13/01/1972

S3UCM0

P 860. CPU TEST INSTRUCTIØNS

S

4K. WØRDS MEMØRY

code 12 N.C 5111 199 86441

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                          IDENT     S3UCMO

                                    /
             ******     ******     *    *************
             **
             *          S3UCMO     P860  CPU TEST PROGRAM FOR  4K, WORDS MEMORY
             *-                          GAMMA INSTRUCTIONS
             **
             ******     ******     *****************

             *                     ASEMMBLY DATE:  13/JANUARY/1972

             *                     PROGRAMMER:  BULOIS M
             *                     FOR INFORMATIONS:  TEL, TO C.T.I.: 702 29 91  EXT, 278

             ******     ******     *****************
             **
             **
             ******     ******     *****************
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Verschil:
address 1174H

opletten om:
progr S3CPU0
P860 CPU ASI-
5111-159 - AGFSL
te vinden

```
                                 EJECT
                    
0000                  BOOT       RES                    BOOTSTRAP LOCATIONS
0040   0000  F                   DATA     ITROUT
0042   0000  F                   DATA     ITROUT
0044   0000  F                   DATA     ITROUT
0046   0000  F                   DATA     ITROUT
0048   0000  F                   DATA     ITROUT
004A   0000  F                   DATA     ITROUT
004C   0000  F                   DATA     ITROUT
004E   0000  F                   DATA     ITROUT
0050   0000  F                   DATA     ITROUT
0052   0000  F                   DATA     ITROUT
0054   0000  F                   DATA     ITROUT
0056   0000  F                   DATA     ITROUT
0058   0000  F                   DATA     ITROUT
005A   0000  F                   DATA     ITROUT
005C   0000  F                   DATA     ITROUT
005E   0000  F                   DATA     ITROUT
0060   4900          ITROUT      RIL      A1            READ INTERUPT LINE
0062   207F                      HLT                    UNEXPECTED INTERRUPT, PROGRAM DESTROYED
0064                             RES      2
```

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                                EJECT
                                AORG    >CA
00CA  8F20                      ABL
00CC  0000  F

                       ******   ******  ******************
                       **
                       ORGTB0   EQU     *
00CE  FFFF                      DATA    X'FFFF'
00D0  8000                      DATA    X'8000'
00D2  4000                      DATA    X'4000'
00D4  2000                      DATA    X'2000'
00D6  1000                      DATA    X'1000'
00D8  0800                      DATA    X'0800'
00DA  0400                      DATA    X'0400'
00DC  0200                      DATA    X'0200'
00DE  0100                      DATA    X'0100'
00E0  0080                      DATA    X'0080'
00E2  0040                      DATA    X'0040'
00E4  0020                      DATA    X'0020'
00E6  0010                      DATA    X'0010'
00E8  0008                      DATA    X'0008'
00EA  0004                      DATA    X'0004'
00EC  0002                      DATA    X'0002'
00EE  0001                      DATA    X'0001'
00F0  0000             ORGTB1   DATA    X'0000'
00F2  0001             ORGTB3   DATA    X'0001'
00F4  0002                      DATA    X'0002'
00F6  0004                      DATA    X'0004'
00F8  0008             ORGTB4   DATA    X'0008'
00FA  0010                      DATA    X'0010'
00FC  0020                      DATA    X'0020'
00FE  0040                      DATA    X'0040'
0100  0080             WMEMOR   DATA    X'0080'
0102  0100                      DATA    X'0100'
0104  0200                      DATA    X'0200'
0106  0400                      DATA    X'0400'
0108  0800                      DATA    X'0800'
010A  1000                      DATA    X'1000'
010C  2000             CMEMOR   DATA    X'2000'
010E  4000                      DATA    X'4000'
0110  8000                      DATA    X'8000'
0112  FFFF             ORGTB2   DATA    X'FFFF'
0114  0000                      DATA    X'0000'
0116  0001                      DATA    X'0001'
0118  FFFF                      DATA    X'FFFF'
                       **
                       ******   ******  ******************
```

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                        EJECT


011A          MEMSTK    RES     [illegible]
              STKP      EQU     *-2
0142          NBOFML    RES     1             ML COUNTER FOR EXECUTION INDEX, ML
0144   00F0   MLIAD     DATA    ORGTB1
0146          INDEXN    RES     1             INDEX WORD
0148          MLCNT     RES     1             USE FOR COMPARE 14 REGISTERS
014A          SAVA4     RES     1             USED TO SAVE REGISTER A4
014C          SAVA15    RES     1             SAVE ADDRESS FOR A15
014E          NBNMS     RES     1             CONTAIN NUMBER OF REG. TO BE STOR.
0150          STAKMS    RES     15
              STAKND    EQU     *-2
016E   0150   MSIAD     DATA    STAKMS
0170   0000   CCIAD     DATA    0
0172          NBNSH     RES     1             NUMBER OF POSITIONS FOR SHIFT INSTRUCTION.
0174          NBNSH1    RES     1             NUMBER OF SHIFTS TO MULT. AND DIV. UTILISAT.
0176   0000   PASCT1    DATA    0
0178   0000   PASCT2    DATA    0

              JAM       EQU     *
```

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00112
00113                  ******    ******    **************
00114                  **
00115                  *         ML        MULTIPLE LOAD
00116                  **
00117                  ******    ******    ****************
00118                  **
00119                  *                                 T4  (M)...(M+N)--IN--A1,..A(N)
00120                  *                                 T5  (M+(X))...(M+(X)+N)--IN--A1,..A(N)
00121                  *                                 T6  ((M)),..((M)+N)--IN--A1,..A(N)
00122                  *                                 T7  ((M+(X))),..((M+(X))+N)--IN--A1,..A(N)
00123                  **
00124                  ******    ******    ****************
00125                  **
00126                  *         TEST CR
00127                  *                                       CR=0 IF (A1) = 0
00128                  *                                       CR=1 IF (A1) > 0
00129                  *                                       CR=2 IF (A1) < 0
00130                  **
00131                  ******    ******    ****************
00132                  MLTST     EQU       *
00133  017A  89C0                ML        3,CMEMOR
       017C  018C
00134  017E  5102                RF(1)     **4
00135  0180  207F                HLT
00136  0182  89C0                ML        3,ORGTB2
       0184  0112
00137  0186  5202                RF(2)     **4
00138  0188  207F                HLT
00139  018A  89C0                ML        3,ORGTB2+2
       018C  0114
00140  018E  5002                RF(0)     **4
00141  0190  207F                HLT
```

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00142                                  EJECT
00143
00144                          ******  ******  ***************
00145                          **
00146                          *       SINGLE TEST ML       T4 TEST
00147                          **
00148                          ******  ******  ******************
00149
00150  0192  87A0                      LDKL    A15,STKP
       0194  0140
00151  0196  F7A1                      CF      A15,ML14RG          LOAD 14 REG.
       0198  0000  F
00152                          *       ML1
00153  019A  B8C0                      ML      1,ORGTB1            EXECUTE ML WITH 1 REG.
       019C  00F0
00154  019E  5002                      RF(0)   *+4                 JP IF CR=0
00155  01A0  207F                      HLT                 ***     PRECEDENT INSTRUCTION ML1 DID NOT MODIF, CR
00156  01A2  E940                      CW      A1,ORGTB1
       01A4  00F0
00157  01A6  5002                      RF(0)   *+4                 JP IF (A1) = (ORGTB1)
00158  01A8  207F                      HLT                 ***     AFTER INSTRUCTION ML1  A1 # (ORGTB1)
00159  01AA  EA40                      CW      A2,ORGTB2
       01AC  0112
00160  01AE  5002                      RF(0)   *+4                 JP IF (A2) = FFFF
00161  01B0  207F                      HLT                 ***     AFTER INSTRUCTION ML1  A2 HAS BEEN MODIF,
00162  01B2  F7A1                      CF      A15,ML14RG          LOAD 14 REG,
       01B4  0000  F
00163                          *       ML2
00164  01B6  8940                      ML      2,ORGT82            EXECUTE ML WITH 2 REG,
       01B8  0112
00165  01BA  5202                      RF(2)   *+4                 JP IF CR=2
00166  01BC  207F                      HLT                 *** PRECEDENT INSTRUCTION ML2 DID NOT MODIF, CR
00167  01BE  E940                      CW      A1,ORGTB2
       01C0  0112
00168  01C2  5002                      RF(0)   *+4                 JP IF (A1) = (ORGTB2)
00169  01C4  207F                      HLT                 ***     AFTER INSTRUCTION ML2  A1 # (ORGTB2)
00170  01C6  EA40                      CW      A2,ORGTB2+2
       01C8  0114
00171  01CA  5002                      RF(0)   *+4                 JP IF (A2) = (ORGTB2+2)
00172  01CC  207F                      HLT                 ***     AFTER INSTRUCTION ML2  A2 # (ORGTB2+2)
00173  01CE  EB40                      CW      A3,ORGTB2
       01D0  0112
00174  01D2  5002                      RF(0)   *+4                 JP IF (A3) = FFFF
00175  01D4  207F                      HLT                 ***     AFTER INSTRUCTION ML2  A3 HAS BEEN MODIF,
00176  01D6  F7A1                      CF      A15,ML14RG          LOAD A1 TO A14 WITH X'FFFF'
       01D8  0000  F
00177                          *       ML3
00178  01DA  B9C0                      ML      3,ORGTB3            EXECUTE INSTRUCTION ML WITH  3 REG,
       01DC  00F2
00179  01DE  5102                      RF(1)   *+4                 JP IF CR=1
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00180  01E0  207F            HLT                    ***  PRECEDENT INSTRUCTION ML3 DID NOT MODIF. CR
00181  01E2  E840            CW      A1,ORGTB3
       01E4  00F2
0  J2  01E6  5002            RF(0)                       JP IF (A1)=ORGTB3
00183  01E8  207F            HLT                    ***  AFTER INSTRUCTION ML3 A1 # (ORGTB3)
00184  01EA  EA40            CW      A2,ORGTB3+2
       01EC  00F4
00185  01EE  5002            RF(0)   **4                 JP IF (A2) = ORGTB3+2
00186  01F0  207F            HLT                    ***  AFTER INSTRUCTION ML3 A2 # (ORGTB3+2)
00187  01F2  E840            CW      A3,ORGTB3+4
       01F4  00F6
00188  01F6  5002            RF(0)   **4                 JP IF (A3) = ORGTB3+4
00189  01F8  207F            HLT                    ***  AFTER INSTRUCTION ML3 A3 # (ORGTB3+4)
00190  01FA  EC40            CW      A4,ORGTB2
       01FC  0112
00191  01FE  5002            RF(0)   **4                 JP IF (A4) = FFFF
00192  0200  207F            HLT                    ***  AFTER INSTRUCTION ML3 A4 HAS BEEN MODIF.
00193  0202  8120            LDKL    A1,4
       0204  0004
00194  0206  8141            ST      A1,NBNMS
       0208  014E
00195  020A  F7A1            CF      A15,ML14RG          LOAD A1 TO A14 WITH X'FFFF'
       020C  0000  F
00196                  *     ML4
00197  020E  8A40            ML      4,ORGTB1    EXECUTE INSTRUCTION ML WITH 4 REG.
       0210  00F0
00198  0212  5002            RF(0)   **4                 JP IF CR = 0
00199  0214  207F            HLT                    ***  PRECEDENT INSTRUCTION ML4 DID NOT MODIF. CR
00200  0216  F7A1            CF      A15,VEFYML          TO VERIFY ML4
       0218  0000  F
00201  021A  8120            LDKL    A1,5
       021C  0005
00202  021E  8141            ST      A1,NBNMS
       0220  014E
00203  0222  F7A1            CF      A15,ML14RG          LOAD A1 TO A14 WITH X'FFFF'
       0224  0000  F
00204                  *     ML5
00205  0226  8AC0            ML      5,ORGTB1            EXECUTE INSTRUCTION ML WITH  5 REG.
       0228  00F0
00206  022A  5002            RF(0)   **4                 JP IF CR=0
00207  022C  207F            HLT                    ***  PRECEDENT INSTRUCTION ML5 DID NOT MODIF. CR
00208  022E  F7A1            CF      A15,VEFYML          TO VERIFY ML5
       0230  0000  F
00209  0232  8120            LDKL    A1,6
       0234  0006
00210  0236  8141            ST      A1,NBNMS
       0238  014E
00211  023A  F7A1            CF      A15,ML14RG          LOAD A1 TO A14 WITH X'FFFF'
       023C  0000  F
00212                  *     ML6
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00213  023E  8840          ML      6,ORGTB1        EXECUTE INSTRUCTION ML WITH  6 REG.
       0240  00F0
00214  0242  5002          RF(0)                   JP IF CR=0
00215  0244  207F          HLT             ***     PRECEDENT INSTRUCTION ML  ID NOT MODIF. CR
00216  0246  F7A1          CF      A15,VEFYML      TO VERIFY ML6
       0248  0000  F
00217  024A  8120          LDKL    A1,7
       024C  0007
00218  024E  8141          ST      A1,NBNMS
       0250  014E
00219  0252  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0254  0000  F
00220                 *     ML7
00221  0256  8BC0          ML      7,ORGTB1        EXECUTE INSTRUCTION ML WITH  7 REG.
       0258  00F0
00222  025A  5002          RF(0)   *+4             JP IF CR=0
00223  025C  207F          HLT             ***     PRECEDENT INSTRUCTION ML7 DID NOT MODIF. CR
00224  025E  F7A1          CF      A15,VEFYML      TO VERIFY ML7
       0260  0000  F
00225  0262  8120          LDKL    A1,8
       0264  0008
00226  0266  8141          ST      A1,NBNMS
       0268  014E
00227  026A  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       026C  0000  F
00228                 *     ML8
00229  026E  8C40          ML      8,ORGTB1        EXECUTE INSTRUCTION ML WITH  8 REG.
       0270  00F0
00230  0272  5002          RF(0)   *+4             JP IF CR=0
00231  0274  207F          HLT             ***     PRECEDENT INSTRUCTION ML8 DID NOT MODIF. CR
00232  0276  F7A1          CF      A15,VEFYML      TO VERIFY ML8
       0278  0000  F
00233  027A  8120          LDKL    A1,9
       027C  0009
00234  027E  8141          ST      A1,NBNMS
       0280  014E
00235  0282  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0284  0000  F
00236                 *     ML9
00237  0286  8CC0          ML      9,ORGTB1        EXECUTE INSTRUCTION ML WITH  9 REG.
       0288  00F0
00238  028A  5002          RF(0)   *+4             JP IF CR=0
00239  028C  207F          HLT             ***     PRECEDENT INSTRUCTION ML9 DID NOT MODIF. CR
00240  028E  F7A1          CF      A15,VEFYML      TO VERIFY ML9
       0290  0000  F
00241  0292  8120          LDKL    A1,10
       0294  000A
00242  0296  8141          ST      A1,NBNMS
       0298  014E
00243  029A  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
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        029C  0000  F
00244                    *          ML10
00245   029E  8D40                  ML       10,ORGTB1         EXECUTE INSTRUCTION ML WITH 10 REG.
        02A0  00F0
00246   02A2  5002                  RF(0)    *+4               JP IF CR=0
00247   02A4  207F                  HLT                   ***  PRECEDENT INSTRUCTION ML10 DID NOT MODIF. CR
00248   02A6  F7A1                  CF       A15,VEFYML        TO VERIFY ML10
        02A8  0000  F
00249   02AA  8120                  LDKL     A1,11
        02AC  000B
00250   02AE  8141                  ST       A1,N8NMS
        02B0  014E
00251   02B2  F7A1                  CF       A15,ML14RG        LOAD A1 TO A14 WITH X'FFFF'
        02B4  0000  F
00252                    *          ML11
00253   02B6  8DC0                  ML       11,ORGTB1         EXECUTE INSTRUCTION ML WITH 11 REG.
        02B8  00F0
00254   02BA  5002                  RF(0)    *+4               JP IF CR=0
00255   02BC  207F                  HLT                   ***  PRECEDENT INSTRUCTION ML11 DID NOT MODIF. CR
00256   02BE  F7A1                  CF       A15,VEFYML        TO VERIFY ML11
        02C0  0000  F
00257   02C2  8120                  LDKL     A1,12
        02C4  000C
00258   02C6  8141                  ST       A1,N8NMS
        02C8  014E
00259   02CA  F7A1                  CF       A15,ML14RG        LOAD A1 TO A14 WITH X'FFFF'
        02CC  0000  F
00260                    *          ML12
00261   02CE  8E40                  ML       12,ORGTB1         EXECUTE INSTRUCTION ML WITH 12 REG.
        02D0  00F0
00262   02D2  5002                  RF(0)    *+4               JP IF CR=0
00263   02D4  207F                  HLT                   ***  PRECEDENT INSTRUCTION ML12 DID NOT MODIF. CR
00264   02D6  F7A1                  CF       A15,VEFYML        TO VERIFY ML12
        02D8  0000  F
00265   02DA  8120                  LDKL     A1,13
        02DC  000D
00266   02DE  8141                  ST       A1,N8NMS
        02E0  014E
00267   02E2  F7A1                  CF       A15,ML14RG        LOAD A1 TO A14 WITH X'FFFF'
        02E4  0000  F
00268                    *          ML13
00269   02E6  8EC0                  ML       13,ORGTB1         EXECUTE INSTRUCTION ML WITH 13 REG.
        02E8  00F0
00270   02EA  5002                  RF(0)    *+4               JP IF CR=0
00271   02EC  207F                  HLT                   ***  PRECEDENT INSTRUCTION ML13 DID NOT MODIF. CR
00272   02EE  F7A1                  CF       A15,VEFYML        TO VERIFY ML13
        02F0  0000  F
00273   02F2  8120                  LDKL     A1,14
        02F4  000E
00274   02F6  8141                  ST       A1,N8NMS
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                02F8  014E
00275           02FA  F7A1          CF      15,ML14RG       LOAD A1 TO A14 WITH X'F
                02FC  0000  F
                                    ML14
00277           02FE  8F40          ML      14,ORGTB1       EXECUTE INSTRUCTION ML WITH 14 REG.
                0300  00F0
00278           0302  5002          RF(0)   **4                     JP IF CR=0
00279           0304  207F          HLT                     ***     PRECEDENT INSTRUCTION ML14 DID NOT MODIF. CR
00280           0306  F7A1          CF      A15,VEFYML              TO VERIFY ML14
                0308  0000  F
00281           030A  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
                030C  0000  F
00282                               ML15
00283           030E  8FC0          ML      15,ORGTB1               EXECUTE INSTRUCTION ML WITH 15 REG.
                0310  00F0
00284           0312  5002          RF(0)   **4                     JP IF CR=0
00285           0314  207F          HLT                     ***     PRECEDENT INSTRUCTION ML15 DID NOT MODIF. CR
00286           0316  EFC0          CW      A15,CMEMOR
                0318  010C
00287           031A  5002          RF(0)   **4                     JP IF A15 = CMEMOR
00288           031C  207F          HLT                     ***     AFTER INSTRUCTION ML15  (A15) # CMEMOR
00289           031E  87A0          LDKL    A15,STKP
                0320  0140
00290           0322  F7A1          CF      A15,VEFYML              TO VERIFY ML15
                0324  0000  F
```

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00291                          EJECT
00292
00293                  **
00294                  *       T5      T.
00295                  **
00296
00297  0326  8120                      LDKL    A1,14                                          42
       0328  000E
00298  032A  8141                      ST      A1,NBNMS
       032C  014E
00299  032E  F7A1                      CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       0330  0000  F
00300  0332  0202                      LDK     A2,2
00301                  *       MLX15
00302  0334  BFC8                      ML      15,ORGT01-2,A2  EXEC. MULT, LOAD WITH 15 REG, INDEX, BY A2
       0336  00EE
00303  0338  5002                      RF(0)   *+4             JP IF CR=0
00304  033A  207F                      HLT             ***     PRECEDENT INSTRUCTION MLX15 DID NOT MODIF, CR
00305  033C  EFC0                      CW      A15,CMEMOR
       033E  010C
00306  0340  5002                      RF(0)   *+4             JP IF A15 = CMEMOR
00307  0342  207F                      HLT             ***     AFTER INSTRUCTION MLX15 (A15) # CMEMOR
00308  0344  87A0                      LDKL    A15,STKP
       0346  0140
00309  0348  F7A1                      CF      A15,VEFYML      TO VERIFY MLX15
       034A  0000  F
00310                  *       T6      TEST
00311                  **
00312  034C  8120                      LDKL    A1,14
       034E  000E
00313  0350  8141                      ST      A1,NBNMS
       0352  014E
00314  0354  F7A1                      CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0356  0000  F
00315                  *       MLI15
00316  0358  BFE0                      ML*     15,MLIAD        EXEC. MULT, LOAD WITH 15 REG, INDIR, BY MLIAD
       035A  0144
00317  035C  5002                      RF(0)   *+4             JP IF CR=0
00318  035E  207F                      HLT             ***     PRECEDENT INSTRUCTION MLI15 DID NOT MODIF, CR
00319  0360  EFC0                      CW      A15,CMEMOR
       0362  010C
00320  0364  5002                      RF(0)   *+4             JP IF A15=CMEMOR
00321  0366  207F                      HLT             ***     AFTER INSTRUCTION MLI15 (A15) # CMEMOR
00322  0368  87A0                      LDKL    A15,STKP
       036A  0140
00323  036C  F7A1                      CF      A15,VEFYML      TO VERIFY MLI15
       036E  0000  F
00324                  **
00325                  *       T7      TEST
00326                  **
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00327  0370  010E          LDK     A1,14
00328  0372  8141          ST      A1,NBNMS
       0374  014E
  29   0376  F7A1          CF      A1,ML14RG       LOAD A1 TO A14 WITH X'FF'
       0378  0000  F
00330  037A  80A0          LDKL    A8,-2
       037C  FFFE
00331                      MLIX15
00332  037E  BFE2          ML*     15,MLIAD+2,A8   EXEC. MULTIPLE LOAD IND. AND INDEX. BY A8
       0380  0146
00333  0382  5002          RF(0)   *+4             JP IF CR = 0
00334  0384  207F          HLT                     *** PRECEDENT INSTRUCTION MLIX15 DID NOT MODIF. CR
00335  0386  EFC0          CW      A15,CMEMOR
       0388  010C
00336  038A  5002          RF(0)   *+4             JP IF A15 = CMEMOR
00337  038C  207F          HLT                     *** AFTER INSTRUCTION MLIX15 A15 # CMEMOR
00338  038E  87A0          LDKL    A15,STKP
       0390  0140
00339  0392  F7A1          CF      A15,VEFYML      TO VERIFY MLIX15
       0394  0000  F.
```

```
                                 EJECT

                        ******   ******     ***************
                        **
                        *        MS         MULTIPLE STORE   T4  A1,,,A(N)--IN--(M),,,(M)+N
                        *                                    T5  A1,,,A(N)--IN--(M+(X)),,,(M+(X))+N
                        *                                    T6  A1,,,A(N)--IN--((M)),,,((M))+N
                        *                                    T7  A1,,,A(N)--IN--((M)+(X)),,,((M+(X))+N
                        **
                        ******   ******     ***************

                        **
                        *        T4 TEST  A1,,,A(N)--IN--(M),,,(M)+N
                        **
                        MSTST    EQU        *
0396   87A0                      LDKL       A15,STKP
0398   0140
039A   F7A1                      CF         A15,SETM1
039C   0000   F
039E   F7A1                      CF         A15,LD14RG          LOAD A1 TO A14
03A0   0000   F
03A2   86C0                      LD         A14,ORGTB2
03A4   0112
                        *        MS1
03A6   88C1                      MS         1,STAKMS
03A8   0150
03AA   5202                      RF(2)      *+4                 JP IF CR = 2
03AC   207F                      HLT                        *** PRECEDENT INSTRUCTION MS1 HAS MODIFIED CR
03AE   E940                      CW         A1,STAKMS
03B0   0150
03B2   5002                      RF(0)      *+4                 JP IF (STAKMS) = A1
03B4   207F                      HLT                        *** AFTER INSTRUCTION MS1 (STAKMS) IS # A1
03B6   8340                      LD         A3,STAKMS+2
03B8   0152
03BA   5202                      RF(2)      *+4                 JP IF (STAKMS+2) < 0
03BC   207F                      HLT                        *** AFTER INST, MS1 (STAKMS+2) HAS BEEN MODIF,
03BE   F7A1                      CF         A15,SETM1
03C0   0000   F
03C2   F7A1                      CF         A15,LD14RG          LOAD A1 TO A14
03C4   0000   F
                        *        MS2
03C6   8941                      MS         2,STAKMS
03C8   0150
03CA   5202                      RF(2)      *+4                 JP IF CR=2
03CC   207F                      HLT                        *** PRECEDENT INSTRUCTION MS2 HAS MODIF, CR
03CE   E940                      CW         A1,STAKMS
03D0   0150
03D2   5002                      RF(0)      *+4                 JP IF (STAKMS) = A1
03D4   207F                      HLT                        *** AFTER INSTRUCTION MS2 (STAKMS) IS # A1
03D6   EA40                      CW         A2,STAKMS+2
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        03D8  0152
00379   03DA  5002              RF(0)     *+4                 JP IF (STAKMS+2) = A2
00380   03DC  207F              HLT                      ***  AFTER INSTRUCTION MS2 ([illegible]MS+2) IS # A2
00381   03DE  8340              LD         STAKMS+4
        03E0  0154
00382   03E2  5202              RF(2)     *+4                 JP IF (STAKMS+4) < 0
00383   03E4  207F              HLT                      ***  AFTER INST. MS2 (STAKMS+4) HAS BEEN MODIF.
00384   03E6  0103              LDK       A1,3
00385   03E8  8141              ST        A1,NBNMS
        03EA  014E
00386   03EC  F7A1              CF        A15,SETM1           STORE -1 IN STAKMS TABLE
        03EE  0000  F
00387   03F0  F7A1              CF        A15,LD14RG          LOAD A1 TO A14
        03F2  0000  F
00388                   *       MS3
00389   03F4  B9C1              MS        3,STAKMS            EXECUTE MULTIPLE STORE WITH 3 REG.
        03F6  0150
00390   03F8  F7A1              CF        A15,VEFYMS          TO VERIF. MS3
        03FA  0000  F
00391   03FC  F7A1              CF        A15,SETM1           STORE -1 IN STAKMS TABLE
        03FE  0000  F
00392   0400  F7A1              CF        A15,LD14RG          LOAD A1 TO A14
        0402  0000  F
00393   0404  9041              IM        NBNMS
        0406  014E
00394                   *       MS4
00395   0408  BA41              MS        4,STAKMS            EXECUTE MULTIPLE STORE WITH 4 REG.
        040A  0150
00396   040C  F7A1              CF        A15,VEFYMS          TO VERIF. MS4
        040E  0000  F
00397   0410  F7A1              CF        A15,SETM1           STORE -1 IN STAKMS TABLE
        0412  0000  F
00398   0414  F7A1              CF        A15,LD14RG          LOAD A1 TO A14
        0416  0000  F
00399   0418  9041              IM        NBNMS
        041A  014E
00400                   *       MS5
00401   041C  BAC1              MS        5,STAKMS            EXECUTE MULTIPLE STORE WITH 5 REG.
        041E  0150
00402   0420  F7A1              CF        A15,VEFYMS          TO VERIF. MS5
        0422  0000  F
00403   0424  F7A1              CF        A15,SETM1           STORE -1 IN STAKMS TABLE
        0426  0000  F
00404   0428  F7A1              CF        A15,LD14RG          LOAD A1 TO A14
        042A  0000  F
00405   042C  9041              IM        NBNMS
        042E  014E
00406                   *       MS6
00407   0430  BB41              MS        6,STAKMS            EXECUTE MULTIPLE STORE WITH 6 REG.
        0432  0150
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00408  0434  F7A1          CF      A15,VEFYMS6     TO VERIF, MS6
       0436  0000  F
00409  0438  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE.
       043A  0000  F
00410  043C  F7A1          CF      A15,LD14RG      LOAD A1 TO A14
       043E  0000  F
00411  0440  9041          IM      NBNMS                                          16
       0442  014E
00412                  *    MS7
00413  0444  BCC1          MS      7,STAKMS        EXECUTE MULTIPLE STORE WITH 7 REG.
       0446  0150
00414  0448  F7A1          CF      A15,VEFYMS      TO VERIF, MS7
       044A  0000  F
00415  044C  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       044E  0000  F
00416  0450  F7A1          CF      A15,LD14RG      LOAD A1 TO A14
       0452  0000  F
00417  0454  9041          IM      NBNMS
       0456  014E
00418                  *    MS8
00419  0458  BC41          MS      8,STAKMS        EXECUTE MULTIPLE STORE WITH 8 REG.
       045A  0150
00420  045C  F7A1          CF      A15,VEFYMS      TO VERIF, MS8
       045E  0000  F
00421  0460  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       0462  0000  F
00422  0464  F7A1          CF      A15,LD14RG      LOAD A1 TO A14
       0466  0000  F
00423  0468  9041          IM      NBNMS
       046A  014E
00424                  *    MS9
00425  046C  BCC1          MS      9,STAKMS        EXECUTE MULTIPLE STORE WITH 9 REG.
       046E  0150
00426  0470  F7A1          CF      A15,VEFYMS      TO VERIF, MS9
       0472  0000  F
00427  0474  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       0476  0000  F
00428  0478  F7A1          CF      A15,LD14RG      LOAD A1 TO A14
       047A  0000  F
00429  047C  9041          IM      NBNMS
       047E  014E
00430                  *    MS10
00431  0480  BD41          MS      10,STAKMS       EXECUTE MULTIPLE STORE WITH 10 REG.
       0482  0150
00432  0484  F7A1          CF      A15,VEFYMS      TO VERIF, MS10
       0486  0000  F
00433  0488  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       048A  0000  F
00434  048C  F7A1          CF      A15,LD14RG      LOAD A1 TO A14
       048E  0000  F
```

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00435  0490  9041          IM      NBNMS
       0492  014E
0 436                  *   MS11
0 437  0494  BDC1          MS      . ,STAKMS        EXECUTE MULTIPLE STORE W  H 11 REG.
       0496  0150
00438  0498  F7A1          CF      A15,VEFYMS       TO VERIF, MS11
       049A  0000  F
00439  049C  F7A1          CF      A15,SETM1        STORE -1 IN STAKMS TABLE
       049E  0000  F
00440  04A0  F7A1          CF      A15,LD14RG       LOAD A1 TO A14
       04A2  0000  F
00441  04A4  9041          IM      NBNMS
       04A6  014E
00442                  *   MS12
00443  04A8  BE41          MS      12,STAKMS        EXECUTE MULTIPLE STORE WITH 12 REG.
       04AA  0150
00444  04AC  F7A1          CF      A15,VEFYMS       TO VERIF, MS12
       04AE  0000  F
00445  04B0  F7A1          CF      A15,SETM1        STORE -1 IN STAKMS TABLE
       04B2  0000  F
00446  04B4  F7A1          CF      A15,LD14RG       LOAD A1 TO A14
       04B6  0000  F
00447  04B8  9041          IM      NBNMS
       04BA  014E
00448                  *   MS13
00449  04BC  BEC1          MS      13,STAKMS        EXECUTE MULTIPLE STORE WITH 13 REG.
       04BE  0150
00450  04C0  F7A1          CF      A15,VEFYMS       TO VERIF, MS13
       04C2  0000  F
00451  04C4  F7A1          CF      A15,SETM1        STORE -1 IN STAKMS TABLE
       04C6  0000  F
00452  04C8  F7A1          CF      A15,LD14RG       LOAD A1 TO A14
       04CA  0000  F
00453  04CC  9041          IM      NBNMS
       04CE  014E
00454                  *   MS14
00455  04D0  BF41          MS      14,STAKMS        EXECUTE MULTIPLE STORE WITH 14 REG.
       04D2  0150
00456  04D4  F7A1          CF      A15,VEFYMS       TO VERIF, MS14
       04D6  0000  F
00457  04D8  F7A1          CF      A15,SETM1        STORE -1 IN STAKMS TABLE
       04DA  0000  F
00458  04DC  F7A1          CF      A15,LD14RG       LOAD A1 TO A14
       04DE  0000  F
00459                  *   MS15
00460  04E0  BFC1          MS      15,STAKMS        EXECUTE MULTIPLE STORE WITH 15 REG.
       04E2  0150
00461  04E4  EFC0          CW      A15,STAKND
       04E6  016C
00462  04E8  5002          RF(0)   **4              JP IF STAKND = A15
```

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00463  04EA  207F          HLT                  *** AFTER INSTRUCTION MS15  STAKND # A15
00464  04EC  87A0          LDKL    A1, STKP
       04EE  0140
0  65  04F0  F7A1          CF      ,VEFYMS       TO VERIF, MS15
       04F2  0000  F
```

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00466                                  EJECT
00467
00468                          **
00469                          *       T5 TEST  A  ..A(N)--IN-->(M+(X)),,(M+(X))+N
00470                          **
00471  04F4  F7A1                      CF       A15,SETM1      STORE =1 IN STAKMS TABLE
       04F6  0000  F
00472  04F8  F7A1                      CF       A15,LD14RG     LOAD A1 TO A14
       04FA  0000  F
00473  04FC  87A0                      LDKL     A15,=2
       04FE  FFFE
00474                          *       MSX15
00475  0500  BFDF                      MS       15,STAKMS+2,A15  EXECUTE MULTIPLE STORE INDEX, BY A15
       0502  0152
00476  0504  EFC0                      CH       A15,STAKND
       0506  016C
00477  0508  5002                      BF(0)    **+4           JP IF STAKND = A15
00478  050A  207F                      HLT                     *** AFTER INSTRUCTION MSX15  STAKND # A15
00479  050C  87A0                      LDKL     A15,14
       050E  000E
00480  0510  87C1                      ST       A15,NBNMS
       0512  014E
00481  0514  87A0                      LDKL     A15,STKP
       0516  0140
00482  0518  F7A1                      CF       A15,VEFYMS     TO VERIFY MSX15
       051A  0000  F
00483                          **
00484                          *       T6 TEST  A1,,,A(N)--IN-->((M)),,,((M))+N
00485                          **
00486  051C  F7A1                      CF       A15,SETM1
       051E  0000  F
00487  0520  F7A1                      CF       A15,LD14RG
       0522  0000  F
00488  0524  87C0                      LD       A15,CMEMOR
       0526  010C
00489                          *       MSI15
00490  0528  BFE1                      MS*      15,MSIAD       EXECUTE MULTIPLE STORE INDIRECT BY MSIAD
       052A  016E
00491  052C  EFC0                      CH       A15,STAKND
       052E  016C
00492  0530  5002                      BF(0)    **+4           JP IF STAKND = A15
00493  0532  207F                      HLT                     *** AFTER INSTRUCTION MSI15  STAKND  # A15
00494  0534  87A0                      LDKL     A15,14
       0536  000E
00495  0538  87C1                      ST       A15,NBNMS
       053A  014E
00496  053C  87A0                      LDKL     A15,STKP
       053E  0140
00497  0540  F7A1                      CF       A15,VEFYMS     TO VERIFYC, MSI15
       0542  0000  F
```

```
00498                    **
00499                    *          T7 TEST  ...A(N)--IN--((M+(X)),..((M+(X))+N
0 00                     **
0 01  0544  F7A1                    CF        ,,SETM1        STORE -1 IN STAKMS TABLE
      0546  0000  F
00502 0548  F7A1                    CF        A15,LD14RG
      054A  0000  F
00503 054C  87A0                    LDKL      A15,-2
      054E  FFFE
00504                    *          MSIX15
00505 0550  BFFF                    MS*       15,MSIAD+2,A15 EXEC, MULTIPLE STORE IND, AND INDEX, BY A15
      0552  0170
00506 0554  EFC0                    CW        A15,STAKND
      0556  016C
00507 0558  5002                    RF(0)     **+4           JP IF STAKND = A15
00508 055A  207F                    HLT                ***  AFTER INSTRUCTION MSIX15  STAKND # A15
00509 055C  87A0                    LDKL      A15,14
      055E  000E
00510 0560  87C1                    ST        A15,NBNMS
      0562  014E
00511 0564  87A0                    LDKL      A15,STKP
      0566  0140
00512 0568  F7A1                    CF        A15,VEFYMS     TO VERIFYC, MSIX15
      056A  0020  F
```

```
                                EJECT

                     ******     ******     **************
                     **
                     *          MLR        MULTIPLE LOAD/REGISTER
                     *                                T3A  ((R2))---------IN A1
                     *                                     ((R2)+2--------IN A2
                     *                                     ((R2)+2N-2)---IN AN
                     *                                T3B  (A15)+2N-------IN A15
                     *                                     (A15)----------IN A1
                     *                                     (A15-2)--------IN A2
                     *                                     (A15-2N+2)-----IN AN
                     **
                     ******     ******     ****************

                     **
                     *          TEST       CR
                     *                                CR=0 IF (A1) =0
                     *                                CR=1 IF (A1) >0
                     *                                CR=2 IF (A1) <0
                     **
                     MLRTST     EQU        *
      056C  8120                LDKL       A1,CMEMOR
      056E  010C
      0570  8220                LDKL       A2,-2
      0572  FFFE
                     *          MLRCR1
      0574  B9A4                MLR        3,A1
      0576  5102                RF(1)      *+4                 JP IF CR>0
      0578  207F                HLT                       ***  PRECEDENT INSTRUCTION MLRCR1 DID NOT MODIF,CR
      057A  80A0                LDKL       A8,ORGTB2
      057C  0112
                     *          MLRCR2
      057E  B9A2                MLR        3,A8
      0580  5202                RF(2)      *+4                 JP IF CR<0
      0582  207F                HLT                       ***  PRECEDENT INSTRUCTION MLRCR2 DID NOT MODIF,CR
      0584  86A0                LDKL       A14,ORGTB2+2
      0586  0114
                     *          MLRCR0
      0588  B9BA                MLR        3,A14
      058A  5002                RF(0)      *+4                 JP IF CR=0
      058C  207F                HLT                       ***  PRECEDENT INSTRUCTION MLRCR0 DID NOT MODIF,CR

                     **
                     *          T3A        TEST
                     **
      058E  87A0                LDKL       A15,STKP
      0590  0140
      0592  8220                LDKL       A2,ORGTB1
      0594  00F0
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00557                    *   MLR1
00558  0596  B8A8            MLR     1,?            EXECUTE MLR WITH 1 REG.    A2
00559  0598  5002            RF(0)                  JP IF CR=0
00560  059A  207F            HLT               ***  PRECEDENT INSTRUCTION ML    DID NOT MODIF.CR
00561  059C  E940            CW      A1,ORGTB1
       059E  00F0
00562  05A0  5002            RF(0)   *+4            JP IF (A1) = (ORGTB1)
00563  05A2  207F            HLT               ***  AFTER INSTRUCTION MLR1 (A1) # (ORGTB1)
00564  05A4  EA20            CWK     A2,ORGTB1
       05A6  00F0
00565  05A8  5002            RF(0)   *+4            JP IF (A2) = ORGTB1
00566  05AA  207F            HLT               ***  AFTER INSTRUCTION MLR1 (A2) HAS BEEN MODIF.
00567  05AC  F7A1            CF      A15,ML14RG     LOAD A1,TO A14 WITH X'FFFF'
       05AE  0000  F
00568  05B0  8120            LDKL    A1,ORGTB2
       05B2  0112
00569                    *   MLR2
00570  05B4  B924            MLR     2,A1           EXECUTE MLR WITH 2 REG. BY A1
00571  05B6  5202            RF(2)   *+4            JP IF CR=2
00572  05B8  207F            HLT               ***  PRECEDENT INSTRUCTION MLR2 DID NOT MODIF. CR
00573  05BA  E940            CW      A1,ORGTB2
       05BC  0112
00574  05BE  5002            RF(0)   *+4            JP IF (A1) = (ORGTB2)
00575  05C0  207F            HLT               *** AFTER INSTRUCTION MLR2 A1 # (ORGTB2)
00576  05C2  EA40            CW      A2,ORGTB2+2
       05C4  0114
00577  05C6  5002            RF(0)   *+4            JP IF (A2) = (ORGTB2+2)
00578  05C8  207F            HLT               ***  AFTER INSTRUCTION MLR2 (A2) # (ORGTB2+2)
00579  05CA  EB40            CW      A3,ORGTB2
       05CC  0112
00580  05CE  5002            RF(0)   *+4            JP IF (A3) = X'FFFF'
00581  05D0  207F            HLT               ***  AFTER INSTRUCTION MLR2  A3 HAS BEEN MODIF.
00582  05D2  8120            LDKL    A1,3
       05D4  0003
00583  05D6  8141            ST      A1,NBNMS
       05D8  014E
00584  05DA  F7A1            CF      A15,ML14RG     LOAD A1,TO A14 WITH X'FFFF'
       05DC  0000  F
00585  05DE  8320            LDKL    A3,ORGTB1
       05E0  00F0
00586                    *   MLR3
00587  05E2  B9AC            MLR     3,A3           EXECUTE MLR WITH 3 REG. BY A3
00588  05E4  5002            RF(0)   *+4            JP IF CR = 0
00589  05E6  207F            HLT               ***  PRECEDENT INSTRUCTION MLR3 DID NOT MODIF.CR
00590  05E8  F7A1            CF      A15,VEFYML     TO VERIFY MLR3
       05EA  0000  F
00591  05EC  8120            LDKL    A1,4
       05EE  0004
00592  05F0  8141            ST      A1,NBNMS
       05F2  014E
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00593  05F4  F7A1            CF      A15,ML14RG          LOAD A1,TO A14 WITH X'FFFF'
       05F6  0000  F
00594  05F8  8420            LOKL    A4,ORGTB1
       05FA  00F0
00595                  *     MLR4
00596  05FC  BA30            MLR     4,A4                EXECUTE MLR WITH 4 REG, BY A4
00597  05FE  5002            RF(0)   *+4                 JP IF CR # 0
00598  0600  207F            HLT                     *** PRECEDENT INSTRUCTION MLR4 DID NOT MODIF,CR
00599  0602  F7A1            CF      A15,VEFYML          TO VERIFY MLR4
       0604  0000  F
00600  0606  8120            LOKL    A1,5
       0608  0005
00601  060A  8141            ST      A1,NBNMS
       060C  014E
00602  060E  F7A1            CF      A15,ML14RG          LOAD A1,TO A14 WITH X'FFFF'
       0610  0000  F
00603  0612  8520            LOKL    A5,ORGTB1
       0614  00F0
00604                  *     MLR5
00605  0616  BAB4            MLR     5,A5                EXECUTE MLR WITH 5 REG, BY A5
00606  0618  5002            RF(0)   *+4
00607  061A  207F            HLT                     *** PRECEDENT INSTRUCTION MLR5 DID NOT MODIF,CR
00608  061C  F7A1            CF      A15,VEFYML          TO VERIFY MLR5
       061E  0000  F
00609  0620  8120            LOKL    A1,6
       0622  0006
00610  0624  8141            ST      A1,NBNMS
       0626  014E
00611  0628  F7A1            CF      A15,ML14RG          LOAD A1,TO A14 WITH X'FFFF'
       062A  0000  F
00612  062C  8620            LOKL    A6,ORGTB1
       062E  00F0
00613                  *     MLR6
00614  0630  BB38            MLR     6,A6                EXECUTE MLR WITH 6 REG, BY A6
00615  0632  5002            RF(0)   *+4                 JP IF CR # 0
00616  0634  207F            HLT                     *** PRECEDENT INSTRUCTION MLR6 DID NOT MODIF,CR
00617  0636  F7A1            CF      A15,VEFYML          TO VERIFY MLR6
       0638  0000  F
00618  063A  8120            LOKL    A1,7
       063C  0007
00619  063E  8141            ST      A1,NBNMS
       0640  014E
00620  0642  F7A1            CF      A15,ML14RG          LOAD A1,TO A14 WITH X'FFFF'
       0644  0000  F
00621  0646  8720            LOKL    A7,ORGTB1
       0648  00F0
00622                  *     MLR7
00623  064A  BBBC            MLR     7,A7                EXECUTE MLR WITH 7 REG, BY A7
00624  064C  5002            RF(0)   *+4                 JP IF CR # 0
00625  064E  207F            HLT                     *** PRECEDENT INSTRUCTION MLR7 DID NOT MODIF,CR
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00626  0650  F7A1            CF      A15,VEFYML      TO VERIFY MLR7
       0652  0000  F
00627  0654  8120            LDKL
       0656  0008
00628  0658  8141            ST      A1,N8NMS
       065A  014E
00629  065C  F7A1            CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       065E  0000  F
00630  0660  8A40            LDKL    A8,ORGTB1
       0662  00F0
00631                  *      MLR8
00632  0664  8C22            MLR     8,A8            EXECUTE MLR WITH 8 REG. BY A8
00633  0666  5002            RF(0)   **4             JP IF CR = 0
00634  0668  207F            HLT             ***     PRECEDENT INSTRUCTION MLR8 DID NOT MODIF.CR
00635  066A  F7A1            CF      A15,VEFYML      TO VERIFY MLR8
       066C  0000  F
00636  066E  8120            LDKL    A1,9
       0670  0009
00637  0672  8141            ST      A1,N8NMS
       0674  014E
00638  0676  F7A1            CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       0678  0000  F
00639  067A  81A0            LDKL    A9,ORGTB1
       067C  00F0
00640                  *      MLR9
00641  067E  8CA6            MLR     9,A9            EXECUTE MLR WITH 9 REG. BY A9
00642  0680  5002            RF(0)   **4             JP IF CR = 0
00643  0682  207F            HLT             ***     PRECEDENT INSTRUCTION MLR9 DID NOT MODIF.CR
00644  0684  F7A1            CF      A15,VEFYML      TO VERIFY MLR9
       0686  0000  F
00645  0688  8120            LDKL    A1,10
       068A  000A
00646  068C  8141            ST      A1,N8NMS
       068E  014E
00647  0690  F7A1            CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       0692  0000  F
00648  0694  82A0            LDKL    A10,ORGTB1
       0696  00F0
00649                  *      MLR10
00650  0698  8D2A            MLR     10,A10          EXECUTE MLR WITH 10 REG. BY A10
00651  069A  5002            RF(0)   **4             JP IF CR = 0
00652  069C  207F            HLT             ***     PRECEDENT INSTRUCTION MLR10 DID NOT MODIF.CR
00653  069E  F7A1            CF      A15,VEFYML      TO VERIFY MLR10
       06A0  0000  F
00654  06A2  8120            LDKL    A1,11
       06A4  000B
00655  06A6  8141            ST      A1,N8NMS
       06A8  014E
00656  06AA  F7A1            CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       06AC  0000  F
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00657  06AE  83A0              LDKL    A11,ORGTB1
       06B0  00F0
00658                  *       MLR11
00659  06B2  8DAE              MLR     A11             EXECUTE MLR WITH 11 REG,  / A11
00660  06B4  5002              RF(0)   **4             JP IF CR # 0
00661  06B6  207F              HLT                 ***  PRECEDENT INSTRUCTION MLR11 DID NOT MODIF,CR
00662  06B8  F7A1              CF      A15,VEFYML      TO VERIFY MLR11
       06BA  0000  F
00663  06BC  8120              LDKL    A1,12
       06BE  000C
00664  06C0  8141              ST      A1,NBNMS
       06C2  014E
00665  06C4  F7A1              CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       06C6  0030  F
00666  06C8  84A0              LDKL    A12,ORGTB1
       06CA  00F0
00667                  *       MLR12
00668  06CC  8E32              MLR     12,A12          EXECUTE MLR WITH 12 REG, BY A12
00669  06CE  5002              RF(0)   **4             JP IF CR = 0
00670  06D0  207F              HLT                 ***  PRECEDENT INSTRUCTION MLR12 DID NOT MODIF,CR
00671  06D2  F7A1              CF      A15,VEFYML      TO VERIFY MLR12
       06D4  0000  F
00672  06D6  8120              LDKL    A1,13
       06D8  000D
00673  06DA  8141              ST      A1,NBNMS
       06DC  014E
00674  06DE  F7A1              CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       06E0  0000  F
00675  06E2  85A0              LDKL    A13,ORGTB1
       06E4  00F0
00676                  *       MLR13
00677  06E6  8EB6              MLR     13,A13          EXECUTE MLR WITH 13 REG, BY A13
00678  06E8  5002              RF(0)   **4             JP IF CR = 0
00679  06EA  207F              HLT                 ***  PRECEDENT INSTRUCTION MLR13 DID NOT MODIF,CR
00680  06EC  F7A1              CF      A15,VEFYML      TO VERIFY MLR13
       06EE  0000  F
00681  06F0  8120              LDKL    A1,14
       06F2  000E
00682  06F4  8141              ST      A1,NBNMS
       06F6  014E
00683  06F8  F7A1              CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       06FA  0000  F
00684  06FC  86A0              LDKL    A14,ORGTB1
       06FE  00F0
00685                  *       MLR14
00686  0700  8F3A              MLR     14,A14          EXECUTE MLR WITH 14 REG, BY A14
00687  0702  5002              RF(0)   **4             JP IF CR = 0
00688  0704  207F              HLT                 ***  PRECEDENT INSTRUCTION MLR14 DID NOT MODIF,CR
00689  0706  F7A1              CF      A15,VEFYML      TO VERIFY MLR14
       0708  0000  F
```

```
00690                    **
00691                    *       T3B     TEST
00692                    **
00693  0708  8120                LDKL    ,14
       070C  000E
00694  070E  8141                ST      A1,NBNMS
       0710  014E
00695  0712  F7A1                CF      A15,ML14RG      LOAD A1,TO A14 WITH X'FFFF'
       0714  0000  F
00696  0716  87A0                LDKL    A15,ORGTB0+4
       0718  0002
00697                    *       MLR15
00698  071A  BFBE                MLR     15,A15          EXECUTE MLR WITH 15 REG, BY A15
00699  071C  5002                RF(0)   **+4            JP IF CR = 0
00700  071E  207F                HLT                 ***  PRECEDENT INSTRUCTION MLR15 DID NOT MODIF,CR
00701  0720  87A0                LDKL    A15,STKP
       0722  0140
00702  0724  F7A1                CF      A15,VEFYML      TO VERIFY MLR15
       0726  0000  F
00703                    *       MLR151
00704  0728  87A0                LDKL    A15,ORGTB4-2
       072A  00F6
00705  072C  BFBE                MLR     15,A15          EXECUTE MLR WITH 15 REG, BY A15
00706  072E  5002                RF(0)   **+4            JP IF CR = 0
00707  0730  207F                HLT                     MLR151 NOK
00708  0732  87A0                LDKL    A15,ORGTB1+4
       0734  00F4
00709                    *       MLR152
00710  0736  BFBE                MLR     15,A15          EXECUTE MLR WITH 15 REG, BY A15
00711  0738  5202                RF(2)   **+4            JP IF CR = 2
00712  073A  207F                HLT                     MLR152 NOK
00713  073C  EFC0                CW      A15,ORGTB4-2
       073E  00F6
00714  0740  5002                RF(0)   **+4            JP IF (A15) = (ORGTB2+6)
00715  0742  207F                HLT                 ***  AFTER INSTRUCTION MLR15 (A15) # (ORGTB2+6)
```

```
00716                          EJECT
00717
00718                  ******  ******  **************
00719                  **
00720                  *       MSR     MULTIPLE STORE/REGISTER
00721                  *                                T3A  (A1)----------IN ((R2))
00722                  *                                     (A2)----------IN ((R2))+2
00723                  *                                     (AN)----------IN ((R2))+2N-2
00724                  *                                T3B  (A1----------IN ((A15))
00725                  *                                     (A2)----------IN ((A15))-2
00726                  *                                     (AN)----------IN ((A5))-2N+2
00727                  *                                     ((A15))-2N----IN A15
00728                  **
00729                  ******  ******  ******************
00730
00731                  **
00732                  *       T3A     TEST
00733                  **
00734                  MSRTST  EQU     *
00735  0744  87A0              LOKL    A15,STKP
       0746  0140
00736  0748  F7A1              CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       074A  0000  F
00737  074C  F7A1              CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
       074E  0000  F
00738  0750  8120              LOKL    A1,STAKMS
       0752  0150
00739  0754  86A0              LOKL    A14,-1
       0756  FFFF
00740  0758  B8A3      MSR1    MSR     1,A1            EXECUTE MSR WITH 1 REG. BY A1
00741  075A  5202              RF(2)   *+4             JP IF CR = 2
00742  075C  207F              HLT                     ***  PRECEDENT INSTRUCTION MSR1 HAS MODIFIED CR
00743  075E  E940              CW      A1,STAKMS
       0760  0150
00744  0762  5002              RF(0)   *+4             JP IF (STAKMS) = (A1)
00745  0764  207F              HLT                     ***  AFTER INSTRUCTION MSR1: (STAKMS) IS # (A1)
00746  0766  EEC0              CW      A14,STAKMS+2
       0768  0152
00747  076A  5002              RF(0)   *+4             JP IF (STAKMS+2) = -1
00748  076C  207F              HLT                     ***  AFTER INST, MSR1, (STAKMS+2) HAS BEEN MODIF.
00749  076E  F7A1              CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       0770  0000  F
00750  0772  F7A1              CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
       0774  0000  F
00751  0776  86A0              LOKL    A14,-1
       0778  FFFF
00752  077A  8220              LOKL    A2,STAKMS
       077C  0150
00753  077E  8720              LOKL    A7,0
       0780  0000
```

```
00754  0782  8929      MSR2    MSR     2,A2            EXECUTE MSR WITH 2 REG. BY A2
00755  0784  5002              RF(0)   *4              JP IF CR = 0
00756  0786  207F              HLT                     *** PRECEDENT INSTRUCTION MSR2 HAS MODIFIED CR
00757  0788  E940              CW      STAKMS
       078A  0150
00758  078C  5002              RF(0)   **4             JP IF (STAKMS) = (A1)
00759  078E  207F              HLT                     *** AFTER INSTRUCTION MSR2: (STAKMS) IS # (A1)
00760  0790  EA40              CW      A2,STAKMS+2
       0792  0152
00761  0794  5002              RF(0)   **4             JP IF (STAKMS+2) = (A2)
00762  0796  207F              HLT                     *** AFTER INSTRUCTION MSR2: (STAKMS+2) IS # (A2)
00763  0798  EEC0              CW      A14,STAKMS+4
       079A  0154
00764  079C  5002              RF(0)   **4             JP IF (STAKMS+4) = -1
00765  079E  207F              HLT                     *** AFTER INST. MSR2:(STAKMS+4) HAS BEEN MODIF.
00766  07A0  8103              LDK     A1,3
00767  07A2  8141              ST      A1,NBNMS
       07A4  014E
00768  07A6  F7A1              CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       07A8  0000  F
00769  07AA  F7A1              CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
       07AC  0000  F
00770  07AE  8320              LDKL    A3,STAKMS
       07B0  0150
00771  07B2  D9AD      MSR3    MSR     3,A3            EXECUTE MSR WITH 3 REG. BY A3
00772  07B4  F7A1              CF      A15,VEFYMS      TO VERIFY MRS3
       07B6  0000  F
00773  07B8  8104              LDK     A1,4
00774  07BA  8141              ST      A1,NBNMS
       07BC  014E
00775  07BE  F7A1              CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       07C0  0000  F
00776  07C2  F7A1              CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
       07C4  0000  F
00777  07C6  8420              LDKL    A4,STAKMS
       07C8  0150
00778  07CA  8A31      MSR4    MSR     4,A4            EXECUTE MSR WITH 4 REG. BY A4
00779  07CC  F7A1              CF      A15,VEFYMS      TO VERIFY MRS4
       07CE  0000  F
00780  07D0  8105              LDK     A1,5
00781  07D2  8141              ST      A1,NBNMS
       07D4  014E
00782  07D6  F7A1              CF      A15,SETM1       STORE -1 IN STAKMS TABLE
       07D8  0000  F
00783  07DA  F7A1              CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
       07DC  0000  F
00784  07DE  8520              LDKL    A5,STAKMS
       07E0  0150
00785  07E2  BAB5      MSR5    MSR     5,A5            EXECUTE MSR WITH 5 REG. BY A5
00786  07E4  F7A1              CF      A15,VEFYMS      TO VERIFY MRS5
```

```
                07E6  0000  F
00787           07E8  0106          LDK     A1,6
00788           07EA  8141          ST      A1,NBNMS
                07EC  014E
00789           07EE  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
                07F0  0000  F
00790           07F2  F7A1          CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
                07F4  0000  F
00791           07F6  8620          LDKL    A6,STAKMS
                07F8  0150
00792           07FA  8B59  MSR6    MSR     6,A6            EXECUTE MSR WITH 6 REG, BY A6
00793           07FC  F7A1          CF      A15,VEFYMS      TO VERIFY MRS6
                07FE  0000  F
00794           0800  0107          LDK     A1,7
00795           0802  8141          ST      A1,NBNMS
                0804  014E
00796           0806  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
                0808  0000  F
00797           080A  F7A1          CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
                080C  0000  F
00798           080E  8720          LDKL    A7,STAKMS
                0810  0150
00799           0812  8B8C  MSR7    MSR     7,A7            EXECUTE MSR WITH 7 REG, BY A7
00800           0814  F7A1          CF      A15,VEFYMS      TO VERIFY MRS7
                0816  0000  F
00801           0818  0108          LDK     A1,8
00802           081A  8141          ST      A1,NBNMS
                081C  014E
00803           081E  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
                0820  0000  F
00804           0822  F7A1          CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
                0824  0000  F
00805           0826  8820          LDKL    A8,STAKMS
                0828  0150
00806           082A  8C2B  MSR8    MSR     8,A8            EXECUTE MSR WITH 8 REG, BY A8
00807           082C  F7A1          CF      A15,VEFYMS      TO VERIFY MRS8
                082E  0000  F
00808           0830  0109          LDK     A1,9
00809           0832  8141          ST      A1,NBNMS
                0834  014E
00810           0836  F7A1          CF      A15,SETM1       STORE -1 IN STAKMS TABLE
                0838  0000  F
00811           083A  F7A1          CF      A15,LD14RG      LOAD A1 TO A14 WITH ORGTB1 TABLE
                083C  0000  F
00812           083E  8920          LDKL    A9,STAKMS
                0840  0150
00813           0842  8CA7  MSR9    MSR     9,A9            EXECUTE MSR WITH 9 REG, BY A9
00814           0844  F7A1          CF      A15,VEFYMS      TO VERIFY MRS9
                0846  0000  F
00815           0848  010A          LDK     A1,10
```

```
    316  084A  8141          ST      ,NBNMS
         084C  014E
00817    084E  F7A1          CF      ,SETM1      STORE -1 IN STAKMS TABLE
         0850  0000  F
00818    0852  F7A1          CF      A15,LD14RG  LOAD A1 TO A14 WITH ORGTB1 TABLE
         0854  0000  F
00819    0856  82A0          LDKL    A10,STAKMS                                    30
         0858  0150
00820    085A  8D28      MSR10   MSR     10,A10      EXECUTE MSR WITH 10 REG, BY A10
00821    085C  F7A1          CF      A15,VEFYMS  TO VERIFY MRS10
         085E  0000  F
00822    0860  010B          LDK     A1,11
00823    0862  8141          ST      A1,NBNMS
         0864  014E
00824    0866  F7A1          CF      A15,SETM1   STORE -1 IN STAKMS TABLE
         0868  0000  F
00825    086A  F7A1          CF      A15,LD14RG  LOAD A1 TO A14 WITH ORGTB1 TABLE
         086C  0000  F
00826    086E  83A0          LDKL    A11,STAKMS
         0870  0150
00827    0872  8DAF      MSR11   MSR     11,A11      EXECUTE MSR WITH 11 REG, BY A11
00828    0874  F7A1          CF      A15,VEFYMS  TO VERIFY MRS11
         0876  0000  F
00829    0878  010C          LDK     A1,12
00830    087A  8141          ST      A1,NBNMS
         087C  014E
00831    087E  F7A1          CF      A15,SETM1   STORE -1 IN STAKMS TABLE
         0880  0000  F
00832    0882  F7A1          CF      A15,LD14RG  LOAD A1 TO A14 WITH ORGTB1 TABLE
         0884  0000  F
00833    0886  84A0          LDKL    A12,STAKMS
         0888  0150
00834    088A  8E33      MSR12   MSR     12,A12      EXECUTE MSR WITH 12 REG, BY A12
00835    088C  F7A1          CF      A15,VEFYMS  TO VERIFY MRS12
         088E  0000  F
00836    0890  010D          LDK     A1,13
00837    0892  8141          ST      A1,NBNMS
         0894  014E
00838    0896  F7A1          CF      A15,SETM1   STORE -1 IN STAKMS TABLE
         0898  0000  F
00839    089A  F7A1          CF      A15,LD14RG  LOAD A1 TO A14 WITH ORGTB1 TABLE
         089C  0000  F
00840    089E  85A0          LDKL    A13,STAKMS
         08A0  0150
00841    08A2  8E87      MSR13   MSR     13,A13      EXECUTE MSR WITH 13 REG, BY A13
00842    08A4  F7A1          CF      A15,VEFYMS  TO VERIFY MRS13
         08A5  0000  F
00843    08A8  010E          LDK     A1,14
00844    08AA  8141          ST      A1,NBNMS
         08AC  014E
```

```
08AE  F7A1                CF      A15,SETM1        STORE -1 IN STAKMS TABLE
08B0  0000  F
08B2  F7A1                CF      A15,LD14RG       LOAD A1 TO A14 WITH ORGT81 TABLE
08B4  0000  F
08B6  86A0                LDKL    A14,STAKMS
08B8  0152
08BA  8F38       MSR14    MSR     14,A14           EXECUTE MSR WITH 14 REG, BY A14
08BC  F7A1                CF      A15,VEFYMS       TO VERIFY MRS14
08BE  0000  F
                **
                *         T38     TEST
                **
08C0  010E                LDK     A1,14
08C2  8141                ST      A1,NBNMS
08C4  014E
08C6  F7A1                CF      A15,SETM1        STORE -1 IN STAKMS TABLE
08C8  0000  F
08CA  F7A1                CF      A15,LD14RG       LOAD A1 TO A14 WITH ORGT81 TABLE
08CC  0000  F
08CE  87A0                LDKL    A15,STAKMS+28
08D0  016C
08D2  8F8F       MSR15    MSR     15,A15           EXECUTE MSR WITH 15 REG, BY A15
08D4  EFA0                CWK     A15,STAKMS-2
08D6  014E
08D8  5002                RF(0)   *+4              JP IF (A15)= ADDR, STAKMS-2 AFTER INST, MSR15
08DA  207F                HLT                  *** AFTER INSTRUCTION MSR15: (A15) IS # STAKMS-2
08DC  87A0                LDKL    A15,STKP
08DE  0140
08E0  F7A1                CF      A15,VEFMS2       TO VERIFY MSR 15
08E2  0000  F
```

```
                          EJECT
                 ******   ******   ****************
                 **
                 *        MLK      MULTIPLE LOAD CONSTANT
                 *                             KL1,KL2,---KLN-----IN A1,A2---AN
                 **
                 ******   ******   ****************

                 **
                 *        CHECK OF NUMBER OF N, FOR MLK INSTRUCTION
                 **

                  MLKTST  EQU      *
08E4  89A0        MLKP3   MLK      3                   EXECUTE MLK WITH 3  REG.
08E6  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK3 LOADED 0 REG.
08E8  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK3 LOADED 1 REG.
08EA  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK3 LOADED 2 REG.
08EC  5700  F             RF(7)    MLKP12              BRANCH IF INSTRUCTION MLK3 LOADED 3 REG.
08EE  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 4 REG.
08F0  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 5 REG.
08F2  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 6 REG.
08F4  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 7 REG.
08F6  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 8 REG.
08F8  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 9 REG.
08FA  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 10 REG.
08FC  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 11 REG.
08FE  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 12 REG.
0900  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 13 REG.
0902  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 14 REG.
0904  5700  F             RF(7)    MLK3ST              BRANCH IF INSTRUCTION MLK3 LOADED 15 REG.
0906  207F        MLK3ST  HLT                     ***  STOP IF INSTRUCTION MLK3 LOADED > 3 REG.
0908  8E20        MLKP12  MLK      12                  EXECUTE MLK WITH 12 REG.
090A  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 0 REG.
090C  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 1 REG.
090E  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 2 REG.
0910  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 3 REG.
0912  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 4 REG.
0914  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 5 REG.
0916  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 6 REG.
0918  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 7 REG.
091A  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 8 REG.
091C  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 9 REG.
091E  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 10 REG.
0920  207F                DATA     X'207F'        ***  IF HALT HERE. INST. MLK12 LOADED 11 REG.
0922  5700  F             RF(7)    CRTMLK              BRANCH IF INST. MLK12 LOADED 12 REG.
0924  5700  F             RF(7)    MLK12S              BRANCH IF INST. MLK12 LOADED 13 REG.
0926  5700  F             RF(7)    MLK12S              BRANCH IF INST. MLK12 LOADED 14 REG.
0928  5700  F             RF(7)    MLK12S              BRANCH IF INST. MLK12 LOADED 15 REG.
092A  207F        MLK12S  HLT                     ***  STOP IF MLK12 LOADED > 12 REG.
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```
00914                    *        CR      TEST
00915                    *                CR = 0 IF (A1) = 0
00916                    *                   = 1 IF (A1) > 0
00917                    *                CR = 2 IF (A2) < 0
00918
00919                    CRTMLK   EQU     *
00920  092C  87A0               LOKL    A15,STKP                                    33
       092E  0140
00921  0930  F7A1               CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0932  0000  F
00922  0934  B8A0        MLKCR0 MLK     1
00923  0936  0000               DATA    0
00924  0938  5002               RF(0)   *+4             JP IF CR=0
00925  093A  207F               HLT                     *** PRECEDENT INST. MLKCR0 DID NOT MODIF, CR
00926  093C  E940               CW      A1,MLKCR0+2
       093E  0936
00927  0940  5002               RF(0)   *+4             JP IF (A1) = 0
00928  0942  207F               HLT                     *** AFTER INSTRUCTION MLKCR0 (A1) # 0
00929  0944  EA20               CWK     A2,-1
       0946  FFFF
00930  0948  5002               RF(0)   *+4             JP IF (A2) = 1
00931  094A  207F               HLT                     *** AFTER INSTRUCTION MLKCR0 A2 HAS BEEN MODF,
00932  094C  87A0               LOKL    A15,STKP
       094E  0140
00933  0950  F7A1               CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0952  0000  F
00934  0954  B920        MLKCR1 MLK     2
00935  0956  0001               DATA    1
00936  0958  0000               DATA    0
00937  095A  5102               RF(1)   *+4             JP IF CR = 1
00938  095C  207F               HLT                     *** PRECEDENT INST, MLKCR1 DID NOT MODIF, CR
00939  095E  E940               CW      A1,MLKCR1+2
       0960  0956
00940  0962  5002               RF(0)   *+4             JP IF (A1) = 1
00941  0964  207F               HLT                     *** AFTER INSTRUCTION MLKCR1  (A1) # 1
00942  0966  EA40               CW      A2,MLKCR1+4
       0968  0958
00943  096A  5002               RF(0)   *+4             JP IF (A2) = 0
00944  096C  207F               HLT                     *** AFTER INSTRUCTION MLKCR1 (A2) # 0
00945  096E  EB20               CWK     A3,-1
       0970  FFFF
00946  0972  5002               RF(0)   *+4             JP IF (A3) = -1
00947  0974  207F               HLT                     *** AFTER INSTRUCTION MLKCR1 (A3) # -1
00948  0976  8120               LOKL    A1,3
       0978  0003
00949  097A  8141               ST      A1,NBNMS
       097C  014E
00950  097E  F7A1               CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0980  0000  F
00951  0982  B9A0        MLK3   MLK     3               EXECUTE MULTIPLE LOAD CONSTANT WITH 3 REG,
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00952  0984  0000          DATA    X'0000'
00953  0986  0001          DATA    X'0001'
00954  0988  0002          DATA    X'0002'
00955  098A  5002          RF(0)   *+4                     JP IF CR = 0
00956  098C  207F          HLT                     ***     PRECEDENT INSTRUCTION MLK3  DID NOT MODIF,CR
00957  098E  F7A1          CF      A15,VEFYML              TO VERIFY MLK3
       0990  0000  F
00958  0992  8120          LOKL    A1,4
       0994  0004
00959  0996  8141          ST      A1,NBNMS
       0998  014E
00960  099A  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
       099C  0000  F
00961  099E  8A20    MLK4  MLK     4                       EXECUTE MULTIPLE LOAD CONSTANT WITH 4 REG,
00962  09A0  0000          DATA    X'0000'
00963  09A2  0001          DATA    X'0001'
00964  09A4  0002          DATA    X'0002'
00965  09A6  0004          DATA    X'0004'
00966  09A8  5002          RF(0)   *+4                     JP IF CR = 0
00967  09AA  207F          HLT                     ***     PRECEDENT INSTRUCTION MLK4  DID NOT MODIF,CR
00968  09AC  F7A1          CF      A15,VEFYML              TO VERIFY MLK4
       09AE  0000  F
00969  09B0  8120          LOKL    A1,5
       09B2  0005
00970  09B4  8141          ST      A1,NBNMS
       09B6  014E
00971  09B8  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
       09BA  0000  F
00972  09BC  8AA0     MLK5 MLK     5                       EXECUTE MULTIPLE LOAD CONSTANT WITH 5 REG,
00973  09BE  0000          DATA    X'0000'
00974  09C0  0001          DATA    X'0001'
00975  09C2  0002          DATA    X'0002'
00976  09C4  0004          DATA    X'0004'
00977  09C6  0008          DATA    X'0008'
00978  09C8  5002          RF(0)   *+4                     JP IF CR = 0
00979  09CA  207F          HLT                     ***     PRECEDENT INSTRUCTION MLK5  DID NOT MODIF,CR
00980  09CC  F7A1          CF      A15,VEFYML              TO VERIFY MLK5
       09CE  0000  F
00981  09D0  8120          LOKL    A1,6
       09D2  0006
00982  09D4  8141          ST      A1,NBNMS
       09D6  014E
00983  09D8  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
       09DA  0000  F
00984  09DC  8B20     MLK6 MLK     6                       EXECUTE MULTIPLE LOAD CONSTANT WITH 6 REG,
00985  09DE  0000          DATA    X'0000'
00986  09E0  0001          DATA    X'0001'
00987  09E2  0002          DATA    X'0002'
00988  09E4  0004          DATA    X'0004'
00989  09E6  0008          DATA    X'0008'
```

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         09E8   0010                    DATA    X'0010'
         09EA   5002                    RF(0)   *+4                JP IF CR = 0
         09EC   207F                    HLT                   ***  PRECEDENT INSTRUCTION ML...  DID NOT MODIF,CR
         09EE   F7A1                    CF      A15,VEFYML         TO VERIFY MLK6
         09F0   0000   F
         09F2   0120                    LDKL    A1,7
         09F4   0007
         09F6   8141                    ST      A1,NBNMS
         09F8   014E
         09FA   F7A1                    CF      A15,ML14RG         LOAD A1 TO A14 WITH X'FFFF'
         09FC   0000   F
         09FE   8BA0         MLK7       MLK     7                  EXECUTE MULTIPLE LOAD CONSTANT WITH 7 REG,
         0A00   0000                    DATA    X'0000'
         0A02   0001                    DATA    X'0001'
         0A04   0002                    DATA    X'0002'
         0A06   0004                    DATA    X'0004'
         0A08   0008                    DATA    X'0008'
         0A0A   0010                    DATA    X'0010'
         0A0C   0020                    DATA    X'0020'
         0A0E   5002                    RF(0)   *+4                JP IF CR = 0
         0A10   207F                    HLT                   ***  PRECEDENT INSTRUCTION MLK7  DID NOT MODIF,CR
         0A12   F7A1                    CF      A15,VEFYML         TO VERIFY MLK7
         0A14   0000   F
         0A16   0120                    LDKL    A1,8
         0A18   0008
         0A1A   8141                    ST      A1,NBNMS
         0A1C   014E
         0A1E   F7A1                    CF      A15,ML14RG         LOAD A1 TO A14 WITH X'FFFF'
         0A20   0000   F
         0A22   8C20         MLK8       MLK     8                  EXECUTE MULTIPLE LOAD CONSTANT WITH 8 REG,
         0A24   0000                    DATA    X'0000'
         0A26   0001                    DATA    X'0001'
         0A28   0002                    DATA    X'0002'
         0A2A   0004                    DATA    X'0004'
         0A2C   0008                    DATA    X'0008'
         0A2E   0010                    DATA    X'0010'
         0A30   0020                    DATA    X'0020'
         0A32   0040                    DATA    X'0040'
         0A34   5002                    RF(0)   *+4                JP IF CR = 0
         0A36   207F                    HLT                   ***  PRECEDENT INSTRUCTION MLK8  DID NOT MODIF,CR
         0A38   F7A1                    CF      A15,VEFYML         TO VERIFY MLK8
         0A3A   0000   F
         0A3C   0120                    LDKL    A1,9
         0A3E   0009
         0A40   8141                    ST      A1,NBNMS
         0A42   014E
         0A44   F7A1                    CF      A15,ML14RG         LOAD A1 TO A14 WITH X'FFFF'
         0A46   0000   F
         0A48   8CA0         MLK9       MLK     9                  EXECUTE MULTIPLE LOAD CONSTANT WITH 9 REG,
         0A4A   0000                    DATA    X'0000'
```

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01028  0A4C  0001          DATA    X'0001'
01029  0A4E  0002          DATA    X'0002'
01030  0A50  0004          DATA    X'0004'
01031  0A52  0008          DATA    X'0008'
01032  0A54  0010          DATA    X'0010'
01033  0A56  0020          DATA    X'0020'
01034  0A58  0040          DATA    X'0040'
01035  0A5A  0080          DATA    X'0080'
01036  0A5C  5002          RF(0)   *+4                     JP IF CR # 0
01037  0A5E  207F          HLT                     ***     PRECEDENT INSTRUCTION MLK9  DID NOT MODIF,CR
01038  0A60  F7A1          CF      A15,VEFYML              TO VERIFY MLK9
       0A62  0000  F
01039  0A64  8120          LDKL    A1,10
       0A66  000A
01040  0A68  8141          ST      A1,NBNMS
       0A6A  014E
01041  0A6C  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
       0A6E  0000  F
01042  0A70  8020    MLK10 MLK     10                      EXECUTE MULTIPLE LOAD CONSTANT WITH 10 REG,
01043  0A72  0000          DATA    X'0000'
01044  0A74  0001          DATA    X'0001'
01045  0A76  0002          DATA    X'0002'
01046  0A78  0004          DATA    X'0004'
01047  0A7A  0008          DATA    X'0008'
01048  0A7C  0010          DATA    X'0010'
01049  0A7E  0020          DATA    X'0020'
01050  0A80  0040          DATA    X'0040'
01051  0A82  0080          DATA    X'0080'
01052  0A84  0100          DATA    X'0100'
01053  0A86  5002          RF(0)   *+4                     JP IF CR # 0
01054  0A88  207F          HLT                     ***     PRECEDENT INSTRUCTION MLK10 DID NOT MODIF,CR
01055  0A8A  F7A1          CF      A15,VEFYML              TO VERIFY MLK10
       0A8C  0000  F
01056  0A8E  8120          LDKL    A1,11
       0A90  000B
01057  0A92  8141          ST      A1,NBNMS
       0A94  014E
01058  0A96  F7A1          CF      A15,ML14RG              LOAD A1 TO A14 WITH X'FFFF'
       0A98  0000  F
01059  0A9A  8DA0    MLK11 MLK     11                      EXECUTE MULTIPLE LOAD CONSTANT WITH 11 REG,
01060  0A9C  0000          DATA    X'0000'
01061  0A9E  0001          DATA    X'0001'
01062  0AA0  0002          DATA    X'0002'
01063  0AA2  0004          DATA    X'0004'
01064  0AA4  0008          DATA    X'0008'
01065  0AA6  0010          DATA    X'0010'
01066  0AA8  0020          DATA    X'0020'
01067  0AAA  0040          DATA    X'0040'
01068  0AAC  0080          DATA    X'0080'
01069  0AAE  0100          DATA    X'0100'
```

```
0A70  0AB0  0200          DATA    X'0200'
0A71  0AB2  5002          RF(0)   *+4             JP IF CR ≠ 0
0A72  0AB4  207F          HLT                 ***  PRECEDENT INSTRUCTION ML[illegible] DID NOT MODIF,CR
0A73  0AB6  F7A1          CF      A15,VEFYML      TO VERIFY MLK11
      0AB8  0000  F
0A74  0ABA  8120          LDKL    A1,12
      0ABC  000C
0A75  0ABE  8141          ST      A1,NBNMS
      0AC0  014E
0A76  0AC2  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
      0AC4  0000  F
0A77  0AC6  8E20    MLK12 MLK     12              EXECUTE MULTIPLE LOAD CONSTANT WITH 12 REG,
0A78  0AC8  0000          DATA    X'0000'
0A79  0ACA  0001          DATA    X'0001'
0A80  0ACC  0002          DATA    X'0002'
0A81  0ACE  0004          DATA    X'0004'
0A82  0AD0  0008          DATA    X'0008'
0A83  0AD2  0010          DATA    X'0010'
0A84  0AD4  0020          DATA    X'0020'
0A85  0AD6  0040          DATA    X'0040'
0A86  0AD8  0080          DATA    X'0080'
0A87  0ADA  0100          DATA    X'0100'
0A88  0ADC  0200          DATA    X'0200'
0A89  0ADE  0400          DATA    X'0400'
0A90  0AE0  5002          RF(0)   *+4             JP IF CR ≠ 0
0A91  0AE2  207F          HLT                 ***  PRECEDENT INSTRUCTION MLK12 DID NOT MODIF,CR
0A92  0AE4  F7A1          CF      A15,VEFYML      TO VERIFY MLK12
      0AE6  0000  F
0A93  0AE8  8120          LDKL    A1,13
      0AEA  000D
0A94  0AEC  8141          ST      A1,NBNMS
      0AEE  014E
0A95  0AF0  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
      0AF2  0000  F
0A96  0AF4  8E20    MLK13 MLK     13              EXECUTE MULTIPLE LOAD CONSTANT WITH 13 REG,
0A97  0AF6  0000          DATA    X'0000'
0A98  0AF8  0001          DATA    X'0001'
0A99  0AFA  0002          DATA    X'0002'
0A100 0AFC  0004          DATA    X'0004'
0A101 0AFE  0008          DATA    X'0008'
0A102 0B00  0010          DATA    X'0010'
0A103 0B02  0020          DATA    X'0020'
0A104 0B04  0040          DATA    X'0040'
0A105 0B06  0080          DATA    X'0080'
0A106 0B08  0100          DATA    X'0100'
0A107 0B0A  0200          DATA    X'0200'
0A108 0B0C  0400          DATA    X'0400'
0A109 0B0E  0800          DATA    X'0800'
0A110 0B10  5002          RF(0)   *+4             JP IF CR ≠ 0
0A111 0B12  207F          HLT                 ***  PRECEDENT INSTRUCTION MLK13 DID NOT MODIF,CR
```

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01112  0814  F7A1          CF      A15,VEFYML      TO VERIFY MLK13
       0816  0000  F
01113  0818  8120          LDKL    14
       081A  002E
01114  081C  8141          ST      A1,N0NMS
       081E  014E
01115  0820  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'                    32
       0822  0000  F
01116  0824  8F20  MLK14    MLK     14              EXECUTE MULTIPLE LOAD CONSTANT WITH 14 REG.
01117  0825  0000          DATA    X'0000'
01118  0828  0001          DATA    X'0001'
01119  082A  0002          DATA    X'0002'
01120  082C  0004          DATA    X'0004'
01121  082E  0008          DATA    X'0008'
01122  0830  0010          DATA    X'0010'
01123  0832  0020          DATA    X'0020'
01124  0834  0040          DATA    X'0040'
01125  0836  0080          DATA    X'0080'
01126  0838  0100          DATA    X'0100'
01127  083A  0200          DATA    X'0200'
01128  083C  0400          DATA    X'0400'
01129  083E  0800          DATA    X'0800'
01130  0840  1000          DATA    X'1000'
01131  0842  5002          RF(0)   *+4             JP IF CR ≠ 0
01132  0844  207F          HLT                ***  PRECEDENT INSTRUCTION MLK14 DID NOT MODIF.CR
01133  0846  F7A1          CF      A15,VEFYML      TO VERIFY MLK14
       0848  0000  F
01134  084A  8120          LDKL    A1,14
       084C  002E
01135  084E  8141          ST      A1,N0NMS
       0850  014E
01136  0852  F7A1          CF      A15,ML14RG      LOAD A1 TO A14 WITH X'FFFF'
       0854  0000  F
01137  0856  8FA0  MLK15    MLK     15              EXECUTE MULTIPLE LOAD CONSTANT WITH 15 REG.
01138  0858  0000          DATA    X'0000'
01139  085A  0001          DATA    X'0001'
01140  085C  0002          DATA    X'0002'
01141  085E  0004          DATA    X'0004'
01142  0860  0008          DATA    X'0008'
01143  0862  0010          DATA    X'0010'
01144  0864  0020          DATA    X'0020'
01145  0866  0040          DATA    X'0040'
01146  0868  0080          DATA    X'0080'
01147  086A  0100          DATA    X'0100'
01148  086C  0200          DATA    X'0200'
01149  086E  0400          DATA    X'0400'
01150  0870  0800          DATA    X'0800'
01151  0872  1000          DATA    X'1000'
01152  0874  2000          DATA    X'2000'
01153  0876  5002          RF(0)   *+4             JP IF CR ≠ 0
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0154  0878  207F                HLT                    ***  PRECEDENT INSTRUCTION MLK15 DID NOT MODIF,CR
0155  087A  EFC0                CW     A15,CMEMOR
      087C  010C
0156  087E  5002                RF(0)  **+4                 JP IF (A15) # (CMEMOR)
0157  0880  207F                HLT                    ***  AFTER INSTRUCTION MLK15, (A15) IS # (CMEMOR)
0158  0882  87A0                LDKL   A15,STKP
      0884  0140
0159  0886  F7A1                CF     A15,VEFYML           TO VERIFY MLK15
      0888  0000  F
```

```
                         EJECT
                ******   ******   ****************
                **
                *        CC       COMPARE CHARACTER

                *                 T4 TEST------(R1)R COMP, WITH (M)L/R-------CR
                *                 T5 TEST------(R1)R COMP, WITH (M+(X))L/R--CR
                *                 T6 TEST------(R1)R COMP, WITH ((M))L/R----CR
                *                 T7 TEST------(R1)R COMP, WITH ((M+(X))L/R-CR
                **
                ******   ******   ****************

                ******   ******   ****************
                **
                *                 CR=0 IF (R1)R = (2ND OPERAND)L/R
                *                 CR=1 IF (R1)R = (2ND OPERAND)L/R
                *                 CR=2 IF (R1)R = (2ND OPERAND)L/R
                **
                ******   ******   ****************

                **
                *        T4  TEST
                **

                CCTST    EQU      *
0B8A  8220               LOKL     A2,-1
0B8C  FFFF
0B8E  0100               LOK      A1,0
0B90  E941      CC1L0    CC       A1,ORGTB1        EXECUTE COMPARE CHARACTER LEFT  EXP: =
0B92  20F0
0B94  5002               RF(0)    *+4              JP IF CR = 0
0B96  207F               HLT                  ***  INSTRUCTION CC1L0  DID NOT MODIF, CR
0B98  E941      CC1L2    CC       A1,WMEMOR+2      EXECUTE COMPARE CHARACTER LEFT, EXP: <
0B9A  0102
0B9C  5202               RF(2)    *+4          JP IF CR = 2
0B9E  207F               HLT                  ***  INSTRUCTION CC1L2  DID NOT MODIF, CR
0BA0  E941      CC1R0    CC       A1,ORGTB1+1      EXECUTE COMPARE CHARACTER RIGHT, EXP: =
0BA2  00F1
0BA4  5002               RF(0)    *+4              JP IF CR = 0
0BA6  207F               HLT                  ***  INSTRUCTION CC1R0  DID NOT MODIF, CR
0BA8  E941      CC1R2    CC       A1,WMEMOR+1      EXECUTE COMPARE CHARACTER RIGHT, EXP: <
0BAA  0101
0BAC  5202               RF(2)    *+4          JP IF CR = 2
0BAE  207F               HLT                  ***  INSTRUCTION CC1R2  DID NOT MODIF, CR
0BB0  8220               LOKL     A2,-1
0BB2  FFFF
0BB4  EA41      CC2L0    CC       A2,ORGTB2        EXECUTE COMPARE CHARACTER LEFT, EXP: =
0BB6  0112
0BB8  5002               RF(0)    *+4              JP IF CR = 0
```

```
0BBA   207F                 HLT                       *** INSTRUCTION CC2L0  DID NOT MODIF. CR
0BBC   EA41       CC2L1     CC       A2,ORGTB1            EXECUTE COMPARE CHARACTER LEFT. EXP: >
0BBE   00F0
0BC0   5102                 RF(1)    *+4                  JP IF CR # 1
0BC2   207F                 HLT                       *** INSTRUCTION CC2L1  DID NOT MODIF. CR
0BC4   EA41       CC2R0     CC       A2,ORGTB2+1          EXECUTE COMPARE CHARACTER RIGHT. EXP: =
0BC6   0113
0BC8   5002                 RF(0)    *+4                  JP IF CR # 0
0BCA   207F                 HLT                       *** INSTRUCTION CC2R0  DID NOT MODIF. CR
0BCC   EA41       CC2R1     CC       A2,ORGTB1+1          EXECUTE COMPARE CHARACTER RIGHT. EXP: >
0BCE   00F1
0BD0   5102                 RF(1)    *+4                  JP IF CR # 1
0BD2   207F                 HLT                       *** INSTRUCTION CC2R1  DID NOT MODIF. CR
0BD4   8320                 LDKL     A3,X'FF00'
0BD6   FF00
                  CW1       EQU      *-2
0BD8   EB41       CC3L0     CC       A3,CW2               EXECUTE COMPARE CHARACTER LEFT. EXP: =
0BDA   0000  F
0BDC   5002                 RF(0)    *+4                  JP IF CR # 0
0BDE   207F                 HLT                       *** INSTRUCTION CC3L0  DID NOT MODIF. CR
0BE0   8320                 LDKL     A3,X'00FF'
0BE2   00FF
                  CW2       EQU      *-2
0BE4   EB41       CC3R0     CC       A3,CW2+1             EXECUTE COMPARE CHARACTER RIGHT. EXP: =
0BE6   0BE3
0BE8   5002                 RF(0)    *+4                  JP IF CR # 0
0BEA   207F                 HLT                       *** INSTRUCTION CC3R0  DID NOT MODIF. CR
                  **
                  *         T5  TEST
                  **
0BEC   8420                 LDKL     A4,X'00FF'
0BEE   00FF
                  CW3       EQU      *-2
0BF0   8620                 LDKL     A6,2
0BF2   0002
0BF4   EC59       CC4XL0    CC       A4,CW1-2,A6          EXECUTE CC INDEX, BY A6, LEFT. EXP: =
0BF6   0BD4
0BF8   5002                 RF(0)    *+4                  JP IF CR # 0
0BFA   207F                 HLT                       *** INSTRUCTION CC4XL0 DID NOT MODIF. CR
0BFC   8420                 LDKL     A4,X'FF00'
0BFE   FF00
                  CW4       EQU      *-2
0C00   EC59       CC4XR0    CC       A4,CW4-1,A6          EXECUTE CC INDEX, BY A6, RIGHT. EXP: =
0C02   0BFD
0C04   5002                 RF(0)    *+4                  JP IF CR # 0
0C06   207F                 HLT                       *** INSTRUCTION CC4XR0 DID NOT MODIF. CR
                  **
                  *         T6  TEST
                  **
0C08   8520                 LDKL     A5,WMEMOR
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```
                0C2A  0120
 01241          0C2C  8541                ST      A5,CCIAD
                0C2E  0170
 01242          0C30  8520                LDKL    A5,X'FF00'
                0C32  FF00
 01243          0C34  E061      CC5IL0    CC*     A5,CCIAD        EXECUTE CC INDIRECT BY CCIAD, EXP: =
                0C36  0170
 01244          0C38  5002                RF(0)   *+4             JP IF CR = 0
 01245          0C3A  207F                HLT                     *** INSTRUCTION CC5IL0 DID NOT MODIF, CR
 01246          0C3C  8620                LDKL    A6,WMEMOR+1
                0C3E  0101
 01247          0C40  8641                ST      A6,CCIAD
                0C42  0170
 01248          0C44  E061      CC5IR2    CC*     A5,CCIAD        EXECUTE CC INDIRACT BY CCIAD, EXP: <
                0C46  0170
 01249          0C48  5202                RF(2)   *+4             JP IF CR = 2
 01250          0C4A  207F                HLT                     *** INSTRUCTION CC5IR2 DID NOT MODIF, CR
 01251                                    **
 01252                                    *       T7  TEST
 01253                                    **
 01254          0C4C  8720                LDKL    A7,X'00FF'
                0C4E  00FF
 01255                        CW5         EQU     *-2
 01256          0C50  8CA8                LDKL    A8,2
                0C52  0002
 01257          0C54  8620                LDKL    A6,CW1
                0C56  0806
 01258          0C58  8641                ST      A6,CCIAD
                0C5A  0170
 01259          0C5C  EF63      CC6IXL    CC*     A7,CCIAD-2,A8   EXECUTE CC INDIRACT AND INDX, BY A8 LEFT,
                0C5E  016E
 01260          0C60  5002                RF(0)   *+4             JP IF CR = 0
 01261          0C62  207F                HLT                     *** INSTRUCTION CC6IXL DID NOT MODIF, CR
 01262          0C64  8720                LDKL    A7,X'FF00'
                0C66  FF00
 01263                        CW6         EQU     *-2
 01264          0C68  8620                LDKL    A6,CW6+1
                0C6A  0C67
 01265          0C6C  8641                ST      A6,CCIAD
                0C6E  0170
 01266          0C70  EF63      CC6IXR    CC*     A7,CCIAD-2,A8   EXECUTE CC INDIRACT AND INDX, BY A8, RIGHT,
                0C72  016E
 01267          0C74  5002                RF(0)   *+4             JP IF CR = 0
 01268          0C76  207F                HLT                     *** INSTRUCTION CC6IXR DID NOT MODIF, CR
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01269                          EJECT
01270
01271                  ******  ******  ****************
01272                  **
01273                  *       CCR     COMPARE CHARACTER/REGISTER
01274                  *               T3----------(R1)R COMP, WITH ((R2))L/R==>CR
01275                  *               CR=0 IF (R1)R = ((R2))L/R
01276                  *               CR=1 IF (R1)R < ((R2))L/R
01277                  *               CR=2 IF (R1)R > ((R2))L/R
01278                  **
01279                  ******  ******  ******************
01280
01281                  CCRTST  EQU     *
01282  0C58  8220              LOKL    A2,ORGTB1
      0C5A  00F0
01283  0C5C  0100              LDK     A1,0
01284  0C5E  E929      CCR2L0  CCR     A1,A2           EXECUTE COMP, CHARACT, REG, BY A2, LEFT,EXP:=
01285  0C60  5002              RF(0)   *+4             JP IF CR = 0
01286  0C62  207F              HLT             ***     INSTRUCTION CCR2L0 DID NOT MODIF, CR,
01287  0C64  8320              LOKL    A3,ORGTB1+1
      0C66  0CF1
01288  0C68  E920      CCR3R0  CCR     A1,A3           EXECUTE COMP, CHARACT, REG, BY A3,RIGHT EXP:=
01289  0C6A  5002              RF(0)   *+4             JP IF CR = 0
01290  0C6C  207F              HLT             ***     INSTRUCTION CCR3R0 DID NOT MODIF, CR,
01291  0C6E  8420              LOKL    A4,WMEMOR+2
      0C70  0102
01292  0C72  E931      CCR4L2  CCR     A1,A4           EXECUTE COMP, CHARACT, REG, BY A4,LEFT EXP:<
01293  0C74  5202              RF(2)   *+4             JP IF CR = 2
01294  0C76  207F              HLT             ***     INSTRUCTION CCR4L2 DID NOT MODIF, CR,
01295  0C78  8520              LOKL    A5,WMEMOR+1
      0C7A  0101
01296  0C7C  E935      CCR5R2  CCR     A1,A5           EXECUTE COMP, CHARACT, REG, BY A5,RIGHT EXP:=
01297  0C7E  5202              RF(2)   *+4             JP IF CR = 2
01298  0C80  207F              HLT             ***     INSTRUCTION CCR5R2 DID NOT MODIF, CR,
01299  0C82  8620              LOKL    A6,-1
      0C84  FFFF
01300  0C86  8720              LOKL    A7,ORGTB2
      0C88  0112
01301  0C8A  EE3D      CCR7L0  CCR     A6,A7           EXECUTE COMP, CHARACT, REG, BY A7,LEFT,EXP:=
01302  0C8C  5002              RF(0)   *+4             JP IF CR = 0
01303  0C8E  207F              HLT             ***     INSTRUCTION CCR7R0 DID NOT MODIF, CR,
01304  0C90  8AA0              LOKL    A8,ORGTB1
      0C92  00F0
01305  0C94  8620              LOKL    A6,-1
      0C96  FFFF
01306  0C98  EE23      CCR8L1  CCR     A6,A8           EXECUTE COMP, CHARACT, REG, BY A8 LEFT, EXP:>
01307  0C9A  5102              RF(1)   *+4             JP IF CR = 1
01308  0C9C  207F              HLT             ***     INSTRUCTION CCR8L1 DID NOT MODIF, CR,
01309  0C9E  81A0              LOKL    A9,ORGTB2+1
      0CA0  0113
```

```
0131?  0CA2  EE27      CCR9R0  CCR     A6,A9           EXECUTE COMP, CHARACT, REG, BY A9,RIGHT EXP:F
0131?  0CA4  5002              RF(0)   **+4            JP IF CR = 0
0131?  0CA6  207F              HLT                 ***  INSTRUCTION CCR9R0 DID NOT MODIF, CR,
0131?  0CA8  EE2D      CCR3R1  CCR     A6,A3           EXECUTE COMP, CHARACT, REG, BY A3 RIGHT,EXP:>
0131?  0CAA  5102              RF(1)   **+4            JP IF CR = 1
0131?  0CAC  207F              HLT                 ***  INSTRUCTION CCR3R1 DID NOT MODIF, CR,
0131?  0CAE  86A0              LDKL    A14,X'FF00'
       0CB0  FF00
0131?                  CWR1    EQU     *-2
0131?  0CB2  87A0              LDKL    A15,X'00FF'
       0CB4  00FF
0131?                  CWR2    EQU     *-2
0131?  0CB6  82A0              LDKL    A10,CWR1
       0CB8  0CB0
0131?  0CBA  83A0              LDKL    A11,CWR2
       0CBC  0CB4
0131?  0CBE  84A0              LDKL    A12,CWR1+1
       0CC0  0CB1
0131?  0CC2  85A0              LDKL    A13,CWR2+1
       0CC4  0CB5
0131?  0CC6  EEAF      CCR110  CCR     A14,A11         EXEC, COMP, CHAR, REG, BY A11,LEFT, EXP:F
0131?  0CC8  5002              RF(0)   **+4            JP IF CR = 0
0131?  0CCA  207F              HLT                 ***  INSTRUCTION CCR110 DID NOT MODIF, CR,
0131?  0CCC  EEAB      CCR102  CCR     A14,A10         EXEC, COMP, CHAR, REG, BY A10, LEFT, EXP:<
0131?  0CCE  5202              RF(2)   **+4            JP IF CR = 2
0131?  0CD0  207F              HLT                 ***  INSTRUCTION CCR102 DID NOT MODIF, CR,
0131?  0CD2  EEB3      CCR120  CCR     A14,A12         EXEC, COMP, CHAR, REG, BY A12, RIGHT, EXP:F
0131?  0CD4  5002              RF(0)   **+4            JP IF CR = 0
0131?  0CD6  207F              HLT                 ***  INSTRUCTION CCR120 DID NOT MODIF, CR,
0131?  0CD8  EEB7      CCR132  CCR     A14,A13         EXEC, COMP, CHAR, REG, BY A13, RIGHT, EXP:<
0131?  0CDA  5202              RF(2)   **+4            JP IF CR = 2
0131?  0CDC  207F              HLT                 ***  INSTRUCTION CCR132 DID NOT MODIF, CR,
0131?  0CDE  EFAB      CCR100  CCR     A15,A10         EXEC, COMP, CHAR, REG, BY A10, LEFT, EXP:F
0131?  0CE0  5002              RF(0)   **+4            JP IF CR = 0
0131?  0CE2  207F              HLT                 ***  INSTRUCTION CCR100 DID NOT MODIF, CR,
0131?  0CE4  EFAF      CCR111  CCR     A15,A11         EXEC, COMP, CHAR, REG, BY A11, LEFT, EXP:>
0131?  0CE6  5102              RF(1)   **+4            JP IF CR = 1
0131?  0CE8  207F              HLT                 ***  INSTRUCTION CCR111 DID NOT MODIF, CR,
0131?  0CEA  EFB7      CCR130  CCR     A15,A13         EXEC, COMP, CHAR, REG, BY A13 RIGHT, EXP:F
0131?  0CEC  5002              RF(0)   **+4            JP IF CR = 0
0131?  0CEE  207F              HLT                 ***  INSTRUCTION CCR130 DID NOT MODIF, CR,
0131?  0CF0  EFB3      CCR121  CCR     A15,A12         EXEC, COMP, CHAR, REG, BY A12 RIGHT, EXP:>
0131?  0CF2  5102              RF(1)   **+4            JP IF CR = 1
0131?  0CF4  207F              HLT                 ***  INSTRUCTION CCR121 DID NOT MODIF, CR,
```

```
                                EJECT
                        ******  ******  ***************
                        **
                        *       CCK     COMPARE CHARACTER CONSTANT,
                        *               (R1)R COMP, WITH KL LEFT-------CR
                        *                 CR = 0 IF (R1)R = KL LEFT
                        *                 CR = 1 IF (R1)R > KL LEFT
                        *                 CR = 2 IF (R1)R < KL LEFT
                        **
                        ******  ******  ****************
                        CCKTST  EQU     *
0CF6  8240              CCK1L0  LD      A2,ORGT83
0CF8  00F2
0CFA  8100              CCK1L1  LDK     A1,0
0CFC  E921              CCK1L2  CCK     A1,X'0000'      EXECUTE COMP. CHAR. CONST. BY A1. EXP: =
0CFE  0000
0D00  5002                      RF(0)   **4             JP IF CR = 0
0D02  207F                      HLT             ***     INSTRUCTION CCK1L0 DID NOT MODIF. CR.
0D04  8340              CCK2L0  LD      A3,ORGT82
0D06  0112
0D08  EA21              CCK2L1  CCK     A2,X'0100'      EXECUTE COMP. CHAR. CONST. BY A2. EXP: >
0D0A  0100
0D0C  5002                      RF(0)   **4             JP IF CR = 0
0D0E  207F                      HLT             ***     INSTRUCTION CCK2L0 DID NOT MODIF. CR.
0D10  8440              CCK3L0  LD      A4,WMEMOR+2
0D12  0102
0D14  EB21              CCK3L1  CCK     A3,X'FFFF'      EXECUTE COMP. CHAR. CONST. BY A3. EXP: <
0D16  FFFF
0D18  5002                      RF(0)   **4             JP IF CR = 0
0D1A  207F                      HLT             ***     INSTRUCTION CCK3L0 DID NOT MODIF. CR.
0D1C  8520              CCK4L0  LDKL    A5,X'0800'
0D1E  0800
0D20  EC21              CCK4L2  CCK     A4,X'0100'      EXECUTE COMP. CHAR. CONST. BY A4. EXP: <
0D22  0100
0D24  5202                      RF(2)   **4             JP IF CR = 2
0D26  207F                      HLT             ***     INSTRUCTION CCK4L2  DID NOT MODIF. CR.
0D28  ED21              CCK5L0  CCK     A5,X'0080'      EXECUTE COMP. CHAR. CONST. BY A5. EXP: <
0D2A  0080
0D2C  5002                      RF(0)   **4             JP IF CR = 0
0D2E  207F                      HLT             ***     INSTRUCTION CCK5L0  DID NOT MODIF. CR.
0D30  8620              CCK6L0  LDKL    A6,X'00FF'
0D32  00FF
0D34  EE21              CCK6L1  CCK     A6,X'FF00'      EXECUTE COMP. CHAR. CONST. BY A6. EXP: >
0D36  FF00
0D38  5002                      RF(0)   **4             JP IF CR = 0
0D3A  207F                      HLT             ***     INSTRUCTION CCK6L0  DID NOT MODIF. CR.
0D3C  8720              CCK7L0  LDKL    A7,X'FF00'
0D3E  FF00
```

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01385  0040  80A8            LDKL    A8,X'00FF'
       0042  00FF
01387  0044  EF21  CCK7L0    CCK     ,X'00FF'        EXECUTE COMP, CHAR, CON  BY A7, EXP: =
       0046  00FF
01388  0048  5002            RF(0)   **+4            JP IF CR = 0
01389  004A  207F            HLT                ***  INSTRUCTION CCK7L0  DID NOT MODIF, CR,
01390  004C  81A0            LDKL    A9,X'FF00'
       004E  FF00
01391  0050  E8A1  CCK8L1    CCK     A8,X'00FF'      EXECUTE COMP, CHAR, CONST, BY A8, EXP: >
       0052  00FF
01392  0054  5102            RF(1)   **+4            JP IF CR = 1
01393  0056  207F            HLT                ***  INSTRUCTION CCK8L1  DID NOT MODIF, CR,
01394  0058  E9A1  CCK9L2    CCK     A9,X'FF00'      EXECUTE COMP, CHAR, CONST, BY A9, EXP: <
       005A  FF00
01395  005C  5202            RF(2)   **+4            JP IF CR = 2
01396  005E  207F            HLT                ***  INSTRUCTION CCK9L2  DID NOT MODIF, CR,
01397  0060  82A0            LDKL    A10,X'0001'
       0062  0001
01398  0064  EAA1  CCK101     CCK     A10,X'0080'     EXECUTE COMP, CHAR, CONST, BY A10 EXP: >
       0066  0080
01399  0068  5102            RF(1)   **+4            JP IF CR = 1
01400  006A  207F            HLT                ***  INSTRUCTION CCK101  DID NOT MODIF, CR,
01401  006C  83A0            LDKL    A11,X'0001'
       006E  0001
01402  0070  EBA1  CCK112    CCK     A11,X'0200'     EXECUTE COMP, CHAR, CONST, BY A11 EXP: <
       0072  0200
01403  0074  5202            RF(2)   **+4            JP IF CR = 2
01404  0076  207F            HLT                ***  INSTRUCTION CCK112  DID NOT MODIF, CR
01405  0078  84A0            LDKL    A12,X'0080'
       007A  0080
01406  007C  ECA1  CCK120     CCK     A12,X'8000'     EXECUTE COMP, CHAR, CONST, BY A12 EXP: =
       007E  8000
01407  0080  5002            RF(0)   **+4            JP IF CR = 0
01408  0082  207F            HLT                ***  INSTRUCTION CCK120  DID NOT MODIF, CR,
01409  0084  85A0            LDKL    A13,X'007F'
       0086  007F
01410  0088  86A0            LDKL    A14,X'0080'
       008A  0080
01411  008C  EDA1  CCK132     CCK     A13,X'8000'     EXECUTE COMP, CHAR, CONST, BY A13 EXP: <
       008E  8000
01412  0090  5202            RF(2)   **+4            JP IF CR = 2
01413  0092  207F            HLT                ***  INSTRUCTION CCK132  DID NOT MODIF, CR,
01414  0094  EEA1  CCK141     CCK     A14,X'7F00'     EXECUTE COMP, CHAR, CONST, BY A14 EXP: >
       0096  7F00
01415  0098  5102            RF(1)   **+4            JP IF CR = 1
01416  009A  207F            HLT                ***  INSTRUCTION CCK141  DID NOT MODIF, CR,
01417  009C  87A0            LDKL    A15,X'0055'
       009E  0055
01418  00A0  EFA1  CCK150     CCK     A15,X'5500'     EXECUTE COMP, CHAR, CONST, BY A15 EXP: =
       00A2  5500
```

```
01419  0DA4  5002          RF(0)    **+4          JP IF CR = 0
01420  0DA6  207F          HLT                    *** INSTRUCTION CCK150 DID NOT MODIF, CR,
```

47

```
                                EJECT
                        ******  ******  ****************
                        **
                        *       SLA     SINGLE LEFT ARITHMETIC SHIFT
                        **
                        ******  ******  ****************

                        SLATST  EQU     *
                                LDKL    A15,STKP
                                CF      A15,INISHI
                                LDK     A1,1
                                CF      A15,SSHCOM
                                LDKL    A1,X'5555'
SLA00   SLA     A1,0            SINGLE LEFT ARITHMETIC SHIFT, 0 POSITION
        RF(1)   *+4             JP IF CR RESULT = 1
        HLT                     ***  PRECEDENT INSTRUCTION SLA00 HAS MODIF, CR
        CWK     A1,X'5555'
        RF(0)   *+4             JP IF (REG,A1) = X'5555'
        HLT                     ***  INSTRUCTION SLA00 EXECUTION WAS WRONG

                        ******  ******  ****************
                        **
                        *       SRA     SINGLE RIGHT ARITHMETIC SHIFT
                        **
                        ******  ******  ****************

                        SRATST  EQU     *
                                LDKL    A15,STKP
                                CF      A15,INISHI
                                LDK     A2,1
                                LDKL    A1,-1
                                CF      A15,SHCOM1
                                LDKL    A2,X'AAAA'
SRA00   SRA     A2,0            SINGLE RIGHT ARITHMETIC SHIFT, 0 POSITION
        RF(2)   *+4             JP IF CR RESULT = 2
        HLT                     ***  PRECEDENT INSTRUCTION SRA00 HAS MODIF, CR
        CWK     A2,X'AAAA'
        RF(0)   *+4             JP IF (REG, A2) = X'AAAA'
        HLT                     ***  INSTRUCTION SRA00 EXECUTION WAS WRONG
```

```
01460
01461                    ******    ******    ******************
01462                    **
01463                    *         SLL       SINGLE LEFT LOGICAL SHIFT
01464                    **
01465                    ******    ******    ******************
01466
01467                    SLLTST    EQU       *
01468  00EC  87A0                  LDKL      A15,STKP
       00EE  0140
01469  00F0  F7A1                  CF        A15,INISHI
       00F2  0000  F
01470  00F4  0100                  LDK       A1,0
01471  00F6  F7A1                  CF        A15,SSHCOM
       00F8  0000  F
01472  00FA  8320                  LOKL      A3,X'00001'
       00FC  0001
01473  00FE  3040        SLL00     SLL       A3,0              SINGLE LEFT LOGICAL SHIFT, 0 POSITION
01474  0100  5102                  RF(1)     *+4               JP IF CR RESULT = 1
01475  0102  207F                  HLT                   ***   PRECEDENT INSTRUCTION SLL00 HAS MODIF, CR
01476  0104  E820                  CWK       A3,1
       0106  0001
01477  0108  5002                  RF(0)     *+4               JP IF (REG, A3) = 1
01478  010A  207F                  HLT                   ***   INSTRUCTION SLL00 EXECUTION WAS WRONG
```

```
                          EJECT
                              
                ******    ******    *****************
                **
                *         SRL       SINGLE RIGHT LOGICAL SHIFT
                **
                ******    ******    *****************

                SRLTST    EQU       *
 0E0C  87A0               LDKL      A15,STKP
 0E0E  0140
 0E10  F7A1               CF        A15,INISHI
 0E12  0000  F
 0E14  0200               LDK       A2,0
 0E16  8120               LDKL      A1,-1
 0E18  FFFF
 0E1A  F7A1               CF        A15,SHCOM1
 0E1C  0000  F
 0E1E  8420               LDKL      A4,X'8000'
 0E20  8000
 0E22  3C60     SRL00     SRL       A4,0                SINGLE RIGHT LOGICAL SHIFT, 0 POSITION
 0E24  5202               RF(2)     *+4                 JP IF CR RESULT = 2
 0E26  207F               HLT                     ***   PRECEDENT INSTRUCTION SRL00 HAS MODIF, CR
 0E28  EC20               CWK       A4,X'8000'
 0E2A  8000
 0E2C  5002               RF(0)     *+4                 JP IF (REG, A4) = X'8000'
 0E2E  207F               HLT                     ***   INSTRUCTION SRL00 EXECUTION HAS WRONG

                ******    ******    *****************
                **
                *         SLC       SINGLE LEFT CIRCULAR SHIFT
                **
                ******    ******    *****************

                SLCTST    EQU       *
 0E30  87A0               LDKL      A15,STKP
 0E32  0140
 0E34  F7A1               CF        A15,INISHI
 0E36  0000  F
 0E38  8220               LDKL      A2,-1
 0E3A  FFFF
 0E3C  8120               LDKL      A1,-1
 0E3E  FFFF
 0E40  F7A1               CF        A15,SHCOM1
 0E42  0000  F
 0E44  8520               LDKL      A5,X'5555'
 0E46  5555
 0E48  3DC0     SLC00     SLC       A5,0                SINGLE LEFT CIRCULAR SHIFT, 0 POSITION
 0E4A  5102               RF(1)     *+4                 JP IF CR RESULT = 1
 0E4C  207F               HLT                     ***   PRECEDENT INSTRUCTION SLC00 HAS MODIF, CR
```

```
 01517  0E4E  ED20            CWK     A5,X'5555'
        0E50  5555
 01518  0E52  5002            RF(0)                   JP IF (REG, A5) = X'5555'
 01519  0E54  207F            HLT                 *** INSTRUCTION SLC00 EXECUTION WAS WRONG
 01520
 01521                ******  ******  ****************
 01522                **
 01523                *       SRC     SINGLE RIGHT CIRCULAR SHIFT
 01524                **
 01525                ******  ******  ****************
 01526
 01527                SRCTST  EQU     *
 01528  0E56  87A0            LOKL    A15,STKP
        0E58  0140
 01529  0E5A  F7A1            CF      A15,INISHI
        0E5C  0000  F
 01530  0E5E  87C1            ST      A15,FSRC
        0E60  0000  F
 01531  0E62  0200            LOK     A2,0
 01532  0E64  8120            LOKL    A1,-1
        0E66  FFFF
 01533  0E68  F7A1            CF      A15,SHCOM1
        0E6A  0000  F
 01534  0E6C  8620            LOKL    A6,X'AAAA'
        0E6E  AAAA
 01535  0E70  3EE0    SRC00   SRC     A6,0            SINGLE RIGHT CIRCULAR SHIFT, 0 POSITION
 01536  0E72  5202            RF(2)   **4             JP IF CR RESULT = 2
 01537  0E74  207F            HLT                 *** PRECEDENT INSTRUCTION SRC00 HAS MODIF, CR
 01538  0E76  EE20            CWK     A6,X'AAAA'
        0E78  AAAA
 01539  0E7A  5002            RF(0)   **4             JP IF (REG, A6) = X'AAAA'
 01540  0E7C  207F            HLT                 *** INSTRUCTION SRC00 EXECUTION WAS WRONG
```

```
                                EJECT
                        ******  ******  **************
                        **
                        *       SLN     SINGLE LEFT AND NORMALIZE SHIFT
                        **
                        ******  ******  ******************

                        SLNTST  EQU     *
                                LDK     A2,0
                                LDKL    A3,X'FFFF'
                                SLN     A3,A2           SINGLE LEFT AND NORMALIZE SHIFT, EXP: 15
                                RF(2)    *+4            JP IF CR = 2
                                HLT                 ***  PRECEDENT INSTRUCTION SLN161 HAS MODIF, CR
                                CWK     A2,15
                                RF(0)    *+4            JP IF (REG, A2) = X'000F'
                                HLT                 ***  INSTRUCTION SLN161 EXECUTION WAS WRONG
                                LDK     A3,0
                                LDK     A2,0
                        SLN160  SLN     A3,A2           SINGLE LEFT AND NORMALIZE SHIFT, EXP: 16
                                RF(0)    *+4            JP IF CR = 0
                                HLT                 ***  PRECEDENT INSTRUCTION SLN160 HAS MODIF, CR
                                CWK      A2,16
                                RF(0)    *+4            JP IF (REG,A2) = X'0010'
                                HLT                 ***  INSTRUCTION SLN160 EXECUTION WAS WRONG
                                LDKL    A3,X'8000'
                        SLN001  SLN     A3,A2           SINGLE LEFT AND NORMALIZE SHIFT, EXP: 0
                                RF(2)    *+4            JP IF CR = 2
                                HLT                 ***  PRECEDENT INSTRUCTION SLN001 HAS MODIF, CR
                                CWK      A2,0
                                RF(0)    *+4            JP IF (REG,A2) = X'0000'
                                HLT                 ***  INSTRUCTION SLN001 EXECUTION WAS WRONG
                                LDKL    A3,X'7FFF'
                                LDKL    A2,0
                        SLN000  SLN     A3,A2           SINGLE LEFT AND NORMALIZE SHIFT, EXP: 0
                                RF(0)    *+4            JP IF CR = 0
                                HLT                 ***  PRECEDENT INSTRUCTION SLN000 HAS MODIF, CR
                                CWK     A2,0
                                RF(0)    *+4            JP IF (REG, A2) = X'0000'
                                HLT                 ***  INSTRUCTION SLN000 EXECUTION WAS WRONG
                                LDK     A4,14
                                LDK     A3,X'0001'
```

```
01583  0ED0  850C            LDR     A5,A3
01584  0ED2  3888   SLN151   SLN     A3,A2             SINGLE LEFT AND NORMALIZE SHIFT, EXP: 14 TO 1
01585  0ED4  EA10            CWR     [illegible]A4
01586  0ED6  5002            RF(0)   *+4               JP IF (REG, A2) = (REG, A4)
01587  0ED8  207F            HLT                   *** INSTRUCTION SLN151 EXECUTION WAS WRONG
01588  0EDA  9514            ADR     A5,A5
01589  0EDC  8314            LDR     A3,A5
01590  0EDE  9420            ADKL    A4,=1
       0EE0  FFFF
01591  0EE2  5912            RB(1)   SLN151            JP IF (REG, A4) IS POSITIVE
```

```
                                EJECT

                  ******        ******    ****************
                  **
                  *             SRN       SINGLE RIGHT AND NORMALIZE SHIFT
                  **
                  ******        ******    *****************

                  SRNTST        EQU       *
0EE4   0200                     LDK       A2,0
0EE6   8320                     LDKL      A3,X'0001'
0EE8   0001
0EEA   38A8       SRN000        SRN       A3,A2                    SINGLE RIGHT AND NORMALIZE SHIFT, EXP:  0
0EEC   5102                     RF(1)     *+4                      JP IF CR = 1
0EEE   207F                     HLT                          ***   PRECEDENT INSTRUCTION SRN000 HAS MODIF, CR
0EF0   EA20                     CWK       A2,0
0EF2   0000
0EF4   5002                     RF(0)     *+4                      JP IF (REG, A2) = X'0000'
0EF6   207F                     HLT                          ***   INSTRUCTION SRN000 EXECUTION WAS WRONG
0EF8   EB20                     CWK       A3,X'0001'
0EFA   0001
0EFC   5002                     RF(0)     *+4                      JP IF (REG,A3) = X'0001'
0EFE   207F                     HLT                          ***   INSTRUCTION SRN000 EXECUTION WAS WRONG
0F00   8220                     LDKL      A2,0
0F02   0000
0F04   0300                     LDK       A3,0
0F06   38A8       SRN160        SRN       A3,A2                    SINGLE RIGHT AND NORMALIZE SHIFT, EXP: 16
0F08   5002                     RF(0)     *+4                      JP IF CR = 0
0F0A   207F                     HLT                          ***   PRECEDENT INSTRUCTION SRN160 HAS MODIF, CR
0F0C   EA20                     CWK       A2,16
0F0E   0010
0F10   5002                     RF(0)     *+4                      JP IF (REG, A2) = X'0010'
0F12   207F                     HLT                          ***   INSTRUCTION SRN160 EXECUTION WAS WRONG
0F14   EB20                     CWK       A3,0
0F16   0000
0F18   5002                     RF(0)     *+4                      JP IF (REG, A3) = X'0000'
0F1A   207F                     HLT                          ***   INSTRUCTION SRN160 EXECUTION WAS WRONG
0F1C   0200                     LDK       A2,0
0F1E   8320                     LDKL      A3,X'FFFF'
0F20   FFFF
0F22   38A8       SRN001        SRN       A3,A2                    SINGLE RIGHT AND NORMALIZE SHIFT, EXP:  0
0F24   5202                     RF(2)     *+4                      JP IF CR = 2
0F26   207F                     HLT                          ***   PRECEDENT INSTRUCTION SRN001 HAS MODIF, CR
0F28   EA20                     CWK       A2,0
0F2A   0000
0F2C   5002                     RF(0)     *+4                      JP IF (REG, A2) = X'0000'
0F2E   207F                     HLT                          ***   INSTRUCTION SRN001 EXECUTION WAS WRONG
0F30   EB20                     CWK       A3,X'FFFF'
0F32   FFFF
0F34   5002                     RF(0)     *+4                      JP IF (REG, A3) = X'FFFF'
```

```
01633  0F36  207F                HLT                    ***  INSTRUCTION SRN001 EXECUTION WAS WRONG
01634  0F38  031C                LDK     ,28
01635  0F3A  040E                LDK     ,14
01636  0F3C  8334                LD      A3,ORGT83,A5
       0F3E  0FF2
01637  0F40  3BA8          SRN141 SRN     A3,A2          SINGLE RIGHT AND NORMAL. SHIFT. EXP: 14 TO 1
01638  0F42  5102                RF(1)   **+4           JP IF CR = 0
01639  0F44  207F                HLT                    ***  PRECEDENT INSTRUCTION SRN141 HAS MODIF. CR
01640  0F46  EA10                CWR     A2,A4
01641  0F48  5002                RF(0)   **+4           JP IF (REG. A2) = (REG. A4)
01642  0F4A  207F                HLT                    ***  INSTRUCTION SRN141 EXECUTION WAS WRONG
01643  0F4C  EB20                CWK     A3,1
       0F4E  0001
01644  0F50  5002                RF(0)   **+4           JP IF (REG. A3) = X'0001'
01645  0F52  207F                HLT                    ***  INSTRUCTION SRN141 EXECUTION WAS WRONG
01646  0F54  9520                ADKL    A5,-2
       0F56  FFFE
01647  0F58  9420                ADKL    A4,-1
       0F5A  FFFF
01648  0F5C  5922                R8(1)   SRN141-4       JP IF (REG. A4) IS POSITIVE
01649  0F5E  8320                LDKL     A3,X'8000'
       0F60  8000
01650  0F62  3BA8          SRN151 SRN     A3,A2          SINGLE RIGHT AND NORMALIZE SHIFT. EXP: 15
01651  0F64  5202                RF(2)   **+4           JP IF CR = 2
01652  0F66  207F                HLT                    ***  PRECEDENT INSTRUCTION SRN151 HAS MODIF. CR
01653  0F68  EA20                CWK      A2,15
       0F6A  000F
01654  0F6C  5002                RF(0)   **+4           JP IF (REG. A2) = X'000F'
01655  0F6E  207F                HLT                    ***  INSTRUCTION SRN151 EXECUTION WAS WRONG
01656  0F70  EB20                CWK     A3,X'FFFF'
       0F72  FFFF
01657  0F74  5002                RF(0)    **+4          JP IF (REG. A3) = X'FFFF'
01658  0F76  207F                HLT                    ***  INSTRUCTION SRN151 EXECUTION WAS WRONG
```

```
                                EJECT
                        ******  ******  ****************
                        **
                        *       DLA     DOUBLE LEFT ARITHMETIC SHIFT
                        **
                        ******  ******  ****************

                        DLATST  EQU     *
 0F78  87A0             DLATST  LDKL    A15,STKP
 0F7A  8140
 0F7C  F7A1                     CF      A15,INISHI
 0F7E  0000  F
 0F80  0101                     LDK     A1,1
 0F82  F7A1                     CF      A15,OSHCOM
 0F84  0000  F
 0F86  0100                     LDK     A1,0
 0F88  8220                     LDKL    A2,X'8001'
 0F8A  8001
 0F8C  380F             DLAC07  DLA     15              DOUBLE LEFT ARITHMETIC SHIFT FOR N = 15
 0F8E  5102                     RF(1)   *+4             JP IF CR RESULT > 0
 0F90  207F                     HLT             ***     CR RESULT OF INSTRUCTION DLAC07 IS WRONG
 0F92  E920                     CWK     A1,1
 0F94  0001
 0F96  5002                     RF(0)   *+4             JP IF (REG, A1 = 1)
 0F98  207F                     HLT             ***     INSTRUCTION DLAC07 EXECUTION IS WRONG
 0F9A  EA20                     CWK     A2,X'8000'
 0F9C  8000
 0F9E  5002                     RF(0)   *+4             JP IF (REG,A2 = 0)
 0FA0  207F                     HLT             ***     INSTRUCTION DLAC07 EXECUTION WAS WRONG
 0FA2  8120                     LDKL    A1,X'5555'
 0FA4  5555
 0FA6  8220                     LDKL    A2,X'5555'
 0FA8  5555
 0FAA  3800             DLA00   DLA     0               DOUBLE LEFT ARITHMETIC SHIFT, 0 POSITION
 0FAC  5102                     RF(1)   *+4             JP IF CR RESULT = 1
 0FAE  207F                     HLT             ***     PRECEDENT INSTRUCTION DLA00 HAS MODIF, CR
 0FB0  E920                     CWK     A1,X'5555'
 0FB2  5555
 0FB4  5002                     RF(0)   *+4             JP IF (REG, A1) = X'5555'
 0FB6  207F                     HLT             ***     INSTRUCTION DLA00 EXECUTION WAS WRONG
 0FB8  EA20                     CWK     A2,X'5555'
 0FBA  5555
 0FBC  5002                     RF(0)   *+4             JP IF (REG,A2) = X'5555'
 0FBE  207F                     HLT             ***     INSTRUCTION DLA00 EXECUTION WAS WRONG

                        ******  ******  ****************
                        **
                        *       DRA     DOUBLE RIGHT ARITHMETIC SHIFT
                        **
```

```
01699                          ******    ******    ****************
01700
01701                          DRATST    EQU
01702  0FC0  87A0                        LDKL      A15,STKP
       0FC2  0140
01703  0FC4  F7A1                        CF        A15,INISHI
       0FC6  0000  F
01704  0FC8  0201                        LDK       A2,1
01705  0FCA  8120                        LDKL      A1,-1
       0FCC  FFFF
01706  0FCE  F7A1                        CF        A15,DHCOM1
       0FD0  0000  F
01707  0FD2  8120                        LDKL      A1,X'AAAA'
       0FD4  AAAA
01708  0FD6  8220                        LDKL      A2,X'AAAA'
       0FD8  AAAA
01709  0FDA  3820          DRA00         DRA       0                   DOUBLE RIGHT ARITHMETIC SHIFT, 0 POSITION
01710  0FDC  5202                        RF(2)     **+4                JP IF CR RESULT = 2
01711  0FDE  207F                        HLT                     ***   PRECEDENT INSTRUCTION DRA00 HAS MODIF, CR
01712  0FE0  E920                        CWK       A1,X'AAAA'
       0FE2  AAAA
01713  0FE4  5002                        RF(0)     **+4                JP IF (REG, A1) = X'AAAA'
01714  0FE6  207F                        HLT                     ***   INSTRUCTION DRA00 EXECUTION WAS WRONG
01715  0FE8  EA20                        CWK       A2,X'AAAA'
       0FEA  AAAA
01716  0FEC  5002                        RF(0)     **+4                JP IF (REG, A2) = X'AAAA'
01717  0FEE  207F                        HLT                     ***   INSTRUCTION DRA00 EXECUTION WAS WRONG
01718
01719                          ******    ******    ****************
01720                          **
01721                          *         DLL       DOUBLE LEFT LOGICAL SHIFT
01722                          **
01723                          ******    ******    ****************
01724
01725                          DLLTST    EQU       *
01726  0FF0  87A0                        LDKL      A15,STKP
       0FF2  0140
01727  0FF4  F7A1                        CF        A15,INISHI
       0FF6  0000  F
01728  0FF8  0100                        LDK       A1,0
01729  0FFA  F7A1                        CF        A15,DSHCOM
       0FFC  0000  F
01730  0FFE  8120                        LDKL      A1,X'0001'
       1000  0001
01731  1002  8220                        LDKL      A2,X'0001'
       1004  0001
01732  1006  3840          DLL00         DLL       0                   DOUBLE LEFT LOGICAL SHIFT, 0 POSITION
01733  1008  5102                        RF(1)     **+4                JP IF CR RESULT = 1
01734  100A  207F                        HLT                     ***   PRECEDENT INSTRUCTION DLL00 HAS MODIF, CR
01735  100C  E920                        CWK       A1,1
```

```
1ØØE  ØØØ1
1Ø1Ø  5ØØ2          RF(Ø)    *+4                  JP IF (REG, A1) = 1
1Ø12  2Ø7F          HLT                       *** INSTRUCTION DLLØØ EXECU[illegible]N WAS WRONG
1Ø14  EA2Ø          CWK      A2,1
1Ø16  ØØØ1
1Ø18  5ØØ2          RF(Ø)    *+4                  JP IF (REG, A2) = 1
1Ø1A  2Ø7F          HLT                       *** INSTRUCTION DLLØØ EXECUTION WAS WRONG

             ******   ******   *****************
             **
             *        DRL      DOUBLE RIGHT LOGICAL SHIFT
             **
             ******   ******   *****************

             DRLTST   EQU      *
1Ø1C  87AØ            LDKL     A15,STKP
1Ø1E  Ø14Ø
1Ø2Ø  F7A1            CF       A15,INISHI
1Ø22  ØØØØ  F
1Ø24  Ø2ØØ            LDK      A2,Ø
1Ø26  812Ø            LDKL     A1,-1
1Ø28  FFFF
1Ø2A  F7A1            CF       A15,DHCOM1
1Ø2C  ØØØØ  F
1Ø2E  812Ø            LDKL     A1,X'8ØØØ'
1Ø3Ø  8ØØØ
1Ø32  822Ø            LDKL     A2,X'8ØØØ'
1Ø34  8ØØØ
1Ø36  386Ø   DRLØØ    DRL      Ø                      DOUBLE RIGHT LOGICAL SHIFT, Ø POSITION
1Ø38  52Ø2            RF(2)    *+4                    JP IF CR RESULT = 2
1Ø3A  2Ø7F            HLT                         *** PRECEDENT INSTRUCTION DRLØØ HAS MODIF, CR
1Ø3C  E92Ø            CWK      A1,X'8ØØØ'
1Ø3E  8ØØØ
1Ø4Ø  5ØØ2            RF(Ø)    *+4                    JP IF (REG, A1) = X'8ØØØ'
1Ø42  2Ø7F            HLT                         *** INSTRUCTION DRLØØ EXECUTION WAS WRONG
1Ø44  EA2Ø            CWK      A2,X'8ØØØ'
1Ø46  8ØØØ
1Ø48  5ØØ2            RF(Ø)    *+4                    JP IF (REG, A2) = X'8ØØØ'
1Ø4A  2Ø7F            HLT                         *** INSTRUCTION DRLØØ EXECUTION WAS WRONG
```

```
                            EJECT
                    ******  ******  *****************
                    **
                    *       DLC     DOUBLE      LEFT CIRCULAR SHIFT
                    **
                    ******  ******  *****************

                    DLCTST  EQU     *
 104C  87A0                 LDKL    A15,STKP
 104E  0140
 1050  F7A1                 CF      A15,INISHI
 1052  0000  F
 1054  8220                 LDKL    A2,-1
 1056  FFFF
 1058  8120                 LDKL    A1,-1
 105A  FFFF
 105C  F7A1                 CF      A15,DHCOM1
 105E  0000  F
 1060  0200                 LDK     A2,0
 1062  8120                 LDKL    A1,X'AAAA'
 1064  AAAA
 1066  3800         DLC07   DLC     16                DOUBLE LEFT CIRCULAR SHIFT, 16 POSITIONS
 1068  5102                 RF(1)   *+4               JP IF CR RESULT = 1
 106A  207F                 HLT                 ***   CR RESULT OF INSTRUCTION DLC07 IS WRONG
 106C  E920                 CWK     A1,0
 106E  0000
 1070  5002                 RF(0)   *+4               JP IF (REG, A1) = 0
 1072  207F                 HLT                 ***   INSTRUCTION DLC07 EXECUTION WAS WRONG
 1074  EA20                 CWK     A2,X'AAAA'
 1076  AAAA
 1078  5002                 RF(0)   *+4               JP IF (REG, A2) = X'AAAA'
 107A  207F                 HLT                 ***   INSTRUCTION DLC07 EXECUTION WAS WRONG
 107C  8120                 LDKL    A1,X'5555'
 107E  5555
 1080  8220                 LDKL    A2,X'5555'
 1082  5555
 1084  38C0         DLC00   DLC     0                 DOUBLE LEFT CIRCULAR SHIFT, 0 POSITION
 1086  5102                 RF(1)   *+4               JP IF CR RESULT = 1
 1088  207F                 HLT                 ***   PRECEDENT INSTRUCTION DLC00 HAS MODIF, CR
 108A  E920                 CWK     A1,X'5555'
 108C  5555
 108E  5002                 RF(0)   *+4               JP IF (REG, A1) = X'5555'
 1090  207F                 HLT                 ***   INSTRUCTION DLC00 EXECUTION WAS WRONG
 1092  EA20                 CWK     A2,X'5555'
 1094  5555
 1096  5002                 RF(0)   *+4               JP IF (REG, A2) = X'5555'
 1098  207F                 HLT                 ***   INSTRUCTION DLC00 EXECUTION WAS WRONG
```

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01803                          ******    ******    ******************
01804                          **
01805                          *         DRC       UBLE RIGHT CIRCULAR SHIFT
01806                          **
01807                          ******    ******    ******************
01808
01809                          DRCTST    EQU       *
01810  109A  87A0                       LDKL      A15,STKP
       109C  0140
01811  109E  F7A1                       CF        A15,INISHI
       10A0  0000  F
01812  10A2  87C1                       ST        A15,FDRC
       10A4  0000  F
01813  10A6  0200                       LDK       A2,0
01814  10A8  8120                       LDKL      A1,-1
       10AA  FFFF
01815  10AC  F7A1                       CF        A15,DHCOM1
       10AE  0000  F
01816  10B0  8220                       LDKL      A2,X'AAAA'
       10B2  AAAA
01817  10B4  8120                       LDKL      A1,0
       10B6  0000
01818  10B8  38F0          DRC07        DRC       16                  DOUBLE RIGHT CIRCULAR SHIFT, 16 POSITIONS
01819  10BA  52#2                       RF(2)     *+4                 JP IF CR RESULT < 0
01820  10BC  207F                       HLT                     ***   CR RESULT OF INSTRUCTION DRC07 IS WRONG
01821  10BE  EA20                       CWK       A2,0
       10C0  0000
01822  10C2  50#2                       RF(0)     *+4                 JP IF (REG, A2) = 0
01823  10C4  207F                       HLT                     ***   INSTRUCTION DRC07 EXECUTION WAS WRONG
01824  10C6  E920                       CWK       A1,X'AAAA'
       10C8  AAAA
01825  10CA  50#2                       RF(0)     *+4                 JP IF (REG, A1) = X'AAAA'
01826  10CC  207F                       HLT                     ***   INSTRUCTION DRC07 EXECUTION WAS WRONG
01827  10CE  8120                       LDKL      A1,X'AAAA'
       10D0  AAAA
01828  10D2  8220                       LDKL      A2,X'AAAA'
       10D4  AAAA
01829  10D6  38E0          DRC00        DRC       0                   DOUBLE RIGHT CIRCULAR SHIFT, 0 POSITION
01830  10D8  52#2                       RF(2)     *+4                 JP IF CR RESULT = 2
01831  10DA  207F                       HLT                     ***   PRECEDENT INSTRUCTION DRC00 HAS MODIF, CR
01832  10DC  E920                       CWK       A1,X'AAAA'
       10DE  AAAA
01833  10E0  50#2                       RF(0)     *+4                 JP IF (REG, A1) = X'AAAA'
01834  10E2  207F                       HLT                     ***   INSTRUCTION DRC00 EXECUTION WAS WRONG
01835  10E4  EA20                       CWK       A2,X'AAAA'
       10E6  AAAA
01836  10E8  50#2                       RF(0)     *+4                 JP IF (REG, A2) = X'AAAA'
01837  10EA  207F                       HLT                     ***   INSTRUCTION DRC00 EXECUTION WAS WRONG
```

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01838                                  EJECT
01839
01840                          ******  ******  ****************
01841                          **
01842                          *       DLN     DOUBLE LEFT AND NORMALIZE SHIFT
01843                          **
01844                          ******  ******  ******************
01845
01846                          DLNTST  EQU     *
01847  10EC  0700              LDK     A7,0
01848  10EE  0100              LDK     A1,0
01849  10F0  8220              LDKL    A2,X'7FFF'
       10F2  7FFF
01850  10F4  389C      DLN151  DLN     A7                      DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 15 SH.
01851  10F6  51W2              RF(1)   *+4                     JP IF CR = 1
01852  10F8  207F              HLT                     ***     PRECEDENT INSTRUCTION DLN151 HAS MODIF. CR
01853  10FA  E920              CWK     A1,X'7FFF'
       10FC  7FFF
01854  10FE  5W02              RF(0)   *+4                     JP IF (REG. A1) = X'7FFF'
01855  1100  207F              HLT                     ***     INSTRUCTION DLN151 EXECUTION WAS WRONG
01856  1102  EA20              CWK     A2,0
       1104  0000
01857  1106  5W02              RF(0)   *+4                     JP IF (REG. A2) = 0
01858  1108  207F              HLT                     ***     INSTRUCTION DLN151 EXECUTION WAS WRONG
01859  110A  EF20              CWK     A7,15
       110C  000F
01860  110E  5W02              RF(0)   *+4                     JP IF NUMBER OF SHIFTS = 15
01861  1110  207F              HLT                     ***     INSTRUCTION DLN151 EXECUTION WAS WRONG
01862  1112  078F              LDK     A7,15
01863  1114  822W              LDKL    A2,X'5555'
       1116  5555
01864  1118  8120              LDKL    A1,X'8000'
       111A  8000
01865  111C  389C      DLN000  DLN     A7                      DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 0  SH.
01866  111E  52W2              RF(2)   *+4                     JP IF CR = 2
01867  1120  207F              HLT                     ***     PRECEDENT INSTRUCTION DLN000 HAS MODIF. CR
01868  1122  E920              CWK     A1,X'8000'
       1124  8000
01869  1126  5W02              RF(0)   *+4                     JP IF (REG. A1) = X'8000'
01870  1128  207F              HLT                     ***     INSTRUCTION DLN000 EXECUTION WAS WRONG
01871  112A  EA20              CWK     A2,X'5555'
       112C  5555
01872  112E  5W02              RF(0)   *+4                     JP IF (REG. A2) = X'5555'
01873  1130  207F              HLT                     ***     INSTRUCTION DLN000 EXECUTION WAS WRONG
01874  1132  EF20              CWK     A7,0
       1134  0000
01875  1136  5W02              RF(0)   *+4                     JP IF (REG. A7) = 0
01876  1138  207F              HLT                     ***     INSTRUCTION DLN000 EXECUTION WAS WRONG
01877  113A  8WA0              LDKL    A8,15
       113C  000F
```

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01878  113E  8120          LDKL    A1,X'7FFF'
       1140  7FFF
01879  1142  8220          LDKL    A2,X'8001'
       1144  8001
01880  1146  3882  DLN001  DLN     A8              DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 0  SH,
01881  1148  5202          RF(2)   *+4             JP IF CR = 2
01882  114A  207F          HLT                 ***  PRECEDENT INSTRUCTION DLN001 HAS MODIF, CR      02
01883  114C  E920          CWK     A1,X'7FFF'
       114E  7FFF
01884  1150  5002          RF(0)   *+4             JP IF (REG, A1) = X'7FFF'
01885  1152  207F          HLT                 ***  INSTRUCTION DLN001 EXECUTION WAS WRONG
01886  1154  EA20          CWK     A2,X'8001'
       1156  8001
01887  1158  5002          RF(0)   *+4             JP IF (REG, A2) = X'8001'
01888  115A  207F          HLT                 ***  INSTRUCTION DLN001 EXECUTION WAS WRONG
01889  115C  E8A0          CWK     A8,0
       115E  0000
01890  1160  5002          RF(0)   *+4             JP IF NUMBER OF SHIFTS = 0
01891  1162  207F          HLT                 ***  INSTRUCTION DLN001 EXECUTION WAS WRONG
01892  1164  8220          LDKL    A2,X'8001'
       1166  8001
01893  1168  0100          LDK     A1,0
01894  116A  0700          LDK     A7,0
01895  116C  389C  DLN291  DLN     A7              DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 29 SH,
01896  116E  5202          RF(2)   *+4             JP IF CR = 2
01897  1170  207F          HLT                 ***  PRECEDENT INSTRUCTION DLN291 HAS MODIF, CR
01898  1172  EA20          CWK     A2,X'8000'
       1174  8000
01899  1176  5002          RF(0)   *+4             JP IF (REG, A2) = X'8000'
01900  1178  207F          HLT                 ***  INSTRUCTION DLN291 EXECUTION WAS WRONG
01901  117A  E920          CWK     A1,X'4000'
       117C  4000
01902  117E  5002          RF(0)   *+4             JP IF (REG, A1) = X'4000'
01903  1180  207F          HLT                 ***  INSTRUCTION DLN291 EXECUTION WAS WRONG
01904  1182  EF20          CWK     A7,29
       1184  001D
01905  1186  5002          RF(0)   *+4             JP IF NUMBER OF SHIFTS = 29
01906  1188  207F          HLT                 ***  INSTRUCTION DLN291 EXECUTION WAS WRONG
01907  118A  0100          LDK     A1,0
01908  118C  0200          LDK     A2,0
01909  118E  87A0          LDKL    A15,0
       1190  0000
01910  1192  389E  DLNNN0  DLN     A15             DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 31 SH,
01911  1194  5002          RF(0)   *+4             JP IF CR = 0
01912  1196  207F          HLT                 ***  PRECEDENT INSTRUCTION DLNNN0 HAS MODIF, CR
01913  1198  EFA0          CWK     A15,31
       119A  001F
01914  119C  5002          RF(0)   *+4             JP IF NUMBER OF SHIFTS = 31
01915  119E  207F          HLT                 ***  INSTRUCTION DLNNN0 EXECUTION WAS WRONG
01916  11A0  8120          LDKL    A1,X'FFFF'
```

```
                11A2  FFFF
P1917           11A4  A220            LDKL    A2,X'FFFF'
                11A6  FFFF
P1918           11A8  0700            LDK     A7,0
P1919           11AA  359C    DLNNN1  DLN     A7                      DOUBLE LEFT AND NORMALIZE SHIFT, EXP: 30 SH,
P1920           11AC  5202            RF(2)   **+4                    JP IF CR = 2
P1921.          11AE  207F            HLT                     ***     PRECEDENT INSTRUCTION DLNNN1 HAS MODIF, CR
P1922           11B0  E920            CWK     A1,X'8000'
                11B2  8000
P1923           11B4  5002            RF(0)   **+4                    JP IF (REG, A1) = X'8000'
P1924           11B6  207F            HLT                     ***     INSTRUCTION DLNNN1 EXECUTION WAS WRONG
P1925           11B8  EA20            CWK     A2,X'8000'
                11BA  8000
P1926           11BC  5002            RF(0)   **+4                    JP IF (REG, A2) = X'8000'
P1927           11BE  207F            HLT                     ***     INSTRUCTION DLNNN1 EXECUTION WAS WRONG
P1928           11C0  EF20            CWK     A7,30
                11C2  001E
P1929           11C4  5002            RF(0)   **+4                    JP IF NUMBER OF SHIFTS = 30
P1930           11C6  207F            HLT                     ***     INSTRUCTION DLNNN1 EXECUTION WAS WRONG
```

```
                                EJECT
                        ******  ******  ****************
                        **
                        *       DRN     DOUBLE RIGHT AND NORMALIZE SHIFT
                        **
                        ******  ******  ******************

                DRNTST  EQU     *
11C8  8120              LDKL    A1,X'8000'
11CA  8000
11CC  0200              LDK     A2,0
11CE  80A0              LDKL    A8,0
1100  0000
1102  38A2      DRN301  DRN     A8              DOUBLE RIGHT AND NORMALIZE SHIFT, EXP, 30 SH,
1104  5002              RF(0)   **4             JP IF CR = 0
1106  207F              HLT                 ***  PRECEDENT INSTRUCTION DRN301 HAS MODIF, CR
1108  E920              CWK     A1,X'FFFF'
110A  FFFF
110C  5002              RF(0)   **4             JP IF (REG, A1) = X'FFFF'
110E  207F              HLT                 ***  INSTRUCTION DRN301 EXECUTION WAS WRONG
1110  EA20              CWK     A2,X'7FFF'
1112  7FFF
1114  5002              RF(0)   **4             JP IF (REG, A2) = X'7FFF'
1116  207F              HLT                 ***  INSTRUCTION DRN301 EXECUTION WAS WRONG
1118  E8A0              CWK     A8,30
111A  001E
111C  5002              RF(0)   **4             JP IF NUMBER OF SHIFTS =30
111E  207F              HLT                 ***  INSTRUCTION DRN301 EXECUTION WAS WRONG
1120  87A0              LDKL    A15,0
1122  0000
1124  0201              LDK     A2,X'0001'
1126  8120              LDKL    A1,X'8000'
1128  8000
112A  38BE      DRN001  DRN     A15             DOUBLE RIGHT AND NORMALIZE SHIFT, EXP, 0  SH,
112C  5202              RF(2)   **4             JP IF CR = 2
112E  207F              HLT                 ***  PRECEDENT INSTRUCTION DRN001 HAS MODIF, CR
1130  E920              CWK     A1,X'8000'
1132  8000
1134  5002              RF(0)   **4             JP IF (REG, A1) = X'8000'
1136  207F              HLT                 ***  INSTRUCTION DRN001 EXECUTION WAS WRONG
1138  EA20              CWK     A2,X'0001'
113A  0001
113C  5002              RF(0)   **4             JP IF (REG, A2) = X'0001'
113E  207F              HLT                 ***  INSTRUCTION DRN001 EXECUTION WAS WRONG
1140  EFA0              CWK     A15,0
1142  0000
1144  5002              RF(0)   **4             JP IF NUMBER OF SHIFTS = 0
1146  207F              HLT                 ***  INSTRUCTION DRN001 EXECUTION WAS WRONG
1148  0100              LDK     A1,0
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 01971  121A  8220            LDKL    A2,X'8000'
        121C  8000
 01972  121E  0600            LDK     A6,0
 01973  1220  3868    DRN310  DRN     A6              DOUBLE RIGHT AND NORMALIZE SHIFT, EXP, 31 SH,
 01974  1222  5202            RF(2)   *+4             JP IF CR = 2
 01975  1224  207F            HLT                     ***  PRECEDENT INSTRUCTION DRN310 HAS MODIF, CR
 01976  1226  E920            CWK     A1,0
        1228  0000
 01977  122A  5002            RF(0)   *+4             JP IF (REG, A1) = 0
 01978  122C  207F            HLT                     ***  INSTRUCTION DRN310 EXECUTION WAS WRONG
 01979  122E  EA20            CWK     A2,X'8000'
        1230  8000
 01980  1232  5002            RF(0)   *+4             JP IF (REG, A2) = X'8000'
 01981  1234  207F            HLT                     ***  INSTRUCTION DRN310 EXECUTION WAS WRONG
 01982  1236  EE20            CWK     A6,31
        1238  001F
 01983  123A  5002            RF(0)   *+4             JP IF NUMBER OF SHIFTS = 31
 01984  123C  207F            HLT                     ***  INSTRUCTION DRN310 EXECUTION WAS WRONG
 01985  123E  041E            LDK     A4,30
 01986  1240  051E            LDK     A5,30
 01987                 CDRN1   EQU     *
 01988  1242  0600            LDK     A6,0
 01989  1244  8154            LD      A1,ORGTB3,A5
        1246  0FF2
 01990  1248  8220            LDKL    A2,X'8000'
        124A  8000
 01991  124C  3868    DRN300  DRN     A6              DOUBLE RIGHT AND NORMAL, SHIFT EXP, 30 TO 16
 01992  124E  5202            RF(2)   *+4             JP IF CR = 2
 01993  1250  207F            HLT                     ***  PRECEDENT INSTRUCTION DRN300 HAS MODIF, CR
 01994  1252  EC18            CWR     A4,A6
 01995  1254  5002            RF(0)   *+4             JP IF (REG, A6) = ( REG, A4)
 01996  1256  207F            HLT                     ***  INSTRUCTION DRN300 EXECUTION WAS WRONG
 01997  1258  EC20            CWK     A4,30
        125A  001E
 01998  125C  5400  F         RF(4)   CDRN2           JP IF NUMBER OF SHIFTS # 30
 01999  125E  EA20            CWK     A2,X'FFFF'
        1260  FFFF
 02000  1262  5002            RF(0)   *+4             JP IF (REG, A2) = X'FFFF'
 02001  1264  207F            HLT                     ***  INSTRUCTION DRN300 EXECUTION WAS WRONG
 02002  1266  E920            CWK     A1,X'FFFF'
        1268  FFFF
 02003  126A  5002            RF(0)   *+4             JP IF (REG, A1) = X'FFFF'
 02004  126C  207F            HLT                     ***  INSTRUCTION DRN300 EXECUTION WAS WRONG
 02005  126E  5700  F         RF(7)   CDRN3
 02006                 CDRN2   EQU     *
 02007  1270  E920            CWK     A1,0
        1272  0000
 02008  1274  5002            RF(0)   *+4             JP IF (REG, A1) = 0
 02009  1276  207F            HLT                     ***  INSTRUCTION DRN300 EXECUTION WAS WRONG
 02010  1278  EA20            CWK     A2,X'8001'
```

```
127A  8001
127C  5002                RF(0)     *+4             JP IF (REG, A2) = X'8001'
127E  207F                HLT                  ***  INSTRUCTION DRN300 EXEC   ON WAS WRONG
            CDRN3         EQU       *
1280  9420                ADKL      A4,-1
1282  FFFF
1284  9520                ADKL      A5,-2
1286  FFFE
1288  5E48                RB(5)     CDRN1           JP IF (REG, A5) IS POSITIVE OR NUL
            CDRN4         EQU       *
128A  051C                LDK       A5,28
128C  8254                LD        A2,ORGTB3,A5
128E  00F2
1290  8120                LDKL      A1,X'4000'
1292  4000
1294  3888  DRN15         DRN       A6              DOUBLE RIGHT AND NORMAL, SHIFT EXP, 15 TO 1
1296  5102                RF(1)     *+4             JP IF CR = 1
1298  207F                HLT                  ***  PRECEDENT INSTRUCTION DRN15  HAS MODIF, CR
129A  EC18                CWR       A4,A6
129C  5002                RF(0)     *+4             JP IF (REG, A6) = (REG,A4)
129E  207F                HLT                  ***  INSTRUCTION DRN15  EXECUTION WAS WRONG
12A0  E954                CW        A1,ORGTB0+4,A5
12A2  0002
12A4  5002                RF(0)     *+4             JP IF (REG, A1) = (ORGTB3 INDEX, BY A5)
12A6  207F                HLT                  ***  INSTRUCTION DRN15  EXECUTION WAS WRONG
12A8  EA20                CWK       A2,1
12AA  0001
12AC  5002                RF(0)     *+4             JP IF (REG, A2) = 1
12AE  207F                HLT                  ***  INSTRUCTION DRN15  EXECUTION WAS WRONG
12B0  9420                ADKL      A4,-1
12B2  FFFF
12B4  9520                ADKL      A5,-2
12B6  FFFE
12B8  5E2E                RB(6)     CDRN4+2         JP IF (REG, A5) IS POSITIVE OR NUL
12BA  8F20                ABL       MUTST
12BC  0000  F
```

```
                              EJECT
                    *
                    ******    ******    ******************
                    **
                    *         LD14RG    LOAD A1 TO A14 WITH ORGTB1 TABLE
                    **
                    ******    ******    ******************
                    *
                    LD14RG    EQU       *
      12BE  87C1              ST        A15,SAVA15          SAVE REGISTER A15
      12C0  014C
      12C2  87A0              LDKL      A15,-28
      12C4  FFE4
      12C6  86A0              LDKL      A14,X'80DE'
      12C8  80DE
      12CA  86C1              ST        A14,EXEMS1
      12CC  0000  F
      12CE  85A0              LDKL      A14,CMEMOR
      12D0  010C
      12D2  86C1              ST        A14,EXEMS1+2
      12D4  0000  F
      12D6  0000    EXEMS1    DATA      0
      12D8  0000              DATA      0
      12DA  97A0              ADKL      A15,2
      12DC  0002
      12DE  5600  F           RF(6)     EXEMS2              JP IF STORE IS FINISH
      12E0  8740              LD        A7,WMEMOR
      12E2  0100
      12E4  9741              ADS       A7,EXEMS1
      12E6  12D6
      12E8  5F14              RB(7)     EXEMS1
                    EXEMS2    EQU       *
      12EA  87C0              LD        A15,SAVA15
      12EC  014C
      12EE  F03E              RTN       A15                 RETURN
```

```
02062                                  EJECT
02063                          ******  ******  ****************
02064                          **
02065                          *       STORE VALUE X'FFFF' INTO STARKMS ZONE
02066                          **
02067                          ******  ******  ****************
02068                          *
02069                          SETM1   EQU     *
02070  12F0  8320                     LOKL    A3,-1
       12F2  FFFF
02071  12F4  8420                     LOKL    A4,-28
       12F6  FFE4
02072                          SETM11  EQU     *
02073  12F8  8351                     ST      A3,STAKND,A4
       12FA  010C
02074  12FC  1402                     AOK     A4,2
02075  12FE  5008                     RR(5)   SETM11          JP IF STORE NOT FINISH YET
02076  1300  F03E                     RTN     A15             RETURN
```

```
02077                                EJECT
02078                       *
02079                       ******   ******   ****************
02080                       **
02081                       *        VEFYMS   VERIFY MULTIPLE STORE
02082                       **
02083                       ******   ******   ****************
02084
02085                       VEFYMS   EQU      *
02086  1302  87C1                    ST       A15,SAVA15          SAVE REGISTER A15
       1304  014C
02087  1306  87A0                    LDKL     A15,STAKMS
       1308  0150
02088  130A  87C1                    ST       A15,EXEVFY+2
       130C  0000  F
02089  130E  87A0                    LDKL     A15,2
       1310  0002
02090  1312  87C1                    ST       A15,LOADA1+2
       1314  0000  F
02091                       VEFMS1   EQU      *
02092  1316  87A0                    LDKL     A15,X'E940'
       1318  E940
02093  131A  87C1                    ST       A15,EXEVFY
       131C  0000  F
02094  131E  87C0                    LD       A15,NBNMS
       1320  014E
02095  1322  0000           EXEVFY   DATA     0                   EXECUTE COMPARE A(N) TO A14 WITH STAKMS IND,
02096  1324  0000                    DATA     0
02097  1326  5002                    RF(0)    *+4                 JP IF COMPARE OK
02098  1328  207F                    HLT                     ***  COMPARE NO OK  A(N) # STAKMS+(A15)
02099  132A  8140                    LD       A1,WMEMOR+2
       132C  0102
02100  132E  9141                    ADS      A1,EXEVFY
       1330  1322
02101                       LOADA1   EQU      *
02102  1332  8120                    LDKL     A1,2
       1334  0002
02103  1336  9141                    ADS      A1,EXEVFY+2
       1338  1324
02104  133A  97C0                    AD       A15,ORGTB2
       133C  0112
02105  133E  8140                    LD       A1,EXEVFY
       1340  1322
02106  1342  E920                    CWK      A1,X'F040'
       1344  F040
02107  1346  5400  F                 RF(4)    VEFYM1         NO JP IF THE FIRST SEVEN REGISTER ALREADY VERIFY
02108  1348  8120                    LDKL     A1,X'E8C0'
       134A  E8C0
02109  134C  8141                    ST       A1,EXEVFY
       134E  1322
```

```
02110                          VEFYM1   EQU     *
02111  1350  EFA0                      CWK     A15,0
       1352  0000
02112  1354  5934                      RB(1)   EXEVFY          JP IF COMPARE NOT FINISH YET
02113  1356  87C0                      LD      A15,SAVA15
       1358  014C
02114  135A  F03E                      RTN     A15             RETURN                                  70
02115  135C  207F                      HLT                     HALT  HALT  HALT  HALT  HALT  HALT
02116                          VEFMS2   EQU     *
02117  135E  87C1                      ST      A15,SAVA15      SAVE REGISTER A15
       1360  014C
02118  1362  87A0                      LDKL    A15,-2
       1364  FFFE
02119  1366  87C1                      ST      A15,LOADA1+2
       1368  1334
02120  136A  87A0                      LDKL    A15,STAKMS
       136C  0150
02121  136E  EFC0                      CW      A15,STAKMS
       1370  0150
02122  1372  5002                      RF(0)   *+4             JP IF (STAKMS) = (A15)
02123  1374  207F                      HLT             *** AFTER INST, MSR15 (STAKMS) IS # (A15) INITIAL
02124  1376  87A0                      LDKL    A15,STAKND
       1378  016C
02125  137A  5F66                      RB(7)   VEFMS1
```

```
                                   EJECT

                   ******    ******    ****************
                   **
                   *         VEFYML    VERIFY MULTIPLE LOAD
                   **
                   ******    ******    *****************

                   VEFYML    EQU       *
137C  87C1                   ST        A15,SAVA15          SAVE REGISTER A15
137E  014C
1380  87A0                   LDKL      A15,ORGTB1
1382  00F0
1384  87C1                   ST        A15,EXEVML+2
1386  0000  F
1388  87A0                   LDKL      A15,X'E940'
138A  E940
138C  87C1                   ST        A15,EXEVML
138E  0000  F
1390  87C0                   LD        A15,NBNMS
1392  014E
1394  0000         EXEVML    DATA      0               EXECUTE COMPARE (A1) TO (A(N)) WITH ORGTB1 TABLE
1396  0000                   DATA      0
1398  5002                   RF(0)     *+4                 JP IF COMPARE OK
139A  207F                   HLT                       *** COMPARE NOT OK A(N) # (ORGTB1+(A15))
139C  8140                   LD        A1,WMEMOR+2
139E  0102
13A0  9141                   ADS       A1,EXEVML
13A2  1394
13A4  0102                   LDK       A1,2
13A6  9141                   ADS       A1,EXEVML+2
13A8  1396
13AA  97C0                   AD        A15,ORGTB2
13AC  0112
13AE  8140                   LD        A1,EXEVML
13B0  1394
13B2  E920                   CWK       A1,X'F040'
13B4  F040
13B6  5400  F                RF(4)     EXEVF1          NO JP IF THE FIRST SEVEN REGISTER ALREADY VERIFY
13B8  8120                   LDKL      A1,X'E8C0'
13BA  E8C0
13BC  8141                   ST        A1,EXEVML
13BE  1394
                   EXEVF1    EQU       *
13C0  EFA0                   CWK       A15,0
13C2  0000
13C4  5932                   RB(1)     EXEVML              JP IF COMPARE NOT FINISH YET
13C6  87C0                   LD        A15,SAVA15
13C8  014C
13CA  F03E                   RTN       A15                 RETURN
```

```
                          EJECT

                  ******  ******  ***************
                  **
                  *       ML14RG  LOAD 14 REGISTERS WITH X'FFFF'
                  **
                  ******  ******  *****************

                  ML14RG  EQU     *
13CC  87C1                ST      A15,SAVA15       SAVE REGISTER 15
13CE  014C
13D0  87A0                LDKL    A15,-28
13D2  FFE4
13D4  86A0                LDKL    A14,X'80C0'
13D6  80C0
13D8  86C1                ST      A14,EXEML1
13DA  0000  F
13DC  86A0                LDKL    A14,ORGTB2
13DE  0112
13E0  86C1                ST      A14,EXEML1+2
13E2  0000  F
13E4  0000        EXEML1  DATA    0
13E6  0000                DATA    0
13E8  97A0                ADKL    A15,2
13EA  0002
13EC  5600  F             RF(6)   EXEML2           JP IF LOAD FINISH
13EE  8740                LD      A7,WMEMOR
13F0  0100
13F2  9741                ADS     A7,EXEML1
13F4  13E4
13F6  5F14                RB(7)   EXEML1
                  EXEML2  EQU     *
13F8  87C0                LD      A15,SAVA15
13FA  014C
13FC  F03E                RTN     A15              RETURN
```

```
                                EJECT
                        ******  ******  ****************
                        **
                        *       SSHCOM  SINGLE SHIFT COMMON ROUTINE
                        **
                        ******  ******  ******************

                SSHCOM  EQU     *
13FE  0201              LDK     A2,1
                SHCOM1  EQU     *
1400  8141              ST      A1,FSR
1402  0000  F
1404  8241              ST      A2,FSR1
1406  0000  F
1408  0101              LDK     A1,1
140A  8141              ST      A1,NBNSH
140C  0172
140E  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 1  POSITION AND FOR A1 TO A7
1410  0000  F
1412  0102              LDK     A1,2
1414  8141              ST      A1,NBNSH
1416  0172
1418  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 2  POSITION AND FOR A1 TO A7
141A  0000  F
141C  0103              LDK     A1,3
141E  8141              ST      A1,NBNSH
1420  0172
1422  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 3  POSITIONS AND FOR A1 TO A7
1424  0000  F
1426  0104              LDK     A1,4
1428  8141              ST      A1,NBNSH
142A  0172
142C  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 4  POSITIONS AND FOR A1 TO A7
142E  0000  F
1430  0105              LDK     A1,5
1432  8141              ST      A1,NBNSH
1434  0172
1436  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 5  POSITIONS AND FOR A1 TO A7
1438  0000  F
143A  0106              LDK     A1,6
143C  8141              ST      A1,NBNSH
143E  0172
1440  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 6  POSITIONS AND FOR A1 TO A7
1442  0000  F
1444  0107              LDK     A1,7
1446  8141              ST      A1,NBNSH
1448  0172
144A  F7A1              CF      A15,SLRCOM      TO SLRCOM FOR 7  POSITIONS AND FOR A1 TO A7
```

```
                144C  0000  F
02220           144E  0108        LDK     A1,8
02221           1450  8141        ST      A1,NBNSH
                1452  0172
02222           1454  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 8  POSITIONS AND FOR A1 TO A7
                1456  0000  F
02223           1458  0109        LDK     A1,9
02224           145A  8141        ST      A1,NBNSH
                145C  0172
02225           145E  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 9  POSITIONS AND FOR A1 TO A7
                1460  0000  F
02226           1462  010A        LDK     A1,10
02227           1464  8141        ST      A1,NBNSH
                1466  0172
02228           1468  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 10 POSITIONS AND FOR A1 TO A7
                146A  0000  F
02229           146C  010B        LDK     A1,11
02230           146E  8141        ST      A1,NBNSH
                1470  0172
02231           1472  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 11 POSITIONS AND FOR A1 TO A7
                1474  0000  F
02232           1476  010C        LDK     A1,12
02233           1478  8141        ST      A1,NBNSH
                147A  0172
02234           147C  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 12 POSITIONS AND FOR A1 TO A7
                147E  0000  F
02235           1480  010D        LDK     A1,13
02236           1482  8141        ST      A1,NBNSH
                1484  0172
02237           1486  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 13 POSITIONS AND FOR A1 TO A7
                1488  0000  F
02238           148A  010E        LDK     A1,14
02239           148C  8141        ST      A1,NBNSH
                148E  0172
02240           1490  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 14 POSITIONS AND FOR A1 TO A7
                1492  0000  F
02241           1494  010F        LDK     A1,15
02242           1496  8141        ST      A1,NBNSH
                1498  0172
02243           149A  F7A1        CF      A15,SLRCOM      TO SLRCOM FOR 15 POSITIONS AND FOR A1 TO A7
                149C  0000  F
02244           149E  F03E        RTN     A15             RETURN
```

```
02245                          EJECT
02246
02247                  ******  ******  ****************
02248                  **
02249                  *       SLRCOM  SINGLE SHIFT COMMON ROUTINE FOR A1 TO A7 AND N=1 TO 15
02250                  **
02251                  ******  ******  ******************
02252
02253  14A0            FSR     RES     1               SHIFT RIGHT FLAG,
02254  14A2            FSR1    RES     1
02255                  *                               =1 IF SHIFT RIGHT INSTRUCTION
02256                  *                               =0 IF SHIFT LEFT INSTRUCTION
02257                  SLRCOM  EQU     *
02258  14A4  F7A1              CF      A15,STOSLR
       14A6  0000  F
02259  14A8  F7A1              CF      A15,INISH
       14AA  0000  F
02260  14AC  0101              LDK     A1,1
02261  14AE  0201              LDK     A2,1
02262  14B0  0301              LDK     A3,1
02263  14B2  0401              LDK     A4,1
02264  14B4  0501              LDK     A5,1
02265  14B6  0601              LDK     A6,1
02266  14B8  0701              LDK     A7,1
02267  14BA  80C0              LO      A8,NBNSH
       14BC  0172
02268  14BE  90C0              AD      A8,NBNSH
       14C0  0172
02269  14C2  81C0              LD      A9,FSR1
       14C4  14A2
02270  14C6  5200  F           RF(2)   SLA11           JP IF SLC, SINGLE LEFT CIRCULAR SHIFT,
02271  14C8  81C0              LD      A9,FSR
       14CA  14A0
02272  14CC  5200  F           RF(2)   SRC0            JP IF SINGLE RIGHT SHIFT
02273
02274                  ******  ******  ******************
02275                  **
02276                  *       SLC0    SINGLE LEFT SHIFT COMMON ROUTINE
02277                  **
02278                  ******  ******  ******************
02279
02280                  SLC0    EQU     *
02281  14CE  0000      SLA11   DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A1
02282  14D0  B142              XR      A1,ORGTB3,A8
       14D2  00F2
02283  14D4  5002              RF(0)   *+4             JP IF CR = 0
02284  14D6  207F              HLT                 ***  INSTRUCTION SLA11 EXECUTION WAS WRONG
02285  14D8  0000      SLA21   DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A2
02286  14DA  B242              XR      A2,ORGTB3,A8
       14DC  00F2
```

75

```
                                  EJECT

                   ******         ******    ****************
                   **
                   *              SLRCOM    SINGLE SHIFT COMMON ROUTINE FOR A1 TO A7 AND N=1 TO 15
                   **
                   ******         ******    ****************

14A0               FSR            RES       1                      SHIFT RIGHT FLAG.
14A2               FSR1           RES       1
                   *                                               =1 IF SHIFT RIGHT INSTRUCTION
                   *                                               =0 IF SHIFT LEFT INSTRUCTION
                   SLRCOM         EQU       *
14A4  F7A1                        CF        A15,STOSLR
14A6  0000  F
14A8  F7A1                        CF        A15,INISH
14AA  0000  F
14AC  0101                        LDK       A1,1
14AE  0201                        LDK       A2,1
14B0  0301                        LDK       A3,1
14B2  0401                        LDK       A4,1
14B4  0501                        LDK       A5,1
14B6  0601                        LDK       A6,1
14B8  0701                        LDK       A7,1
14BA  80C0                        LD        A8,NBNSH
14BC  0172
14BE  90C0                        AD        A8,NBNSH
14C0  0172
14C2  81C0                        LD        A9,FSR1
14C4  14A2
14C6  5200  F                     RF(2)     SLA11                  JP IF SLC, SINGLE LEFT CIRCULAR SHIFT.
14C8  81C0                        LD        A9,FSR
14CA  14A0
14CC  5200  F                     RF(2)     SRCO                   JP IF SINGLE RIGHT SHIFT

                   ******         ******    ****************
                   **
                   *              SLCO      SINGLE LEFT SHIFT COMMON ROUTINE
                   **
                   ******         ******    ****************

                   SLCO           EQU       *
14CE  0000         SLA11          DATA      0                      SINGLE LEFT ARITHMETIC SHIFT BY A1
14D0  8142                        XR        A1,ORGTB3,A8
14D2  00F2
14D4  5002                        RF(0)     *+4                    JP IF CR = 0
14D6  207F                        HLT                         ***  INSTRUCTION SLA11 EXECUTION WAS WRONG
14D8  0000         SLA21          DATA      0                      SINGLE LEFT ARITHMETIC SHIFT BY A2
14DA  B242                        XR        A2,ORGTB3,A8
14DC  00F2
```

F5

```
02287  14DE  5002            RF(0)   *+4             JP IF CR = 0
02288  14E0  207F            HLT                ***  INSTRUCTION SLA21 EXECUTION WAS WRONG
02289  14E2  0000   SLA31     DATA                    SINGLE LEFT ARITHMETIC SHIFT BY A3
02290  14E4  B342            XR      A3,ORGTB3,A8
       14E6  00F2
02291  14E8  5002            RF(0)   *+4             JP IF CR = 0
02292  14EA  207F            HLT                ***  INSTRUCTION SLA31 EXECUTION WAS WRONG
02293  14EC  0000   SLA41     DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A4
02294  14EE  B442            XR      A4,ORGTB3,A8
       14F0  00F2
02295  14F2  5002            RF(0)   *+4             JP IF CR = 0
02296  14F4  207F            HLT                ***  INSTRUCTION SLA41 EXECUTION WAS WRONG
02297  14F6  0000   SLA51     DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A5
02298  14F8  B542            XR      A5,ORGTB3,A8
       14FA  00F2
02299  14FC  5002            RF(0)   *+4             JP IF CR = 0
02300  14FE  207F            HLT                ***  INSTRUCTION SLA51 EXECUTION WAS WRONG
02301  1500  0000   SLA61     DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A6
02302  1502  B642            XR      A6,ORGTB3,A8
       1504  00F2
02303  1506  5002            RF(0)   *+4             JP IF CR = 0
02304  1508  207F            HLT                ***  INSTRUCTION SLA61 EXECUTION WAS WRONG
02305  150A  0000   SLA71     DATA    0               SINGLE LEFT ARITHMETIC SHIFT BY A7
02306  150C  B742            XR      A7,ORGTB3,A8
       150E  00F2
02307  1510  5002            RF(0)   *+4             JP IF CR = 0
02308  1512  207F            HLT                ***  INSTRUCTION SLA71 EXECUTION WAS WRONG
02309  1514  F03E            RTN     A15             RETURN
```

```
                                   EJECT
                                   
                       ******      ******  ****************
                       **
                       *           SRCO    SINGLE RIGHT COMMON ROUTINE
                       **
                       ******      ******  ****************
                                   
1516                   FSRC        RES     1                  SINGLE RIGHT CIRCULAR SHIFT FLAG
                       SRCO        EQU     *
1518  8120                         LDKL    A1,X'8000'
151A  8000
151C  8220                         LDKL    A2,X'8000'
151E  8000
1520  8320                         LDKL    A3,X'8000'
1522  8000
1524  8420                         LDKL    A4,X'8000'
1526  8000
1528  8520                         LDKL    A5,X'8000'
152A  8000
152C  8620                         LDKL    A6,X'8000'
152E  8000
1530  8720                         LDKL    A7,X'8000'
1532  8000
1534  0000             SRA11       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A1
1536  8142                         XR      A1,TBRIGH,A8
1538  0000  F
153A  5002                         RF(0)   *+4                JP IF CR=0
153C  207F                         HLT                    *** INSTRUCTION SRA11 EXECUTION WAS WRONG
153E  0000             SRA21       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A2
1540  8242                         XR      A2,TBRIGH,A8
1542  0000  F
1544  5002                         RF(0)   *+4                JP IF CR=0
1546  207F                         HLT                    *** INSTRUCTION SRA21 EXECUTION WAS WRONG
1548  0000             SRA31       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A3
154A  8342                         XR      A3,TBRIGH,A8
154C  0000  F
154E  5002                         RF(0)   *+4                JP IF CR=0
1550  207F                         HLT                    *** INSTRUCTION SRA31 EXECUTION WAS WRONG
1552  0000             SRA41       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A4
1554  8442                         XR      A4,TBRIGH,A8
1556  0000  F
1558  5002                         RF(0)   *+4
155A  207F                         HLT                    *** INSTRUCTION SRA41 EXECUTION WAS WRONG
155C  0000             SRA51       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A5
155E  8542                         XR      A5,TBRIGH,A8
1560  0000  F
1562  5002                         RF(0)   *+4                JP IF CR=0
1564  207F                         HLT                    *** INSTRUCTION SRA51 EXECUTION WAS WRONG
1566  0000             SRA61       DATA    0                  SINGLE RIGHT ARITHMETIC SHIFT BY A6
```

```
02348  1568  8642          XR      A6,TBRIGH,A8
       156A  0000  F
02349  156C  5202          RF(0)                   JP IF CR=0
02350  156E  207F          HLT                 ***  INSTRUCTION SRA61 EXECUTION WAS WRONG
02351  1570  0000    SRA71 DATA    0               SINGLE RIGHT ARITHMETIC SHIFT BY A7
02352  1572  8742          XR      A7,TBRIGH,A8
       1574  0000  F                                                                    78
02353  1576  5002          RF(0)   *+4             JP IF CR=0
02354  1578  207F          HLT                 ***  INSTRUCTION SRA71 EXECUTION WAS WRONG
02355  157A  81A0          LDKL    A9,FSRC
       157C  1516
02356  157E  5500  F       RF(5)   SRAC01          JP IF NOT SINGLE RIGHT CIRCULAR SHIFT
02357  1580  8720          LDKL    A7,X'5555'
       1582  5555
02358  1584  3FEF    SRC151 SRC    A7,15
02359  1586  EF20          CWK     A7,X'AAAA'
       1588  AAAA
02360  158A  5202          RF(0)   *+4             JP IF A7 REG. = X'AAAA'
02361  158C  207F          HLT                 ***  PRECEDENT INST. SRC151 EXECUTION WAS WRONG
02362                 SRAC01 EQU   *
02363  158E  F03E          RTN     A15             RETURN
02364  1590  8000    TBRIGH DATA   X'8000'
02365  1592  C000          DATA    X'C000'
02366  1594  E000          DATA    X'E000'
02367  1596  F000          DATA    X'F000'
02368  1598  F800          DATA    X'F800'
02369  159A  FC00          DATA    X'FC00'
02370  159C  FE00          DATA    X'FE00'
02371  159E  FF00          DATA    X'FF00'
02372  15A0  FF80          DATA    X'FF80'
02373  15A2  FFC0          DATA    X'FFC0'
02374  15A4  FFE0          DATA    X'FFE0'
02375  15A6  FFF0          DATA    X'FFF0'
02376  15A8  FFF8          DATA    X'FFF8'
02377  15AA  FFFC          DATA    X'FFFC'
02378  15AC  FFFE          DATA    X'FFFE'
02379  15AE  FFFF          DATA    X'FFFF'
```

```
02380                                  EJECT
02381
02382                          ******  ******  ****************
02383                          **
02384                          *       INISHI  SHIFT INITIALIZATION ROUTINE
02385                          **
02386                          ******  ******  ******************                    30
02387
02388                          INISHI  EQU     *
02389  1580  81A0                      LOKL    A9,X'FFE0'
       1582  FFE0
02390  1584  0100                      LOK     A1,0
02391  1586  8141                      ST      A1,FSRC
       1588  1516
02392  158A  8141                      ST      A1,FORC
       158C  0000  F
02393  158E  F03E                      RTN     A15             RETURN
02394
02395
02396                          ******  ******  ******************
02397                          **
02398                          *       INISH   SHIFT INITIALIZATION
02399                          **
02400                          ******  ******  ******************
02401
02402                          INISH   EQU     *
02403  15C0  8140                      LD      A1,NBNSH
       15C2  0172
02404  15C4  9141                      ADS     A1,SLA11
       15C6  14CE
02405  15C8  9141                      ADS     A1,SRA11
       15CA  1534
02406  15CC  9141                      ADS     A1,SLA21
       15CE  1408
02407  15D0  9141                      ADS     A1,SRA21
       15D2  153E
02408  15D4  9141                      ADS     A1,SLA31
       15D6  14E2
02409  15D8  9141                      ADS     A1,SRA31
       15DA  1548
02410  15DC  9141                      ADS     A1,SLA41
       15DE  14EC
02411  15E0  9141                      ADS     A1,SRA41
       15E2  1552
02412  15E4  9141                      ADS     A1,SLA51
       15E6  14F6
02413  15E8  9141                      ADS     A1,SRA51
       15EA  155C
02414  15EC  9141                      ADS     A1,SLA61
       15EE  1500
```

```
P2415  15F0  9141          ADS   A1,SRA61
       15F2  1566
P2416  15F4  9141          ADS   SLA71
       15F6  150A
P2417  15F8  9141          ADS   A1,SRA71
       15FA  1570
P2418  15FC  F03E          RTN   A15        RETURN
```

84

```
                              EJECT
                 ******       ******    *****************
                 **
                 *            SHIFT CODE TABLE
                 **
                 ******       ******    *****************

15FE   3900      TABSLA       DATA      X'3900'
1600   3A00                   DATA      X'3A00'
1602   3B00                   DATA      X'3B00'
1604   3C00                   DATA      X'3C00'
1606   3D00                   DATA      X'3D00'
1608   3E00                   DATA      X'3E00'
160A   3F00                   DATA      X'3F00'
160C   3920      TABSRA       DATA      X'3920'
160E   3A20                   DATA      X'3A20'
1610   3B20                   DATA      X'3B20'
1612   3C20                   DATA      X'3C20'
1614   3D20                   DATA      X'3D20'
1616   3E20                   DATA      X'3E20'
1618   3F20                   DATA      X'3F20'
161A   3940      TABSLL       DATA      X'3940'
161C   3A40                   DATA      X'3A40'
161E   3B40                   DATA      X'3B40'
1620   3C40                   DATA      X'3C40'
1622   3D40                   DATA      X'3D40'
1624   3E40                   DATA      X'3E40'
1626   3F40                   DATA      X'3F40'
1628   3960      TABSRL       DATA      X'3960'
162A   3A60                   DATA      X'3A60'
162C   3B60                   DATA      X'3B60'
162E   3C60                   DATA      X'3C60'
1630   3D60                   DATA      X'3D60'
1632   3E60                   DATA      X'3E60'
1634   3F60                   DATA      X'3F60'
1636   39C0      TABSLC       DATA      X'39C0'
1638   3AC0                   DATA      X'3AC0'
163A   3BC0                   DATA      X'3BC0'
163C   3CC0                   DATA      X'3CC0'
163E   3DC0                   DATA      X'3DC0'
1640   3EC0                   DATA      X'3EC0'
1642   3FC0                   DATA      X'3FC0'
1644   39E0      TABSRC       DATA      X'39E0'
1646   3AE0                   DATA      X'3AE0'
1648   3BE0                   DATA      X'3BE0'
164A   3CE0                   DATA      X'3CE0'
164C   3DE0                   DATA      X'3DE0'
164E   3EE0                   DATA      X'3EE0'
1650   3FE0                   DATA      X'3FE0'
```

```
02468                                  EJECT
02469
02470                          ******  ******  ***************
02471                          **
02472                          *       STOSLR  STORE SLA CODE FOR A1 TO A7
02473                          *               OR    SRA CODE FOR A1 TO A7
02474                          *               OR    SLL CODE FOR A1 TO A7
02475                          *               OR    SRL CODE FOR A1 TO A7
02476                          *               OR    SLC CODE FOR A1 TO A7
02477                          *               OR    SRC CODE FOR A1 TO A7
02478                          **
02479                          ******  ******  ******************
02480
02481                        STOSLR  EQU     *
02482  1652  050C                    LDK     A5,12
02483  1654  0600                    LDK     A6,0
02484                        STOXR1  EQU     *
02485  1656  8720                    LDKL    A7,TBRIGH
       1658  1590
02486  165A  8759                    ST      A7,SRA71+4,A6
       165C  1574
02487  165E  9620                    ADKL    A6,-10
       1660  FFF6
02488  1662  9520                    ADKL    A5,-2
       1664  FFFE
02489  1666  5E12                    RB(6)   STOXR1          JP IF TRANSFER NOT YET FINISH
02490  1668  020C                    LDK     A2,12
02491  166A  0300                    LDK     A3,0
02492                        STOSL1  EQU     *
02493  166C  84C8                    LD      A12,TABSRA,A2
       166E  16AC
02494  1670  84CD                    ST      A12,SRA71,A3
       1672  1570
02495  1674  81C0                    LD      A9,FSR1
       1676  14A2
02496  1678  5000  F                 RF(0)   STOSL5          JP IF SRL, SINGLE RIGHT LOGICAL SHIFT,
02497  167A  5200  F                 RF(2)   STOSL6          JP IF SLC, SINGLE LEFT CIRCULAR SHIFT,
02498  167C  81C0                    LD      A9,FSR
       167E  14A0
02499  1680  5000  F                 RF(0)   STOSL4          JP IF SLL, SINGLE LEFT LOGICAL SHIFT
02500  1682  5200  F                 RF(2)   STOSL3          JP IF SRA, SINGLE RIGHT ARITHMETIC SHIFT
02501  1684  8448                    LD      A4,TABSLA,A2
       1686  15FE
02502                        STOSL2  EQU     *
02503  1688  844D                    ST      A4,SLA71,A3
       168A  150A
02504                        STOSL3  EQU     *
02505  168C  84CD                    ST      A12,SRA71,A3
       168E  1570
02506  1690  9320                    ADKL    A3,-10
```

```
                1692  FFF6
 02507          1694  9220            ADKL    A2,-2
                1696  FFFE
 02508          1698  5E2E            RB(6)   STOSL1          JP IF TRANSFER NOT YET FINISH
 02509          169A  F03E            RTN     A15             RETURN
 02510                          STOSL4  EQU     *
 02511          169C  8448            LD      A4,TABSLL,A2                                    83
                169E  161A
 02512          16A0  5F1A            RB(7)   STOSL2
 02513                          STOSL5  EQU     *
 02514          16A2  050C            LDK     A5,12
 02515          16A4  0600            LDK     A6,0
 02516          16A6  8720            LDKL    A7,ORGTB0+2
                16A8  0200
 02517                          STOXR   EQU     *
 02518          16AA  8759            ST      A7,SRA71+4,A6
                16AC  1574
 02519          16AE  9620            ADKL    A6,-10
                16B0  FFF6
 02520          16B2  9520            ADKL    A5,-2
                16B4  FFFE
 02521          16B6  5E0E            RB(6)   STOXR          JP IF TRANSFER NOT YET FINISH
 02522          16B8  84C8            LD      A12,TABSRL,A2
                16BA  1628
 02523          16BC  81C0            LD      A9,FSRC
                16BE  1516
 02524          16C0  5500  F         RF(5)   STOXR2          JP IF NOT SINGLE RIGHT CIRCULAR SHIFT
 02525          16C2  84C8            LD      A12,TABSRC,A2
                16C4  1644
 02526                          STOXR2  EQU     *
 02527          16C6  5F3C            RB(7)   STOSL3
 02528                          STOSL6  EQU     *
 02529          16C8  8448            LD      A4,TABSLC,A2
                16CA  1636
 02530          16CC  5F46            RB(7)   STOSL2
```

```
                                 EJECT
                       ******    ******    ***************
                       **
                       *         DSHCOM    DOUBLE SHIFT COMMON ROUTINE
                       **
                       ******    ******    *****************
 16CE                  FORC      RES        1
                       DSHCOM    EQU       *
 16D0  0201                      LDK       A2,1
                       DHCOM1    EQU       *
 16D2  8141                      ST        A1,FSR
 16D4  14A0
 16D6  8241                      ST        A2,FSR1
 16D8  14A2
 16DA  0101                      LDK       A1,1
 16DC  8141                      ST        A1,NBNSH
 16DE  0172
 16E0  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  1 POSITION
 16E2  0000  F
 16E4  0102                      LDK       A1,2
 16E6  8141                      ST        A1,NBNSH
 16E8  0172
 16EA  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  2 POSITIONS
 16EC  0000  F
 16EE  0103                      LDK       A1,3
 16F0  8141                      ST        A1,NBNSH
 16F2  0172
 16F4  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  3 POSITIONS
 16F6  0000  F
 16F8  0104                      LDK       A1,4
 16FA  8141                      ST        A1,NBNSH
 16FC  0172
 16FE  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  4 POSITIONS
 1700  0000  F
 1702  0105                      LDK       A1,5
 1704  8141                      ST        A1,NBNSH
 1706  0172
 1708  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  5 POSITIONS
 170A  0000  F
 170C  0106                      LDK       A1,6
 170E  8141                      ST        A1,NBNSH
 1710  0172
 1712  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  6 POSITIONS
 1714  0000  F
 1716  0107                      LDK       A1,7
 1718  8141                      ST        A1,NBNSH
 171A  0172
 171C  F7A1                      CF        A15,DLRCOM        TO DLRCOM FOR  7 POSITIONS
```

```
                171E  0000  F
02566           1720  0108        LDK     A1,8
02567           1722  8141        ST      A1,NBNSH
                1724  0172
02568           1726  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR  8 POSITIONS
                1728  0000  F
02569           172A  0109        LDK     A1,9
02570           172C  8141        ST      A1,NBNSH
                172E  0172
02571           1730  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR  9 POSITIONS
                1732  0000  F
02572           1734  010A        LDK     A1,10
02573           1736  8141        ST      A1,NBNSH
                1738  0172
02574           173A  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 10 POSITIONS
                173C  0000  F
02575           173E  0108        LDK     A1,11
02576           1740  8141        ST      A1,NBNSH
                1742  0172
02577           1744  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 11 POSITIONS
                1746  0000  F
02578           1748  010C        LDK     A1,12
02579           174A  8141        ST      A1,NBNSH
                174C  0172
02580           174E  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 12 POSITIONS
                1750  0000  F
02581           1752  010D        LDK     A1,13
02582           1754  8141        ST      A1,NBNSH
                1756  0172
02583           1758  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 13 POSITIONS
                175A  0000  F
02584           175C  010E        LDK     A1,14
02585           175E  8141        ST      A1,NBNSH
                1760  0172
02586           1762  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 14 POSITIONS
                1764  0000  F
02587           1766  010F        LDK     A1,15
02588           1768  8141        ST      A1,NBNSH
                176A  0172
02589           176C  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 15 POSITIONS
                176E  0000  F
02590           1770  0110        LDK     A1,16
02591           1772  8141        ST      A1,NBNSH
                1774  0172
02592           1776  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 16 POSITIONS
                1778  0000  F
02593           177A  0111        LDK     A1,17
02594           177C  8141        ST      A1,NBNSH
                177E  0172
02595           1780  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 17 POSITIONS
```

```
                 1782  0000  F
 02596           1784  0112          LDK     A1,18
 02597           1786  8141          ST      A1,NBNSH
                 1788  0172
 02598           178A  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 18 POSITIONS
                 178C  0000  F
 02599           178E  0113          LDK     A1,19
 02600           1790  8141          ST      A1,NBNSH
                 1792  0172
 02601           1794  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 19 POSITIONS
                 1796  0000  F
 02602           1798  0114          LDK     A1,20
 02603           179A  8141          ST      A1,NBNSH
                 179C  0172
 02604           179E  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 20 POSITIONS
                 17A0  0000  F
 02605           17A2  0115          LDK     A1,21
 02606           17A4  8141          ST      A1,NBNSH
                 17A6  0172
 02607           17A8  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 21 POSITIONS
                 17AA  0000  F
 02608           17AC  0116          LDK     A1,22
 02609           17AE  8141          ST      A1,NBNSH
                 17B0  0172
 02610           17B2  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 22 POSITIONS
                 17B4  0000  F
 02611           17B6  0117          LDK     A1,23
 02612           17B8  8141          ST      A1,NBNSH
                 17BA  0172
 02613           17BC  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 23 POSITIONS
                 17BE  0000  F
 02614           17C0  0118          LDK     A1,24
 02615           17C2  8141          ST      A1,NBNSH
                 17C4  0172
 02616           17C6  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 24 POSITIONS
                 17C8  0000  F
 02617           17CA  0119          LDK     A1,25
 02618           17CC  8141          ST      A1,NBNSH
                 17CE  0172
 02619           17D0  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 25 POSITIONS
                 17D2  0000  F
 02620           17D4  011A          LDK     A1,26
 02621           17D6  8141          ST      A1,NBNSH
                 17D8  0172
 02622           17DA  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 26 POSITIONS
                 17DC  0000  F
 02623           17DE  011B          LDK     A1,27
 02624           17E0  8141          ST      A1,NBNSH
                 17E2  0172
 02625           17E4  F7A1          CF      A15,DLRCOM      TO DLRCOM FOR 27 POSITIONS
```

```
                17E6  0000  F
02626           17E8  011C        LDK     A1,28
02627           17EA  8141        ST      A1,NBNSH
                17EC  0172
02628           17EE  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 28 POSITIONS
                17F0  0000  F
02629           17F2  011D        LDK     A1,29
02630           17F4  8141        ST      A1,NBNSH
                17F6  0172
02631           17F8  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 29 POSITIONS
                17FA  0000  F
02632           17FC  011E        LDK     A1,30
02633           17FE  8141        ST      A1,NBNSH
                1800  0172
02634           1802  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 30 POSITIONS
                1804  0000  F
02635           1806  8140        LD      A1,FSR1
                1808  14A2
02636           180A  5500  F     RF(5)   DSH1            JP IF FSR1 # 1
02637           180C  8540        LD      A5,FSR
                180E  1440
02638           1810  5000  F     RF(0)   DSH1            JP IF FSR # 0
02639           1812  5700  F     RF(7)   DSH2
02640                         DSH1  EQU     *
02641           1814  011F        LDK     A1,31
02642           1816  8141        ST      A1,NBNSH
                1818  0172
02643           181A  F7A1        CF      A15,DLRCOM      TO DLRCOM FOR 31 POSITIONS
                181C  0000  F
02644                         DSH2  EQU     *
02645           181E  F03E        RTN     A15             RETURN
```

```
02646                                  EJECT
02647
02648                          ******  ******  ****************
02649                          **
02650                          *       DLRCOM  DOUBLE SHIFT COMMON ROUTINE FOR N = 1 TO 31
02651                          **
02652                          ******  ******  ******************
02653
02654                          DLRCOM  EQU     *
02655  1820  0100                     LDK     A1,0
02656  1822  0201                     LDK     A2,1
02657  1824  8440                     LD      A4,NBNSH
       1826  0172
02658  1828  8540                     LD      A5,FSR
       182A  14A0
02659  182C  5000  F                  RF(0)   TRDLL           JP IF DLL INSTRUCTION
02660  182E  5500  F                  RF(5)   TRFSR1          JP IF FSR # 1
02661
02662                          ******  ******  ******************
02663                          **
02664                          *       TRDLA   DLA INSTRUCTION TEST
02665                          **
02666                          ******  ******  ******************
02667
02668                          TRDLA   EQU     *
02669  1830  EC20                     CWK     A4,14
       1832  000E
02670  1834  5100  F                  RF(1)   DLACO2          JP IF NUMBER OF SHIFTS > 14
02671  1836  A1C1                     ANS     A9,DLACO1
       1838  0000  F
02672  183A  9441                     ADS     A4,DLACO1
       183C  0000  F
02673  183E  384E             DLACO1  DLA     14              DOUBLE LEFT ARITHMETIC SHIFT FOR N = 1 TO 14
02674  1840  5102                     RF(1)   **4             JP IF CR RESULT > 0
02675  1842  207F                     HLT                     ***  CR RESULT OF INSTRUCTION DLACO1 IS WRONG
02676  1844  9440                     AD      A4,NBNSH
       1846  0172
02677  1848  B250                     XR      A2,ORGT83,A4
       184A  00F2
02678  184C  5002                     RF(0)   **4             JP IF CR = 0
02679  184E  207F                     HLT                     ***  INSTRUCTION DLACO1 EXECUTION WAS WRONG
02680  1850  E920                     CWK     A1,0
       1852  0000
02681  1854  5002                     RF(0)   **4             JP IF (REG, A1 = 0)
02682  1856  207F                     HLT                     ***  INSTRUCTION DLACO1 EXECUTION WAS WRONG
02683  1858  F03E                     RTN     A15             RETURN
02684
02685                          DLACO2  EQU     *
02686  185A  8440                     LD      A4,NBNSH
       185C  0172
```

```
02687  185E  80C0            LD      A8,FSR
       1860  14A0
02688  1862  5000  F         BF(0)   DLC02           JP IF DLL INSTRUCTION
02689  1864  5200  F         BF(2)   DLC02           JP IF DLC INSTRUCTION
02690  1866  A1C1            ANS     A9,DLAC03
       1868  0000  F
02691  186A  9441            ADS     A4,DLAC03                                        89
       186C  0000  F
02692  186E  381E      DLAC03 DLA     30              DOUBLE LEFT ARITHMETIC SHIFT FOR N = 15 TO 30
02693  1870  5100  F         BF(1)   DLAC05          JP IF CR RESULT > 0
02694  1872  5300  F         BF(3)   DLAC04          JP IF CR RESULT = OVERFLOW
02695  1874  207F            HLT                     *** CR RESULT OF INSTRUCTION DLAC03 IS WRONG
02696                 DLAC04  EQU     *
02697  1876  EC20            CWK     A4,30
       1878  001E
02698  187A  5000  F         BF(0)   DLAC06          JP IF NUMBER OF SHIFTS = 30
02699                 DLAC05  EQU     *
02700  187C  EC20            CWK     A4,30
       187E  001E
02701  1880  5202            BF(2)   *+4             JP IF NUMBER OF SHIFTS < 30
02702  1882  207F            HLT                     *** CR RESULT OF INSTRUCTION DLAC03 IS WRONG
02703                 DLAC06  EQU     *
02704  1884  9440            AD      A4,NBNSH
       1886  0172
02705  1888  8150            XR      A1,ORGTB3-30,A4
       188A  0004
02706  188C  5002            BF(0)   *+4             JP IF CR = 0
02707  188E  207F            HLT                     *** INSTRUCTION DLAC03 EXECUTION WAS WRONG
02708  1890  EA20            CWK     A2,0
       1892  0000
02709  1894  5002            BF(0)   *+4             JP IF (REG, A2 = 0)
02710  1896  207F            HLT                     *** INSTRUCTION DLAC03 EXECUTION WAS WRONG
02711  1898  F03E            RTN     A15             RETURN
```

```
02712                                  EJECT
02713
02714                          ******  ******  ****************
02715                          **
02716                          *       TROLL   DLL INSTRUCTION TEST
02717                          **
02718                          ******  ******  ******************
02719
02720                          TROLL   EQU     *
02721  189A  EC20                      CWK     A4,15
       189C  000F
02722  189E  5946                      RB(1)   DLAC02          JP IF NUMBER OF SHIFTS > 15
02723  18A0  A1C1                      ANS     A9,DLLC01
       18A2  0000  F
02724  18A4  9441                      ADS     A4,DLLC01
       18A6  0000  F
02725  18A8  384F              DLLC01  DLL     15              DOUBLE LEFT LOGICAL SHIFT FOR N = 1 TO 15
02726  18AA  5F6C                      RB(7)   DLAC01+2
02727
02728                          DLLC02  EQU     *
02729  18AC  A1C1                      ANS     A9,DLLC03
       18AE  0000  F
02730  18B0  9441                      ADS     A4,DLLC03
       18B2  0000  F
02731  18B4  385F              DLLC03  DLL     31              DOUBLE LEFT LOGICAL SHIFT FOR N = 16 TO 31
02732  18B6  5100  F                   RF(1)   DLLC05          JP IF CR RESULT > 0
02733  18B8  5600  F                   RF(6)   DLLC06-2        JP IF CR RESULT IS WRONG
02734  18BA  EC20                      CWK     A4,31
       18BC  001F
02735  18BE  5000  F                   RF(0)   DLLC06          JP IF NUMBER OF SHIFTS = 31
02736  18C0  207F                      HLT                     ***  CR RESULT OF INSTRUCTION DLLC03 IS WRONG
02737                          DLLC05  EQU     *
02738  18C2  EC20                      CWK     A4,31
       18C4  001F
02739  18C6  52A2                      RF(2)   *+4             JP IF NUMBER OF SHIFTS < 31
02740  18C8  207F                      HLT                     ***  CR RESULT OF INSTRUCTION DLLC03 IS WRONG
02741                          DLLC06  EQU     *
02742  18CA  9420                      ADKL    A4,-1
       18CC  FFFF
02743  18CE  5F4C                      RB(7)   DLAC06
```

```
                             EJECT
                   ******    ******    *****************
                   **
                   *         TRFSR1    FSR1 FLAG TEST
                   **
                   ******    ******    *****************

                   TRFSR1    EQU       *
18D0  8120                   LDKL      A1,X'4000'
18D2  4020
18D4  0201                   LDK       A2,1
18D6  8440                   LD        A4,NBNSH
18D8  0172
18DA  8740                   LD        A7,FDRC
18DC  15CE
18DE  5100  F                RF(1)     TRDRC              JP IF DRC INSTRUCTION
18E0  8540                   LD        A6,FSR1
18E2  14A2
18E4  5000  F                RF(0)     TRDRL              JP IF DRL INSTRUCTION
18E6  5100  F                RF(1)     TRDRA              JP IF DRA INSTRUCTION

                   ******    ******    *****************
                   **
                   *         TRDLC     DLC INSTRUCTION TEST
                   **
                   ******    ******    *****************

                   TRDLC     EQU       *
18E8  0100                   LDK       A1,0
18EA  0201                   LDK       A2,1
18EC  EC20                   CWK       A4,15
18EE  000F
18F0  5998                   RB(1)     DLAC02             JP IF NUMBER OF SHIFTS > 15
18F2  A1C1                   ANS       A9,DLC01
18F4  0000  F
18F6  9441                   ADS       A4,DLC01
18F8  0000  F
18FA  38CF         DLC01     DLC       15                 DOUBLE LEFT CIRCULAR SHIFT FOR N = 1 TO 15
18FC  5F8E                   RB(7)     DLAC01+2

                   DLC02     EQU       *
18FE  A1C1                   ANS       A9,DLC03
1900  0000  F
1902  9441                   ADS       A4,DLC03
1904  0000  F
1906  38DE         DLC03     DLC       30                 DOUBLE LEFT CIRCULAR SHIFT FOR N = 16 TO 31
1908  5F54                   RB(7)     DLLC03+2
```

```
02783                                  EJECT
02784
02785                          ******  ******  ***************
02786                          **
02787                          *       TRDRA   DRA INSTRUCTION TEST
02788                          **
02789                          ******  ******  ******************
02790
02791                          TRDRA   EQU     *
02792  190A  EC20                      CWK     A4,14
       190C  000E
02793  190E  5100  F                   RF(1)   DRACO2          JP IF N. OF SHIFTS > 14
02794  1910  A1C1                      ANS     A9,DRACO1
       1912  0000  F
02795  1914  9441                      ADS     A4,DRACO1
       1916  0000  F
02796  1918  382F            DRACO1    DRA     15              DOUBLE RIGHT ARITHMETIC SHIFT FOR N = 1 TO 14
02797  191A  5102                      RF(1)   **+4            JP IF CR RESULT > 0
02798  191C  207F                      HLT                 ***  CR RESULT OF INSTRUCTION DRACO1 IS WRONG
02799  191E  9440                      AD      A4,NBNSH
       1920  0172
02800  1922  B150                      XR      A1,ORGTB0+4,A4
       1924  0002
02801  1926  5002                      RF(0)   **+4            JP IF CR = 0
02802  1928  207F                      HLT                 ***  INSTRUCTION DRACO1 EXECUTION WAS WRONG
02803  192A  EA20                      CWK     A2,0
       192C  0000
02804  192E  5002                      RF(0)   **+4            JP IF (REG. A2) = 0
02805  1930  207F                      HLT                 ***  INSTRUCTION DRACO1 EXECUTION WAS WRONG
02806  1932  FW3E                      RTN     A15             RETURN
02807                          DRACO2  EQU     *
02808  1934  A1C1                      ANS     A9,DRACO3
       1936  0000  F
02809  1938  9441                      ADS     A4,DRACO3
       193A  0000  F
02810  193C  383E            DRACO3    DRA     30              DOUBLE RIGHT ARITHMETIC SHIFT FOR N =16 TO 30
02811  193E  5100  F                   RF(1)   DRACO4          JP IF CR RESULT > 0
02812  1940  5000  F                   RF(0)   DRACO5          JP IF CR = 0
02813  1942  207F                      HLT                 ***  CR RESULT OF INSTRUCTION DRACO3 IS WRONG
02814                          DRACO4  EQU     *
02815  1944  EC20                      CWK     A4,29
       1946  001D
02816  1948  5500  F                   RF(5)   DRACO5          JP IF NUMBER OF SHIFTS < 30
02817  194A  207F                      HLT                 ***  CR RESULT OF INSTRUCTION DRACO3 IS WRONG
02818                          DRACO5  EQU     *
02819  194C  EC20                      CWK     A4,30
       194E  001E
02820  1950  5000  F                   RF(0)   DRACO6          JP IF NUMBER OF SHIFTS = 30
02821  1952  207F                      HLT                 ***  CR RESULT OF INSTRUCTION DRACO3 IS WRONG
02822                          DRACO6  EQU     *
```

```
02823  1954  E920          CWK     A1,0
       1956  0000
02824  1958  5002          RF(0)                   JP IF (REG, A1) = 0
02825  195A  207F          HLT             ***     INSTRUCTION DRACO3 EXECUTION WAS WRONG
02826  195C  9440          AD      A4,NBNSH
       195E  0172
02827  1960  8250          XR      A2,ORGTBO+26,A4                                          93
       1962  0004
02828  1964  5002          RF(0)   *+4             JP IF CR = 0
02829  1966  207F          HLT             ***     INSTRUCTION DRACO3 EXECUTION WAS WRONG
02830  1968  F03E          RTN     A15             RETURN
```

```
02831                                  EJECT
02832
02833                          ******  ******  ****************
02834                          **
02835                          *       TRDRL   DRL INSTRUCTION TEST
02836                          **
02837                          ******  ******  ******************
02838
02839                          TRDRL   EQU     *
02840  196A  8120                     LDKL    A1,X'80001'
       196C  8000
02841  196E  EC20                     CWK     A4,15
       1970  000F
02842  1972  5100  F                  RF(1)   DRLC02          JP IF NUMBER OF SHIFTS > 15
02843  1974  A1C1                     ANS     A9,DRLC01
       1976  0000  F
02844  1978  9441                     ADS     A4,DRLC01
       197A  0000  F
02845  197C  386F           DRLC01    DRL     15              DOUBLE RIGHT LOGICAL SHIFT FOR N = 1 TO 15
02846  197E  5102                     RF(1)   *+4             JP IF CR RESULT > 0
02847  1980  207F                     HLT                     ***  CR RESULT OF INSTRUCTION DRLC01 IS WRONG
02848  1982  9440                     AD      A4,NBNSH
       1984  0172
02849  1986  B150                     XR      A1,ORGTB0+2,A4
       1988  0000
02850  198A  5002                     RF(0)   *+4             JP IF CR = 0
02851  198C  207F                     HLT                     ***  INSTRUCTION DRLC01 EXECUTION WAS WRONG
02852  198E  EA20                     CWK     A2,0
       1990  0000
02853  1992  5002                     RF(0)   *+4             JP IF (REG,A2) = 0
02854  1994  207F                     HLT                     ***  INSTRUCTION DRLC01 EXECUTION WAS WRONG
02855  1996  F03E                     RTN     A15             RETURN
02856
02857                          **
02858                          DRLC02  EQU     *
02859                          **
02860
02861  1998  A1C1                     ANS     A9,DRLC03
       199A  0000  F
02862  199C  9441                     ADS     A4,DRLC03
       199E  0000  F
02863  19A0  387F           DRLC03    DRL     31              DOUBLE LEFT LOGICAL SHIFT FOR N 16 TO 31
02864  19A2  5100  F                  RF(1)   DRLC04          JP IF CR RESULT > 0
02865  19A4  207F                     HLT                     ***  CR RESULT OF INSTRUCTION DRLC03 IS WRONG
02866                          DRLC04  EQU     *
02867  19A6  9440                     AD      A4,NBNSH
       19A8  0172
02868  19AA  B250                     XR      A2,ORGTB0-30,A4
       19AC  0000
02869  19AE  5002                     RF(0)   *+4             JP IF CR = 0
```

```
02870  1980  207F          HLT                  ***  INSTRUCTION DRLC03 EXECUTION WAS WRONG
02871  1982  E920          CWK     A4,0
       1984  0000
02872  1986  5002          RF(0)   *+4               JP IF (REG, A1) ≠ 0
02873  1988  207F          HLT                  ***  INSTRUCTION DRLC03 EXECUTION WAS WRONG
02874  198A  F03E          RTN     A15               RETURN
```

```
                              EJECT
 
                 ******       ******    ***************
                 **
                 *            TRORC     DRC INSTRUCTION TEST
                 **
                 ******       ******    *****************                              9G
 
                 TRORC        EQU       *
19BC  8120                    LDKL      A1,X'8000'
19BE  8000
19C0  0200                    LDK       A2,0
19C2  EC20                    CKK       A4,15
19C4  000F
19C6  5100  F                 RF(1)     DRC02            JP IF NUMBER OF SHIFTS > 15
19C8  A1C1                    ANS       A9,DRC01
19CA  0000  F
19CC  9441                    ADS       A4,DRC01
19CE  0000  F
19D0  38EF       DRC01        DRC       15               DOUBLE RIGHT CIRCULAR SHIFT FOR N = 1 TO 15
19D2  5F56                    RB(7)     DRLC01+2
                 DRC02        EQU       *
19D4  A1C1                    ANS       A9,DRC03
19D6  0000  F
19D8  9441                    ADS       A4,DRC03
19DA  0000  F
19DC  38FF       DRC03        DRC       31               DOUBLE RIGHT CIRCULAR SHIFT FOR N = 16 TO 31
19DE  5F3E                    RB(7)     DRLC03+2
                 MUTST        EQU       *
19E0  5700                    RF        *+2
19E2  9041                    IM        PASCT1
19E4  0176
19E6  5202                    RF(2)     INCR32           JP IF (COUNTER 1): PASCT1 = X'8000'
19E8  0FCA                    AB        X'CA'
19EA  7D7A       INCR32       LDK       A1,0
19EC  8141                    ST        A1,PASCT1
19EE  0176
19F0  9041                    IM        PASCT2
19F2  0178
19F4  0FCA                    AB        X'CA'            LOOP ON TEST
19F6  207F                    HLT
```

SYMBOL TABLE

BOOT	0000	R	ITROUT	0060	R	JAM	017A	A	ORGTB0	00CE	A
ORGTB1	00F0	A	ORGTB3	00F2	A	ORGTB4	00F8	A	MEMOR	0100	A
CMEMOR	010C	A	ORGTB2	0112	A	MEMSTK	011A	A	STKP	0140	A
NMOFML	0142	A	MLIAD	0144	A	INDEXN	0146	A	MLCNT	0148	A
SAVA4	014A	A	SAVA15	014C	A	N8NMS	014E	A	STAKMS	0150	A
STAKND	016C	A	MSIAD	016E	A	CCIAD	0170	A	N8NSH	0172	A
N8NSH1	0174	A	PASCT1	0176	A	PASCT2	0178	A	MLTST	017A	A
ML14RG	13CC	A	VEFYML	137C	A	MSTST	0396	A	SETM1	12F0	A
LD14RG	12BE	A	VEFYMS	1342	A	MLRTST	050C	A	MSRTST	0744	A
MSR1	0736	A	MSR2	0782	A	MSR3	07B2	A	MSR4	07CA	A
MSR5	07E2	A	MSR6	07FA	A	MSR7	0812	A	MSR8	082A	A
MSR9	0842	A	MSR10	085A	A	MSR11	0872	A	MSR12	088A	A
MSR13	08A2	A	MSR14	08BA	A	MSR15	08D2	A	VEFMS2	135E	A
MLKTST	08E4	A	MLKP3	08E4	A	MLKP12	0908	A	MLK3ST	0926	A
CRTMLK	092C	A	MLK12S	092A	A	MLKCR0	0934	A	MLKCR1	0954	A
MLK3	0972	A	MLK4	099E	A	MLK5	09BC	A	MLK6	09DC	A
MLK7	09FE	A	MLK8	0A22	A	MLK9	0A48	A	MLK10	0A70	A
MLK11	0A9A	A	MLK12	0AC6	A	MLK13	0AF4	A	MLK14	0B24	A
MLK15	0B56	A	CCTST	088A	A	CC1L0	0B90	A	CC1L2	0B98	A
CC1R0	0BA0	A	CC1R2	0BA8	A	CC2L0	0BB4	A	CC2L1	0BBC	A
CC2R0	0BC4	A	CC2R1	0BCC	A	CW1	0BD6	A	CC3L0	0BD8	A
CW2	0BE2	A	CC3R0	0BE4	A	CW3	0BEE	A	CC4XL0	0BF4	A
CW4	0BFE	A	CC4XR0	0C00	A	CC5IL0	0C14	A	CC5IR2	0C24	A
CW5	0C2E	A	CC6IXL	0C3C	A	CW6	0C46	A	CC6IXR	0C50	A
CCRTST	0C58	A	CCR2L0	0C5E	A	CCR3R0	0C68	A	CCR4L2	0C72	A
CCR5R2	0C7C	A	CCR7L0	0C8A	A	CCR8L1	0C98	A	CCR9R0	0CA2	A
CCR3R1	0CA8	A	CWR1	0CB0	A	CWR2	0CB4	A	CCR11Ø	0CC8	A
CCR102	0CCC	A	CCR120	0CD2	A	CCR132	0CD8	A	CCR100	0CDE	A
CCR111	0CE4	A	CCR130	0CEA	A	CCR121	0CF0	A	CCKTST	0CF6	A
CCK1L0	0CFC	A	CCK2L0	0D08	A	CCK3L0	0D14	A	CCK4L2	0D20	A
CCK5L0	0D28	A	CCK6L0	0D34	A	CCK7L0	0D44	A	CCK8L1	0D50	A
CCK9L2	0D58	A	CCK101	0D64	A	CCK112	0D70	A	CCK120	0D7C	A
CCK132	0D8C	A	CCK141	0D94	A	CCK150	0DA0	A	SLATST	0DA8	A
INISHI	1300	A	SSHCOM	13FE	A	SLA00	0D8A	A	SRATST	0DC8	A
SHCOM1	1400	A	SRA00	0DDE	A	SLLTST	0DEC	A	SLL00	0DFE	A
SRLTST	0E0C	A	SRL00	0E22	A	SLCTST	0E30	A	SLC00	0E48	A
SRCTST	0E56	A	FSRC	1516	A	SRC00	0E70	A	SLNTST	0E7E	A
SLN161	0E84	A	SLN160	0E96	A	SLN001	0EA8	A	SLN000	0EBE	A
SLN151	0ED2	A	SRNTST	0EE4	A	SRN000	0EEA	A	SRN160	0F05	A
SRN001	0F22	A	SRN141	0F40	A	SRN151	0F62	A	DLATST	0F78	A
DSHCOM	1600	A	DLAC07	0F8C	A	DLA00	0FAA	A	DRATST	0FC0	A
DHCOM1	1602	A	DRA00	0FDA	A	DLLTST	0FF0	A	DLL00	1006	A
DRLTST	101C	A	DRL00	1036	A	DLCTST	104C	A	DLC07	1066	A
DLC00	1084	A	DRCTST	109A	A	FORC	16CE	A	DRC07	10B8	A
DRC00	10D6	A	DLNTST	10EC	A	DLN151	10F4	A	DLN000	111C	A
DLN001	1146	A	DLN201	116C	A	DLNNN0	1192	A	DLNNN1	11AA	A
DRNTST	11C8	A	DRN301	11D2	A	DRN001	11FA	A	DRN310	1220	A
CDRN1	1242	A	DRN300	124C	A	CDRN2	1270	A	CDRN3	1280	A

CDRN4	128A	A	DRN15	1294	A	MUTST	19E0	A	EXEMS1	12D6	A
EXEMS2	12EA	A	SETM11	12F8	A	EXEVF1	1322	A	LOADA1	1332	A
VEFMS1	1316	A	VEFYM1	1350	A	EXEVML	1394	A	EXEVF1	13C0	A
EXEML1	13E4	A	EXEML2	13F8	A	FSR	14A0	A	FSR1	14A2	A
SLRCOM	14A4	A	STOSLR	1652	A	INISH	15C0	A	SLA11	14CE	A
SRC0	1516	A	SLC0	14CE	A	SLA21	14D8	A	SLA31	14E2	A
SLA41	14EC	A	SLA51	14F6	A	SLA61	1500	A	SLA71	150A	A
SRA11	1534	A	TBRIGH	1590	A	SRA21	153E	A	SRA31	1548	A
SRA41	1552	A	SRA51	155C	A	SRA61	1566	A	SRA71	1570	A
SRAC01	158E	A	SRC151	1584	A	TABSLA	15FE	A	TABSRA	160C	A
TABSLL	161A	A	TABSRL	1628	A	TABSLC	1636	A	TABSRC	1644	A
STOXR1	1656	A	STOSL1	166C	A	STOSL5	16A2	A	STOSL6	16C8	A
STOSL4	169C	A	STOSL3	168C	A	STOSL2	16B5	A	STOXR	16AA	A
STOXR2	16C6	A	DLRCOM	1820	A	DSH1	1814	A	DSH2	181E	A
TROLL	189A	A	TRFSR1	18D4	A	TROLA	1830	A	DLAC02	185A	A
DLAC01	183E	A	DLLC02	18AC	A	DLC02	18FE	A	DLAC03	186E	A
DLAC05	187C	A	DLAC04	1876	A	DLAC06	1884	A	DLLC01	18A8	A
DLLC03	18B4	A	DLLC05	18C2	A	DLLC06	18CA	A	TRORC	195C	A
TRORL	196A	A	TRORA	190A	A	TROLC	18E8	A	DLC01	18FA	A
DLC03	1906	A	DRAC02	1934	A	DRAC01	1918	A	DRAC03	193C	A
DRAC04	1944	A	DRAC05	194C	A	DRAC06	1954	A	DRLC02	1998	A
DRLC01	197C	A	DRLC03	19A0	A	DRLC04	19A6	A	DRC02	19D4	A
DRC01	19D0	A	DRC03	19DC	A						

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