
                                /THE RIGHT HALF OF ACCUMULATOR
1340    STH=1340                /TRANSFER THE HALF WORD FROM THE RIGHT
                                /SIDE OF ACCUMULATOR REGISTER INTO THE
                                /DESIGNED HALF OF A MEMORY REGISTER
1400    SHD=1400                /SKIP IF THE HALF WORD IN ACCUMULATOR
                                /REGISTER AND THE MEMORY REGISTER DIFFER

        /MEMORY REFERENCE OPERATIONS
1440    SAE=1440                /SKIP IF THE CONTENTS OF THE ACCUMULATOR
                                /EQUAL THE CONTENTS OF THE DESIGNATED
                                /MEMORY REGISTER
1500    SRO=1500                /SKIP IF THE RIGHTMOST BIT IN THE
                                /DESIGNATED MEMORY REGISTER IS 0;
                                /AFTER TESTING, ROTATE THE CONTENTS
                                /ONE PLACE TO THE RIGHT.
1540    BCL=1540                /FOR EACH BIT POSITION OF MEMORY REGISTER
                                /Y THAT CONTAINS A 1, CLEAR THE
                                /CORRESPONDING BIT POSITION OF THE
                                /ACCUMULATOR (LOGICAL AND)
1600    BSE=1600                /FOR EACH BIT POSITION OF MEMORY
                                /REGISTER Y THAT CONTAINS A 1, SET THE
                                /CORRESPONDING  BIT POSITION OF THE ACCUMULATOR
                                /(INCLUSIVE OR)
1640    BCO=1640                /FOR EACH BIT POSITION OF MEMORY
                                /REGISTER Y THAT CONTAINS A 1, COMPLEMENT
                                /THE CORRESPONDING BIT POSITION OF THE
                                /ACCUMULATOR (EXCLUSIVE OR)

        /CHARACTER DISPLAY
1740    DSC=1740                /DISPLAY THE CHARACTER STORED IN THE
                                /DESIGNATED MEMORY REGISTER

        /FULL ADDRESS
2000    ADD=2000                /ADD THE CONTENTS OF THE DESIGNATED
                                /MEMORY REGISTER TO ACCUMULATOR
4000    STC=4000                /STORE THE CONTENTS OF ACCUMULATOR
                                /IN THE DESIGNATED MEMORY REGISTER
                                /THEN CLEAR ACCUMULATOR
6000    JMP=6000                /JUMP TO ANOTHER DESIGNATED MEMORY
                                /REGISTER FOR THE NEXT INSTRUCTION.

7200    CLA=7200
7040    CMA=7040
2000    ISZ=2000
6001    ION=6001
6002    IOF=6002
7000    NOP8=7000
7440    SZA=7440
7100    CLL=7100
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```
                7000    AND=0000
                1000    TAD=1000
                3000    DCA=3000
                7604    LAS=7604
                7006    RTL=7006
                5200    JMP8=5200               /JMP TO ANOTHER DESIGNATED MEMORY
                                                /REGISTER FOR THE NEXT INSTRUCTION IN 8 FORMAT
                6141    LINC=6141               /CHANGE TO LINC MODE

                0020    I=0020

                        /A=REGISTER BEFORE OPERATION,
                        /B=A',C', BEFORE OPERATION,
                        /C=REGISTER AFTER OPERATION,
                        /D=RIGHT OR LEFT HALF OF THE ADDRESS TO BE CHANGED,
                        /E=ADDRESS OF OPERATION,


                0001    *1
0001    7300            CLA CLL
0002    2000            ISE     0
0003    5400            5400                    /JMP I 00

                0020    *20
0020    7402            7402                    /INCORRECT STARTING ADDRESS
0021    5221            JMP8    21              /HANG HERE
0022    7777    K7777,  7777                    /
0023    5252    K5252,  5252                    /
0024    0000    TEMPL,  0000                    /
0025    7007            7007                    /
0026    7707            7707                    /
0027    7770            7770                    /
0030    0770            0770                    /
0031    2552            2552                    /
0032    7752            7752                    /
0033    7725            7725                    /
0034    7700            7700                    /
0035    0000    K0000,  0000                    /
0036    2525    K2525,  2525                    /
0037    0000    TEMPH,  0000                    /

                0041    *41
0041    1000            LDA                     /ROUTINE FOR LINC
0042    0040            0040                    / INTERRUPT
0043    1560            BCL+20                  /MASK TO BITS 2-11
0044    6000            6000
0045    1120            ADA+20
0046    6001            6001                    /ADD A JUMP +1
0047    4053            STC     EXIT            /SAVE IT
0050    0017            COM
0051    0500            IOB
0052    6244            6244                    /RESTORE MEMORY FIELDS
0053    6000    EXIT,   JMP                     /EXIT

                0140    *140
```

```
0140  0000  TPA,   0
0141  7011        CLR                     /CLEAR SPECIAL FUNCTION REGISTER
0142  7004        FSF
0143  1000        LDA
0144  0140        TPA
0145  1460        SAE+20
0146  5336        INS+1
0147  0000        HLT                     /TRAPPED FROM WRONG LOCATION
0150  1560        BCL+20                  /MASK TO BITS 2-11
0151  6000        6000
0152  1120        ADA+20
0153  6001        6001                    /ADD A JMP +1
0154  4157        STC     EXIT1           /STORE IN EXIT
0155  0500        IOB
0156  6244        6244
0157  6157  EXIT1, JMP     .               /EXIT


      0400  *400

0400  6141        LINC
0401  0640        LDF
0402  1460        SAE+20
0403  0000        0000
0404  0000        HLT                     /I=0 PRESET FAILED
                                          / TO CLEAR THE A.C.

            /LDF = CHANGE TEST
            /

0405  0011        CLR
0406  0500        IOB
0407  6214        6214
0410  1460        SAE+20
0411  0000        0000
0412  0000        HLT             /LDF=0 AC=0000

0413  0641        LDF+1
0414  0500        IOB
0415  6214        6214
0416  1460        SAE+20
0417  0002        0002
0420  0000        HLT             /LDF=1 AC=0002

0421  0011        CLR
0422  0642        LDF+2
0423  0500        IOB
0424  6214        6214
0425  1460        SAE+20
0426  0004        0004
0427  0000        HLT             /LDF=2 AC=0004

0430  0011        CLR
```

```
0431  0643          LDF+3
0432  0500          IOB
0433  6214          6214
0434  1460          SAE+20
0435  0006          0006
0436  0000          HLT             /LDF=3 AC=0006

0437  0640          LDF             /ROUTINE TO STORE FIXED
0440  1020          LDA+20          /DATA INTO THE LAST
0441  7070          7070            /LOCATION IN EACH CELL
0442  1040          STA
0443  3777          3777
0444  0641          LDF+1
0445  1020          LDA+20
0446  0707          0707
0447  1040          STA
0450  3777          3777
0451  0642          LDF+2
0452  1020          LDA+20
0453  2525          2525
0454  1040          STA

0455  3777          3777
0456  0643          LDF+3
0457  1020          LDA+20
0460  5252          5252
0461  1040          STA
0462  3777          3777            /ROUTINE COMPLETED-ENTER A
0463  0016          NOP             /ROUTINE TO VERIFY THE DATA STORED
0464  0011          CLR
0465  0640          LDF
0466  1000          LDA
0467  3777          3777
0470  1460          SAE+20
0471  7070          7070
0472  0000          HLT             /LDA FAILED DF=0 B=7070
                                    /AC=7070
0473  0011          CLR
0474  0641          LDF+1
0475  1000          LDA
0476  3777          3777
0477  1460          SAE+20
0500  0707          0707
0501  0000          HLT             /LDA FAILED DF=1 B=0707
                                    /AC=0707
0502  0011          CLR
0503  0642          LDF+2
0504  1000          LDA
0505  3777          3777
0506  1460          SAE+20
0507  2525          2525
0510  0000          HLT             /LDA FAILED DF=2 B=2525
                                    /AC=2525
0511  0011          CLR
0512  0643          LDF+3
```

```
0513  1000          LDA
0514  3777          3777
0515  1460          SAE+20
0516  5252          5252
0517  7000          HLT             /LDA FAILED DF=3 B=5252
                                    /AC=5252
0520  7640          LDF


                    /SAE ALL ADDRESSING MODE TESTS
                    /SAE I=1 B=0 TEST IN PART 1
                    /SAE TEST     I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
0521  1020          LDA+20
0522  7777          7777
0523  1440          SAE
0524  0022          K7777
0525  0000          HLT             /SAE FAILED TO SKIP AC=7777 MEM=7777

0526  1020          LDA+20
0527  7777          7777
0530  1440          SAE
0531  0035          K0000
0532  0456          SKP
0533  0000          HLT             /SAE SKIPPED IN ERROR AC=7777 MEM=0000

0534  0011          CLR
0535  1440          SAE
0536  0022          K7777
0537  0456          SKP
0540  0000          HLT             /SAE SKIPPED IN ERROR AC=0000 MEM=7777

0541  0011          CLR
0542  1440          SAE
0543  0035          K0000
0544  0000          HLT             /SAE FAILED TO SKIP AC=0000 MEM=0000

0545  1020          LDA+20
0546  5252          5252
0547  1440          SAE
0550  0023          K5252
0551  0000          HLT             /SAE FAILED TO SKIP AC=5252 MEM=5252

0552  1020          LDA+20
0553  2525          2525
0554  1440          SAE
0555  0023          K5252
0556  0456          SKP
0557  0000          HLT             /SAE SKIPPED IN ERROR AC=2525 MEM=5252

0560  1020          LDA+20
0561  5252          5252
0562  1440          SAE
0563  0036          K2525
0564  0456          SKP
```

```
0565  0000          HLT             /SAE SKIPPED IN ERROR AC=5252 MEM=2525

0566  1020          LDA+20
0567  2525          2525
0570  1440          SAE
0571  0036          K2525
0572  0000          HLT             /SAE FAILED TO SKIP AC=2525 MEM=2525


                    /
                    /SAE TEST     I=0 B=X ADDRESS OF OPERAND IS IN BETA REGISTER
                    /
0573  0077          SET+20+17
0574  0035          K0000
0575  0011          CLR
0576  1457          SAE 17
0577  0000          HLT             /SAE FAILED TO SKIP AC=0000 MEM=0000 B=17

0600  0075          SET+20+15
0601  0035          K0000
0602  1020          LDA+20
0603  7777          7777
0604  1455          SAE 15
0605  0456          SKP
0606  0000          HLT             /SAE SKIPPED IN ERROR AC=7777 MEM=0000 B=14

0607  0076          SET+20+16
0610  0023          K5252
0611  1020          LDA+20
0612  5252          5252
0613  1456          SAE 16
0614  0000          HLT             /SAE FAILED TO SKIP AC=5252 MEM=5252 B=16

0615  0073          SET+20+13
0616  0022          K7777
0617  0011          CLR
0620  1453          SAE 13
0621  0456          SKP
0622  0000          HLT             /SAE SKIPPED IN ERROR AC=0000 MEM=7777 B=13

0623  0075          SET+20+15
0624  0022          K7777
0625  1020          LDA+20
0626  7777          7777
0627  1455          SAE 15
0630  0000          HLT             /SAE FAILED TO SKIP AC=7777 MEM=7777 B=15

0631  0072          SET+20+12
0632  0023          K5252
0633  1020          LDA+20
0634  2525          2525
0635  1452          SAE 12
0636  0456          SKP
0637  0000          HLT             /SAE SKIPPED IN ERROR AC=2525 MEM=5252 B=12
```

```
0640  0071          SET-20-11
0641  0036          K2525
0642  1020          LDA-20
0643  5252          5252
0644  1451          SAE 11
0645  0456          SKP
0646  0000          HLT             /SAE SKIPPED IN ERROR AC-5252 MEM-2525 B-11

0647  0067          SET-20-7
0650  0036          K2525
0651  1020          LDA-20
0652  2525          2525
0653  1447          SAE 7
0654  0000          HLT             /SAE FAILED TO SKIP AC-2525 MEM-2525 B-7


                    /
                    /SAE TEST AUTO INDEXING TEST
                    /ADDRESS OF OPERAND -1 IS IN BETA REGISTER
                    /SAE I-1 B-X

0655  0070          SET-20-10
0656  0034          K0000-I
0657  0011          CLR
0660  1470          SAE-20-10
0661  0000          HLT             /SAE FAILED TO SKIP AC-0000 MEM-0000 B-10

0662  0066          SET-20-6
0663  0034          K0000-I
0664  1020          LDA-20
0665  7777          7777
0666  1466          SAE-20-6
0667  0456          SKP
0670  0000          HLT             /SAE SKIPPED IN ERROR AC-7777 MEM-0000 B-6

0671  0067          SET-20-7
0672  0021          K7777-I
0673  1020          LDA-20
0674  7777          7777
0675  1467          SAE-20-7
0676  0000          HLT             /SAE FAILED TO SKIP AC-7777 MEM-7777 B-7

0677  0072          SET-20-12
0700  0021          K7777-I
0701  0011          CLR
0702  1472          SAE-20-12
0703  0456          SKP
0704  0000          HLT             /SAE SKIPPED IN ERROR AC-0000 MEM-7777 B-12

0705  0066          SET-20-6
0706  0022          K5252-I
0707  1020          LDA-20
0710  5252          5252
0711  1466          SAE-20-6
0712  0000          HLT             /SAE FAILED TO SKIP AC-5252 MEM-5252 B-6
```

```
0713  0073            SET+20+13
0714  0022            K5252-I
0715  1020            LDA+20
0716  2525            2525
0717  1473            SAE+20+13
0720  0456            SKP
0721  0000            HLT             /SAE SKIPPED IN ERROR AC=2525 MEM=5252 B=13

0722  0065            SET+20+5
0723  0035            K2525-I
0724  1020            LDA+20
0725  2525            2525
0726  1465            SAE+20+5
0727  0000            HLT             /SAE FAILED TO SKIP AC=2525 MEM=2525 B=5

0730  0071            SET+20+11
0731  0035            K2525-I
0732  1020            LDA+20
0733  5252            5252
0734  1471            SAE+20+11
0735  0456            SKP
0736  0000            HLT             /SAE SKIPPED IN ERROR AC=5252 MEM=2525 B=11


                      /
                      /SET TEST I=0 B=X
                      /
0737  0057            SET+17
0740  0022            K7777
0741  1020            LDA+20
0742  7777            7777
0743  1440            SAE
0744  0017            0017
0745  0000            HLT             /SET+1 FAILED TO SET BI7 AC=7777

0746  0052            SET+12
0747  0023            K5252
0750  1020            LDA+20
0751  5252            5252
0752  1440            SAE
0753  0012            0012
0754  0000            HLT             /SET+2 FAILED TO SET BI2 AC=5252

0755  0053            SET+13
0756  0036            K2525
0757  1020            LDA+20
0760  2525            2525
0761  1440            SAE
0762  0013            0013
0763  0000            HLT             /SET+3 FAILED TO SET BI3 AC=2525

0764  0054            SET+14
0765  0035            K0000
```

```
2766  1020          LDA+20
2767  0000          0000
2770  1440          SAE
2771  0014          0014
2772  0000          HLT             /SET 4 FAILED TO SET B14 AC=0000

2773  0054          SET+14
2774  0022          K7777
2775  1020          LDA+20
2776  7777          7777
2777  1440          SAE
1000  0014          0014
1001  0000          HLT             /SET+14 FAILED TO SET B14 AC=7777

1002  0055          SET+15
1003  0023          K5252
1004  1020          LDA+20
1005  5252          5252
1006  1440          SAE
1007  0015          0015
1010  0000          HLT             /SET+15 FAILED TO SET B15 AC=5252

1011  0056          SET+16
1012  0036          K2525
1013  1020          LDA+20
1014  2525          2525
1015  1440          SAE
1016  0016          0016
1017  0000          HLT             /SET+16 FAILED TO SET B16 AC=2525

1020  0057          SET+17
1021  0035          K0000
1022  1020          LDA+20
1023  0000          0000
1024  1440          SAE
1025  0017          0017
1026  0000          HLT             /SET+17 FAILED TO SET B17 AC=0000


                    /LDA ALL MODE TEST
                    /I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
                    /
1027  1000          LDA
1030  0035          K0000
1031  1460          SAE+20
1032  0000          0000
1033  0000          HLT             /LDA FAILED AC=0000

1034  1000          LDA
1035  0022          K7777
1036  1460          SAE+20
1037  7777          7777
1040  0000          HLT             /LDA FAILED AC=7777
```

```
1041  1000          LDA
1042  0023          K5252
1043  1460          SAE+20
1044  5252          5252
1045  0000          HLT             /LDA FAILED AC=5252

1046  1000          LDA
1047  0036          K2525
1050  1460          SAE+20
1051  2525          2525
1052  0000          HLT             /LDA FAILED AC=2525

                /I=0 B=X ADDRESS OF OPERAND IS IN B REGISTER
                /

1053  0071          SET+20+11
1054  0035          K0000
1055  1011          LDA I1
1056  1460          SAE+20
1057  0000          0000
1060  0000          HLT             /LDA + B FAILED AC=0000

1061  0072          SET+20+12
1062  0022          K7777
1063  1012          LDA I2
1064  1460          SAE+20
1065  7777          7777
1066  0000          HLT             /LDA + B FAILED AC=7777

1067  0073          SET+20+13
1070  0023          K5252
1071  1013          LDA I3
1072  1460          SAE+20
1073  5252          5252
1074  0000          HLT             /LDA + B FAILED AC=5252

1075  0074          SET+20+14
1076  0036          K2525
1077  1014          LDA I4
1100  1460          SAE+20
1101  2525          2525
1102  0000          HLT             /LDA + B FAILED AC=2525


                /LDA I B TEST
                / I=I B=X ADDRESS OF OPERAND +1 IS IN B REGISTER
                /

1103  0075          SET+20+15
1104  0034          K0000+I
1105  1035          LDA+20+15
1106  1460          SAE+20
1107  0000          0000
1110  0000          HLT             /LDA I B FAILED AC=0000
```

```
1111  0076          SET+20+16
1112  0021          K7777-1
1113  1036          LDA+20+16
1114  1460          SAE+20
1115  7777          7777
1116  0000          HLT             /LDA I B FAILED AC=7777

1117  0077          SET+20+17
1120  0022          K5252-1
1121  1037          LDA+20+17
1122  1460          SAE+20
1123  5252          5252
1124  0000          HLT             /LDA I B FAILED AC=5252

1125  0071          SET+20+11
1126  0035          K2525-1
1127  1031          LDA+20+11
1130  1460          SAE+20
1131  2525          2525
1132  0000          HLT             /LDA I B FAILED AC=2525

                /STA I=1 B=0 TESTED IN PART 1
                /STA ALL MODE TEST
                /I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD

1133  0011          CLA
1134  1040          STA
1135  0024          TEMPL
1136  1440          SAE
1137  0024          TEMPL
1140  0000          HLT             /STA FAILED AC=0000 TEMPL=0000

1141  1020          LDA+20
1142  7777          7777
1143  1040          STA
1144  0037          TEMPH
1145  1440          SAE
1146  0037          TEMPH
1147  0000          HLT             /STA FAILED AC=7777 TEMPH=7777

1150  1020          LDA+20
1151  5252          5252
1152  1040          STA
1153  0024          TEMPL
1154  1440          SAE
1155  0024          TEMPL
1156  0000          HLT             /STA FAILED AC=5252 TEMPL=5252

1157  1020          LDA+20
1160  2525          2525
1161  1040          STA
1162  0037          TEMPH
1163  1440          SAE
1164  0037          TEMPH
```

```
1165  0000          HLT             /STA FAILED AC=2525 TEMPH=2525

1166  0011          CLR
1167  1040          STA
1170  0037          TEMPH
1171  1440          SAE
1172  0037          TEMPH
1173  0000          HLT             /STA FAILED AC=0000 TEMPH=0000

1174  1020          LDA+20
1175  7777          7777
1176  1040          STA
1177  0024          TEMPL
1200  1440          SAE
1201  0024          TEMPL
1202  0000          HLT             /STA FAILED AC=7777 TEMPL=7777

1203  1020          LDA+20
1204  5252          5252
1205  1040          STA
1206  0037          TEMPH
1207  1440          SAE
1210  0037          TEMPH
1211  0000          HLT             /STA FAILED AC=5252 TEMPH=5252

1212  1020          LDA+20
1213  2525          2525
1214  1040          STA
1215  0024          TEMPL
1216  1440          SAE
1217  0024          TEMPL
1220  0000          HLT             /STA FAILED AC=2525 TEMPL=2525

                /STA TEST A
                /STA I=0 B=X ADDRESS OF OPERAND IS IN B REGISTER

1221  0067          SET+20+7
1222  0037          TEMPH
1223  1020          LDA+20
1224  0000          0000
1225  1047          STA 7
1226  1440          SAE
1227  0037          TEMPH
1230  0000          HLT             /STA A FAILED AC=0000 TEMPH=0000 B=7

1231  0066          SET+20+6
1232  0037          TEMPH
1233  1020          LDA+20
1234  7777          7777
1235  1046          STA 6
1236  1440          SAE
1237  0037          TEMPH
1240  0000          HLT             /STA A FAILED AC=7777 TEMPH=7777
```

```
1241  0077          SET-20-17
1242  0037          TEMPH
1243  1020          LDA-20
1244  5252          5252
1245  1057          STA-17
1246  1440          SAE
1247  0037          TEMPH
1250  0000          HLT             /STA A FAILED AC=5252 TEMPH=5252 B=17

1251  0076          SET-20-16
1252  0037          TEMPH
1253  1020          LDA-20
1254  2525          2525
1255  1056          STA-16
1256  1440          SAE
1257  0037          TEMPH
1260  0000          HLT             /STA A FAILED AC=2525 TEMPH=2525 B=16

1261  0067          SET-20-7
1262  0024          TEMPL
1263  1020          LDA-20
1264  0000          0000
1265  1047          STA-7
1266  1440          SAE
1267  0024          TEMPL
1270  0000          HLT             /STA A FAILED AC=0000 TEMPL=0000 B=7

1271  0071          SET-20-11
1272  0024          TEMPL
1273  1020          LDA-20
1274  7777          7777
1275  1051          STA-11
1276  1440          SAE
1277  0024          TEMPL
1300  0000          HLT             /STA A FAILED AC=7777 TEMPL=7777 B=11

1301  0075          SET-20-15
1302  0024          TEMPL
1303  1020          LDA-20
1304  5252          5252
1305  1055          STA-15
1306  1440          SAE
1307  0024          TEMPL
1310  0000          HLT             /STA A FAILED AC=5252 TEMPL=5252 B=15

1311  0074          SET-20-14
1312  0024          TEMPL
1313  1020          LDA-20
1314  2525          2525
1315  1054          STA-14
1316  1440          SAE
1317  0024          TEMPL
1320  0000          HLT             /STA A FAILED AC=2525 TEMPL=2525 B=14
```

```
                    /STA TEST AUTO INDEX
                    /STA I=1 B=X ADDRESS OF OPERAND-1 IS IN B REGISTER

1321  0070              SET+20+10
1322  0023              TEMPL=I
1323  1020              LDA+20
1324  5252              5252
1325  1070              STA 20+10
1326  1440              SAE
1327  0024              TEMPL
1330  0000              HLT             /STA I A FAILED AC=5252 TEMPL=5252 B=10

1331  0067              SET+20+7
1332  0023              TEMPL=I
1333  1020              LDA+20
1334  2525              2525
1335  1067              STA 20+7
1336  1440              SAE
1337  0024              TEMPL
1340  0000              HLT             /STA I A FAILED AC=2525 TEMPL=2525 B=7

1341  0071              SET+20+11
1342  0036              TEMPH=I
1343  1020              LDA+20
1344  5252              5252
1345  1071              STA+20+11
1346  1440              SAE
1347  0037              TEMPH
1350  0000              HLT             /STA I A FAILED AC=5252 TEMPH=5252 B=11

1351  0066              SET+20+6
1352  0036              TEMPH=I
1353  1020              LDA+20
1354  2525              2525
1355  1066              STA+20+6
1356  1440              SAE
1357  0037              TEMPH
1360  0000              HLT             /STA I A FAILED AC=2525 TEMPH=2525 B=6

                    /
                    /ADA ALL MODE ADDRESSING TEST
                    /ADA I=1 B=0 TEST IN PART 1
                    /ADA I=0 B=0 ADDRESS OF OPERAND IN SECOND WORD
1361  0011              CLR
1362  1100              ADA
1363  0035              K0000
1364  1100              ADA
1365  0022              K7777
1366  1460              SAE+20
1367  7777              7777
1370  0000              HLT             /ADA FAILED A=0000 B=7777 AC=7777

1371  0474              FLO+20          /FLO FAILED FLO=0
1372  0000              HLT
```

```
1373  0011          CLR
1374  1100          ADA
1375  0023          K5252
1376  1100          ADA
1377  0023          K5252
1400  1460          SAE+20
1401  2525          2525
1402  0000          HLT             /ADA FAILED A=5252 B=5252 AC=2525

1403  0454          FLO             /FLO FAILED F=1
1404  0000          HLT
1405  0011          CLR
1406  1100          ADA
1407  0022          K7777
1410  1100          ADA
1411  0035          K0000
1412  1460          SAE+20
1413  7777          7777
1414  0000          HLT             /ADA FAILED A=7777 B=0000 AC=7777

1415  0474          FLO+20          /FLOW FAILED FLO=0
1416  0000          HLT

1417  0011          CLR
1420  1100          ADA
1421  0036          K2525
1422  1100          ADA
1423  0036          K2525
1424  1460          SAE+20
1425  5252          5252
1426  0000          HLT             /ADA FAILED A=2525 B=2525 AC=5252

1427  0454          FLO             /FLO FAILED
1430  0000          HLT
1431  0011          CLR
1432  1100          ADA
1433  0023          K5252
1434  1100          ADA
1435  0036          K2525
1436  1460          SAE+20
1437  7777          7777
1440  0000          HLT             /ADA FAILED A=5252 B=2525 AC=7777

1441  0474          FLO+20          /FLO FAILED
1442  0000          HLT
1443  0011          CLR
1444  1100          ADA
1445  0036          K2525
1446  1100          ADA
1447  0023          K5252
1450  1460          SAE+20
1451  7777          7777
1452  0000          HLT             /ADA FAILED A=2525 B=5252 AC=7777
```

```
                    /ADA A TEST
                    /I=0    B=X

1453  0071          SET+20+11
1454  0035          K0000
1455  0011          CLR
1456  1111          ADA 11
1457  1111          ADA 11
1460  1460          SAE+20
1461  0000          0000
1462  0000          HLT             /ADA B FAILED A=0000 B=0000 AC=0000 B=11

1463  0077          SET+20+17
1464  0023          K5252
1465  0011          CLR
1466  1117          ADA 17
1467  1117          ADA 17
1470  1460          SAE+20
1471  2525          2525
1472  0000          HLT             /ADA B FAILED A=5252 B=5252 AC=2525 B=17

1473  0067          SET+20+7
1474  0023          K5252
1475  0070          SET+20+10
1476  0036          K2525
1477  0011          CLR
1500  1107          ADA+7
1501  1110          ADA+10
1502  1460          SAE+20
1503  7777          7777
1504  0000          HLT             /ADA B FAILED A=5252 B=2525 AC=7777 B=7,10

1505  0073          SET+20+13
1506  0036          K2525
1507  0077          SET+20+17
1510  0023          K5252
1511  0011          CLR
1512  1113          ADA+13
1513  1117          ADA+17
1514  1460          SAE+20
1515  7777          7777
1516  0000          HLT             /ADA B FAILED A=2525 B=5252 AC=7777 B=13,17

                    /ADA I A TEST

1517  0067          SET+20+7
1520  0034          K0000-I
1521  0077          SET+20+17
1522  0021          K7777-I
1523  0011          CLR
1524  1127          ADA+20+7
1525  1137          ADA+20+17
1526  1460          SAE+20
1527  7777          7777
1530  0000          HLT             /ADA I A FAILED A=0000 B=7777 AC=7777 B=7,17
```

```
1531  0067            SET+20+07
1532  0022            K5252-I
1533  0070            SET+20+10
1534  0035            K2525-I
1535  0011            CLR
1536  1127            ADA+20+07
1537  1130            ADA+20+10
1540  1460            SAE+20
1541  7777            7777
1542  0000            HLT             /ADA I A FAILED A=0000 B=0000 AC=0000 B=7,10

1543  0072            SET+20+12
1544  0034            K0000-I
1545  0065            SET+20+05
1546  0034            K0000-I
1547  0011            CLR
1550  1132            ADA+20+12
1551  1125            ADA+20+05
1552  1460            SAE+20
1553  0000            0000
1554  0000            HLT             /ADA I A FAILED A=0000 B=0000 AC=0000 B=12,5

1555  0072            SET+20+12
1556  0035            K2525-I
1557  0076            SET+20+16
1560  0022            K5252-I
1561  0011            CLR
1562  1132            ADA+20+12
1563  1136            ADA+20+16
1564  1460            SAE+20
1565  7777            7777
1566  0000            HLT             /ADA I A FAILED A=2525 B=5252 AC=7777 B=12,16


                  /
                  /BCO ALL MODE ADDRESSING TEST
                  /BCO I=0 B=0 ADDRESS OF OPERAND IS IN SECOND WORD
                  /BCO I=1 B=0 TESTED IN PART 1

1567  1020            LDA+20
1570  7777            7777
1571  1640            BCO
1572  0023            K5252
1573  1460            SAE+20
1574  2525            2525
1575  0000            HLT             /BCO FAILED A=7777 B=5252 AC=2525

1576  1020            LDA+20
1577  5252            5252
1600  1640            BCO
1601  0036            K2525
1602  1460            SAE+20
1603  7777            7777
```

```
1604  0000          HLT             /BCO FAILED A=5252 B=2525 AC=7777

1605  1020          LDA+20
1606  2525          2525
1607  1640          BCO
1610  0022          K7777
1611  1460          SAE+20
1612  5252          5252
1613  0000          HLT             /BCO FAILED A=2525 B=7777 AC=5252

1614  0011          CLR
1615  1640          BCO
1616  0035          K0000
1617  1460          SAE+20
1620  0000          0000
1621  0000          HLT             /BCO FAILED A=0000 B=0000 AC=0000

                /BCO A TEST

1622  0071          SET+20+11
1623  0022          K7777
1624  1020          LDA+20
1625  5252          5252
1626  1651          BCO+11
1627  1460          SAE+20
1630  2525          2525
1631  0000          HLT             /BCO FAILED A=5252 B=7777 AC=2525

1632  0077          SET+20+17
1633  0035          K0000
1634  1020          LDA+20
1635  2525          2525
1636  1657          BCO+17
1637  1460          SAE+20
1640  2525          2525
1641  0000          HLT             /BCO FAILED A=2525 B=0000 AC=2525

1642  0075          SET+20+15
1643  0036          K2525
1644  1020          LDA+20
1645  0000          0000
1646  1655          BCO+15
1647  1460          SAE+20
1650  2525          2525
1651  0000          HLT             /BCO FAILED A=0000 B=2525 AC=2525

1652  0072          SET+20+12
1653  0023          K5252
1654  1020          LDA+20
1655  2525          2525
1656  1652          BCO+12
1657  1460          SAE+20
1660  7777          7777
1661  0000          HLT             /BCO FAILED A=2525 B=5252 AC=7777
```

```
                    /BCO I+A TEST

1662  0066          SET+20+6
1663  0021          K7777-I
1664  1020          LDA+20
1665  0000          0000
1666  1666          BCO+20+6
1667  1460          SAE+20
1670  7777          7777
1671  0000          HLT             /BCO FAILED A=0000 B=7777 AC=7777 B=6

1672  0071          SET+20+11
1673  0022          K5252-1
1674  1020          LDA+20
1675  2525          2525
1676  1671          BCO+20+11
1677  1460          SAE+20
1700  7777          7777
1701  0000          HLT             /BCO FAILED A=2525 B=5252 AC=7777 B=11

1702  0073          SET+20+13
1703  0034          K0000-I
1704  1020          LDA+20
1705  5252          5252
1706  1673          BCO+20+13
1707  1460          SAE+20
1710  5252          5252
1711  0000          HLT             /BCO FAILED A=5252 B=0000 AC=5252 B=13

1712  0074          SET+20+14
1713  0035          K2525-I
1714  1020          LDA+20
1715  2525          2525
1716  1674          BCO+20+14
1717  1460          SAE+20
1720  0000          0000
1721  0000          HLT             /BCO FAILED A=2525 B=2525 AC=0000 B=14


                    /BSE I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
                    /BSE ALL ADDRESSING MODE TEST
                    /BSE I=1 B=0 TESTED IN PART 1
1722  0011            CLR
1723  1600            BSE
1724  0036            K2525
1725  1460            SAE+20
1726  2525            2525
1727  0000            HLT             /BSE FAILED A=2525 AC=2525

1730  0011            CLR
1731  1600            BSE
1732  0023            K5252
1733  1460            SAE+20
1734  5252            5252
```

```
1735  0000            HLT             /BSE FAILED A=5252 AC=5252

1736  1020            LDA+20
1737  2525            2525
1740  1600            BSE
1741  0023            K5252
1742  1460            SAE+20
1743  7777            7777
1744  0000            HLT             /BSE FAILED A=2525 B=5252 AC=7777

1745  1020            LDA+20
1746  5252            5252
1747  1600            BSE
1750  0036            K2525
1751  1460            SAE+20
1752  7777            7777
1753  0000            HLT             /BSE FAILED A=5252 B=2525 AC=7777

1754  0641            LDF+1
1755  0601            LIF+1
1756  6100            JMP+100         /CHANGE TO NEXT CELL

      2000    *2000
2000  0000            HLT             /SHOULD NEVER EXECUTE
2001  0000            HLT             /THESE HALTS

      2022    *2022

2022  7777            7777
2023  5252            5252
2024  0000            0000
2025  7007            7007
2026  7707            7707
2027  7770            7770
2030  0770            0770
2031  2552            2552
2032  7752            7752
2033  7725            7725
2034  7700            7700
2035  0000            0000
2036  2525            2525
2037  0000            0000

      2100    *2100

              /BSE TEST
              /BSE I=0 B=X ADDRESS OF OPERAND IN B REGISTER

2100  0071            SET+20+11
2101  0036            K2525
2102  0011            CLR
2103  1611            BSE 11
2104  1460            SAE+20
2105  2525            2525
2106  0000            HLT             /BSE FAILED A=2525 AC=2525 B=11
```

```
2107  0077          SET-20-17
2110  0023          K5252
2111  0011          CLR
2112  1617          BSE-17
2113  1460          SAE-20
2114  5252          5252
2115  0000          HLT             /BSE FAILED A=5252 AC=5252 B=17

2116  0067          SET-20-7
2117  0023          K5252
2120  1020          LDA-20
2121  2525          2525
2122  1607          BSE 7
2123  1460          SAE-20
2124  7777          7777
2125  0000          HLT             /BSE FAILED A=2525 B=5252 AC=7777 B=7


2126  0070          SET-20-10
2127  0022          K7777
2130  1020          LDA-20
2131  5777          5777
2132  1610          BSE 10
2133  1460          SAE-20
2134  7777          7777
2135  0000          HLT             /BSE FAILED A=5777 B=7777 AC=7777 B=10

                    /BSE AUTOINDEX TEST
                    /BSE I=1 B=X ADDRESS OF OPERAND=1 IN THE B REGISTER

2136  0072          SET-20-12
2137  0035          K2525-I
2140  1020          LDA-20
2141  5252          5252
2142  1632          BSE-20-12
2143  1460          SAE-20
2144  7777          7777
2145  0000          HLT             /BSE FAILED A=5252 B=2525 AC=7777 B=12

2146  0076          SET-20-16
2147  0022          K5252-I
2150  1020          LDA-20
2151  2525          2525
2152  1636          BSE-20-16
2153  1460          SAE-20
2154  7777          7777
2155  0000          HLT             /BSE FAILED A=5252 B=2525 AC=7777 B=16

2156  0074          SET-20-14
2157  0034          K0000-I
2160  0011          CLR
2161  1634          BSE-20-14
2162  1460          SAE-20
```

```
2163  0000            0000
2164  0000            HLT             /BSE FAILED A=0000 AC=0000 B=14

2165  0073            SET+20+13
2166  0021            K7777-1
2167  1020            LDA+20
2170  2525            2525
2171  1633            BSE+20+13
2172  1460            SAE+20
2173  7777            7777
2174  0000            HLT             /BSE FAILED A=2525 B=7777 AC=7777 B=13

                /BCL I=1 B=0 TESTED IN PART 1
                /BCL ALL MODE ADDRESSING TEST
                /BCL I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
2175  1020            LDA+20
2176  7777            7777
2177  1540            BCL
2200  0036            K2525
2201  1460            SAE+20
2202  5252            5252
2203  0000            HLT             /BCL FAILED A=7777 B=2525 AC=5252

2204  1020            LDA+20
2205  2525            2525
2206  1540            BCL
2207  0036            K2525
2210  1460            SAE+20
2211  0000            0000
2212  0000            HLT             /BCL FAILED A=2525 B=2525 AC=0000

2213  1020            LDA+20
2214  5252            5252
2215  1540            BCL
2216  0036            K2525
2217  1460            SAE+20
2220  5252            5252
2221  0000            HLT             /BCL FAILED A=5252 B=2525 AC=5252

2222  1020            LDA+20
2223  0000            0000
2224  1540            BCL
2225  0022            K7777
2226  1460            SAE+20
2227  0000            0000
2230  0000            HLT             /BCL FAILED A=0000 B=7777 AC=0000


                /BCL B TEST

2231  0075            SET+20+15
2232  0036            K2525
2233  1020            LDA+20
2234  7777            7777
2235  1555            BCL+15
```

```
2236  1460            SAE+20
2237  5252            5252
2240  0000            HLT             /BCL B FAILED A=7777 B=2525 AC=5252 B=15

2241  0072            SET+20+12
2242  7023            K5252
2243  1020            LDA+20
2244  2525            2525
2245  1552            BCL+12
2246  1460            SAE+20
2247  2525            2525
2250  0000            HLT             /BCL B FAILED A=2525 B=5252 AC=2525

2251  0074            SET+20+14
2252  0036            K2525
2253  1020            LDA+20
2254  5252            5252
2255  1554            BCL+14
2256  1460            SAE+20
2257  5252            5252
2260  0000            HLT             /BCL B FAILED A=5252 B=2525 AC=5252

2261  0076            SET+20+16
2262  0022            K7777
2263  0011            CLR
2264  1556            BCL+16
2265  1460            SAE+20
2266  0000            0000
2267  0000            HLT             /BCL B FAILED A=0000 B=7777 AC=0000

                /BCL I A TEST AUTO INDEX

2270  0077            SET+20+17
2271  0022            K5252-I
2272  1020            LDA+20
2273  2525            2525
2274  1577            BCL+20+17
2275  1460            SAE+20
2276  2525            2525
2277  0000            HLT             /BCL I B FAILED A=2525 B=5252 AC=2525 B=17

2300  0073            SET+20+13
2301  0034            K0000-I
2302  1020            LDA+20
2303  7777            7777
2304  1573            BCL+20+13
2305  1460            SAE+20
2306  7777            7777
2307  0000            HLT             /BCL I B FAILED A=7777 B=0000 AC=7777 B=13


2310  0075            SET+20+15
2311  0021            K7777-I
2312  1020            LDA+20
```

```
2313  0000            0000
2314  1575            BCL+20+15
2315  1460            SAE+20
2316  0000            0000
2317  0000            HLT             /BCL I B FAILED A=0000 B=7777 AC=0000 B=15

2320  0053            SET+13
2321  0035            K2525-1
2322  1020            LDA+20
2323  5252            5252
2324  1573            BCL+20+13
2325  1460            SAE+20
2326  5252            5252
2327  0000            HLT             /BCL I B FAILED A=5252 B=2525 AC=5252 B=13

                /SRO I=0 B=0 ADDRESS OF OPERAND IN NEXT LOCATION
                /SRO ALL MODE ADDRESSING TEST
                /SRO I=1 B=0 TESTED IN PART 1

2330  1020            LDA+20
2331  5252            5252
2332  1040            STA
2333  0024            TEMPL
2334  1500            SRO
2335  0024            TEMPL
2336  0000            HLT             /DID NOT EXECUTE SKIP
2337  1020            LDA+20
2340  2525            2525
2341  1440            SAE
2342  0024            TEMPL
2343  0000            HLT             /SRO FAILED TO ROTATE PROPERLY

2344  1020            LDA+20
2345  7775            7775
2346  1040            STA
2347  0024            TEMPL           /STORE A,C'
2350  1500            SRO
2351  0024            TEMPL
2352  0016            NOP
2353  1020            LDA+20
2354  7776            7776
2355  1440            SAE
2356  0024            TEMPL
2357  0000            HLT             /SRO FAILED TO ROTATE PROPERLY

2360  1020            LDA+20
2361  0002            0002
2362  1040            STA
2363  0037            TEMPH           /STORE A,C'
2364  1500            SRO
2365  0037            TEMPH
2366  0000            HLT             /DID NOT EXECUTE SKIP
2367  1020            LDA+20
2370  0001            0001
2371  1440            SAE
```

```
2372  0037          TEMPH
2373  0000          HLT             /SRO FAILED TO ROTATE PROPERLY


2374  1020          LDA+20
2375  2525          2525
2376  1040          STA
2377  0037          TEMPH           /STORE A,C,
2400  1500          SRO
2401  0037          TEMPH
2402  0016          NOP
2403  1020          LDA+20          /LOAD A,C,
2404  5252          5252
2405  1440          SAE
2406  0037          TEMPH
2407  0000          HLT             /SRO FAILED TO ROTATE PROPERLY

                /SRO A TEST

2410  0075          SET+20+15       /SET 15
2411  0024          TEMPL
2412  1020          LDA+20
2413  5252          5252
2414  1040          STA
2415  0024          TEMPL           /STORE A,C,
2416  15I5          SRO+15
2417  00I6          NOP
2420  10I5          LDA 15
2421  1460          SAE+20
2422  2525          2525
2423  0000          HLT             /SRO FAILED TO ROTATE PROPERLY E=15

2424  0072          SET+20+12       /SET 12
2425  0037          TEMPH
2426  1020          LDA+20
2427  2525          2525
2430  1040          STA
2431  0037          TEMPH           /STORE A,C,
2432  15I2          SRO+12
2433  00I6          NOP
2434  10I2          LDA+12
2435  1460          SAE+20
2436  5252          5252
2437  0000          HLT             /SRO FAILED TO ROTATE PROPERLY E=12

2440  0067          SET+20+7        /SET 7
2441  0024          TEMPL
2442  1020          LDA+20
2443  7777          7777
2444  1040          STA
2445  0024          TEMPL           /STORE A,C,
2446  1507          SRO+7
2447  00I6          NOP
2450  1007          LDA+7
```

```
2451  1460            SAE+20
2452  7777            7777
2453  0000            HLT             /SRO FAILED TO ROTATE PROPERLY E=7


2454  0076            SET+20+16       /SET 16
2455  0037            TEMPH
2456  1020            LDA+20
2457  0000            0000
2460  1040            STA
2461  0037            TEMPH           /STORE A,C,
2462  1516            SRO+16
2463  0016            NOP
2464  1016            LDA+16
2465  1460            SAE+20
2466  0000            0000
2467  0000            HLT             /SRO FAILED TO ROTATE PROPERLY E=16

                /SRO I A AUTO INDEXING TEST

2470  0071            SET+20+11       /SET 11
2471  0023            TEMPL=I
2472  1020            LDA+20
2473  5252            5252
2474  1040            STA
2475  0024            TEMPL           /STORE A,C,
2476  1531            SRO+20+11
2477  0016            NOP
2500  1011            LDA 11
2501  1460            SAE+20
2502  2525            2525
2503  0000            HLT             /SRO FAILED TO ROTATE PROPERLY E=11

2504  0066            SET+20+6        /SET 6
2505  0036            TEMPH=I
2506  1020            LDA+20
2507  2525            2525
2510  1040            STA
2511  0037            TEMPH           /STORE A,C,
2512  1526            SRO+20+6
2513  0016            NOP
2514  1006            LDA+6
2515  1460            SAE+20
2516  5252            5252
2517  0000            HLT             /SRO FAILED TO ROTATE PROPERLY E=6

2520  0073            SET+20+13       /SET 13
2521  0023            TEMPL=I
2522  1020            LDA+20
2523  7777            7777
2524  1040            STA
2525  0024            TEMPL           /STORE A,C,
2526  1533            SRO+20+13
2527  0016            NOP
```

```
2530  1013          LDA 13
2531  1460          SAE+20
2532  7777          7777
2533  0000          HLT             /SRO FAILED TO ROTATE PROPERLY E=13

                /LDH I=1 B=0 TESTED IN PART 1
                /LDH ALL MODE ADDRESSING TEST
                /LDH I=0 B=0 OPERAND ADDRESS IN THE NEXT ADDRESS

2534  0011          CLR
2535  1300          LDH
2536  0025          0025            /LOAD A,C, WITH LEFT HALF
2537  1100          ADA
2540  0026          0026            /ADD A CONSTANT
2541  1460          SAE+20
2542  7777          7777
2543  0000          HLT             /LDH FAILED, A=7007 B=7707 AC=7777

2544  0011          CLR
2545  1300          LDH
2546  4025          4025            /LOAD A,C, WITH RIGHT HALF
2547  1100          ADA
2550  0027          0027            /ADD A CONSTANT
2551  1460          SAE+20
2552  7777          7777
2553  0000          HLT             /LDH FAILED, A=7007 B=7770 AC=7777

2554  0011          CLR
2555  1300          LDH
2556  0030          0030            /LOAD A,C, WITH LEFT HALF
2557  1100          ADA
2560  0027          0027            /ADD A CONSTANT
2561  1460          SAE+20
2562  7777          7777
2563  0000          HLT             /LDH FAILED, A=0770 B=7770 AC=7777

2564  0011          CLR
2565  1300          LDH
2566  4030          4030            /LOAD A,C, WITH RIGHT HALF
2567  1100          ADA
2570  0026          0026            /ADD A CONSTANT
2571  1460          SAE+20
2572  7777          7777
2573  0000          HLT             /LDH FAILED, A=0770 B=7707 AC=7777

2574  0011          CLR
2575  1300          LDH
2576  0031          0031            /LOAD A,C, WITH LEFT HALF
2577  1100          ADA
2600  0032          0032            /ADD A CONSTANT
2601  1460          SAE+20
2602  7777          7777
2603  0000          HLT             /LDH FAILED, A=2552 B=7752 AC=7777

2604  0011          CLR
```

```
2605  1300            LDH
2606  4031            4031            /LOAD AC WITH RIGHT HALF
2607  1100            ADA
2610  0033            0033            /ADD A CONSTANT
2611  1460            SAE+20
2612  7777            7777
2613  0000            HLT             /LDH FAILED, A=2552 B=7725 AC=7777


2614  0011            CLR
2615  1300            LDH
2616  0025            0025                    /LOAD A',C', WITH LEFT HALF
2617  1100            ADA
2620  0027            0027                    /ADD A CONSTANT
2621  1460            SAE+20
2622  7777            7777
2623  0456            SKP
2624  0000            HLT                     /LDH ERROR', A=7007 B=7770 AC NOT 7777

2625  0011            CLR
2626  1300            LDH
2627  4025            4025                    /LOAD A',C', WITH LEFT HALF
2630  1100            ADA
2631  0026            0026                    /ADD A CONSTANT
2632  1460            SAE+20
2633  7777            7777
2634  0456            SKP
2635  0000            HLT                     /LDH ERROR', A=7007 B=7707 AC NOT 7777

                /LDH
                /LDH I=0 B=X OPERAND ADDRESS IN B REGISTER

2636  0011            CLR
2637  0067            SET+20+7                /SET 7
2640  0025            0025
2641  1307            LDH+7                   /LOAD A',C',
2642  1100            ADA
2643  0026            0026                    /ADD A CONSTANT
2644  1460            SAE+20
2645  7777            7777
2646  0000            HLT                     /LDH FAILED', A=7007 B=7707 AC=7777

2647  0011            CLR
2650  0067            SET+20+7                /SET 7
2651  4025            4025
2652  1307            LDH+7                   /LOAD A',C',
2653  1100            ADA
2654  0027            0027                    /ADD A CONSTANT
2655  1460            SAE+20
2656  7777            7777
2657  0000            HLT                     /LDH FAILED', A=7007 B=7770 AC=7777

2660  0011            CLR
2661  0067            SET+20+7                /SET 7
2662  0030            0030
```

```
2663  1307          LDH+7                   /LOAD A',C',
2664  1100          ADA
2665  0027          0027                    /ADD A CONSTANT
2666  1460          SAE+20
2667  7777          7777
2670  0000          HLT                     /LDH FAILED, A=0770 B=7770 AC=7777

2671  0011          CLR
2672  0067          SET+20+7                /SET 7
2673  4030          4030
2674  1307          LDH+7                   /LOAD A',C',
2675  1100          ADA
2676  0026          0026
2677  1460          SAE+20                  /ADD A CONSTANT
2700  7777          7777
2701  0000          HLT                     /LDH FAILED, A=0770 B=7707 AC=7777

                /LDH I=1 B=0
                /LDH I=1 B=0 OPERAND IS IN THE NEXT LOCATION

2702  0011          CLR
2703  1320          LDH+20
2704  7007          7007                    /LOAD THE A',C',
2705  1100          ADA
2706  0026          0026                    /ADD A CONSTANT
2707  1460          SAE+20
2710  7777          7777
2711  0000          HLT                     /LDH FAILED A=7007 B=7707 AC=7777

2712  0011          CLR
2713  1320          LDH+20
2714  0770          0770                    /LOAD THE A',C',
2715  1100          ADA
2716  0027          0027                    /ADD A CONSTANT
2717  1460          SAE+20
2720  7777          7777
2721  0000          HLT                     /LDH FAILED A=0770 B=7770 AC=7777

2722  0011          CLR
2723  1320          LDH+20
2724  2552          2552                    /LOAD THE A',C',
2725  1100          ADA
2726  0032          0032                    /ADD A CONSTANT
2727  1460          SAE+20
2730  7777          7777
2731  0000          HLT                     /LDH FAILED A=2552 B=7752 AC=7777

2732  0011          CLR
2733  1320          LDH+20                  /LOAD THE A',C',
2734  5225          5225
2735  1100          ADA
2736  0033          0033                    /ADD A CONSTANT
2737  1460          SAE+20
2740  7777          7777
2741  0000          HLT                     /LDH FAILED A=5252 B=7725 AC=7777
```

```
2742  0011            CLR
2743  1320            LDH+20                  /LOAD THE A',C',
2744  0770            0770
2745  1100            ADA
2746  0032            0032                    /ADD A CONSTANT
2747  1460            SAE+20
2750  7777            7777
2751  0456            SKP
2752  0000            HLT                     /LDH ERROR', A=0770 B=7752 AC NOT 7777

2753  0011            CLR
2754  1320            LDH+20                  /LOAD THE A',C',
2755  2552            2552
2756  1100            ADA
2757  0031            0031                    /ADD A CONSTANT
2760  1460            SAE+20
2761  7777            7777
2762  0456            SKP
2763  0000            HLT                     /LDH ERROR', A=2552 B=2552 AC NOT 7777

                /LDH I=1 B=X
                /LDH I=1 B=X OPERAND ADDRESS =1 IS IN THE B REGISTER

2764  0011            CLR
2765  0067            SET+20+7                /SET 7
2766  4030            4030
2767  1327            LDH+20+7                /LOAD A',C',
2770  1100            ADA
2771  0032            0032                    /ADD A CONSTANT
2772  1460            SAE+20
2773  7777            7777
2774  0000            HLT                     /LDH FAILED A=2552 B=7752 AC=7777 B=?

2775  0011            CLR
2776  1327            LDH+20+7                /LOAD A',C', WITH OTHER HALF
2777  1100            ADA
3000  0033            0033                    /ADD A CONSTANT
3001  1460            SAE+20
3002  7777            7777
3003  0000            HLT                     /LDH FAILED A=2552 B=7725 AC=7777 B=?

3004  0011            CLR
3005  0067            SET+20+7                /SET 7
3006  4024            4024
3007  1327            LDH+20+7                /LOAD A',C',
3010  1100            ADA
3011  0026            0026                    /ADD A CONSTANT
3012  1460            SAE+20
3013  7777            7777
3014  0000            HLT                     /LDH FAILED A=7007 B=7707 AC=7777 B=?

3015  0011            CLR
3016  1327            LDH+20+7                /LOAD A',C', WITH OTHER HALF
```

```
3017  1100          ADA
3020  0027          0027                    /ADD A CONSTANT
3021  1460          SAE+20
3022  7777          7777
3023  0000          HLT                     /LDH FAILED A=0007 B=7770 AC=7777 B=0

3024  0011          CLR
3025  0077          SET+20+17               /SET 17
3026  4024          4024
3027  1337          LDH+20+17               /LOAD A',C',
3030  1100          ADA
3031  0026          0026                    /ADD A CONSTANT
3032  1460          SAE+20
3033  7777          7777
3034  0000          HLT                     /LDH FAILED A=0007 B=7707 AC=7777 B=17

3035  0011          CLR
3036  1337          LDH+20+17               /LOAD A',C', WITH OTHER HALF
3037  1100          ADA
3040  0027          0027                    /ADD A CONSTANT
3041  1460          SAE+20
3042  7777          7777
3043  0000          HLT                     /LDH FAILED A=0007 B=7770 AC=7777 B=17


3044  0011          CLR
3045  0067          SET+20+7                /SET 7
3046  4024          4024
3047  1327          LDH+20+7                /LOAD A',C',
3050  1100          ADA
3051  0030          0030                    /ADD A CONSTANT
3052  1460          SAE+20
3053  7777          7777
3054  0456          SKP
3055  0000          HLT                     /LDH ERROR', A=0007 B=0770 AC NOT 7777 B=0

3056  0011          CLR
3057  1327          LDH+20+7                /LOAD A',C', WITH OTHER HALF
3060  1100          ADA
3061  0030          0030                    /ADD A CONSTANT
3062  1460          SAE+20
3063  7777          7777
3064  0456          SKP
3065  0000          HLT                     /LDH ERROR', A=0007 B=0770 AC NOT 7777 B=0

                /STH I=0 B=0
                /STH I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION
                /
                /A=REGISTER BEFORE OPERATION
                /B=A',C', BEFORE OPERATION
                /C=REGISTER AFTER OPERATION
                /D=RIGHT OR LEFT HALF OF THE ADDRESS TO BE CHANGED
                /E=ADDRESS OF OPERATION
```

```
3066  0011          CLR
3067  2067          SET 20,7                /SET 7
3070  2525          2525
3071  1300          LDH
3072  0025          0025                    /LOAD A',C',
3073  1340          STH
3074  4007          4007                    /STORE IT IN RIGHT HALF
3075  0011          CLR
3076  1300          LDH
3077  4007          4007                    /LOAD A',C',
3100  1100          ADA
3101  0026          0026                    /ADD A CONSTANT
3102  1460          SAE 20
3103  7777          7777
3104  0000          HLT                     /STH FAILED, A=2525 B=0070 C=2570 D=R E=?

3105  0011          CLR
3106  1300          LDH
3107  0007          0007                    /LOAD AC WITH OTHER HALF
3110  1100          ADA
3111  0032          0032
3112  1460          SAE 20                  /ADD A CONSTANT
3113  7777          7777
3114  0000          HLT                     /STH MODIFIED WRONG HALF

3115  0011          CLR
3116  0067          SET 20,7                /SET 7
3117  2525          2525
3120  1300          LDH
3121  0025          0025                    /LOAD A',C',
3122  1340          STH
3123  0007          0007                    /STORE IN LEFT HALF
3124  0011          CLR
3125  1300          LDH
3126  0007          0007                    /LOAD A',C',
3127  1100          ADA
3130  0026          0026
3131  1460          SAE 20                  /ADD A CONSTANT
3132  7777          7777
3133  0000          HLT                     /STH FAILED, A=2525 B=0070 C=7025 D=L E=?

3134  0011          CLR
3135  1300          LDH
3136  4007          4007                    /LOAD AC WITH OTHER HALF
3137  1100          ADA
3140  0032          0032                    /ADD A CONSTANT
3141  1460          SAE 20
3142  7777          7777
3143  0000          HLT                     /STH MODIFIED WRONG HALF

3144  0011          CLR
3145  0067          SET 20,7                /SET 7
3146  7777          7777
3147  1300          LDH
```

```
3150  0023          0023                    /LOAD IN LEFT HALF
3151  1340          STH
3152  4007          4007                    /STORE IT
3153  0011          CLR
3154  1300          LDH
3155  4007          4007                    /LOAD A',C',
3156  1100          ADA
3157  0033          0033                    /ADD A CONSTANT
3160  1460          SAE+20
3161  7777          7777
3162  0000          HLT                     /STH FAILED A=7777 B=0052 C=7752 D=R E=?

3163  0011          CLR
3164  1300          LDH
3165  0007          0007                    /LOAD AC
3166  1100          ADA
3167  0034          0034                    /ADD A CONSTANT
3170  1460          SAE+20
3171  7777          7777
3172  0000          HLT                     /STH MODIFIED WRONG HALF

3173  0011          CLR
3174  0067          SET+2047                /SET 7
3175  7777          7777
3176  1300          LDH
3177  0023          0023                    /LOAD A',C',
3200  1340          STH
3201  0007          0007                    /STORE IN LEFT HALF
3202  0011          CLR
3203  1300          LDH
3204  0007          0007                    /LOAD A',C',
3205  1100          ADA
3206  0033          0033                    /ADD A CONSTANT
3207  1460          SAE+20
3210  7777          7777
3211  0000          HLT                     /STH FAILED A=7777 B=0052 C=5277 D=L E=?

3212  0011          CLR
3213  1300          LDH
3214  4007          4007                    /LOAD RIGHT HALF
3215  1100          ADA
3216  0034          0034                    /ADD A CONSTANT
3217  1460          SAE+20
3220  7777          7777
3221  0000          HLT                     /STH MODIFIED WRONG HALF


3222  0011          CLR
3223  0067          SET+2047                /SET 7
3224  2525          2525
3225  1300          LDH
3226  4025          4025                    /LOAD RIGHT HALF
3227  1340          STH
3230  4007          4007                    /STORE IT IN THE RIGHT HALF
3231  0011          CLR
```

```
3232  1300          LDH
3233  4007          4007                    /LOAD AC FROM RIGHT HALF
3234  1100          ADA
3235  0027          0027                    /ADD A CONSTANT
3236  1460          SAE+20
3237  7777          7777
3240  0000          HLT                     /STH FAILED A=2525 B=0007 C=2525 D=R E=7

                /STH I=0 B=X
                /STH I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

3241  0011          CLR
3242  0067          SET+20+7                /SET 7
3243  4006          4006
3244  0011          CLR
3245  0066          SET+20+6                /SET 6
3246  7777          7777
3247  1300          LDH
3250  4025          4025                    /LOAD A',C', WITH RIGHT HALF
3251  1347          STH+7                   /STORE IT
3252  0011          CLR
3253  1300          LDH
3254  4006          4006                    /LOAD FROM RIGHT HALF
3255  1100          ADA
3256  0027          0027                    /ADD A CONSTANT
3257  1460          SAE+20
3260  7777          7777
3261  0000          HLT                     /STH FAILED A=7777 B=0007 C=7707 D=R E=6,7

3262  0011          CLR
3263  1300          LDH
3264  0006          0006                    /LOAD A',C', FROM LEFT HALF
3265  1100          ADA
3266  0034          0034                    /ADD A CONSTANT
3267  1460          SAE+20
3270  7777          7777
3271  0000          HLT                     /STH MODIFIED WRONG HALF

3272  0011          CLR
3273  0067          SET+20+7                /SET 7
3274  0006          0006
3275  0011          CLR
3276  0066          SET+20+6                /SET 6
3277  7777          7777
3300  1300          LDH
3301  4025          4025                    /LOAD RIGHT HALF INTO THE A',C',
3302  1347          STH+7                   /STORE IT
3303  0011          CLR
3304  1300          LDH
3305  0006          0006                    /LOAD LEFT HALF INTO THE A',C',
3306  1100          ADA
3307  0027          0027                    /ADD A CONSTANT
3310  1460          SAE+20
3311  7777          7777
3312  0000          HLT                     /STH FAILED A=7777 B=0007 C=0777 D=L E=6,7
```

```
3313  0011          CLR
3314  1300          LDW
3315  4006          4006                    /LOAD RIGHT HALF INTO THE A,C'S
3316  1100          ADA
3317  0034          0034                    /ADD A CONSTANT
3320  1460          SAE+20
3321  7777          7777
3322  0000          HLT                     /STH MODIFIED WRONG HALF

3323  0011          CLR
3324  0067          SET+2047                /SET 7
3325  4006          4006
3326  0011          CLR
3327  0066          SET+2046                /SET 6
3330  7777          7777
3331  1300          LDW
3332  4031          4031                    /LOAD RIGHT HALF INTO THE A,C'S
3333  1347          STH+7                   /STORE IT
3334  0011          CLR
3335  1300          LDW
3336  4006          4006                    /LOAD A,C'S
3337  1100          ADA
3340  0033          0033                    /ADD A CONSTANT
3341  1460          SAE+20
3342  7777          7777
3343  0000          HLT                     /STH FAILED A=7777 B=0052 C=7752 D=R E=6,7

3344  0011          CLR
3345  1300          LDW
3346  0006          0006                    /LOAD OTHER HALF INTO THE A,C'S
3347  1100          ADA
3350  0034          0034                    /ADD A CONSTANT
3351  1460          SAE+20
3352  7777          7777
3353  0000          HLT                     /STH MODIFIED WRONG HALF

3354  0011          CLR
3355  0067          SET+2047                /SET 7
3356  0006          0006
3357  0011          CLR
3360  0066          SET+2046                /SET 6
3361  7777          7777
3362  1300          LDW
3363  4031          4031                    /LOAD RIGHT HALF INTO THE A,C'S
3364  1347          STH+7                   /STORE A,C'S
3365  0011          CLR
3366  1300          LDW
3367  0006          0006                    /LOAD HALF WORD
3370  1100          ADA
3371  0033          0033                    /ADD A CONSTANT
3372  1460          SAE+20
3373  7777          7777
3374  0000          HLT                     /STH FAILED A=7777 B=0052 C=5277 D=L E=6,7
```

```
3375  0011          CLR
3376  1300          LDH
3377  4006          4006                    /LOAD AC
3400  1100          ADA
3401  0034          0034                    /ADD A CONSTANT
3402  1460          SAE+20
3403  7777          7777
3404  0000          HLT                     /STH MODIFIED WRONG HALF

                /ADM I=0 B=0
                /ADM I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION

3405  0011          CLR
3406  1040          STA
3407  0007          0007                    /STORE A',C', IN 7
3410  1140          ADM
3411  0007          0007                    /LOAD A',C, FROM 7
3412  1460          SAE+20
3413  0000          0000
3414  0000          HLT                     /ADM FAILED A=0000 B=0000 E=7

3415  0474          FLO+20                  /FLO FAILED FLO=0
3416  0000          HLT
3417  0011          CLR
3420  0017          COM
3421  1040          STA
3422  0007          0007                    /STORE A',C', IN 7
3423  1140          ADM
3424  0007          0007                    /LOAD A',C', FROM 7
3425  1460          SAE+20
3426  7777          7777
3427  0000          HLT                     /ADM FAILED A=7777 B=0000 C=7777 E=7

3430  0011          CLR
3431  0067          SET+20+7                /SET 7 TO 2525
3432  2525          2525
3433  1020          LDA+20
3434  5252          5252                    /LOAD A',C', WITH 5252
3435  1140          ADM
3436  0007          0007                    /ADM 7 TO THE A',C',
3437  1460          SAE+20
3440  7777          7777
3441  0000          HLT                     /ADM FAILED A=2525 B=5252 C=7777 E=7

3442  0011          CLR
3443  0067          SET+20+7                /SET 7 TO 7777
3444  7777          7777
3445  1020          LDA+20                  /LOAD A',C', WITH 7
3446  0001          0001
3447  1140          ADM
3450  0007          0007                    /ADM A,C', FROM 7
3451  0452          LEE
```

```
3452  0000          HLT                     /ADM CHANGED LINK
3453  1460          SAE+20
3454  0001          0001
3455  0000          HLT                     /ADM FAILED AC SHOULD = 0001

3456  0011          CLR
3457  0067          SET+20+7                /SET 7 TO 2525
3460  2525          2525
3461  1020          LDA+20
3462  5253          5253                    /LOAD A',C', WITH 5253
3463  1140          ADM
3464  0007          0007                    /ADM A,C', FROM 7
3465  0452          LZE
3466  0000          HLT                     /ADM CHANGED LINK
3467  1460          SAE+20
3470  0001          0001
3471  0000          HLT                     /ADM FAILED A=2525 B=5253 C=0001 E=7

3472  0011          CLR
3473  1020          LDA+20
3474  4000          4000
3475  0261          ROL+20+1                /SET THE LINK
3476  0452          LZE
3477  0456          SKP
3500  0000          HLT                     /ROL FAILED LINK = 0
3501  0067          SET+20+7
3502  7777          7777                    /SET 7 TO 7777
3503  1020          LDA+20
3504  0001          0001                    /LOAD A',C', WITH 1
3505  1140          ADM
3506  0007          0007                    /ADM A',C', FROM 7
3507  0452          LZE
3510  0456          SKP
3511  0000          HLT                     /ADM CHANGED LINK
3512  1460          SAE+20
3513  0001          0001
3514  0000          HLT                     /ADM FAILED A=7777 B=0001 C=0001 E=7


3515  0011          CLR
3516  1020          LDA+20
3517  0001          0001
3520  0321          ROR+20+1                /SET LINK
3521  0452          LZE
3522  0456          SKP
3523  0000          HLT                     /ROR FAILED L=0
3524  0067          SET+20+7                /SET 7 WITH 5252
3525  5252          5252
3526  1020          LDA+20
3527  5252          5252                    /LOAD A',C', WITH 5252
3530  1140          ADM
3531  0007          0007                    /ADM A,C', FROM 7
3532  0452          LZE
3533  0456          SKP
3534  0000          HLT                     /ADM CHANGED LINK L=1
```

```
3535  1460            SAE+20
3536  2525            2525
3537  0000            HLT                     /ADM FAILED A=5252 B=5252 C= E=7

3540  0454            FLO                     /FLO FAILED FLO=1
3541  0000            HLT
                /ADM I=0 B=X
                /ADM I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

3542  0011            CLR
3543  0066            SET+20+6                /SET 6 WITH 7777
3544  7777            7777
3545  0067            SET+20+7                /SET 7 WITH 0006
3546  0006            0006
3547  1020            LDA+20
3550  0001            0001                    /LOAD A,C, WITH 1
3551  1147            ADM+7                   /ADM A,C, WITH INDIRECT 7
3552  1460            SAE+20
3553  0001            0001
3554  0000            HLT                     /ADM FAILED
3555  1000            LDA
3556  0006            0006                    /LOAD A,C, WITH THE VALUE OF 6
3557  1460            SAE+20
3560  0001            0001
3561  0000            HLT                     /ADM FAILED A=7777 B=0001 C=0001 E=6,7


3562  0011            CLR
3563  0066            SET+20+6                /SET 6 WITH 2525
3564  2525            2525
3565  0067            SET+20+7                /SET 7 WITH 0006
3566  0006            0006
3567  1020            LDA+20
3570  5253            5253                    /LOAD A,C, WITH 5253
3571  1147            ADM+7
3572  1460            SAE+20
3573  0001            0001                    /ADM A,C, FROM 7 INDIRECT
3574  0000            HLT                     /ADM FAILED A=2525 B=5253 C=0001 E=6,7

3575  0011            CLR
3576  1020            LDA+20
3577  4000            4000
3600  0261            ROL+20+1                /SET LINK
3601  0452            LZE
3602  0456            SKP
3603  0000            HLT                     /ROL FAILED L=0
3604  0066            SET+20+6                /SET 6 WITH 7777
3605  7777            7777
3606  0067            SET+20+7                /SET 7 WITH 0006
3607  0006            0006
3610  1020            LDA+20
3611  0001            0001                    /LOAD A,C, WITH 1
3612  1147            ADM+7                   /ADM A,C, FROM 7 INDIRECT
3613  0452            LZE
3614  0456            SKP
```

```
3615  0000          HLT                     /ADM CHANGED LINK L=0
3616  1460          SAE+20
3617  0001          0001                    /ADM FAILED
3620  0000          HLT
3621  1000          LDA
3622  0006          0006                    /LOAD A,C, WITH VALUE OF 6
3623  1460          SAE+20
3624  0001          0001
3625  0000          HLT                     /ADM FAILED A=7777 B=0001 C=0001 E=6,7

                /ADM I=1 B=0
                /ADM I=1 B=0 OPERAND IS IN THE NEXT LOCATION

3626  0011          CLR
3627  1020          LDA+20
3630  0001          0001                    /LOAD A,C, WITH I
3631  1040          STA
3632  3636                  .+4             /STORE IT
3633  1020          LDA+20
3634  7776          7776                    /LOAD A,C, WITH 7776
3635  1160          ADM+20
3636  0001          0001                    /ADM A,C, WITH NEXT LOCATION
3637  1460          SAE+20
3640  7777          7777
3641  0000          HLT                     /ADM FAILED A=7776 B=0001 C=7777

3642  1000          LDA
3643  3636          .-3                     /GET VALUE OF ADM
3644  1460          SAE+20
3645  7777          7777
3646  0000          HLT                     /ADM FAILED TO CHANGE DATA

3647  0011          CLR
3650  1020          LDA+20
3651  0001          0001                    /LOAD A,C, WITH I
3652  1040          STA
3653  3657                  .+4             /STORE IT

3654  1020          LDA+20
3655  7777          7777                    /LOAD A,C, WITH 7777
3656  1160          ADM+20
3657  0001          0001                    /ADM A,C, WITH NEXT LOCATION
3660  1460          SAE+20
3661  0001          0001
3662  0000          HLT                     /ADM FAILED A=7777 B=0001 C=0001

3663  1000          LDA
3664  3657          .-3                     /GET THE VALUE OF THE ADM
3665  1460          SAE+20
3666  0001          0001
3667  0000          HLT                     /ADM FAILED

3670  0011          CLR
3671  1020          LDA+20
3672  5253          5253                    /LOAD A,C, WITH 5253
```

```
3673  1040          STA
3674  3700                ,+4             /STORE IT
3675  1020          LDA+20
3676  2525          2525                  /LOAD A,C, WITH 2525
3677  1160          ADM+20                /ADM A,C, WITH NEXT LOCATION
3700  5253          5253
3701  1460          SAE+20
3702  0001          0001
3703  0000          HLT                   /ADM FAILED A=2525 B=5253 C=0001

3704  1000          LDA
3705  3700          ,-5                   /GET VALUE OF ADM
3706  1460          SAE+20
3707  0001          0001
3710  0000          HLT                   /ADM FAILED



3711  0011          CLR
3712  1020          LDA+20                /LOAD A,C,
3713  2525          2525
3714  1040          STA
3715  3721                ,+4             /STORE IT
3716  1020          LDA+20                /LOAD A,C,
3717  5252          5252
3720  1160          ADM+20                /ADM A,C, WITH THE NEXT LOCATION
3721  2525          2525
3722  1460          SAE+20
3723  7777          7777
3724  0000          HLT                   /ADM FAILED A=5252 B=2525 C=7777

3725  1000          LDA
3726  3721          ,-5                   /GET VALUE OF ADM
3727  1460          SAE+20
3730  7777          7777
3731  0000          HLT                   /ADM FAILED

3732  0011          CLR
3733  1020          LDA+20                /LOAD A,C,
3734  2526          2526
3735  1040          STA
3736  3742                ,+4             /STORE IT
3737  1020          LDA+20
3740  5252          5252                  /LOAD A,C, WITH 5252
3741  1160          ADM+20                /ADM A,C, WITH THE NEXT LOCATION
3742  2526          2526
3743  1460          SAE+20
3744  0001          0001
3745  0000          HLT                   /ADM FAILED A=5252 B=2526 C=0001

3746  1000          LDA
3747  3742          ,-5                   /GET VALUE OF ADM
3750  1460          SAE+20
3751  0001          0001
3752  0000          HLT                   /ADM FAILED
```

```
                    /ADM I=1 B=X
                    /ADM I=1 B=X OPERAND ADDRESS =1 IS IN THE B REGISTER

3753  0011          CLR
3754  0067          SET+20+7                  /SET 7 WITH 0005
3755  0005          0005
3756  0066          SET+20+6                  /SET 6 WITH 7776
3757  7776          7776
3760  1020          LDA+20                    /LOAD A,C(
3761  0001          0001
3762  1167          ADM+20+7                  /ADM A,C( WITH 7 INDIRECT
3763  1460          SAE+20
3764  7777          7777
3765  0000          HLT                       /ADM FAILED A=7776 B=0001 C=7777 E=6,7
3766  1000          LDA
3767  0006          0006                      /LOAD A,C( WITH THE VALUE OF 6
3770  1460          SAE+20
3771  7777          7777
3772  0000          HLT                       /ADM FAILED

3773  0642          LDF+2
3774  0602          LIF+2
3775  6200          JMP+200                   /CHANGE TO NEXT CELL

      4000    *4000
4000  7402          7402                      /SHOULD NEVER
4001  0000          0000
4002  7402          7402                      /EXECUTE THESE HALTS

      4020    *4020

4020  0000          HLT                       /INCORRECT STARTING ADDRESS
4021  6021          JMP     21                /HANG HERE
4022  7777          7777
4023  5252          5252
4024  0000          0000
4025  7007          7007
4026  7707          7707
4027  7770          7770
4030  0770          0770
4031  2552          2552
4032  7752          7752
4033  7725          7725
4034  7700          7700
4035  0000          0000
4036  2525          2525
4037  0000          0000

4040  0000          0000                      /HALT = LINC INTERRUPT
4041  0000          0000                      /FAILED TO INTERRUPT TO CELL 0

      4140    *4140
```

```
4140  0000          HLT                     /DID NOT
4141  0000          HLT                     / TRAP PROPERLY

      4200    *4200
4200  0011          CLR
4201  0067          SET+20+7                /SET 7 WITH 0016
4202  0016          0016
4203  0077          SET+20+17               /SET 17 WITH 7776
4204  7776          7776
4205  1020          LDA+20
4206  0001          0001                    /LOAD A,C,
4207  1167          ADM+20+7                /ADM A,C, WITH 7 INDIRECT
4210  1460          SAE+20
4211  7777          7777
4212  0000          HLT                     /ADM FAILED A=7776 B=0001 C=7777 E=7,17

4213  1000          LDA
4214  0017          0017                    /GET VALUE OF ADM
4215  1460          SAE+20
4216  7777          7777
4217  0000          HLT                     /ADM FAILED

4220  0011          CLR
4221  0067          SET+20+7                /SET 7 WITH 0016
4222  0016          0016
4223  0077          SET+20+17               /SET 17 WITH 2525
4224  2525          2525
4225  1020          LDA+20
4226  5252          5252                    /LOAD A,C,
4227  1167          ADM+20+7                /ADM A,C, WITH 7 INDIRECT
4230  1460          SAE+20
4231  7777          7777
4232  0000          HLT                     /ADM FAILED A=2525 B=5252 C=7777 E=7,17

4233  1000          LDA
4234  0017          0017                    /GET VALUE OF ADM
4235  1460          SAE+20
4236  7777          7777
4237  0000          HLT                     /ADM FAILED



4240  0011          CLR
4241  0067          SET+20+7                /SET 7 WITH 0016
4242  0016          0016
4243  0077          SET+20+17               /SET 17 WITH 5252
4244  5252          5252
4245  1020          LDA+20
4246  2526          2526                    /LOAD A,C,
4247  1167          ADM+20+7                /ADM A,C, WITH 7 INDIRECT
4250  1460          SAE+20
4251  0001          0001
4252  0000          HLT                     /ADM FAILED A=5252 B=2526 C=0001 E=7,17

4253  1000          LDA
```

```
4254  0017          0017                    /GET VALUE OF ADM
4255  1460          SAE+20
4256  0001          0001
4257  0000          HLT                     /ADM FAILED

                /LAM I=0 B=0
                /LAM I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION

4260  0011          CLR
4261  1020          LDA+20
4262  4000          4000
4263  0261          ROL+20+1                /SET LINK
4264  0067          SET+20+7
4265  6517          6517                    /SET 7 WITH 6517
4266  1020          LDA+20
4267  3743          3743                    /LOAD A,C, WITH 3743
4270  1200          LAM
4271  0007          0007                    /LAM 7
4272  1460          SAE+20
4273  2463          2463
4274  0000          HLT                     /LAM FAILED AC SHOULD = 2463
4275  0474          FLO+20
4276  0000          HLT                     /FLO FAILED FLO=0

4277  0452          LAE
4300  0456          SKP
4301  0000          HLT                     /LINK SHOULD = 1

4302  1000          LDA
4303  0007          0007                    /GET VALUE OF 7
4304  1460          SAE+20
4305  2463          2463
4306  0000          HLT                     /LAM FAILED TO MODIFY LOCATION 7

4307  0011          CLR
4310  0067          SET+20+7                /SET 7 WITH 5253
4311  5253          5253
4312  1020          LDA+20                  /LOAD A,C, WITH 2525
4313  2525          2525
4314  1200          LAM                     /LAM 7
4315  0007          0007
4316  1460          SAE+20
4317  0000          0000
4320  0000          HLT                     /LAM FAILED AC SHOULD BE 0000

4321  0452          LAE
4322  0456          SKP
4323  0000          HLT                     /LINK SHOULD BE SET

4324  1000          LDA
4325  0007          0007
4326  1460          SAE+20
4327  0000          0000
4330  0000          HLT                     /LAM FAILED TO MODIFY CORRECT ADDRESS
```

```
4331  0011          CLA
4332  1020          LDA+20
4333  4000          4000
4334  0261          ROL+20+1                /SET LINK
4335  0067          SET+20+7
4336  5252          5252                    /SET 7 WITH 5252
4337  1020          LDA+20
4340  5252          5252                    /LOAD A.C.
4341  1200          LAM
4342  0007          0007                    /LAM 7
4343  1460          SAE+20
4344  2525          2525
4345  0000          HLT                     /LAM FAILED AC SHOULD BE 2525
4346  0472          LZE+20
4347  0000          HLT                     /LINK SHOULD = 0
4350  1000          LDA
4351  0007          0007
4352  1460          SAE+20                  /GET VALUE OF LAM
4353  2525          2525
4354  0000          HLT                     /LAM FAILED TO STORE DATA IN ADDRESS 7 PROPERLY
4355  0454          FLO
4356  0000          HLT                     /FLO FAILED FLO=1

4357  6420          JMP     420             /GO TO THE NEXT TEST

      4400    *4400
4400  0000          HLT                     /INCORRECT STARTING ADDRESS
4401  6401          JMP     401             /HANG HERE


      4420    *4420
              /LAM I=0 B=X
              /LAM I=0 B=X OPERAND ADDRESS IS IN THE B REGISTER

4420  0011          CLA
4421  1020          LDA+20
4422  4000          4000
4423  0261          ROL+20+1                /SET LINK
4424  0066          SET+20+6                /SET 6 WITH 2525
4425  2525          2525
4426  0067          SET+20+7                /SET 7 WITH 0006
4427  0006          0006
4430  1020          LDA+20
4431  5252          5252                    /LOAD AC WITH 5252
4432  1207          LAM+7                   /LAM 7
4433  1460          SAE+20
4434  0000          0000
4435  7000          HLT                     /LAM FAILED AC SHOULD BE 0000
4436  0452          LZE
4437  0456          SKP
4440  0000          HLT                     /LINK FAILED L=0

4441  0011          CLA
4442  0066          SET+20+6                /SET 6 WITH 2525
```

```
4443  2525            2525
4444  0067            SET+20+7                /SET 7 WITH 0006
4445  0006            2006
4446  1020            LDA+20                  /LOAD AC
4447  5252            5252
4450  1207            LAM+7
4451  0452            LZE
4452  0000            HLT                     /LINK SHOULD = 0
4453  1460            SAE+20
4454  7777            7777
4455  0000            HLT                     /LAM FAILED AC SHOULD BE 7777

4456  0011            CLR
4457  1020            LDA+20
4460  4000            4000
4461  0261            ROL+20+1                /SET LINK
4462  0066            SET+20+6                /SET 6 WITH 5251
4463  5251            5251
4464  0067            SET+20+7                /SET 7 WITH 0006
4465  0006            0006
4466  1020            LDA+20                  /LOAD AC
4467  2525            2525
4470  1207            LAM+7
4471  0452            LZE
4472  0000            HLT                     /LINK FAILED = 0
4473  1460            SAE+20
4474  7777            7777
4475  0000            HLT                     /LAM FAILED AC SHOULD BE 7777


                /LAM I=1 B=0
                /LAM I=1 B=0 OPERAND IS IN THE NEXT LOCATION

4476  0011            CLR
4477  1020            LDA+20                  /LOAD AC WITH 0707
4500  0707            0707
4501  1040            STA                     /STORE AC
4502  4506                    .+4
4503  1020            LDA+20                  /LOAD AC WITH 7070
4504  7070            7070
4505  1220            LAM+20                  /LAM NEXT LOCATION
4506  0707            0707
4507  0452            LZE
4510  0000            HLT                     /LINK FAILED L=1
4511  1460            SAE+20
4512  7777            7777
4513  0000            HLT                     /LAM FAILED AC SHOULD BE 7777

4514  0011            CLR
4515  1020            LDA+20                  /LOAD AC WITH 0001
4516  0001            0001
4517  1040            STA                     /STORE AC
4520  4524                    .+4
4521  1020            LDA+20                  /LOAD AC WITH 7777
4522  7777            7777
```

```
4523  1220          LAM+20                  /LAM NEXT LOCATION
4524  0001          0001
4525  0452          LZE
4526  0456          SKP
4527  0000          HLT                     /LINK FAILED L=0
4530  1460          SAE+20
4531  0000          0000
4532  0000          HLT                     /LAM FAILED AC SHOULD BE 0000

4533  0011          CLR
4534  1020          LDA+20
4535  4000          4000
4536  0261          ROL+20+1                /SET LINK
4537  1020          LDA+20                  /LOAD AC WITH 5251
4540  5251          5251
4541  1040          STA                     /STORE IT
4542  4546                  ;+4
4543  1020          LDA+20                  /LOAD AC WITH 2525
4544  2525          2525
4545  1220          LAM+20                  /LAM NEXT LOCATION
4546  5251          5251
4547  0452          LZE
4550  0000          HLT                     /LINK FAILED L=1
4551  1460          SAE+20
4552  7777          7777
4553  0000          HLT                     /LAM FAILED AC SHOULD BE 7777


                /LAM I=1 B=X
                /LAM I=1 B=X OPERAND ADDRESS =1 IS IN THE B REGISTER

4554  0011          CLR
4555  0067          SET+20+7                /SET 7 WITH 0005
4556  0005          0005
4557  0066          SET+20+6                /SET 6 WITH 7777
4560  7777          7777
4561  1020          LDA+20
4562  0001          0001
4563  1227          LAM+20+7                /LAM AC WITH 7 INDIRECT
4564  0452          LZE
4565  0456          SKP
4566  0000          HLT                     /LINK FAILED L=1
4567  1460          SAE+20
4570  0000          0000
4571  0000          HLT                     /LAM FAILED AC SHOULD BE 0000 B=6,7
4572  1000          LDA                     /LOAD AC WITH VALUE OF 6
4573  0006          0006
4574  1460          SAE+20
4575  0000          0000
4576  0000          HLT                     /LAM FAILED 6=XXXX

4577  0011          CLR
4600  0067          SET+20+7                /SET 7 WITH 0016
4601  0016          0016
4602  0077          SET+20+17               /SET 17 WITH 2525
```

```
4603  2525            2525
4604  1020            LDA+20                  /LOAD AC WITH 5252
4605  5252            5252
4606  1227            LAM+20+7                /LAM AC WITH 7 INDIRECT
4607  0452            LZE
4610  0000            HLT                     /LINK FAILED L=1
4611  1460            SAE+20
4612  7777            7777
4613  0000            HLT                     /LAM FAILED AC SHOULD BE 7777 B=7,I7
4614  1000            LDA                     /LOAD A,C, WITH VALUE OF 17
4615  0017            0017
4616  1460            SAE+20
4617  7777            7777
4620  0000            HLT                     /LAM FAILED 0017=>7777

4621  0011            CLR
4622  1020            LDA+20
4623  4000            4000
4624  0261            ROL+20+1                /SET LINK
4625  0067            SET+20+7                /SET 7 WITH 0016
4626  0016            0016
4627  0077            SET+20+17               /SET 17 WITH 5252
4630  5252            5252
4631  1020            LDA+20                  /LOAD AC WITH 2524
4632  2524            2524
4633  1227            LAM+20+7                /LAM AC WITH 7 INDIRECT
4634  0452            LZE
4635  0000            HLT                     /LINK FAILED L=1
4636  1460            SAE+20
4637  7777            7777
4640  0000            HLT                     /LAM FAILED AC SHOULD BE 7777
4641  1000            LDA                     /LOAD AC WITH VALUE OF 17
4642  0017            0017
4643  1460            SAE+20
4644  7777            7777
4645  0000            HLT                     /LAM FAILED
                /MUL
                /MULTIPLY ROUTINE DATA HANDLER

4646  0011            CLR
4647  0005            QAC                     /READ M,Q,
4650  1460            SAE+20
4651  0000            0000
4652  0000            HLT                     /QAC FAILED MQ NOT 0000
4653  0455            QLC
4654  0000            HLT                     /MQ BIT 11=1
4655  1020            LDA+20
4656  4000            4000
4657  0005            QAC
4660  0451            APO
4661  0000            HLT                     /QAC DID NOT CLEARED AC BIT 0

4662  0011            CLR
4663  1020            LDA+20                  /LOAD AC WITH 7777
4664  7777            7777
```

```
4665  0314            ROR+14
4666  1560            BCL+20                  /CLEAR AC
4667  7777            7777
4670  0005            QAC                     /READ M',Q',
4671  1460            SAE+20
4672  3777            3777
4673  0000            HLT                     /MQ NOT 3777

4674  0011            CLR
4675  1020            LDA+20                  /LOAD AC
4676  5252            5252
4677  0314            ROR+14
4700  1560            BCL+20                  /CLEAR AC
4701  7777            7777
4702  0005            QAC                     /READ M',Q',
4703  1460            SAE+20
4704  2525            2525
4705  0000            HLT                     /MQ NOT 5252

4706  0011            CLR
4707  1020            LDA+20                  /LOAD AC
4710  2525            2525
4711  0314            ROR+14
4712  1560            BCL+20                  /CLEAR AC
4713  7777            7777
4714  0005            QAC                     /READ M',Q',
4715  1460            SAE+20
4716  1252            1252
4717  0000            HLT                     /MQ NOT 2525


                /MUL
                /MUL I=0 B=0 OPERAND ADDRESS IS IN THE NEXT LOCATION

4720  0011    RMA,    CLR
4721  0066            SET+20+6                /SET 6 WITH 0001
4722  0001            0001
4723  0067            SET+20+7                /SET 7 WITH 0001
4724  0001            0001
4725  1000    RMB,    LDA                     /LOAD AC WITH VALUE OF 7
4726  0007            0007
4727  1240            MUL                     /MULTIPLY AC BY THE
4730  0006            0006                    /VALUE OF LOCATION 6
4731  1440            SAE
4732  0007            0007
4733  0000            HLT                     /MUL AC FAILED

4734  4003            STC     3               /CLEAR AC
4735  0005            QAC                     /READ M',Q',
4736  1440            SAE
4737  0007            0007
4740  0000            HLT                     /MUL MQ FAILED
4741  1000            LDA                     /LOAD AC WITH VALUE OF 7
4742  0007            0007
4743  0241            ROL+1
```

```
4744  0451            APO                     /AC NEGATIVE?
4745  6751            JMP     .+4             /YES, EXIT
4746  1040            STA                     /NO, SAVE AC
4747  0007            0007
4750  6725            JMP     RMB             /RE-EXECUTE MULTIPLY

                /MUL
                /MUL 1-0 B-X OPERAND ADDRESS IN THE B REGISTER

4751  0011    RMAC,   CLR
4752  0066            SET-20-6                /SET 6 WITH 0001
4753  0001            0001
4754  0067            SET-20-7                /SET 7 WITH 0001
4755  0001            0001
4756  0077            SET-20-17               /SET 17 WITH 0006
4757  0006            0006
4760  0076            SET-20-16               /SET 16 WITH 0007
4761  0007            0007
4762  1016    RMBC,   LDA-16                  /LOAD AC WITH VALUE OF 16
4763  1257            MUL-17                  /MULTIPLY AC BY THE VALUE OF 17
4764  1456            SAE-16
4765  0000            HLT                     /MUL AC FAILED

4766  4003            STC     3               /CLEAR AC
4767  0005            QAC                     /READ M.Q.
4770  1456            SAE-16
4771  0000            HLT                     /MUL MQ FAILED
4772  1016            LDA-16
4773  0241            ROL-1
4774  0451            APO                     /AC NEGATIVE?
4775  7000            JMP     .+3             /YES, EXIT
4776  1056            STA-16                  /NO, SAVE AC
4777  6762            JMP     RMBC            /RE-EXECUTE

                /MUL
                /MUL 1-1 B-0 OPERAND IS IN THE NEXT LOCATION

5000  0011    RMAB,   CLR
5001  0066            SET-20-6                /SET 6 WITH 0001
5002  0001            0001
5003  1020            LDA-20                  /LOAD AC WITH 0001
5004  0001            0001
5005  5011            STC     .+4             /SAVE AC
5006  1000    RMBB,   LDA                     /MULTIPLICAN
5007  0006            0006
5010  1260            MUL-20
5011  0000    RMCB,   0000                    /MULTIPLIER
5012  1440            SAE
5013  0006            0006
5014  0000            HLT                     /MUL MQ FAILED

5015  4003            STC     3               /CLEAR AC
5016  7005            QAC                     /READ MQ
5017  1440            SAE
5020  0006            0006
```

```
5021  0000          HLT                     /MUL MQ FAILED
5022  1000          LDA
5023  0006          0006
5024  0241          ROL-1
5025  0451          APO                     /AC NEGATIVE?
5026  7032          JMP     .+4             /YES, EXIT
5027  1040          STA                     /NO, SAVE AC
5030  0006          0006
5031  7006          JMP     RMBB            /RE-EXECUTE

                /MUL
                /MUL I-1 B-X OPERAND ADDRESS -1 IS IN THE B REGISTER

5032  0011    RMAD, CLR
5033  0066          SET-20-6                /SET 6 WITH 0001
5034  0001          0001
5035  0067          SET-20-7                /SET 7 WITH 0001
5036  0001          0001
5037  0077    RMBD, SET-20-17               /SET 17 WITH 0005
5040  0005          0005
5041  0076          SET-20-16               /SET 16 WITH 0006
5042  0006          0006
5043  1036          LDA-20-16               /MULTIPLICAN
5044  1277          MUL-20-17               /MULTIPLIER
5045  1456          SAE-16
5046  0000          HLT                     /MUL AC FAILED

5047  4003          STC     3               /CLEAR AC
5050  0005          QAC                     /READ MQ
5051  1456          SAE-16
5052  0000          HLT                     /MUL MQ FAILED
5053  1000          LDA
5054  0007          0007
5055  0241          ROL-1
5056  0451          APO                     /AC NEGATIVE?
5057  7063          JMP     .+4             /YES, EXIT
5060  1040          STA                     /NO, SAVE AC
5061  0007          0007
5062  7037          JMP     RMBD            /RE-EXECUTE

5063  0235          XSK-20-15
5064  0456          SKP
5065  7071          JMP     .+4
5066  0640          LDF                     /EXECUTE PREVIOUS INSTRUCTIONS 1777 TIMES
5067  0600          LIF                     /RETURN TO CELL 0
5070  6405          JMP     405             / AND REPEAT TEST

                /DJR TEST
                /DJR ROUTINE FOR CORRECT OPERATION EXECUTE 1777 TIMES

5071  0011    DJR1, CLR
5072  0060          SET-20-0                /SET 0 TO 7777
5073  7777          7777
5074  0006          DJR                     /PROTECT 0
```

```
5075  7076            JMP     .+1
5076  1000            LDA                     /LOAD VALUE OF 0
5077  0000            0000
5100  1460            SAE+20
5101  7777            7777
5102  0000            HLT                     /DJR FAILED LOC 0 NOT 7777
5103  7104            JMP     .+1
5104  1000            LDA                     /LOAD VALUE OF 0
5105  0000            0000
5106  1460            SAE+20
5107  7777            7777
5110  0456            SKP
5111  0000            HLT                     /DJR FAILED 0=7777 DJR NOT RESET ON 2ND JUMP
5112  0235            XSK+20+15
5113  7071            JMP     DJR1

                /SPECIAL FUNCTION TEST OF THE FAST SAMPLE
                /ENABLE AND HALF SIZE CHARACTER
                /BIT ASSIGNMENTS ON AN "A" SYSTEM,
                /RSW BIT 5 = (1) TO INHIBIT THIS TEST,

5114  0516            RSW                     /READ RIGHT SWITCHES
5115  1560            BCL+20                  /MASK TO BIT 5
5116  7677            7677
5117  1460            SAE+20                  /IS IT AN "A" SYSTEM?
5120  0000            0000
5121  7211            JMP     REST            /NO, EXIT
5122  0011            CLR                     /YES, CONTINUE
5123  0024            SFA                     /READ S.F. REGISTER
5124  1560            BCL+20                  /MASK TO BIT 5
5125  7677            7677
5126  0450            AZE                     /DID I-O PRESET CLEAR
                                              /THAT BIT?
5127  0000            HLT                     /NO, ERROR IN THE AC

                /NOW READ THE HALF SIZE CHARACTER BIT

5130  0011            CLR
5131  0024            SFA                     /READ S.F. REGISTER
5132  1560            BCL+20                  /MASK TO BIT 4
5133  7577            7577
5134  1460            SAE+20                  /DID I-O POWER CLEAR SET
5135  0200            0200                    /BIT 5 TO A 1?
5136  0000            HLT                     /NO,

                /NOW LOAD THE S.F. REGISTER AND CHECK IT,

5137  0011            CLR                     /YES, CONTINUE
5140  0004            ESF                     /LOAD THE S.F. REGISTER
5141  2016            NOP                     /WITH 0000
5142  0024            SFA
5143  1460            SAE+20
5144  0000            0000
5145  0000            HLT                     /ERROR READ FROM S.F.
```

```
5146  1020          LDA-20
5147  0100          0100
5150  7004          ESF                     /SET FAST SAMPLE ENABLE
5151  1460          SAE-20                  /DID ESF CLEAR THE A',C',
5152  0100          0100
5153  7000          HLT                     /YES, ERROR ESF CLEARED
                                            / THE A',C',
5154  0011          CLR
5155  0024          SFA                     /READ S',F', REGISTER
5156  1460          SAE-20                  /IS THE A',C', CORRECT?
5157  0100          0100
5160  0000          HLT                     /NO

5161  1020          LDA-20                  /YES
5162  0200          0200
5163  7004          ESF                     /LOAD SF WITH 0200
5164  0011          CLR
5165  0024          SFA                     /READ S',F', REGISTER
5166  1460          SAE-20                  /IS THE A',C', CORRECT?
5167  0200          0200
5170  0000          HLT                     /NO, ERROR


                    /NOW CHECK THE TAPE TRAP BIT
                    /OF THE S',F', REGISTER

5171  0011          CLR
5172  1020          LDA-20                  /LOAD AC WITH 400
5173  0400          0400
5174  7004          ESF                     /LOAD S',F', REGISTER
5175  0011          CLR
5176  0024          SFA                     /READ S',F', REGISTER
5177  1460          SAE-20                  /IS THE A',C', CORRECT?
5200  0400          0400
5201  0000          HLT                     /NO, ERROR IN THE AC

                    /NOW CLEAR ALL BITS IN S,F', REGISTER

5202  0011          CLR
5203  7004          ESF                     /CLEAR S',F', REGISTER
5204  0011          CLR
5205  0024          SFA                     /READ S',F', REGISTER
5206  1460          SAE-20                  /IS IT CORRECT?
5207  0000          0000
5210  0000          HLT                     /NO


                    /SPECIAL FUNCTION TEST
                    /DISABLE TTY INTERRUPT

5211  1020    REST, LDA-20                  /LOAD AC WITH 0040
5212  0040          0040
5213  7004          ESF                     /DISABLE TTY INTERRUPT
5214  0011          CLR
5215  0024          SFA                     /READ SPECIAL FUNCTION REGISTER
```

```
5216  1560            BCL+20
5217  7300            3300                    /CLEAR BITS 4 AND 9
5220  1460            SAE+20
5221  0040            0040
5222  0000            HLT                     /FAILED TO READ SF PROPERLY

                /TEST FOR UNEXPECTED INTERRUPTS

5223  0011            CLR
5224  0004            ESF                     /ENABLE TTY INTERRUPT   SINCE BIT 6 = 0
5225  0002            PDP                     /PDP 8 MODE
5226  3004            DCA     4               /
5227  7040            CMA                     /SET AC TO 7777
5230  6001            ION                     /ENABLE INTERRUPTS
5231  7000            NOP8
5232  7000            NOP8
5233  7000            NOP8
5234  2004            ISZ     4
5235  5234            JMP8    .-1             /DELAY
5236  7000            NOP8
5237  7000            NOP8
5240  7040            CMA                     /AC SHOULD BE 7777 CHANGE TO 0000
5241  7440            SZA                     /DID INTERRUPT OCCUR ?
5242  7402            7402                    /YES, UNEXPECTED INTERRUPT
5243  6002            IOF                     /DISABLE INTERRUPTS
5244  6046            6046                    /PRINT A NULL CHARACTER
5245  6041            6041
5246  5245            JMP8    .-1             /WAIT FOR FLAG
5247  6001            6001
5250  7000            7000
5251  7402            7402                    /INTERRUPT FAILED, NO INTERRUPT FROM TTY

5252  6141            LINC                    /LINC MODE
5253  1020            LDA+20
5254  0040            0040
5255  0004            ESF                     /DISABLE TTY INTERRUPT
5256  0011            CLR
5257  0002            PDP                     /PDP 8 MODE
5260  6001            6001
5261  7000            7000
5262  7410            7410                    /
5263  7402            7402                    /INTERRUPT DECTED S,F', DID NOT DISABLE TTY INTERRUPT
5264  6002            6002                    / OR EXTERNAIOUS INTERRUPT OCCURED
5265  6141            LINC
5266  0011            CLR
5267  0004            ESF                     /ENABLE TTY INTERRUPT
5270  0002            PDP
5271  6001            6001                    /SF=0 TTY ENABLED TO INTERRUPT
5272  7000            7000                    /NO INTERRUPT OCCURED
5273  7402            7402
5274  6141            LINC                    /LINC MODE


                /TRAP ROUTINE
```

```
                    /TRAP LOADING OF SPECIAL FUNCTION REGISTER

5275  0011  REA,    CLR                     /NO INSTRUCTION IN THIS
5276  1020          LDA     I               / ROUTINE SHOULD TRAP
5277  1000                  1000
5300  7004          ESF                     / ONLY THE LOCATION "INS" IS
5301  0011          CLR                     / CONSIDERED A LEGAL TRAP LOCATION
5302  0024          SFA                     /READ SPECIAL FUNCTION REGISTER
5303  1560          BCL+20
5304  0300          0300
5305  1460          SAE     I
5306  1000                  1000
5307  0000          HLT                     /SFA FAILED AC NOT 1000
5310  0011          CLR
5311  0004          ESF                     /CLEAR SPECIAL FUNCTION REGISTER
5312  0011          CLR
5313  1020          LDA     I
5314  1000                  1000
5315  7004          ESF                     /SET TRAP ENABLE
5316  0016          NOP                     /NOP SHOULD NOT TRAP
5317  0016          NOP
5320  0011          CLR                     / ERROR IF IT DOES
5321  0004          ESF
5322  0067          SET+20  .+7             /SET UP INITIAL ADDRESS
5323  5600                  TABL            /OF THE TRAP TABLE
5324  1027  REB,    LDA     I+7             /GET VALUE OF 9 INDIRECT
5325  1460          SAE     I               /IS IT 7777?
5326  7777                  7777
5327  0456          SKP                     /NO,
5330  7340          JMP     INS+3           /YES, EXIT
5331  5335          STC     .+4             /SAVE AC
5332  1020  REC,    LDA     I
5333  1000                  1000
5334  0004          ESF                     /SET TRAP ENABLE
5335  0000  INS,    0000                    /TRAP INSTRUCTION LOCATION
5336  0000          HLT                     /INSTRUCTION DID NOT TRAP
5337  7324          JMP     REB
5340  0235          XSK     I+15            /INCREMENT 15
5341  7275          JMP     REA             /RE-EXECUTE
5342  0011          CLR
5343  0004          ESF                     /CLEAR SPECIAL FUNCTION REGISTER


                    /CHECK OF LIF WITH INTERRUPT INHIBIT
                    /
5344  0002          PDP
5345  7200          CLA
5346  6046          6046
5347  6041          6041
5350  5347          JMP8    .-1             /WAIT FOR FLAG
5351  6141          LINC
5352  0500          IOB
5353  6001          6001
5354  0016          NOP
5355  0000          HLT                     /NO INTERRUPT
```

```
5356  1460          SAE+20
5357  7777          7777
5360  0000          HLT                     /INTERRUPT OCCURRED
                                            /BUT AC INCORRECT

5361  0011          CLR
5362  0602          LIF+2
5363  0500          IOB
5364  6001          6001                    /INTERRUPT ENABLE
5365  0016          NOP
5366  0456          SKP
5367  0000          HLT                     /INTERRUPT INHIBIT
                                            /FAILED
5370  7371          JMP     .+1
5371  0456          SKP
5372  0000          HLT                     /INTERRUPT INHIBIT RESET ON
                                            / THE FIRST JUMP

5373  7374          JMP     .+1
5374  0000          HLT                     /INTERRUPT INHIBIT FAILED TO RESET
                                            / ON THE SECOND JUMP

5375  1460          SAE+20
5376  7777          7777
5377  0000          HLT                     /INTERRUPT OCCURRED BUT
                                            / THE AC IS INCORRECT

                /SPECIAL FUNCTION TEST
                /GENERATE I-O POWER CLEAR

5400  1020          LDA+20
5401  0020          0020
5402  0004          ESF
5403  0011          CLR
5404  0002          PDP
5405  6041          6041                    /FLAG SHOULD BE CLEARED AND
5406  7410          7410                    /SHOULD NOT SKIP
5407  7402          7402                    /FAILED TO CLEAR PPY FLAG
5410  6141          LINC

                /CHECK FOR AN "A" SYSTEM
                /YES, DO THIS ROUTINE
                /NO, DO NOT DO THIS ROUTINE
                /TEST RSW 5

5411  0516          RSW                     /READ RSW
5412  1560          BCL+20                  /MASK TO BIT 5
5413  7677          7677
5414  0450          AZE                     /IS IT SET?
5415  7447          JMP     RESET           /NO, EXIT

5416  0011          CLR                     /YES
5417  0061          SET+20+1                /SET LOCATION 1 TO 0000
5420  0000          0000
5421  0004          ESF                     /LOAD S.F. REGISTER
5422  0024          SFA                     /READ S.F. REGISTER
```

```
5423  0221            XSK+20+1                /LOC 1 EQUAL TO 1777
5424  7421            JMP     .-3             /NO, DO IT AGAIN
5425  1460            SAE+20                  /YES, CHECK IT
5426  0000            0000
5427  0000            HLT                     /BIT IN ERROR IN THE AC
5430  0011            CLR
5431  0061            SET+20+1                /SET LOC 1 TO 0000
5432  0000            0000
5433  1020            LDA+20                  /LOAD AC WITH 1740
5434  1740            1740
5435  0004            ESF                     /LOAD S,F, REGISTER
5436  0024            SFA                     /READ S,F, REGISTER
5437  0221            XSK+20+1                /IS LOC 1 EQUAL TO 1777
5440  7435            JMP     .-3             /NO, DO IT AGAIN
5441  1460            SAE+20                  /YES, CHECK RESULTS
5442  1740            1740
5443  0000            HLT                     /ERROR IN THE A,C,
5444  1020            LDA+20
5445  0020            0020
5446  0004            ESF


5447  1020    RESET,  LDA+20
5450  0207            0207
5451  0002            PDP
5452  6002            IOF
5453  6046            6046                    /PRINT BELL
5454  6041            6041
5455  5254            JMP8    .+401
5456  6042            6042                    /CLEAR FLAG
5457  6141            LINC
5460  0640            LDF                     /SET DATA FIELD 0
5461  0600            LIF                     /SET INSTRUCTION FIELD 0
5462  6405            JMP     405             /EXECTUE PROGRAM AGAIN


      5600      *5600
                /ILLEGAL INSTRUCTIONS OF THE OPERATE CLASS
                /THESE SHOULD GENERATE TRAP

5600  0000    TABL,   0000
5601  0501            0501
5602  0502            0502
5603  0503            0503
5604  0504            0504
5605  0505            0505
5606  0506            0506
5607  0507            0507
5610  0510            0510
5611  0511            0511
5612  0512            0512
5613  0513            0513
5614  0514            0514
5615  0515            0515
```

```
5616  0521                0521
5617  0522                0522
5620  0523                0523
5621  0524                0524
5622  0525                0525
5623  0527                0527
5624  0530                0530
5625  0531                0531
5626  0532                0532
5627  0533                0533
5630  0534                0534
5631  0535                0535

                  /ILLEGAL INSTRUCTIONS OF THE EXECUTE CLASS
                  /THESE SHOULD GENERATE TRAP

5632  0740                0740
5633  0741                0741
5634  0742                0742
5635  0743                0743
5636  0744                0744
5637  0745                0745
5640  0746                0746
5641  0747                0747
5642  0750                0750
5643  0751                0751
5644  0752                0752
5645  0753                0753
5646  0754                0754
5647  0755                0755
5650  0756                0756
5651  0757                0757
5652  0760                0760
5653  0761                0761
5654  0762                0762
5655  0763                0763
5656  0764                0764
5657  0765                0765
5660  0766                0766
5661  0767                0767
5662  0770                0770
5663  0771                0771
5664  0772                0772
5665  0773                0773
5666  0774                0774
5667  0775                0775
5670  0776                0776
5671  0777                0777

                  /ILLEGAL INSTRUCTIONS OF THE UNDEFINED GROUP 1
                  /THESE SHOULD GENERATE TRAP

5672  0540                0540
5673  0541                0541
5674  0542                0542
```

```
5675  0543                0543
5676  0544                0544
5677  0545                0545
5700  0546                0546
5701  0547                0547
5702  0550                0550
5703  0551                0551
5704  0552                0552
5705  0553                0553
5706  0554                0554
5707  0555                0555
5710  0556                0556
5711  0557                0557
5712  0560                0560
5713  0561                0561
5714  0562                0562
5715  0563                0563
5716  0564                0564
5717  0565                0565
5720  0566                0566
5721  0567                0567
5722  0570                0570
5723  0571                0571
5724  0572                0572
5725  0573                0573
5726  0574                0574
5727  0575                0575
5730  0576                0576
5731  0577                0577

                  /ILLEGAL INSTRUCTION OF THE UNDEFINED GROUP 2
                  /THESE SHOULD GENERATE TRAP

5732  1701                1701
5733  1702                1702
5734  1703                1703
5735  1704                1704
5736  1705                1705
5737  1706                1706
5740  1707                1707
5741  1710                1710
5742  1711                1711
5743  1712                1712
5744  1713                1713
5745  1714                1714
5746  1715                1715
5747  1716                1716
5750  1717                1717
5751  1721                1721
5752  1722                1722
5753  1723                1723
5754  1724                1724
5755  1725                1725
5756  1726                1726
5757  1727                1727
```

```
5760  1730              1730
5761  1731              1731
5762  1732              1732
5763  1733              1733
5764  1734              1734
5765  1735              1735
5766  1736              1736
5767  1737              1737
5770  7777              7777
                $
```

```
0000  21112222  20000000  11111111  11111111  01111111  11110000  00000000  00000000
0100  00000000  00000000  00000000  00000000  11111111  11111111  00000000  00000000

0200
0300

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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

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

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111110  00000000  00000000

2000  11000000  00000000  00111111  11111111  00000000  00000000  00000000  00000000
2100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

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

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100
```

```
4000  11122333  03333000  111111111  111111111  111000000  000000000  000000000  000000000
4100  00233333  03330000  000000000  000000000  111000000  000000000  000000000  000000000

4200  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111
4300  111111111  111111111  111111111  111111111  111111111  111111111  000000000  000000000

4400  111000000  000000000  111111111  111111111  111111111  111111111  111111111  111111111
4500  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111

4600  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111
4700  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111


5000  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111
5100  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111

5200  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111
5300  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111

5400  111111111  111111111  111111111  111111111  111111111  111111111  111000000  000000000
5500  000000000  000000000  000000000  000000000  000000000  000000000  000000000  000000000

5600  111111111  111111111  111111111  111111111  111111111  111111111  111111111  111111111
5700  111111111  111111111  111111111  111111111  111111111  111111111  111111111  100000000


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```

ADA	1100	CLC	0455
ADD	2000	CLA	5275
ADM	1140	REB	5324
AND	0000	REC	5332
APO	0451	RESET	5447
ATR	0014	REST	5251
AZE	0450	RMA	4720
BCL	1540	RMAB	5000
BCO	1640	RMAC	4751
BSE	1600	RMAD	5032
CLA	7200	RMB	4725
CLL	7100	RMBB	5006
CLR	0011	RMBC	4762
CMA	7040	RMBD	5037
COM	0017	RMCB	5011
DCA	3000	ROL	0240
DJR	0006	ROR	0300
DJR1	5071	RSW	0516
DSC	1740	RTA	0015
ESP	0004	RTL	7006
EXIT	0053	SAE	1440
EXIT1	0157	SCR	0340
FLO	0454	SET	0040
HLT	0000	SFA	0024
I	0020	SHD	1400
IBZ	0453	SKP	0456
INS	5335	SNS	0440
IOB	0500	SRO	1500
IOF	6002	STA	1040
ION	6001	STC	4000
ISZ	2000	STH	1340
JMP	6000	SXL	0400
JMP8	5200	SZA	7440
K0000	0035	TABL	5600
K2525	0036	TAD	1000
K5252	0023	TEMPH	0037
K7777	0022	TEMPL	0024
KST	0415	TPA	0140
LAM	1200	XSK	0200
LAS	7604		
LDA	1000		
LDF	0640		
LDH	1300		
LIF	0600		
LINC	6141		
LSW	0517		
LZE	0452		
MUL	1240		
NOP	0016		
NOP8	7000		
PDP	0002		
QAC	0005		

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 19 SECONDS

2K CORE USED