```
/PROGRAM TITLE:         PDP-12 BASIC MEMORY CONTROL TEST
/IDENTIFICATION:        MAINDEC 12-D1FA-D
/DATE CREATED:          28 FEBRUARY, 1971
/AUTHOR:                HAROLD LONG
/MAINTAINED BY:         DIAGNOSTIC GROUP
```

MEMCT

sel 7777 = 5301

```
/PDP-12 MAINDEC 12-D1FA-L      BASIC MEMORY CONTROL TEST
/COPYRIGHT, 1970, 1971, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
/
/AUTHOR:  HAROLD LONG
/
/THIS TEST IS DESIGNED TO EXERCISE ALL MEMORY
/CONTROL INSTRUCTIONS AVAILABLE ON A PDP-12
/COMPUTER,  IT OPERATES IN BOTH 8 AND L MODE.
/4K OF MEMORY IS REQUIRED,
/
/
/
/RIGHT SWITCH REGISTER OPTIONS:
/SR00=1, INHIBIT ERROR HALT
/SR01=1, INHIBIT ERROR PRINTOUT
/SR02=1, SCOPE LOOP ON FAILING ROUTINE
/SR03=1, SCOPE LOOP ON NON-FAILING ROUTINE
/SR05=1, INHIBIT BELL
/SR06=1, INHIBIT PASS COUNTER PRINTOUT
/
/
/NORMAL SWITCH SETTING IS RSW=0000.
/
/
/
/
/PROGRAM CONTROL IS HANDLED BY A MONITOR RESIDENT IN BANK 0,
/LOCATIONS 5000 TO 5177. MOST ROUTINES VISIT THE MONITOR 4096 TIMES
/AT THE COMPLETION OF A TEST, AN ERROR WILL CAUSE THE
/PROGRAM TO TYPE OUT THE ERROR MESSAGE AND HALT. THE
/HALT IS AT LOCATION 5033. THE HALTS IN THE PROGRAM
/BLOCKS ARE NOT, REPEAT NOT, EXECUTED, THEY ARE
/THERE FOR MANUAL PROGRAM CONTROL ONLY.
/
/
/I/O PRESET TO PMODE, START 20
/
```

These switches do more than these notes indicate; I don't trust the notes. Can I trust the diagnostic program?

```
/PDP-12 INSTRUCTION DEFINITIONS
/L MODE MEMORY REFERENCE
LDF=0640                /LOAD DATA FIELD 0-37
LIF=0600                /LOAD INSTRUCTION FIELD 0-37
DJR=0006                /DISABLE JUMP RETURN
/MODE CHANGE
PDP=0002                /SWITCH TO P MODE
LINC=6141               /SWITCH TO L MODE
/L MODE PROGRAMMING INSTRUCTIONS
LJMP=6000               /JMP
CLR=0011
AZE=0450
ADD=2000
IOB=0500
LNOP=0016               /NOP
ROR=0300
LSKP=0456
ROL=0240
BSE=1600
BCL=1540
SET=0060                /(REALLY SET I)
STC=4000
SRO=1500                /USED AS A SWITCH CHECK
LDA=1000
STA=1040
XSK=0220                /(REALLY XSK I)
/DATA MATRIX SWITCHES
EXITA=7777
EXITB=4444              /SPECIAL RESTART SWITCH
EXIT=0000
```

```
                /P MODE INTERRUPT HANDLER
                *0000
0000  0000  PINTR,  0000                    /INTERRUPT RETURN STORAGE (ALSO LINC JUMP SAVE)
0001  7320          CLA CLL CML             /SET LINK, CLEAR AC
0002  6234          RIB                     /READ SF
0003  3125          DCA     PREG            /SAVE IT
0004  1124          TAD     PPOINT          /GET SWITCH
0005  7650          SNA CLA                 /SET?
0006  5535          JMP I   RETURN          /NO, RETURN THROUGH PRESET LINKUP
0007  3124          DCA     PPOINT          /CLEAR SWITCH
0010  6244          RMF                     /RESTORE MEMORY
0011  2000          ISZ     0               /INCREMENT RETURN OVER JMP .
0012  5400          JMP I   PINTR           /BACK TO MAINLINE VIA INTERRUPT RETURN LINKUP
                /AUTO-INDEX REGISTERS
0013  0000  LREG1,  0000                    /DATA POINTER
0014  0000  PINT,   0000                    /MESSAGE POINTER
0015  0000  AUTO11, 0000
0016  0000  AUTO12, 0000
0017  0000  COUNT,  0000
                /
                /CROSS-PAGE REFERENCE TAGS AND CONSTANTS
                /
                *0020
0020  5176          JMP     176             /MINOR START
                /
                /LOC 0021-0037 RESERVED FOR SUBROUTINES
                /
```

```
                /LMODE INTERRUPT HANDLER
                *0040
0040  0000  LINTR,  0000                    /INTERRUPT RETURN STORAGE
0041  0011        CLR                      /CLEAR LINK, CLEAR AC
0042  0500  LHAN,  IOB                      /
0043  6234        RIB                      /READ SAVE FIELD REG
0044  4064        STC     LREG             /SAVE IT
0045  1500        SRO                      /SWITCH SET?
0046  0065        LPOINT                   /
0047  0456        LSKP                     /TO HERE IF BIT 0=1
0050  6050  LSET,  LJMP    .               /NO, RETURN TO BANK 0 THROUGH PRESET LINKUP
0051  0500        IOB                      /
0052  6244        RMF                      /YES, RESTORE MEMORY FIELDS
0053  0220        XSK     0                /INCREMENT
0054  2040        ADD     LINTR            /GET RETURN
0055  1620        BSE     20               /MAKE IT A LINC JUMP (BSE I)
0056  6000        6000                     /
0057  4063        STC     .+4              /STORE FOR EXECUTION
0060  4065        STC     LPOINT           /CLEAR SWITCH
0061  0500        IOB                      /
0062  6001        ION                      /ENABLE INTERRUPTS
0063  6063        LJMP    .                /BACK TO BANK 0 VIA INTERRUPT RETURN LINKUP
0064  0000  LREG,  0000
0065  0000  LPOINT, 0000
```

```
                /
                /MORE TAGS AND CONSTANTS
                /
0066  5337  BELL,   BELLS                   /CROSS PAGE TO BELL RINGER
0067  5020  ERROR,  ERRORS                  /CROSS PAGE TO ERROR MONITOR
0070  0020  K0020,  0020
0071  0040  K0040,  0040
0072  0077  K0077,  0077
0073  0100  K0100,  0100
0074  0177  K0177,  0177
0075  0207  K0207,  0207
0076  0400  K0400,  0400
0077  1026  K1026,  1026
0100  1777  K1777,  1777
0101  2000  K2000,  2000
0102  2021  K2021,  2021                   /USED IN RELOCATION OF TESTS
0103  5252  K5252,  5252
0104  6020  K6020,  6020
0105  7774  K7774,  7774
0106  0640  KLDF,   LDF                    /LMODE LDF
0107  0600  KLIF,   LIF                    /LMODE LIF
0110  6000  KLJMP,  LJMP                   /LMODE JMP
0111  0003  LMASK,  0003                   /LIF/LDF MASK
0112  0000  LSTERR, 0000                   /LAST ERROR POINTER
0113  5000  NERROR, NERROS                 /CROSS PAGE TO NON-ERROR MONITOR
0114  0354  PNTA,   LOCA                   /INTERRUPT RETURN TEST 07
0115  0434  PNTC,   LOCC                   /INTERRUPT RETURN TEST 09
0116  0400  PNTCA,  LOCCA                  /INTERRUPT RETURN
0117  0477  PNTE,   LOCE                   /INTERRUPT RETURN TEST 11
0120  0757  PNTF,   LOCF                   /INTERRUPT RETURN TEST 21
0121  1115  PNTJ,   LOCJ
0122  1161  PNTO,   LOCO                   /MESSAGE POINTER
0123  5331  PNTP,   LOCP
0124  0000  PPOINT, 0000                   /PMODE SWITCH.
0125  0000  PREG,   0000                   /HOLDS SF
0126  5200  RANDOM, RANDY                  /CROSS PAGE TO RANDOM GENERATOR
0127  0000  REGA,   0000                   /DATA
0130  0000  REGB,   0000                   /DATA
0131  0000  REGC,   0000                   /DATA
0132  0000  REGD,   0000                   /DATA
0133  0000  REGE,   0000                   /DATA
0134  5261  RELOCR, RELOC                  /CROSS PAGE TO RELOCATOR SUBR
0135  0000  RETURN, 0000                   /PMODE INTERRUPT RETURN IF SWITCH=0
0136  5253  SETFLG, FLAG                   /CROSS PAGE TO FLAG SET ROUTINE
0137  0000  SPACE,  0000                   /DATA I/O BUFFER
0140  5306  TSTINT, INTTST
0141  5244  TYPE,   TYPOUT                 /CROSS PAGE TO TYPEOUT SUBR
0142  1124  TST29N, TST29
0143  1001  TRY22N, TRY22A
0144  1163  TEST,   TESTN
```

```
                /
                /TO HERE FROM MINOR START
                /
                *176
0176  7410        SKP                     /DON'T RING ON STARTUP, INITIALIZE TEST
0177  4466        JMS I   BELL            /GO RING BELL, RETURN TO TST03
                /
                /MAJOR START P MODE; INITIALIZATION ROUTINE
                /
0200  7300  START,  CLA CLL                 /CLEAR AC
0201  3127        DCA     REGA            /CLEAR LOOP COUNTER
0202  3112        DCA     LSTERR          /CLEAR OLD ERROR
0203  3017        DCA     COUNT           /CLEAR PASS COUNTER
0204  4540        JMS I   TSTINT          /TEST FOR NO INTERRUPT
```

```
                /LMODE
                /CAN THE DATA FIELD REGISTER BE LOADED WITH BINARY COUNT
                /
0205  1127  TST03,  TAD      REGA            /FETCH TEST NUMBER
0206  0111          AND      LMASK           /SAVE BITS 10-11
0207  3130          DCA      REGB            /SAVE FOR OBSERVATION
0210  1130          TAD      REGB            /FETCH IT
0211  1106          TAD      KLDF            /ADD LDF
0212  3214          DCA      .+2             /PLACE IN ROUTINE
0213  6141          LINC                     /GO TO LINC MODE
0214  0000          0000                     /EXECUTE LDF
0215  0500          IOB                      /PREPARE TO GET DATA FIELD
0216  6214          RDF                      /GET DATA FIELD
0217  0002          PDP                      /BACK TO PMODE
0220  7110          RAR CLL                  /JUSTIFY RIGHT TO AGREE WITH REGB
0221  3131          DCA      REGC            /SAVE FOR TYPING
0222  1131          TAD      REGC            /FETCH IT
0223  7041          CIA                      /2'S COMPLEMENT
0224  1130          TAD      REGB            /COMPARE
0225  6201          CDF      00              /RESTORE DATA FIELD
0226  7650          SNA CLA                  /INCORRECT IF NOT ZERO
0227  4513          JMS I    NERROR          /CHECK WITH MONITOR
0230  4467          JMS I    ERROR           /LDF FAILED
0231  5350          TST03M                   /MESSAGE POINTER
0232  7402          HLT                      /ERROR HLT
0233  7610          SKP CLA                  /GO TO NEXT TEST
0234  0205          TST03                    /SCOPE LOOP; ISZ LOOP
```

```
                /LMODE
                /CAN THE DATA FIELD REGISTER BE LOADED WITH RANDOM NUMBERS
                /
0235  4526  TST04,  JMS I   RANDOM          /GET RANDOM NUMBER
0236  0111          AND     LMASK           /SAVE BITS 10-11
0237  3130          DCA     REGB            /SAVE FOR OBSERVATION
0240  1130          TAD     REGB            /FETCH IT
0241  1106          TAD     KLDF            /ADD LF
0242  3244          DCA     .+2             /PLACE IN ROUTINE
0243  6141          LINC                    /GO TO LINC MODE
0244  0000          0000                    /EXECUTE LDF
0245  0500          IOB                     /PREPARE TO GET DATA FIELD
0246  6214          RDF                     /GET DATA FIELD
0247  0002          PDP                     /BACK TO PMODE
0250  7110          RAR CLL                 /JUSTIFY RIGHT TO AGREE WITH REGB
0251  3131          DCA     REGC            /SAVE FOR TYPING
0252  1131          TAD     REGC            /FETCH IT
0253  7041          CIA                     /2'S COMPLEMENT
0254  1130          TAD     REGB            /COMPARE
0255  6201          CDF     00              /RESTORE DATA FIELD
0256  7650          SNA CLA                 /INCORRECT IF NOT ZERO
0257  4513          JMS I   NERROR          /CHECK WITH MONITOR
0260  4467          JMS I   ERROR           /LDF FAILED
0261  5402          TST04M                  /MESSAGE POINTER
0262  7402          HLT                     /ERROR HALT
0263  7610          SKP CLA                 /GO TO NEXT TEST
0264  0235          TST04                   /SCOPE LOOP; ISZ LOOP
```

```
                /LMODE
                /GATE SHAKER TEST
                /
0265  4526  TST06,  JMS I   RANDOM          /GET A RANDOM NUMBER
0266  0111         AND     LMASK           /SAVE BITS 10-11
0267  3130         DCA     REGB            /SAVE FOR OBSERVATION
0270  1130         TAD     REGB            /FETCH IT
0271  1106         TAD     KLDF            /ADD LDF
0272  3324         DCA     NOW2            /STORE FOR EXECUTION
0273  6141         LINC                    /GO TO LINC MODE
0274  0640         LDF     00              /TRY SOME DATA FIELD
0275  0677         LDF     37              /NOISEMAKERS
0276  0660         LDF     20
0277  0650         LDF     10
0300  0644         LDF     04
0301  0642         LDF     02
0302  0641         LDF     01
0303  0665         LDF     25
0304  0652         LDF     12
0305  0647         LDF     07
0306  0670         LDF     30
0307  0640         LDF     00
0310  0641         LDF     01
0311  0642         LDF     02
0312  0643         LDF     03
0313  0644         LDF     04
0314  0645         LDF     05
0315  0646         LDF     06
0316  0646         LDF     06
0317  0647         LDF     07
0320  0650         LDF     10
0321  0657         LDF     17
0322  0667         LDF     27
0323  0677         LDF     37
0324  0000  NOW2,  0000                    /EXECUTE ACTUAL LDF
0325  0500         IOB                     /PREPARE TO GET DATA FIELD
0326  6214         RDF                     /GET DATA FIELD
0327  0002         PDP                     /GO TO PMODE
0330  7110         RAR CLL                 /JUSTIFY WITH REGB
0331  3131         DCA     REGC            /SAVE FOR TYPING
0332  1131         TAD     REGC            /FETCH IT
0333  7041         CIA                     /2'S COMPLEMENT
0334  1130         TAD     REGB            /COMPARE
0335  6201         CDF     00              /RESTORE DATA FIELD
0336  7650         SNA CLA                 /INCORRECT IF NOT ZERO
0337  4513         JMS I   NERROR          /CHECK WITH MONITOR
0340  4467         JMS I   ERROR           /PROBLEMS WITH NOISY DATA FIELD
0341  5434         TST06M                  /MESSAGE POINTER
0342  7402         HLT                     /ERROR HALT
0343  7610         SKP CLA                 /GO TO NEXT TEST
0344  0265         TST06                   /SCOPE LOOP: ISZ LOOP
```

```
                /THE DATA FIELD IS NOW CONSIDERED TO BE TESTED.
                /NOW CHECK RIB
                /
                /PMODE
                /CHECK INTERRUPT FACILITY.
                /
0345  6041  TST07,  TSF                     /CHECK FOR FLAG
0346  4536        JMS I   SETFLG            /NOT UP; GO SET IT
0347  1114        TAD     PNTA              /GET ADDRESS RETURN
0350  3135        DCA     RETURN            /STORE IT
0351  3124        DCA     PPOINT            /ZERO THE PMODE SWITCH
0352  6001        ION                       /ENABLE INTERRUPT
0353  7000        NOP                       /WAIT
0354  6002  LOCA,  IOF                     /DISABLE INTERRUPT
0355  7430        SZL                       /CHECK LINK; INCORRECT IF ZERO
0356  4513        JMS I   NERROR            /CHECK WITH MONITOR
0357  4467        JMS I   ERROR             /INTERRUPT FAILED
0360  5466        TST07M                    /MESSAGE POINTER
0361  7402        HLT                       /ERROR HALT
0362  7610        SKP CLA                   /GO TO NEXT TEST
0363  0345        TST07                     /SCOPE LOOP; ISZ LOOP
```

```
                /LMODE
                /CHECK INTERRUPT FACILITY
                /
0364  6041  TST9A,  TSF                       /CHECK FOR FLAG
0365  4536          JMS I   SETFLG            /NOT UP; GO SET IT
0366  1116          TAD     PNTCA             /GET RETURN ADDRESS
0367  0100          AND     K1777             /10 BIT ADDRESS
0370  1110          TAD     KLJMP             /ADD LINC JUMP
0371  3050          DCA     LSET              /STORE FOR EXECUTION
0372  3065          DCA     LPOINT            /ZERO THE LMODE SWITCH
0373  7120          CLL CML                   /SET LINK
0374  6141          LINC                      /GO TO LINC MODE
0375  0500          IOB                       /PREPARE TO EXECUTE IOT
0376  6001          ION                       /ENABLE INTERRUPTS
0377  0016          LNOP                      /WAIT
0400  0500  LOCCA,  IOB                       /PREPARE TO EXECUTE IOT
0401  6002          IOF                       /DISABLE INTERRUPTS
0402  0002          PDP                       /BACK TO PMODE
0403  7420          SNL                       /CHECK LINK, INCORRECT IF SET
0404  4513          JMS I   NERROR            /CHECK WITH MONITOR
0405  4467          JMS I   ERROR             /INTERRUPT FAILED
0406  5507          TST9AM                    /MESSAGE POINTER
0407  7402          HLT                       /ERROR HALT
0410  7610          SKP CLA                   /GO TO NEXT TEST
0411  0364          TST9A                     /ISZ LOOP; SCOPE LOOP
```

```
                /LMODE
                /CHECK RIB
                /
0412  6041  TST09,  TSF                     /CHECK FOR FLAG
0413  4536          JMS I   SETFLG          /NOT UP; GO SET IT
0414  1115          TAD     PNTC            /GET RETURN ADDRESS
0415  0100          AND     K1777           /10 BIT ADDRESS
0416  1110          TAD     KLJMP           /ADD LINC JUMP
0417  3050          DCA     LSET            /STORE IN RETURN ADDRESS
0420  4526          JMS I   RANDOM          /GET RANDOM NUMBER
0421  0111          AND     LMASK           /SAVE BITS 10-11
0422  3130          DCA     REGB            /SAVE FOR COMPARISON
0423  1130          TAD     REGB            /FETCH IT
0424  1106          TAD     KLDF            /ADD LDF
0425  3230          DCA     .+3             /STORE FOR EXECUTION
0426  7120          CLL CML                 /SET LINK
0427  6141          LINC                    /GO TO LINC MODE
0430  0000          0000                    /EXECUTE LDF
0431  0500          IOB                     /PREPARE FOR IOT
0432  6001          ION                     /ENABLE INTERUPT
0433  0016          LNOP                    /WAIT
0434  0500  LOCC,    IOB                     /PREPARE FOR IOT
0435  6002          IOF                     /DISABLE INTERRUPT
0436  0500          IOB                     /PREPARE FOR IOT
0437  6234          RIB                     /READ INTERRUPT BUFFER
0440  0242          ROL     2               /JUSTIFY WITH REGB
0441  0002          PDP                     /BACK TO PMODE
0442  0111          AND     LMASK           /SAVE BITS 10-11
0443  3131          DCA     REGC            /SAVE FOR TYPING
0444  1131          TAD     REGC            /FETCH IT
0445  7041          CIA                     /2'S COMPLEMENT
0446  1130          TAD     REGB            /COMPARE
0447  7650          SNA CLA                 /INCORRECT IF NOT ZERO
0450  4513          JMS I   NERROR          /CHECK WITH MONITOR
0451  4467          JMS I   ERROR           /LMODE RIB FAILED
0452  5530          TST09M                  /MESSAGE POINTER
0453  7402          HLT                     /ERROR HALT
0454  7610          SKP CLA                 /GO TO NEXT TEST
0455  0412          TST09                   /SCOPE LOOP: ISZ LOOP
```

```
                /LMODE
                /DOES THE DATA FIELD SET TO ZERO FOR AN INTERRUPT
                /
0456  6041  TST11,  TSF                     /CHECK FLAG
0457  4536          JMS I   SETFLG          /NOT UP; GO SET IT
0460  1117          TAD     PNTE            /GET RETURN ADDRESS
0461  0100          AND     K1777           /10 BIT ADDRESS
0462  1110          TAD     KLJMP           /ADD LINC MODE JMP
0463  3050          DCA     LSET            /STORE IT
0464  4526          JMS I   RANDOM          /GET RANDOM NUMBER
0465  0111          AND     LMASK           /SAVE BITS 10-11
0466  3130          DCA     REGB            /STORE FOR TYPING
0467  1130          TAD     REGB            /FETCH IT
0470  1106          TAD     KLDF            /ADD LDF
0471  3273          DCA     .+2             /STORE FOR EXECUTION
0472  6141          LINC                    /GO TO LINC MODE
0473  0000          0000                    /EXECUTE LDF
0474  0500          IOB                     /PREPARE FOR IOT
0475  6001          ION                     /ENABLE INTERRUPT
0476  0016          LNOP                    /WAIT
0477  0500  LOCE,   IOB                     /PREPARE FOR IOT
0500  6002          IOF                     /DISABLE INTERRUPT
0501  0500          IOB                     /PREPARE FOR IOT
0502  6234          RIB                     /READ INTERRUPT BUFFER
0503  0242          ROL     2               /JUSTIFY WITH REGB
0504  4131          STC     REGC            /SAVE FOR TYPING
0505  0500          IOB                     /PREPARE FOR IOT
0506  6214          RDF                     /READ DATA FIELD
0507  0002          PDP                     /BACK TO PMODE
0510  7110          RAR CLL                 /JUSTIFY WITH REGB
0511  3132          DCA     REGD            /SAVE FOR TYPING
0512  1132          TAD     REGD            /FETCH IT
0513  7650          SNA CLA                 /INCORRECT IF NOT ZERO
0514  4513          JMS I   NERROR          /CHECK WITH MONITOR
0515  4467          JMS I   ERROR           /DATA FIELD FAILED TO ZERO ON INTERRUPT
0516  5562          TST11M                  /MESSAGE POINTER
0517  7402          HLT                     /ERROR HALT
0520  7610          SKP CLA                 /GO TO NEXT TEST
0521  0456          TST11                   /SCOPE LOOP; ISZ LOOP
```

```
                /LMODE
                /DOES STA-LDA WORK FOR ALL DATA FIELDS
                /
0522  7300  TST13,  CLA CLL                  /CLEAR AC
0523  1127        TAD     REGA              /GET CURRENT BANK
0524  0111        AND     LMASK             /SAVE BITS 10-11
0525  3130        DCA     REGB              /SAVE FOR OBSERVATION
0526  1130        TAD     REGB              /GET IT
0527  1106        TAD     KLDF              /ADD LDF
0530  3335        DCA     EXC13             /STORE FOR EXECUTION
0531  1102  TST13A, TAD     K2021             /GET ADDRESS
0532  3013        DCA     LREG1             /STORE FOR INDIRECT ACCESS
0533  1103        TAD     K5252             /GET CONSTANT
0534  6141        LINC                      /GO TO LMODE
0535  0000  EXC13,  0000                     /EXECUTE LDF
0536  1053        STA     LREG1             /STORE INDIRECT TO DF
0537  1013        LDA     LREG1             /FETCH NUMBER
0540  0640        LDF     0                 /RESTORE DATA FIELD
0541  0002        PDP                       /TO PMODE
0542  3131        DCA     REGC              /SAVE FOR TYPING
0543  1131        TAD     REGC              /FETCH IT
0544  7041        CIA                       /2'S COMPLEMENT
0545  1103        TAD     K5252             /COMPARE
0546  7650        SNA CLA                   /INCORRECT IF NOT ZERO
0547  4513        JMS I   NERROR            /CHECK WITH MONITOR
0550  4467        JMS I   ERROR             /STA OR LDA FAILED
0551  5626        TST13M                    /MESSAGE POINTER
0552  7402        HLT                       /ERROR HALT
0553  7610        SKP CLA                   /NEXT TEST
0554  0522        TST13                     /SCOPE LOOP; ISZ LOOP
```

```
                /
                /TEST THE DJR FUNCTION FOR ALL COMBINATIONS
                /
                /LMODE
                /DOES DJR NOT FUNCTION WHEN NOT SET?
                /
0555  7300  TST14,  CLA CLL                    /CLEAR AC
0556  1103          TAD     K5252             /GET CONSTANT
0557  3000          DCA     Ø                 /SET Ø
0560  6141          LINC                      /GO TO LINC MODE
0561  6562          LJMP    .+1               /DO A LINC JUMP
0562  0002          PDP                       /BACK TO P MODE
0563  1000          TAD     Ø                 /GET Ø
0564  7041          CIA                       /2'S COMPLEMENT
0565  1103          TAD     K5252             /ADD CONSTANT
0566  7640          SZA CLA                   /WAS LOCATION Ø CHANGED?
0567  4513          JMS I   NERROR            /YES; CHECK WITH MONITOR
0570  4467          JMS I   ERROR             /LINC JUMP SAVE RETURN FAILED
0571  6040          TST14M                    /MESSAGE POINTER
0572  7402          HLT                       /ERROR HALT
0573  7610          SKP CLA                   /TO NEXT TEST
0574  0555          TST14                     /SCOPE LOOP; ISZ LOOP
                /LMODE
                /DOES DJR FUNCTION WHEN IT'S SET?
                /
0575  7300  TST15,  CLA CLL                    /CLEAR AC
0576  1103          TAD     K5252             /GET CONSTANT
0577  3000          DCA     Ø                 /SET Ø
0600  6141          LINC                      /TO L MODE
0601  0006          DJR                       /DISABLE JUMP SAVE RETURN
0602  6603          LJMP    .+1               /DO A LINC JUMP
0603  0002          PDP                       /BACK TO PMODE
0604  1000          TAD     Ø                 /GET Ø
0605  7041          CIA                       /2'S COMPLEMENT
0606  1103          TAD     K5252             /COMPARE WITH CONSTANT
0607  7650          SNA CLA                   /DID DJR WORK?
0610  4513          JMS I   NERROR            /CHECK WITH MONITOR
0611  4467          JMS I   ERROR             /DJR FAILED
0612  6075          TST15M                    /MESSAGE POINTER
0613  7402          HLT                       /ERROR HALT
0614  7610          SKP CLA                   /TO NEXT TEST
0615  0575          TST15                     /SCOPE LOOP; ISZ LOOP
```

```
                    /LMODE
                    /DOES A LINC JUMP CLEAR DJR?
                    /
0616  7300  TST16,  CLA CLL                  /CLEAR AC
0617  1103        TAD     K5252             /GET CONSTANT
0620  3000        DCA     0                 /SET 0
0621  6141        LINC                      /TO LMODE
0622  0006        DJR                       /DISABLE JUMP SAVE RETURN
0623  6624        LJMP    .+1               /DO A LINC JUMP
0624  6625        LJMP    .+1               /DO ANOTHER LINC JUMP
0625  0002        PDP                       /BACK TO PMODE
0626  1000        TAD     0                 /GET 0
0627  7041        CIA                       /2'S COMPLEMENT
0630  1103        TAD     K5252             /COMPARE WITH CONSTANT
0631  7640        SZA CLA                   /DID DJR CLEAR?
0632  4513        JMS I   NERROR            /CHECK MONITOR
0633  4467        JMS I   ERROR             /DJR FAILED TO CLEAR
0634  6123        TST16M                    /MESSAGE POINTER
0635  7402        HLT                       /ERROR HALT
0636  7610        SKP CLA                   /TO NEXT TEST
0637  0616        TST16                     /SCOPE LOOP; ISZ LOOP
                    /PMODE
                    /DOES JUMP SAVE RETURN WORK IN ERROR FOR 8 MODE JUMPS?
                    /
0640  7300  TST17,  CLA CLL                  /CLEAR AC
0641  1103        TAD     K5252             /GET CONSTANT
0642  3000        DCA     0                 /SET 0
0643  5244        JMP     .+1               /DO AN 8 MODE JUMP
0644  1000        TAD     0                 /GET 0
0645  7041        CIA                       /2'S COMPLEMENT
0646  1103        TAD     K5252             /COMPARE WITH CONSTANT
0647  7650        SNA CLA                   /DID WE SAVE IN ERROR?
0650  4513        JMS I   NERROR            /CHECK MONITOR
0651  4467        JMS I   ERROR             /JUMP SAVE RETURN OPERATED IN ERROR
0652  6150        TST17M                    /MESSAGE POINTER
0653  7402        HLT                       /ERROR HALT
0654  7610        SKP CLA                   /TO NEXT TEST
0655  0640        TST17                     /ISZ LOOP; SCOPE LOOP
```

```
                /PMODE
                /DOES JUMP SAVE RETURN WORK IN ERROR FOR NON-JUMP COMMANDS?
                /
0656  7300  TST18, CLA CLL                    /CLEAR AC
0657  1103        TAD     K5252             /GET CONSTANT
0660  3000        DCA     Ø                 /SET Ø
0661  6002        IOF                       /IOF LOOKS LIKE LINC JUMP
0662  1000        TAD     Ø                 /GET Ø
0663  7041        CIA                       /2'S COMPLEMENT
0664  1103        TAD     K5252             /COMPARE WITH CONSTANT
0665  7650        SNA CLA                   /DID CELL Ø CHANGE?
0666  4513        JMS I   NERROR            /CHECK MONITOR
0667  4467        JMS I   ERROR             /IOF CHANGED CELL Ø
0670  6174        TST18M                    /MESSAGE POINTER
0671  7402        HLT                       /ERROR HALT
0672  7610        SKP CLA                   /TO NEXT TEST
0673  0656        TST18                     /SCOPE LOOP; ISZ LOOP

                /LMODE
                /DOES JUMP SAVE RETURN WORK IN ERROR FOR NON-JUMP COMMANDS?
                /
0674  7300  TST19, CLA CLL                    /CLEAR AC
0675  1103        TAD     K5252             /GET CONSTANT
0676  3000        DCA     Ø                 /SET Ø
0677  6141        LINC                      /GO TO LMODE
0700  0500        IOB                       /PREPARE FOR IOT
0701  6002        IOF                       /DISABLE INTERRUPTS
0702  0002        PDP                       /BACK TO PMODE
0703  1000        TAD     Ø                 /FETCH Ø
0704  7041        CIA                       /2'S COMPLEMENT
0705  1103        TAD     K5252             /ADD CONSTANT
0706  7650        SNA CLA                   /EQUAL?
0707  4513        JMS I   NERROR            /CHECK MONITOR
0710  4467        JMS I   ERROR             /IOB/IOF CAUSED LOC ØØØØ TO ALTER
0711  6220        TST19M                    /MESSAGE POINTER
0712  7402        HLT                       /ERROR HALT
0713  7610        SKP CLA                   /TO NEXT TEST
0714  0674        TST19                     /ISZ LOOP; SCOPE LOOP
```

```
                /LMODE
                /DOES DJR CLEAR IN ERROR WITH 8 MODE JUMP?
                /
0715  7300  TST20,  CLA CLL                  /CLEAR AC
0716  1103        TAD     K5252             /GET CONSTANT
0717  3000        DCA     0                 /SET 0
0720  6141        LINC                      /TO LMODE
0721  0006        DJR                       /DISABLE JUMP RETURN SAVE
0722  0002        PDP                       /TO PMODE
0723  5324        JMP     .+1               /JUMP
0724  6141        LINC                      /TO LMODE
0725  6726        LJMP    .+1               /JUMP
0726  0002        PDP                       /TO  PMODE
0727  1000        TAD     0                 /FETCH 0
0730  7041        CIA                       /2'S COMPLEMENT
0731  1103        TAD     K5252             /ADD CONSTANT
0732  7650        SNA CLA                   /EQUAL?
0733  4513        JMS I   NERROR            /CHECK MONITOR
0734  4467        JMS I   ERROR             /8 MODE JUMP CLEARED DJR
0735  6244        TST20M                    /MESSAGE POINTER
0736  7402        HLT                       /ERROR HALT
0737  7610        SKP CLA                   /TO NEXT TEST
0740  0715        TST20                     /ISZ LOOP; SCOPE LOOP
```

```
                /PMODE
                /DOES DJR INHIBIT 8 MODE INTERRUPT SAVE IN ERROR?
                /
0741  7300  TST21,  CLA CLL                  /CLEAR AC
0742  1120        TAD     PNTF              /GET RETURN POINTER TO LOCF
0743  3135        DCA     RETURN            /SET UP INTERRUPT HANDLER
0744  1103        TAD     K5252             /GET CONSTANT
0745  3000        DCA     0                 /STORE IN 0
0746  6041        TSF                       /FLAG SET?
0747  4536        JMS I   SETFLG            /NO, GO SET IT
0750  6141        LINC                      /TO LMODE
0751  0006        DJR                       /SET DJR
0752  0002        PDP                       /TO PMODE
0753  6001        ION                       /ENABLE INTERRUPTS
0754  7000        NOP                       /WAIT
0755  6002        IOF                       /DISABLE INTERRUPTS
0756  7410        SKP                       /IF NO INTERRUPT, THIS CAUSES ERROR
0757  1000  LOCF,  TAD     0                 /GET 0
0760  7041        CIA                       /2'S COMPLEMENT
0761  1103        TAD     K5252             /ADD CONSTANT
0762  7640        SZA CLA                   /EQUAL?
0763  4513        JMS I   NERROR            /CHECK MONITOR
0764  4467        JMS I   ERROR             /DJR INHIBITED 8 MODE INTERRUPT
0765  6265        TST21M                    /MESSAGE POINTER
0766  7402        HLT                       /ERROR HALT
0767  7610        SKP CLA                   /TO NEXT TEST
0770  0741        TST21                     /ISZ LOOP; SCOPE LOOP
```

```
                /LMODE
                /NOW CHECK THE LMODE SF
                /
0771  7300  TST22,  CLA CLL                  /CLEAR AC
0772  1127        TAD     REGA              /GET DATA WORD
0773  0111        AND     LMASK             /SAVE BITS 10-11
0774  3131        DCA     REGC              /SAVE FOR OBSERVATION
0775  1131        TAD     REGC              /GET DF
0776  1106        TAD     KLDF              /ADD KLDF
0777  3543        DCA I   TRY22N            /STORE FOR EXECUTION
1000  6141        LINC
1001  0000  TRY22A, 0000                     /LDF
1002  0600        LIF     0                 /BACK TO IF 0, LOAD SF
1003  0500        IOB                       /
1004  6234        RIB                       /READ SAVE FIELD
1005  0242        ROL     2                 /JUSTIFY
1006  0002        PDP                       /TO PMODE
1007  3133        DCA     REGE              /SAVE FOR TYPEOUT
1010  1133        TAD     REGE              /GET IT
1011  7041        CIA                       /2'S COMPLEMENT
1012  1131        TAD     REGC              /COMPARE
1013  7650        SNA CLA                   /INCORRECT IF NOT ZERO
1014  4513        JMS I   NERROR            /CHECK MONITOR
1015  4467        JMS I   ERROR             /LIF FAILED TO LOAD SF
1016  6314        TST22M                    /MESSAGE POINTER
1017  7402        HLT                       /ERROR HALT
1020  7610        SKP CLA                   /TO NEXT TEST
1021  0771        TST22                     /SCOPE LOOP; ISZ LOOP.
```

```
                /LMODE
                /EXECUTE LIF N AND SEE IF WE REALLY GET THERE.
                /
1022  7300  TST23,  CLA CLL                  /CLEAR AC
1023  1127        TAD     REGA              /GET DATA WORD
1024  0111        AND     LMASK             /SAVE BITS 10-11
1025  3130        DCA     REGB              /STORE FOR OBSERVATION
1026  1130        TAD     REGB              /GET IT
1027  1107        TAD     KLIF              /ADD LIF
1030  3234        DCA     TRY23             /STORE FOR EXECUTION
1031  4534        JMS I   RELOCR            /GO RELOCATE THE NEXT
1032  0007        0007                      /7 LINES OF CODE
1033  6141        LINC                      /TO LMODE
1034  0000  TRY23, 0000                     /EXECUTE LIF N
1035  6024        LJMP    24                /(.+1 IN RELOCATED PROGRAM)
1036  0500        IOB                       /
1037  6224        RIF                       /READ INSTRUCTION FIELD
1040  0600        LIF     0                 /BACK TO FIELD 0
1041  7042        LJMP    .+1               /BACK TO TEST PROGRAM
1042  0002        PDP                       /TO PMODE
1043  7010        RAR                       /JUSTIFY
1044  3131        DCA     REGC              /SAVE IT
1045  1131        TAD     REGC              /GET IT
1046  7041        CIA                       /2'S COMPLEMENT
1047  1130        TAD     REGB              /ADD TARGET
1050  7650        SNA CLA                   /COMPARE; INCORRECT IF NOT ZERO
1051  4513        JMS I   NERROR            /CHECK MONITOR
1052  4467        JMS I   ERROR             /LIF-JMP N FAILED TO FIND IF
1053  6357        TST23M                    /MESSAGE POINTER
1054  7402        HLT                       /ERROR HALT
1055  7610        SKP CLA                   /TO NEXT TEST
1056  1022        TST23                     /IS LOOP; SCOPE LOOP
```

```
                /LMODE
                /INTERRUPT INHIBIT TEST BANK 0 -BANK N- BANK 0
                /
1057  7300  TST28,  CLA CLL                  /CLEAR AC
1060  3065         DCA     LPOINT           /CLEAR HANDLER SWITCH
1061  1121         TAD     PNTJ             /GET ERROR RETURN
1062  1110         TAD     KLJMP            /MAKE IT A LINC JUMP
1063  3050         DCA     LSET             /PLACE IT IN HANDLER
1064  1127         TAD     REGA             /GET DATA WORD
1065  0111         AND     LMASK            /MASK OUT TO BITS 10-11
1066  3130         DCA     REGB             /SAVE BANK
1067  1130         TAD     REGB             /FETCH IT
1070  1107         TAD     KLIF             /MAKE IT A LIF N
1071  3277         DCA     TRY28            /STORE FOR EXECUTION
1072  6041         TSF                      /FLAG SET?
1073  4536         JMS I   SETFLG           /NO, GO SET IT
1074  4534         JMS I   RELOCR           /GO RELOCATE THE NEXT
1075  0017         0017                     /17 LINES OF CODE.
1076  6141         LINC                     /TO LINC MODE
1077  0000  TRY28,  0000                     /EXECUTE LIF N
1100  0500         IOB                      /
1101  6001         ION                      /ENABLE INTERRUPTS (SHOULD INHIBIT)
1102  6026         LJMP    26               /TO EXTENDED MEMORY (.+1 IN RELOCATED SUBROUTINE)
1103  0016         LNOP                     /WAIT FOR INTERRUPT
1104  0600         LIF     0                /LOAD IB
1105  0500         IOB                      /
1106  6001         ION                      /ENABLE INTERRUPT AGAIN
1107  6033         LJMP    33               /BACK TO BANK 0
1110  0016         LNOP                     /WAIT FOR INTERRUPT
1111  0500         IOB                      /
1112  6002         IOF                      /DISABLE INTERRUPT
1113  0002         PDP                      /BACK TO PMODE
1114  5542         JMP I   TST29N           /JUMP TO NEXT PORTION OF TEST
1115  0002  LOCJ,   PDP                      /BACK HERE IF INTERRUPT OCCURS
1116  6002         IOF                      /DISABLE INTERRUPT
1117  4467         JMS I   ERROR            /LIF FAILED TO INHIBIT INTERRUPT
1120  6417         TST28M                   /MESSAGE POINTER
1121  7402         HLT                      /ERROR HALT
1122  7610         SKP CLA                  /TO NEXT TEST
1123  1057         TST28                    /ISZ LOOP; SCOPE LOOP
```

```
                /LMODE
                /SAVE FIELD TEST (TST28 SHOULD HAVE LOADED THE SF)
                /
1124  7300  TST29,  CLA CLL
1125  6141         LINC                    /TO LINC MODE
1126  0500         IOB                     /READ SAVE FIELD
1127  6234         RIB
1130  0303         ROR     3               /JUSTIFY
1131  0002         PDP                     /TO PMODE
1132  0111         AND     LMASK           /MASK OUT NOISE
1133  3131         DCA     REGC            /SAVE IT
1134  1131         TAD     REGC            /FETCH IT
1135  7041         CIA                     /COMPLEMENT
1136  1130         TAD     REGB            /COMPARE WITH IF
1137  7650         SNA CLA                 /EQUAL?
1140  4513         JMS I   NERROR          /YES, CONTINUE WITH TST28
1141  4467         JMS I   ERROR           /NO, LIF FAILED TO LOAD SF
1142  6454         TST29M                  /MESSAGE POINTER
1143  7402         HLT                     /ERROR HALT
1144  7610         SKP CLA                 /TO NEXT TEST
1145  1057         TST28                   /ISZ LOOP, SCOPE LOOP
```

```
                /
                /ALERT OPERATOR OF PASS COMPLETION (INHIBIT IF RSW 06=01)
                /
1146  7300  PASS,   CLA CLL
1147  3127          DCA     REGA            /CLEAR REGA
1150  2017          ISZ     COUNT           /INCREMENT COUNT
1151  7000          NOP                     /DON'T SKIP
1152  7604          LAS                     /GET SWITCHES
1153  0071          AND     K0040           /PICK OUT BIT 06
1154  7640          SZA CLA                 /SET ?
1155  5177          JMP     177             /YES, INHIBIT AND RESTART
1156  1122          TAD     PNTO            /GET POINTER TO TEXT
1157  3467          DCA I   ERROR           /CHEAT MONITOR
1160  5762          JMP I   PASPNT          /GO TYPE MESSAGE
1161  6514  LOCO,   TST37M                  /MESSAGE POINTER
1162  5050  PASPNT, ASCII                   /LINKUP POINTER

                /
                /TEST FOR CTL-C AND RETURN TO PS12 MONITOR IF STRUCK
                /
1163  0000  TESTN,  0
1164  6036          KRB                     /GET KEYBOARD
1165  1372          TAD     M203            /ADD IN MINUS 203
1166  7650          SNA CLA                 /CTL-C?
1167  5773          JMP I   K7605           /YES, CALL MONITOR
1170  7604          LAS                     /NO, GET SWITCHES
1171  5763          JMP I TESTN             /RETURN TO CALLING ROUTINE
1172  7575  M203,   -203
1173  7605  K7605,  7605
```

```
                *2020                           /LOC 2020-2040 RESERVED
2020    0016            LNOP
2021    0016            LNOP
2022    0016            LNOP
2023    0016            LNOP
2024    0016            LNOP
2025    0016            LNOP
2026    0016            LNOP
2027    0016            LNOP
2030    0016            LNOP
2031    0016            LNOP
2032    0016            LNOP
2033    0016            LNOP
2034    0016            LNOP
2035    0016            LNOP
2036    0016            LNOP
2037    0016            LNOP
                *4020                           /LOC 4020 - 4040 RESERVED
4020    0016            LNOP
4021    0016            LNOP
4022    0016            LNOP
4023    0016            LNOP
4024    0016            LNOP
4025    0016            LNOP
4026    0016            LNOP
4027    0016            LNOP
4030    0016            LNOP
4031    0016            LNOP
4032    0016            LNOP
4033    0016            LNOP
4034    0016            LNOP
4035    0016            LNOP
4036    0016            LNOP
4037    0016            LNOP
```

```
                *5000
                /
                /NON ERROR MONITOR DETERMINES IF OPERATOR WANTS TO LOOP ON NON FAILING TEST
5000  0000      NERROS, 0                       /RETURN ADDRESS
5001  7307              CLA CLL IAC RTL         /SET AC = 4
5002  1200              TAD     NERROS          /GET RETURN ADDRESS
5003  3200              DCA     NERROS          /RETURN ADDRESS +4
5004  1600              TAD I   NERROS          /GET SCOPE LOOP ADDRESS
5005  3220              DCA     ERRORS          /STORE IT
5006  2127              ISZ     REGA            /UPDATE DATA
5007  5620              JMP I   ERRORS          /LOOP BACK TO TEST
5010  4544              JMS I   TEST            /CHECK FOR CTL-C AND RETURN WITH SWITCHES
5011  0076              AND     K0400           /SAVE SR3
5012  7640              SZA CLA                 /TEST AND CLEAR
5013  5620              JMP I   ERRORS          / LOOPING
5014  7040              CMA                     /SET AC=-1
5015  1200              TAD     NERROS          /ADD NERRORS
5016  3200              DCA     NERROS          /STORE IN NERRORS
5017  5600              JMP I   NERROS          /JUMP INDIRECT LOOP
                /
                /ERROR PROCESSOR, SCOPE LOOP, HALT, PRINT
5020  0000      ERRORS, 0                       /RETURN ADDRESS STORAGE
5021  4544              JMS I   TEST            /CHECK FOR CTL-C AND RETURN WITH SWITCHES
5022  7004              RAL                     /MOVE SR1 INTO AC00
5023  7700              SMA CLA                 /IS IT SET
5024  5250              JMP     ASCII           /NO TYPE A MESSAGE
5025  1220      ASCRXT, TAD     ERRORS          /GET CURRENT ERROR ADDRESS
5026  7041              CIA                     /INVERT IT
5027  3112              DCA     LSTERR          /STORE IN LAST ERROR
5030  2220              ISZ     ERRORS          /YES INDEX ESCAPE
5031  7604              LAS                     /READ SWITCHES
5032  7700              SMA CLA                 /IS SR0 SET?
5033  7402              HLT                     /NO, ERROR HALT
5034  2220              ISZ     ERRORS          /YES INDEX ESCAPE TO JUMP OUT
5035  2220              ISZ     ERRORS          /INDEX ERRORS TO SCOPE MODE
5036  1620              TAD I   ERRORS          /GET SCOPE ADDRESS
5037  3200              DCA     NERROS          /STORE IN TYPE
5040  7604              LAS                     /READ SWITCHES
5041  7006              RTL                     /MOVE SR02 TO AC0
5042  7710              SPA CLA                 /IS SCOPE MODE SELECTED
5043  5600              JMP I   NERROS          /YES CONTINUE IN SCOPE LOOP
5044  7040              CMA                     /NO SET AC=7777
5045  1220              TAD     ERRORS          /SUBTRACT ONE FROM ERRORS
5046  3220              DCA     ERRORS          /STORE SELECTED ADDRESS
5047  5620              JMP I   ERRORS          /EXIT TO NEXT TEST
```

```
5050  7240  ASCII,  CLA CMA                 /SET C(AC)=-1
5051  1620            TAD I    ERRORS       /GET MESSAGE ADDRESS STORAGE
5052  3014            DCA      PINT         /STORE IT IN AUTO INDEX REGISTER
5053  1220            TAD      ERRORS       /GET RETURN ADDRESS
5054  1112            TAD      LSTERR       /SUBTRACT LAST ERROR ADDRESS
5055  7650            SNA CLA               /TEST
5056  5362            JMP      DATYP        /SAME GO TYPE DATA
5057  1414            TAD I    PINT         /GET FIRST CHARACTER
5060  3200            DCA      NERROS       /SAVE IT
5061  1200            TAD      NERROS       /GET IT
5062  7450            SNA                   /TEST IT
5063  5225            JMP      ASCRXT       /NUMBER=EXIT
5064  7040            CMA                   /INVERT IT
5065  7450            SNA                   /NUMBER=EXITA
5066  5314            JMP      DATUM        /TYPE OUT DATA ROUTINE
5067  7040            CMA                   /CHANGE IT BACK
5070  7112            RTR CLL               /SWAP AC TO THE RIGHT
5071  7012            RTR                   /MOVE
5072  7012            RTR                   /MOVE
5073  4277            JMS      TYPECH       /TYPE IT
5074  1200            TAD      NERROS       /GET IT AGAIN
5075  4277            JMS      TYPECH       /TYPEIT
5076  5257            JMP      ASCII+7      /MUST BE MORE WORDS THAT NEED TYPING
5077  0000  TYPECH,   0
5100  0072            AND      K0077        /SAVE SIGNIFICANT PART
5101  3137            DCA      SPACE        /STORE WORD
5102  1137            TAD      SPACE        /FETCH IT
5103  7650            SNA CLA               /TEST FOR 00 CRLF CODE
5104  4353            JMS      CRLF         /YES IT WAS
5105  1137            TAD      SPACE        /NO TYPE IT
5106  1377            TAD      M40          /SUBTRACT 40
5107  7510            SPA                   /TEST POLARITY
5110  1073            TAD      K0100        /ADD 340
5111  1376            TAD      K240         /ADD 240
5112  4541            JMS I    TYPE         /TYPE
5113  5677            JMP I    TYPECH       /EXIT
```

```
5114  1414  DATUM,  TAD I   PINT            /GET ADDRESS OF REGISTER
5115  3200          DCA     NERROS          /STORE IN TEMP
5116  1200          TAD     NERROS          /GET TEMP
5117  7650          SNA CLA                 /TEST FOR EXIT
5120  5225          JMP     ASCRXT          /EQUALS 0000 EXIT
5121  1200          TAD     NERROS          /GET TEMP
5122  1373          TAD     M4444           /ADD CONSTANT
5123  7650          SNA CLA                 /TEST FOR RESTART
5124  4466          JMS I   BELL           /IT'S THERE; RESTART
5125  1600          TAD I   NERROS          /GET DATA
5126  4332          JMS     OCTYP           /TYPE IT
5127  1376          TAD     K240            /SPACE
5130  4541          JMS I   TYPE            /TYPE IT
5131  5314          JMP     DATUM           /TYPE NUMERIC DATA
5132  0000  OCTYP,  0                       /RETURN ADDRESS STORAGE
5133  3277          DCA     TYPECH          /STORE DATA TO BE PRINTED
5134  1105          TAD     K7774           /SET UP TALLY
5135  3137          DCA     SPACE           /SET IT
```

```
5136  1077  HERE,   TAD      K1026          /GET FLAG NUMBER
5137  3353  REDO,   DCA      CRLF           /STORE
5140  1277          TAD      TYPECH         /GET DATA BACK
5141  7004          RAL                     /JUSTIFY
5142  3277          DCA      TYPECH         /SAVE IT
5143  1353          TAD      CRLF           /GET CRLF CODE
5144  7004          RAL                     /JUSTIFY
5145  7420          SNL                     /FINISHED?
5146  5337          JMP      REDO           /NO, CONTINUE
5147  4541          JMS I    TYPE           /NOW TYPE IT
5150  2137          ISZ      SPACE          /FINISHED?
5151  5336          JMP      HERE           /NO, CONTINUE
5152  5732          JMP I    OCTYP          /EXIT
5153  0000  CRLF,   0                       /RETURN ADDRESS STORAGE
5154  1374          TAD      K0215          /GET CR
5155  4541          JMS I    TYPE           /TYPE IT
5156  1375          TAD      K0212          /GET LF
5157  4541          JMS I    TYPE           /TYPE IT
5160  1074          TAD      K0177          /SET TO RUBOUT
5161  5753          JMP I    CRLF           /EXIT
5162  1414  DATYP,  TAD I    PINT           /GET A TERM OFF OF TYPE LIST
5163  7450          SNA                     /END OF LIST?
5164  5225          JMP      ASCRXT         /YES EXIT
5165  7040          CMA                     /INVERT
5166  7640          SZA CLA                 /BEGINNING OF DATA
5167  5362          JMP      DATYP          /NO
5170  4353          JMS      CRLF           /YES OK RETURN THE TTY CARRIAGE AND LINE FEED
5171  7300          CLA CLL                 /CLEAR AC AND LINK
5172  5314          JMP      DATUM          /GO TYPE THE DATA
5173  3334  M4444,  -4444                   /SWITCH CHECK
5174  0215  K0215,  0215
5175  0212  K0212,  0212
5176  0240  K240,   0240
5177  7740  M40,    -40
```

```
                *5200
5200  0000  RANDY,  0                       /NEW PAGE
5201  1240          TAD     RNA             /RANDOM NUMBER GENERATOR
5202  1241          TAD     RNB
5203  1103          TAD     K5252
5204  3243          DCA     RND
5205  1243          TAD     RND
5206  1242          TAD     RNC
5207  3240          DCA     RNA
5210  7004          RAL
5211  1240          TAD     RNA
5212  1241          TAD     RNB
5213  1103          TAD     K5252
5214  3243          DCA     RND
5215  1243          TAD     RND
5216  1242          TAD     RNC
5217  3241          DCA     RNB
5220  7004          RAL
5221  1240          TAD     RNA
5222  1103          TAD     K5252
5223  3243          DCA     RND
5224  1243          TAD     RND
5225  1241          TAD     RNB
5226  1242          TAD     RNC
5227  3242          DCA     RNC
5230  7004          RAL
5231  1240          TAD     RNA
5232  3240          DCA     RNA
5233  1241          TAD     RNB
5234  1103          TAD     K5252
5235  3243          DCA     RND
5236  1243          TAD     RND
5237  5600          JMP I   RANDY
5240  7601  RNA,    7601
5241  3542  RNB,    3542
5242  3755  RNC,    3755
5243  0016  RND,    0016
5244  0000  TYPOUT, 0
5245  6046          TLS                     /AC TO PRINTER
5246  6041          TSF                     /FLAG SET?
5247  5246          JMP     .-1             /NOT UP; WAIT
5250  6042          TCF                     /NOW CLEAR IT
5251  7200          CLA                     /CLEAR AC
5252  5644          JMP I   TYPOUT          /INDIRECT RETURN
                /
                /TELEPRINTER FLAG SET ROUTINE
                /
5253  0000  FLAG,   0000
5254  7200          CLA                     /CLEAR AC
5255  6046          TLS                     /BUMP PRINTER
5256  6041          TSF                     /WAIT 100 MS
5257  5256          JMP     .-1
5260  5653          JMP I   FLAG            /INDIRECT RETURN.
```

```
                /
                /PROGRAM RELOCATOR
                /CALL: RELOC; LENGTH. --"BANK" MUST BE IN REGB
                /
5261  0000  RELOC,  0000                    /CONTAINS CALLING LOCATION +1
5262  7300          CLA CLL                 /CLEAR AC
5263  1261          TAD     RELOC           /GET ADDRESS
5264  3131          DCA     REGC            /SAVE ADDRESS
5265  1531          TAD I   REGC            /LENGTH
5266  7040          CMA                     /COMPLEMENT
5267  3132          DCA     REGD            /SAVE IT
5270  1261          TAD     RELOC           /GET ADDRESS
5271  3015          DCA     AUTO11          /SAVE AS PICK-UP POINTER
5272  1130          TAD     REGB            /GET BANK
5273  7012          RTR                     /JUSTIFY ADDRESS
5274  7010          RAR                     /JUSTIFY
5275  1070          TAD     K0020           /ASSEMBLE ADDRESS
5276  3016          DCA     AUTO12          /SAVE ADDRESS
5277  2261          ISZ     RELOC           /MOVE RETURN POINTER
5300  2132  INCREL, ISZ     REGD            /CHECK IF DONE
5301  5303          JMP     PICKUP          /NOT DONE; MOVE A WORD
5302  5661          JMP I   RELOC           /RETURN
5303  1415  PICKUP, TAD I   AUTO11          /GET WORD
5304  3416          DCA I   AUTO12          /DEPOSIT WORD
5305  5300          JMP     INCREL          /CHECK BACK
```

```
                /PMODE-LMODE
                /INTERRUPT TEST: DO WE HAVE A SPURIOUS INTERRUPT ON-LINE?
                /
5306  0002      INTTST, 0002
5307  7340              CLA CLL CMA
5310  3127              DCA     REGA
5311  6041              TSF                     /FLAG SET?
5312  4536              JMS I   SETFLG          /NOT UP; GO SET IT
5313  6141              LINC                    /TO LMODE
5314  1020              LDA     20              /GET BIT 07
5315  0020              0020                    /I/O PRESET
5316  0004              0004                    /ESF
5317  0002              PDP                     /TO PMODE
5320  5321              JMP     .+1             /CLEAR INHIBIT
5321  5322              JMP     .+1             /CLEAR INHIBIT
5322  7300              CLA CLL                 /ZERO AC, LINK
5323  1123              TAD     PNTP            /GET POINTER
5324  3135              DCA     RETURN          /SET UP RETURN
5325  6001              ION                     /ENABLE INTERRUPTS
5326  7000              NOP                     /WAIT
5327  6002              IOF                     /DISABLE INTERRUPTS
5330  4513              JMS I   NERROR          /NO INTERRUPT ON-LINE
5331  4467  LOOP,       JMS I   ERROR           /SPURIOUS INTERRUPT!
5332  6532              INTSTM                  /MESSAGE POINTER
5333  7402              HLT                     /ERROR HALT
5334  7410              SKP                     /RETURN
5335  5307              INTTST+1                /ISZ LOOP; SCOPE LOOP
5336  5706              JMP I   INTTST          /RETURN
```

```
                /
                /RING THE BELL
                /
5337  0000  BELLS,  0000
5340  7404          OSR                     /READ SWITCHES
5341  0073          AND     K0100           /SAVE SR05
5342  7640          SZA CLA                 /IS IT SET?
5343  5737          JMP I   BELLS           /YES, INHIBIT BELL
5344  1075          TAD     K0207           /GET BELL
5345  4541          JMS I   TYPE            /GO RING IT
5346  5747          JMP I   .+1             /RETURN
5347  0205          TST03                   /AVOID CLOBBERING PASS COUNTER
```

```
5350  0024  TST03M, 0024                    /TST03
5351  2324          2324
5352  6063          6263
5353  0014          2214                    /LDF OR RDF FAILED (LMODE)
5354  0406          0406                    /SENT RCVD
5355  4017          4017
5356  2240          2240
5357  2204          2204
5360  0640          0640
5361  0601          0601
5362  1114          1114
5363  0504          0504
5364  4050          4050
5365  1415          1415
5366  1704          1704
5367  0551          0551
5370  4000          4000
5371  2305          2305
5372  1624          1624
5373  4022          4022
5374  0326          0326
5375  0400          0400
5376  7777          EXITA
5377  0130          REGB
5400  0131          REGC
5401  0000          EXIT

5402  0024  TST04M, 0024              /TST04
5403  2324          2324              /LDF OR RDF FAILED (LMODE)
5404  6064          6064              /SENT RCVD
5405  0014          0014
5406  0406          0406
5407  4017          4017
5410  2240          2240
5411  2204          2204
5412  0640          0640
5413  0601          0601
5414  1114          1114
5415  0504          0504
5416  4050          4050
5417  1415          1415
5420  1704          1704
5421  0551          0551
5422  0023          0023
5423  0516          0516
5424  2440          2440
5425  2203          2203
5426  2604          2604
5427  4000          4022
5430  7777          EXITA
5431  0130          REGB
5432  0131          REGC
5433  0000          EXIT
```

```
5434  0024  TST06M, 0024            /TST06
5435  2324        2324            /LDF OR RDF FAILED (LMODE)
5436  6066        6066            /SENT RCVD
5437  0014        0014
5440  0406        0406
5441  4017        4017
5442  2240        2240
5443  2204        2204
5444  0640        0640
5445  0601        0601
5446  1114        1114
5447  0504        0504
5450  4050        4050
5451  1415        1415
5452  1704        1704
5453  0551        0551
5454  0023        0023
5455  0516        0516
5456  2440        2440
5457  2203        2203
5460  2604        2604
5461  4000        4000
5462  7777        EXITA
5463  0130        REGB
5464  0131        REGC
5465  0000        EXIT

5466  0024  TST07M, 0024                  /TST07
5467  2324        2324
5470  6067        6067
5471  0020        0020                  /PMODE INTERRUPT FAILED
5472  1517        1517
5473  0405        0405
5474  4011        4011
5475  1624        1624
5476  0522        0522
5477  2225        2225
5500  2024        2024
5501  4006        4006
5502  0111        0111
5503  1405        1405
5504  0400        0400
5505  7777        EXITA
5506  0000        EXIT

5507  0024  TST9AM, 0024                  /TST9A
5510  2324        2324
5511  7101        7101
5512  0014        0014                  /LMODE INTERRUPT FAILED
5513  1517        1517
5514  0405        0405
5515  4011        4011
5516  1624        1624
5517  0522        0522
```

```
5520  2225          2225
5521  2024          2024
5522  4006          4006
5523  0111          0111
5524  1405          1405
5525  0400          0400
5526  7777          EXITA
5527  0000          EXIT

5530  0024  TST09M, 0024                    /TST09
5531  2324          2324
5532  6071          6071
5533  0014          0014                    /LMODE LOAD SF OR RIB FAILED
5534  1517          1517                    / DF   SF
5535  0405          0405
5536  4014          4014
5537  1701          1701
5540  0440          0440
5541  2306          2306
5542  4017          4017
5543  2240          2240
5544  2211          2211
5545  0240          0240
5546  0601          0601
5547  1114          1114
5550  0504          0504
5551  0040          0040
5552  0406          0406
5553  4040          4040
5554  4023          4023
5555  0600          0600
5556  7777          EXITA
5557  0130          REGB
5560  0131          REGC
5561  0000          EXIT

5562  0024  TST11M, 0024                    /TST11
5563  2324          2324
5564  6161          6161
5565  0014          0014                    /LMODE DF FAILED TO ZERO ON AN INTERRUPT
5566  1517          1517                    /SENT SF RCVD
5567  0405          0405
5570  4004          4004
5571  0640          0640
5572  0601          0601
5573  1114          1114
5574  0504          0504
5575  4024          4024
5576  1740          1740
5577  3205          3205
5600  2217          2217
5601  4017          4017
5602  1640          1640
5603  0116          0116
5604  4011          4011
```

```
5605  1624           1624
5606  0522           0522
5607  2225           2225
5610  2024           2024
5611  0023           0023
5612  0516           0516
5613  2440           2440
5614  4023           4023
5615  0640           0640
5616  4022           4022
5617  0326           0326
5620  0400           0400
5621  7777           EXITA
5622  0130           REGB
5623  0131           REGC
5624  0132           REGD
5625  0000           EXIT

5626  0024  TST13M,  0024                    /TST13
5627  2324           2324
5630  6163           6163
5631  0014           0014                    /LMODE STA-LDA FAILED
5632  1517           1517                    /BANK CELL GOOD BAD
5633  0405           0405
5634  4023           4023
5635  2401           2401
5636  5514           5514
5637  0401           0401
5640  4006           4006
5641  0111           0111
5642  1405           1405
5643  0400           0400
5644  0201           0201
5645  1613           1613
5646  4003           4003
5647  0514           0514
5650  1440           1440
5651  1017           1017
5652  1704           1704
5653  4002           4002
5654  0104           0104
5655  4000           4000
5656  7777           EXITA
5657  0130           REGB
5660  0102           K2021
5661  0103           K5252
5662  0131           REGC
5663  0000           EXIT
```

```
                *6020                           /LOCATIONS 6020-6040 RESERVED FOR SUBROUTINES
6020  0016      LNOP
6021  0016      LNOP
6022  0016      LNOP
6023  0016      LNOP
6024  0016      LNOP
6025  0016      LNOP
6026  0016      LNOP
6027  0016      LNOP
6030  0016      LNOP
6031  0016      LNOP
6032  0016      LNOP
6033  0016      LNOP
6034  0016      LNOP
6035  0016      LNOP
6036  0016      LNOP
6037  0016      LNOP

6040  0024  TST14M, 0024                         /TST14
6041  2324        2324
6042  6164        6164
6043  0014        0014                          /LMODE JUMP SAVE RETURN FAILED FOR NORMAL JUMP
6044  1517        1517
6045  0405        0405
6046  4012        4012
6047  2515        2515
6050  2040        2040
6051  2301        2301
6052  2605        2605
6053  4022        4022
6054  0524        0524
6055  2522        2522
6056  1640        1640
6057  0601        0601
6060  1114        1114
6061  0504        0504
6062  4006        4006
6063  1722        1722
6064  4016        4016
6065  1722        1722
6066  1501        1501
6067  1440        1440
6070  1225        1225
6071  1520        1520
6072  4000        4000
6073  7777        EXITA
6074  0000        EXIT

6075  0024  TST15M, 0024                         /TST15
6076  2324        2324
6077  6165        6165
6100  0024        0024                          /DJR FAILED TO INHIBIT JUMP SAVE
6101  1222        1222
6102  4006        4006
```

```
6103  0111           0111
6104  1405           1405
6105  0440           0440
6106  2417           2417
6107  4011           4011
6110  1610           1610
6111  1102           1102
6112  1124           1124
6113  4012           4012
6114  2515           2515
6115  2040           2040
6116  2301           2301
6117  2605           2605
6120  4000           4000
6121  7777           EXITA
6122  0000           EXIT

6123  0024  TST16M,  0024                    /TST16
6124  2324           2324
6125  6166           6166
6126  0014           0014                    /LMODE JUMP FAILED TO CLEAR DJR
6127  1517           1517
6130  0405           0405
6131  4012           4012
6132  1520           1520
6133  4006           4006
6134  0111           0111
6135  1405           1405
6136  0440           0440
6137  2417           2417
6140  4003           4003
6141  1405           1405
6142  0122           0122
6143  4004           4004
6144  1222           1222
6145  4000           4000
6146  7777           EXITA
6147  0000           EXIT

6150  0024  TST17M,  0024                    /TST17
6151  2324           2324
6152  6167           6167
6153  0020           0020                    /PMODE JUMP ALTERED CELL 0000
6154  1517           1517
6155  0405           0405
6156  4012           4012
6157  2515           2515
6160  2040           2040
6161  0114           0114
6162  2405           2405
6163  2205           2205
6164  0440           0440
6165  0305           0305
6166  1414           1414
6167  4060           4060
```

```
6170  6060          6060
6171  6000          6000
6172  7777          EXITA
6173  0000          EXIT

6174  0024  TST18M, 0024                    /TST18
6175  2324          2324
6176  6170          6170
6177  0020          0020                    /PMODE IOF ALTERED CELL 0000
6200  1517          1517
6201  0405          0405
6202  4011          4011
6203  1706          1706
6204  4001          4001
6205  1424          1424
6206  0522          0522
6207  0504          0504
6210  4003          4003
6211  0514          0514
6212  1440          1440
6213  6060          6060
6214  6060          6060
6215  4000          4000
6216  7777          EXITA
6217  0000          EXIT

6220  0024  TST19M, 0024                    /TST19
6221  2324          2324
6222  6171          6171
6223  0014          0014                    /LMODE IOF ALTERED CELL 0000
6224  1517          1517
6225  0405          0405
6226  4011          4011
6227  1706          1706
6230  4001          4001
6231  1424          1424
6232  0522          0522
6233  0504          0504
6234  4003          4003
6235  0514          0514
6236  1440          1440
6237  6060          6060
6240  6060          6060
6241  4000          4000
6242  7777          EXITA
6243  0000          EXIT

6244  0024  TST20M, 0024                    /TST20
6245  2324          2324
6246  6260          6260
6247  0020          0020                    /PMODE JUMP CLEARED DJR
6250  1517          1517
6251  0405          0405
6252  4012          4012
6253  2515          2515
```

```
6254  2040            2040
6255  0314            0314
6256  0501            0501
6257  2205            2205
6260  0440            0440
6261  0412            0412
6262  2200            2200
6263  7777            EXITA
6264  0000            EXIT

6265  0024  TST21M,  0024                    /TST21
6266  2324            2324
6267  6261            6261
6270  0004            0004                  /DJR INHIBITED PMODE INTERRUPT SAVE
6271  1222            1222
6272  4011            4011
6273  1610            1610
6274  1102            1102
6275  1124            1124
6276  0504            0504
6277  4020            4020
6300  1517            1517
6301  0405            0405
6302  4011            4011
6303  1624            1624
6304  0522            0522
6305  2225            2225
6306  2024            2024
6307  4023            4023
6310  0126            0126
6311  0500            0500
6312  7777            EXITA
6313  0000            EXIT

6314  0024  TST22M,  0024                    /TST22
6315  2324            2324                  /LMODE LIF FAILED TO LOAD SF
6316  6262            6262                  /   DF   SF   SF IN ERROR
6317  0014            0014
6320  1517            1517
6321  0405            0405
6322  4014            4014
6323  1106            1106
6324  4006            4006
6325  0111            0111
6326  1405            1405
6327  0440            0440
6330  2417            2417
6331  4014            4014
6332  1701            1701
6333  0440            0440
6334  2306            2306
6335  0040            0040
6336  0406            0406
6337  4040            4040
6340  4023            4023
```

```
6341  0640            0640
6342  4040            4040
6343  2306            2306
6344  4011            4011
6345  1640            1640
6346  0522            0522
6347  2217            2217
6350  2200            2200
6351  7777            EXITA
6352  0130            REGB
6353  0131            REGC
6354  0132            REGD
6355  0133            REGE
6356  0000            EXIT

6357  0024  TST23M,  0024                    /TST23
6360  2324            2324                   /LMODE LIF X FAILED TO FIND CORRECT IF
6361  6263            6263                   /TRY  FOUND
6362  0014            0014
6363  1517            1517
6364  0405            0405
6365  4014            4014
6366  1106            1106
6367  4030            4030
6370  4006            4006
6371  0111            0111
6372  1405            1405
6373  0440            0440
6374  2417            2417
6375  4006            4006
6376  1116            1116
6377  0440            0440
6400  2022            2022
6401  1720            1720
6402  0522            0522
6403  4011            4011
6404  0600            0600
6405  2422            2422
6406  3140            3140
6407  4006            4006
6410  1725            1725
6411  1604            1604
6412  4000            4000
6413  7777            EXITA
6414  0130            REGB
6415  0131            REGC
6416  0000            EXIT

6417  0024  TST28M,  0024                    /TST28
6420  2324            2324                   /LMODE LIF FAILED TO INHIBIT INTERRUPTS
6421  6270            6270                   /BANK
6422  0014            0014
6423  1517            1517
6424  2405            2405
6425  4014            4014
```

```
6426  1106            1106
6427  4006            4006
6430  0111            0111
6431  1405            1405
6432  0440            0440
6433  2417            2417
6434  4011            4011
6435  1610            1610
6436  1102            1102
6437  1124            1124
6440  4011            4011
6441  1624            1624
6442  0522            0522
6443  2225            2225
6444  2024            2024
6445  2300            2300
6446  0201            0201
6447  1613            1613
6450  4000            4000
6451  7777            EXITA
6452  0130            REGB
6453  0000            EXIT

6454  0024  TST29M,  0024                    /TST29
6455  2324            2324                  /LMODE LIF FAILED TO LOAD SF
6456  6271            6271
6457  0014            0014
6460  1517            1517
6461  0405            0405                  / IF    IF
6462  4014            4014
6463  1106            1106                  /SENT RCVD
6464  4006            4006
6465  0111            0111
6466  1405            1405
6467  0440            0440
6470  2417            2417
6471  4014            4014
6472  1701            1701
6473  0440            0440
6474  2306            2306
6475  4000            4000
6476  4011            4011
6477  0640            0640
6500  4040            4040
6501  1106            1106
6502  0023            0023
6503  0516            0516
6504  2440            2440
6505  2203            2203
6506  2604            2604
6507  4000            4000
6510  7777            EXITA
6511  0132            REGB
6512  0131            REGA
6513  0000            EXIT
```

```
6514  0002  TST37M, 0002                    /BASIC MEM TST PASS--(PASS)
6515  0123           0123
6516  1123           1123
6517  4215           4215
6520  0515           0515
6521  4024           4024
6522  2324           2324
6523  4020           4020
6524  0123           0123
6525  2355           2355
6526  5555           5555
6527  7777           EXITA
6530  0017           COUNT
6531  4444           EXITB                 /SPECIAL RESTART: EVENTUALLY GETS TO TST03

6532  0023  INTSTM, 0023                    /SPURIOUS INTERRUPT!
6533  2025           2025                  /(CHECK IOC I/O PRESET)
6534  2211           2211
6535  1725           1725
6536  2340           2340
6537  1116           1116
6540  2405           2405
6541  2222           2222
6542  2520           2520
6543  2441           2441
6544  0050           0050
6545  0310           0310
6546  0503           0503
6547  1340           1340
6550  1117           1117
6551  0340           0340
6552  1157           1157
6553  1740           1740
6554  2022           2022
6555  0523           0523
6556  0524           0524
6557  5100           5100
6560  0000           EXIT

                     $
```

ADD	2000	ASCII	5050	ASCRXT	5025	AUTO11	0015	AUTO12	0016
AZE	0450	BCL	1540	BELL	0266	BELLS	5337	BSE	1600
CLR	7411	COUNT	0217	CRLF	5153	DATUM	5114	DATYP	5162
DJR	2006	ERROR	0067	ERRORS	5220	EXC13	0535	EXIT	0000
EXITA	7777	EXITB	4444	FLAG	5253	HERE	5136	INCREL	5300
INTSTM	6532	INTTST	5306	IOB	0500	KLDF	0106	KLIF	0107
KLJMP	0110	K0020	0070	K0040	0071	K0077	0072	K0100	0073
K0177	0074	K0207	0075	K0212	5175	K0215	5174	K0400	0076
K1026	0077	K1777	0100	K2000	0101	K2021	0102	K240	5176
K5252	0103	K6020	0104	K7605	1173	K7774	0105	LDA	1000
LDF	2640	LHAN	0042	LIF	0600	LINC	6141	LINTR	0040
LJMP	6200	LMASK	0111	LNOP	0016	LOCA	0354	LOCC	0434
LOCCA	0420	LOCE	0477	LOCF	0757	LOCJ	1115	LOCO	1161
LOCP	5331	LPOINT	0065	LREG	0264	LREG1	0013	LSET	0050
LSKP	0456	LSTERR	0112	M203	1172	M40	5177	M4444	5173
NERROR	0113	NERROS	5000	NOW2	0324	OCTYP	5132	PASPNT	1162
PASS	1140	PDP	0002	PICKUP	5303	PINT	0014	PINTR	0000
PNTA	0114	PNTC	0115	PNTCA	0116	PNTE	0117	PNTF	0120
PNTJ	0121	PNTO	0122	PNTP	0123	PPOINT	0124	PREG	0125
RANDOM	0126	RANDY	5200	REDO	5137	REGA	0127	REGB	0130
REGC	0131	REGD	0132	REGE	0133	RELOC	5261	RELOCR	0134
RETURN	0135	RNA	5240	RNB	5241	RNC	5242	RND	5243
ROL	0240	ROR	0300	SET	0060	SETFLG	0136	SPACE	0137
SRO	1500	START	0200	STC	4000	TEST	0144	TESTN	1163
TRY22A	1001	TRY22N	0143	TRY23	1034	TRY28	1077	TSTINT	0140
TST03	0225	TST03M	5350	TST04	0235	TST04M	5402	TST06	0265
TST06M	5434	TST07	0345	TST07M	5466	TST09	0412	TST09M	5530
TST11	0456	TST11M	5562	TST13	0522	TST13A	0531	TST13M	5626
TST14	0555	TST14M	6040	TST15	0575	TST15M	6075	TST16	0616
TST16M	6123	TST17	0640	TST17M	6150	TST18	0656	TST18M	6174
TST19	0674	TST19M	6220	TST20	0715	TST20M	6244	TST21	0741
TST21M	6265	TST22	0771	TST22M	6314	TST23	1022	TST23M	6357
TST28	1057	TST28M	6417	TST29	1124	TST29M	6454	TST29N	0142
TST37M	6514	TST9A	0364	TST9AM	5507	TYPE	0141	TYPECH	5077
TYPOUT	5244	XSK	0220						