special feature
six additional sense switches test

a. purpose

1. test six additional sense switches - 704 or 709 main frame

b. method of test

1. all switches are tested in up - off - conditions.

2. all switches are tested in down - on - condition.

3. all instructions with primary operation 760 are tested.

c. machine units and storage area

1. units

mf, cf, dsu, cr

2. storage locations

0030 - 0344

d. program control

1. deck

000	9ld01 low end loader
001 - 010	9swa program cards
011	transfer card - tra 30
012 - 013	2 blank cards

2. sense switch control

none.

note - switches must in correct position after two manual halts

e. normal stops

0031	halt to throw all switches up
0115	halt to throw all switches down

f. error stops

0036	error switch #1 up - off
0042	error switch #2 up - off
0046	error switch #3 up - off
0052	error switch #4 up - off
0056	error switch #5 up - off
0062	error switch #6 up - off
0066	error switch #7 up - off
0072	error switch #8 up - off
0076	error switch #9 up - off

```
0102        error switch #10 up - off
0106        error switch #11 up - off
0112        error switch #12 up - off

0123        error switch #1 down - on
0130        error switch #2 down - on
0135        error switch #3 down - on
0142        error switch #4 down - on
0147        error switch #5 down - on
0154        error switch #6 down - on
0161        error switch #7 down - on
0166        error switch #8 down - on
0173        error switch #9 down - on
0200        error switch #10 down - on
0205        error switch #11 down - on
0212        error switch #12 down - on

0237        error pbt - with p bit
0243        error pbt - no p bit
0246        error ssn - skipped
0251        error ssp - skipped
0254        error lbt - with low bit
0260        error lbt - no low bit
0264        error clm - skipped
0266        error clm - did not clear acc.
0272        error chs - skipped
0274        error chs - did not change
0300        error com - skipped
0304        error com - did not comp. acc.
0307        error etm - skipped
0312        error ltm - skipped
0315        error rnd - skipped
0317        error dct - off conditions
0324        error dct - on condition - skipped
```

g. printouts

none

h. comments

1. each section of the test will be repeated 64 times

2. the next program cannot be called in the usaual way - switch 6 up.

3. if an error is detected, one octal 7 will be ored to the acc.. for each switch enableing the operator to see at a glance which switch or switches failed.

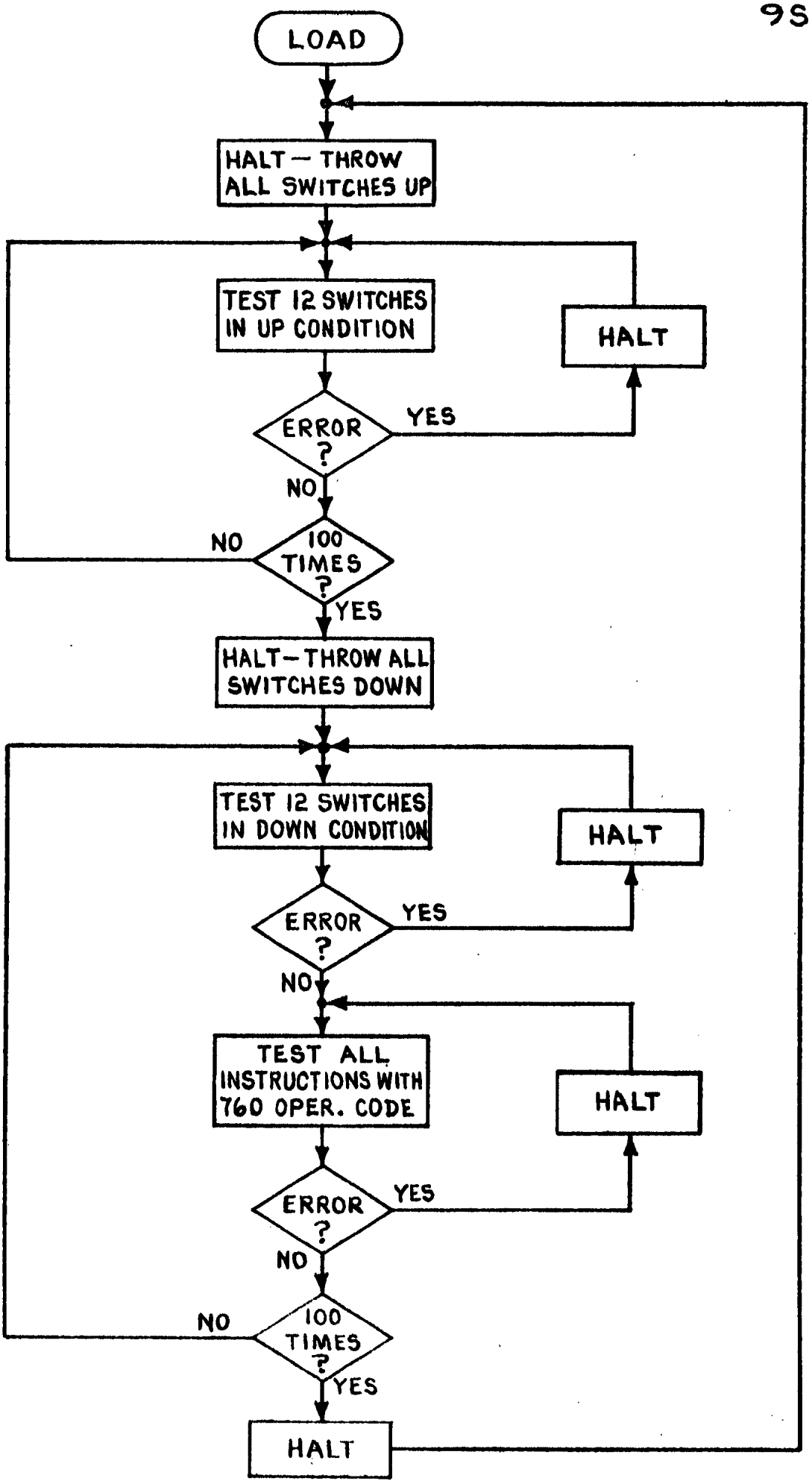
examples ----

```
acc  p.1-35             000000000000000000000000000111
```

would indicate switch 1 failed.

```
acc  p.1-35            000000000000000000000000111000111
```

would indicate switches 1 and 4 failed.


LOAD
HALT – THROW ALL SWITCHES UP
TEST 12 SWITCHES IN UP CONDITION
HALT
ERROR ?
YES
NO
NO
100 TIMES ?
YES
HALT – THROW ALL SWITCHES DOWN
TEST 12 SWITCHES IN DOWN CONDITION
HALT
ERROR ?
YES
NO
TEST ALL INSTRUCTIONS WITH 760 OPER. CODE
HALT
ERROR ?
YES
NO
NO
100 TIMES ?
YES
HALT

9SWA

```
*SPECIAL FEATURE-SIX ADDITIONAL SENSE SWITCHES

                00030         ORG 24

*TEST TWELVE SENSE SWITCHES IN UP POSITION

00030  0534 00 1 00346         LXA RPEAT,1    L +100
00031  0000 00 0 00032  START  HTR *+1        THROW ALL 12 SWITCHES UP
00032 -0754 00 0 00000         PXD            CLEAR ACCUMULATOR
00033  0760 00 0 00161         SWT 1          TEST SWITCH 1
00034  0020 00 0 00037         TRA *+3        UP-OK
00035 -0501 00 0 00330         ORA ONE        7 IN ACC
00036  0000 00 0 00037         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00037  0760 00 0 00162         SWT 2          TEST SWITCH 2
00040  0020 00 0 00043         TRA *+3        UP-OK
00041 -0501 00 0 00331         ORA TWO        77 IN ACC
00042  0000 00 0 00043         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00043  0760 00 0 00163         SWT 3          TEST SWITCH 3
00044  0020 00 0 00047         TRA *+3        UP-OK
00045 -0501 00 0 00332         ORA THREE      777 IN ACC
00046  0000 00 0 00047         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00047  0760 00 0 00164         SWT 4          TEST SWITCH 4
00050  0020 00 0 00053         TRA *+3        UP-OK
00051 -0501 00 0 00333         ORA FOUR       7777 IN ACC
00052  0000 00 0 00053         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00053  0760 00 0 00165         SWT 5          TEST SWITCH 5
00054  0020 00 0 00057         TRA *+3        UP-OK
00055 -0501 00 0 00334         ORA FIVE       77777 IN ACC
00056  0000 00 0 00057         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00057  0760 00 0 00166         SWT 6          TEST SWITCH 6
00060  0020 00 0 00063         TRA *+3        UP-OK
00061 -0501 00 0 00335         ORA SIX        777777 IN ACC
00062  0000 00 0 00063         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00063 -0760 00 0 00161         SWT 7          TEST SWITCH 7
00064  0020 00 0 00067         TRA *+3        UP-OK
00065 -0501 00 0 00336         ORA SVN        7777777 IN ACC
00066  0000 00 0 00067         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00067 -0760 00 0 00162         SWT 8          TEST SWITCH 8
00070  0020 00 0 00073         TRA *+3        UP-OK
00071 -0501 00 0 00337         ORA EIGHT      77777777 IN ACC
00072  0000 00 0 00073         HTR *+1        ERROR-ACTED IN DOWN CONDN.

00073 -0760 00 0 00163         SWT 9          TEST SWITCH 9
00074  0020 00 0 00077         TRA *+3        UP-OK
00075 -0501 00 0 00340         ORA NINE       777777777 IN ACC
00076  0000 00 0 00077         HTR *+1        ERROR-ACTED IN DOWN CONDN.
```

```
00077 -0760 00 0 00164         SWT 10          TEST SWITCH 10
00100  0020 00 0 00103         TRA *+3         UP-OK
00101 -0501 00 0 00341         ORA TEN         7777777777 IN ACC
00102  0000 00 0 00103         HTR *+1         ERROR-ACTED IN DOWN CONDN.

00103 -0760 00 0 00165         SWT 11          TEST SWITCH 11
00104  0020 00 0 00107         TRA *+3         UP-OK
00105 -0501 00 0 00342         ORA ELVN        77777777777 IN ACC
00106  0000 00 0 00107         HTR *+1         ERROR-ACTED IN DOWN CONDN.

00107 -0760 00 0 00166         SWT 12          TEST SWITCH 2
00110  0020 00 0 00113         TRA *+3         UP-OK
00111 -0501 00 0 00343         ORA TWELV       777777777777 IN ACC
00112  0000 00 0 00113         HTR *+1         ERROR-ACTED IN DOWN CONDN.
00113  2 00001 1 00032         TIX START+1,1,1

*TEST TWELVE SENSE SWITCHES IN DOWN POSITION

00114  0534 00 1 00346         LXA RPEAT,1     L +100
00115  0000 00 0 00116  STRT1  HTR *+1         THROW ALL SWITCHES UP
00116 -0754 00 0 00000         PXD
00117  0760 00 0 00161         SWT 1           TEST SWITCH 1
00120  0020 00 0 00122         TRA *+2         UP-ERROR-SHBE DOWN
00121  0020 00 0 00124         TRA *+3         OK-DOWN
00122 -0501 00 0 00330         ORA ONE         7 IN ACC
00123  0000 00 0 00124         HTR *+1         ERROR-SWITCH 1-DOWN CONDN

00124  0760 00 0 00162         SWT 2           TEST SWITCH 2
00125  0020 00 0 00127         TRA *+2         UP-ERROR-SHBE DOWN
00126  0020 00 0 00131         TRA *+3         OK-DOWN
00127 -0501 00 0 00331         ORA TWO         77 IN ACC
00130  0000 00 0 00131         HTR *+1         ERROR-SWITCH 2-DOWN CONDN

00131  0760 00 0 00163         SWT 3           TEST SWITCH 3
00132  0020 00 0 00134         TRA *+2         UP-ERROR-SHBE DOWN
00133  0020 00 0 00136         TRA *+3         OK-DOWN
00134 -0501 00 0 00332         ORA THREE       777 IN ACC
00135  0000 00 0 00136         HTR *+1         ERROR-SWITCH 3-DOWN CONDN

00136  0760 00 0 00164         SWT 4           TEST SWITCH 4
00137  0020 00 0 00141         TRA *+2         UP-ERROR-SHBE DOWN
00140  0020 00 0 00143         TRA *+3         OK-DOWN
00141 -0501 00 0 00333         ORA FOUR        7777 IN ACC
00142  0000 00 0 00143         HTR *+1         ERROR-SWITCH 4-DOWN CONDN

00143  0760 00 0 00165         SWT 5           TEST SWITCH 5
00144  0020 00 0 00146         TRA *+2         UP-ERROR-SHBE DOWN
00145  0020 00 0 00150         TRA *+3         OK-DOWN
00146 -0501 00 0 00334         ORA FIVE        77777 IN ACC
00147  0000 00 0 00150         HTR *+1         ERROR-SWITCH 5-DOWN CONDN

00150  0760 00 0 00166         SWT 6           TEST SWITCH 6
00151  0020 00 0 00153         TRA *+2         UP-ERROR-SHBE DOWN
00152  0020 00 0 00155         TRA *+3         OK-DOWN
00153 -0501 00 0 00335         ORA SIX         777777 IN ACC
00154  0000 00 0 00155         HTR *+1         ERROR-SWITCH 6-DOWN CONDN
```

```
00155 -0760 00 0 00161         SWT 7          TEST SWITCH 7
00156  0020 00 0 00160         TRA *+2        UP-ERROR-SHBE DOWN
00157  0020 00 0 00162         TRA *+3        OK-DOWN
00160 -0501 00 0 00336         ORA SVN        7777777 IN ACC
00161  0000 00 0 00162         HTR *+1        ERROR-SWITCH 7-DOWN CONDN

00162 -0760 00 0 00162         SWT 8          TEST SWITCH 8
00163  0020 00 0 00165         TRA *+2        UP-ERROR-SHBE DOWN
00164  0020 00 0 00167         TRA *+3        OK-DOWN
00165 -0501 00 0 00337         ORA EIGHT      77777777 IN ACC
00166  0000 00 0 00167         HTR *+1        ERROR-SWITCH 8-DOWN CONDN

00167 -0760 00 0 00163         SWT 9          TEST SWITCH 9
00170  0020 00 0 00172         TRA *+2        UP-ERROR-SHBE DOWN
00171  0020 00 0 00174         TRA *+3        OK-DOWN
00172 -0501 00 0 00340         ORA NINE       777777777 IN ACC
00173  0000 00 0 00174         HTR *+1        ERROR-SWITCH 9-DOWN CONDN

00174 -0760 00 0 00164         SWT 10         TEST SWITCH 10
00175  0020 00 0 00177         TRA *+2        UP-ERROR-SHBE DOWN
00176  0020 00 0 00201         TRA *+3        OK-DOWN
00177 -0501 00 0 00341         ORA TEN        7777777777 IN ACC
00200  0000 00 0 00201         HTR *+1        ERROR-SWITCH 10-DOWN CONDN

00201 -0760 00 0 00165         SWT 11         TEST SWITCH 11
00202  0020 00 0 00204         TRA *+2        UP-ERROR-SHBE DOWN
00203  0020 00 0 00206         TRA *+3        OK-DOWN
00204 -0501 00 0 00342         ORA ELVN       77777777777 IN ACC
00205  0000 00 0 00206         HTR *+1        ERROR-SWITCH 11-DOWN CONDN

00206 -0760 00 0 00166         SWT 12         TEST SWITCH 12
00207  0020 00 0 00211         TRA *+2        UP-ERROR-SHBE DOWN
00210  0020 00 0 00213         TRA *+3        OK-DOWN
00211 -0501 00 0 00343         ORA TWELV      777777777777 IN ACC
00212  0000 00 0 00213         HTR *+1        ERROR-SWITCH 12-DOWN CONDN

*TEST INSTRUCTIONS WITH SIMILAR OPERATION CODES

00213  0761 00 0 00161         NOP 113        TEST
00214  0020 00 0 00216         TRA *+2        FOR
00215  0000 00 0 00216         HTR *+1        NOP
                                              INSTRUCTIONS
00216  0761 00 0 00162         NOP 114        WITH
00217  0020 00 0 00221         TRA *+2        ADDRESSESS
00220  0000 00 0 00221         HTR *+1        OF
                                              FIRST
00221  0761 00 0 00163         NOP 115        SIX
00222  0020 00 0 00224         TRA *+2        SWITCHES
00223  0000 00 0 00224         HTR *+1        WILL
                                              NOT
00224  0761 00 0 00164         NOP 116        CONFLICT
00225  0020 00 0 00227         TRA *+2        WITH
00226  0000 00 0 00227         HTR *+1        SENSE
                                              SWITCHES
00227  0761 00 0 00165         NOP 117        ADDRESSESS
```

```
00230  0020 00 0 00232         TRA *+2
00231  0000 00 0 00232         HTR *+1        NOP
                                              TESTED
00232  0761 00 0 00166         NOP 118        WITH
00233  0020 00 0 00235         TRA *+2        SWITCHES
00234  0000 00 0 00235         HTR *+1        DOWN

*TEST PBT, SSP, SSM, LBT, CLM, CHS, COM, ETM, LTM{ RND, DCT

00235 -0500 00 0 00344         CAL PBIT       L-0
00236 -0760 00 0 00001         PBT
00237  0000 00 0 00240         HTR *+1        ERROR-SHBE P BIT
00240  0767 00 0 00001         ALS 1          CLEAR P
00241 -0760 00 0 00001         PBT
00242  0020 00 0 00245         TRA *+3        OK-NO BIT
00243  0000 00 0 00244         HTR *+1        ERROR-INDICATED P BIT

00244 -0760 00 0 00003         SSM
00245  0020 00 0 00247         TRA *+2        OK
00246  0000 00 0 00247         HTR *+1        ERROR-SKIPPED

00247  0760 00 0 00003         SSP
00250  0020 00 0 00252         TRA *+2        OK
00251  0000 00 0 00252         HTR *+1        ERROR-SKIPPED

00252  0500 00 0 00345         CLA LBIT       L +1
00253  0760 00 0 00001         LBT
00254  0000 00 0 00255         HTR *+1        ERROR-SHBE LOW BIT
00255  0771 00 0 00001         ARS 1          CLEAR LOW BIT
00256  0760 00 0 00001         LBT
00257  0020 00 0 00261         TRA *+2        OK-NO BIT
00260  0000 00 0 00261         HTR *+1        ERROR-INDICATED LOW BIT

00261 -0500 00 0 00343         CAL TWELV      ALL ONES
00262  0760 00 0 00000         CLM
00263  0020 00 0 00265         TRA *+2        OK
00264  0000 00 0 00265         HTR *+1        ERROR-SKIPPED
00265  0100 00 0 00267         TZE *+2        OK-ZERO
00266  0000 00 0 00267         HTR *+1        CLM DID NOT OPERATE

00267 -0754 00 0 00000         PXD            CLEAR ACC
00270  0760 00 0 00002         CHS
00271  0020 00 0 00273         TRA *+2        OK
00272  0000 00 0 00273         HTR *+1        ERROR-SKIPPED
00273 -0120 00 0 00275         TMI *+2        OK-MINUS
00274  0000 00 0 00275         HTR *+1        ERROR-DID NOT CHANGE SIGN

00275 -0754 00 0 00000         PXD
00276  0760 00 0 00006         COM
00277  0020 00 0 00301         TRA *+2        OK
00300  0000 00 0 00301         HTR *+1        ERROR-SKIPPED
00301  0771 00 0 00002         ARS 2          CLEAR P AND Q
00302  0402 00 0 00327         SUB TEST L 377777777777
00303  0100 00 0 00305         TZE *+2        OK
00304  0000 00 0 00305         HTR *+1        DID NOT COM CORRECTLY
```

```
00305  0760 00 0 00007         ETM             CHECK ENTER TRAP MODE
00306  0021 00 0 00310         TTR *+2         OK
00307  0000 00 0 00310         HTR *+1         ERROR-SKIPPED-MAY NOT GET
                                                BACK TO PROGRAM FROM HERE,
                                                IF ERROR.

00310 -0760 00 0 00007         LTM             CHECK LEAVE TRAP MODE
00311  0020 00 0 00313         TRA *+2         OK
00312  0000 00 0 00313         HTR *+1         ERROR-SKIPPED

00313  0760 00 0 00010         RND             CHECK RND INSTRUCTION
00314  0020 00 0 00316         TRA *+2         OK
00315  0000 00 0 00316         HTR *+1         ERROR-SKIPPED

00316  0760 00 0 00012         DCT             TEST DIVIDE CHECK
00317  0000 00 0 00320         HTR *+1         ERROR-SHOULD BE OFF

00320 -0500 00 0 00344         CAL PBIT        BIT INTO P
00321  0221 00 0 00343         DVP TWELV       DIVISION SHOULD NOT TAKE
                                                PLACE. DIVIDE CHECK SHOULD
                                                COME ON.
00322  0760 00 0 00012         DCT
00323  0020 00 0 00325         TRA *+2         OK-SHOULD BE ON
00324  0000 00 0 00325         HTR *+1         ERROR-SKIPPED

00325  2 00001 1 00116         TIX STRT1+1,1,1 REPEAT 100 TIMES
00326  0020 00 0 00030         TRA START-1     PROGRAM WILL REPEAT
                                                INDEFINATELY. TO CALL NEXT
                                                PROGRAM, RESET AND HIT LOAD
                                                CARDS BUTTON
00327 +377777777777     TEST   OCT 377777777777
00330 +000000000007     ONE    OCT 7
00331 +000000000077     TWO    OCT 77
00332 +000000000777     THREE  OCT 777
00333 +000000007777     FOUR   OCT 7777
00334 +000000077777     FIVE   OCT 77777
00335 +000000777777     SIX    OCT 777777
00336 +000007777777     SVN    OCT 7777777
00337 +000077777777     EIGHT  OCT 77777777
00340 +000777777777     NINE   OCT 777777777
00341 +007777777777     TEN    OCT 7777777777
00342 +077777777777     ELVN   OCT 77777777777
00343 -377777777777     TWELV  OCT 777777777777
00344 -000000000000     PBIT   OCT -0
00345 +000000000001     LBIT   OCT 1
00346 +000000000100     RPEAT  OCT 100
                 00000          END
```

EOF*