SOMEMO

MEMORY TEST

FØR P850 MEMØRY SIZE > 512 WORDS
P860
P850 MEMØRY M.OS

21/04/1972

S

CØDE 12 NC 5111 19985371

TYPE ØF PAGE : 265

#**** CLOCK= / / AT H= M= S=

#!ASI

```
00000                    IDENT    SOMEMO
00001
00002
00003
00004          ******   ******   **********************
00005          **
00006          *        SOMEMO   MEMORY TEST FOR  ALPHA, GAMMA, ALPHA MEMORY MOS
00007          **
00008          ******   ******   **********************
00009
00010
00011          ******   ******   **********************
00012          **
00013          *        BEFORE TO START:
00014          *    1)  LOAD A1 REGISTER WITH THE MEMORY SIZE:
00015          *        X'03FE'  FOR 512 WORDS 16 BITS
00016          *        X'07FE'  FOR 1 K WORDS 16 BITS
00017          *        X'0FFE'  FOR 2 K WORDS 16 BITS
00018          *        X'1FFE'  FOR 4 K WORDS 16 BITS
00019          *        X'3FFE'  FOR 8 K WORDS 16 BITS
00020          *        X'7FFE'  FOR 16 K WORDS 16 BITS
00021          *        X'FFFE'  FOR 32 K WORDS 16 BITS
00022          *    2)  PUT INTO A2 REGISTER: THE COMPUTER TYPE AND THE STOP MODE ON ERROR:
00023          *      **COMPUTER TYPE
00024          *        IF BIT 0 OF A2 REGISTER = 1 IT MEANS: IT IS ALPHA COMPUTER
00025          *        IF BIT 0 OF A2 REGISTER = 0 IT MEANS: IT IS GAMMA COMPUTER
00026          *        IF BIT 1 OF A2 REGISTER = 1 IT MEANS: IT IS ALPHA COMPUTER MEMORY MOS
00027          *      **STOP MODE ON ERROR
00028          *        IF BIT 15 OF A2 REGISTER = 0 IT MEANS: ON ERROR THE PROGRAM STOPS ON
00029          *                                               HALT INSTRUCTION: X'207F'
00030          *        IF BIT 15 OF A2 REGISTER = 1 IT MEANS: ON ERROR THE PROGRAM STOPS ON
00031          *                                               R8(7)  * INSTRUCTION: X'5F02'
00032          **
00033          ******   ******   **********************
00034
00035
00036          ******   ******   **********************
00037          **
00038          *        START ADDRESS = X'0136'
00039          **
00040          ******   ******   **********************
```

Wed /16A

```
00041                                  EJECT
00042  0000                            ORG     **X'40'
00043                          ITPOWF  EQU     *
00044  0040  0000 R  0040              DATA    RITPW
00045  0042  0000 R  0040              DATA    RITPW
00046  0044  0000 R  0042              DATA    RITPW
00047  0046  0000 R  0044              DATA    RITPW
00048  0048  0000 R  0046              DATA    RITPW
00049  004A  0000 R  0048              DATA    RITPW
00050  004C  0000 R  004A              DATA    RITPW
00051  004E  0000 R  004C              DATA    RITPW
00052  0050  0000 R  004E              DATA    RITPW
00053  0052  0000 R  0050              DATA    RITPW
00054  0054  0000 R  0052              DATA    RITPW
00055  0056  0000 R  0054              DATA    RITPW
00056  0058  0000 R  0056              DATA    RITPW
00057  005A  0000 R  0058              DATA    RITPW
00058  005C  0000 R  005A              DATA    RITPW
00059  005E  0000 R  005C              DATA    RITPW
00060
00061  0060  0000                      CTN1    DATA    0
00062  0062  0000                      SAVA1   DATA    0       SAVE REGISTER A 1
00063  0064  0000                      SAVA2   DATA    0       SAVE REGISTER A 2
00064  0066  0000                      SAVA3   DATA    0       SAVE REGISTER A 3
00065  0068  0000                      SAVA4   DATA    0       SAVE REGISTER A 4
00066  006A  0000                      SAVA5   DATA    0       SAVE REGISTER A 5
00067  006C  0000                      SAVA6   DATA    0       SAVE REGISTER A 6
00068  006E  0000                      SAVA8   DATA    0       SAVE REGISTER A 8
00069  0070  0000                      SAVA9   DATA    0       SAVE REGISTER A 9
00070  0072  0000                      SAVA11  DATA    0       SAVE REGISTER A 11
00071  0074  0000                      SAVA12  DATA    0       SAVE REGISTER A 12
00072  0076  0000                      SAVA15  DATA    0       SAVE REGISTER A 15
00073  0078                            FLPOW   RES     1       POWER FAILURE AND AUTOMATIC RESTART FLAG
00074                                  *                       IF = 0 IT MEANS POWER FAILURE INTERRUPT
00075                                  *                       IF = 1 IT MEANS AUTOMATIC RESTART INTERRUPT
00076  007A  8000                      ITPWF   DATA    X'8000' POWER FAILURE AND AUTOMATIC RESTART INT. LINE
00077  007C  2710                      ITAUTR  DATA    M'2710'
```

```
00078                                   EJECT
00079
00080
00081                          ******   ******   **********************
00082                          **
00083                          *        RITPW    POWER FAILURE AND AUTOMATIC RESTART INTERRUPT ROUTINE
00084                          **
00085                          ******   ******   **********************
00086
00087                          RITPW    EQU      *
00088  007E  8740                      LD       A7,FLPOW
       0080  0078 R
00089  0082  5400              0082     RF(4)    RITPW1          JP IF AUTOMATIC RESTART INTERRUPT
00090  0084  8141                      ST       A1,SAVA1        SAVE A 1
       0086  0062 R
00091  0088  8241                      ST       A2,SAVA2        SAVE A 2
       008A  0064 R
00092  008C  8341                      ST       A3,SAVA3        SAVE A 3
       008E  0066 R
00093  0090  8441                      ST       A4,SAVA4        SAVE A 4
       0092  0068 R
00094  0094  8541                      ST       A5,SAVA5        SAVE A 5
       0096  006A R
00095  0098  8641                      ST       A6,SAVA6        SAVE A 6
       009A  006C R
00096  009C  80C1                      ST       A8,SAVA8        SAVE A 8
       009E  006E R
00097  00A0  81C1                      ST       A9,SAVA9        SAVE A 9
       00A2  0070 R
00098  00A4  83C1                      ST       A11,SAVA11      SAVE A 11
       00A6  0072 R
00099  00A8  84C1                      ST       A12,SAVA12      SAVE A 12
       00AA  0074 R
00100  00AC  87C1                      ST       A15,SAVA15      SAVE A 15
       00AE  0076 R
00101  00B0  4900                      RIL      A1
00102  00B2  E940                      CW       A1,ITPWF
       00B4  007A R
00103  00B6  5C02                      RB(4)    *               HALT IF INTERRUPT #-POWER-FAILURE
00104  00B8  0701                      LDK      A7,1
00105  00BA  8741                      ST       A7,FLPOW        SET FLPOW
       00BC  0078 R
00106  00BE  20EF                      RIT      X'17'
00107  00C0  5F02                      RB(7)    *               WAIT
00108                          RITPW1   EQU      *
00109  00C2  4900                      RIL      A1
00110  00C4  E940                      CW       A1,ITPWF
       00C6  007A R
00111  00C8  5C02                      RB(4)    *               HALT IF INTERRUPT #-AUTOMATIC RESTART
00112  00CA  0100                      LDK      A1,0
00113  00CC  8141                      ST       A1,CTN1
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                00CE  0060 R
00114                          RITPW2   EQU     *
00115           00D0  9041               CTN1
                00D2  0060 R
00116           00D4  8240               LD      A2,CTN1
                00D6  0060 R
00117           00D8  EA40               CW      A2,ITAUTR
                00DA  007C R
00118           00DC  5A0E               RB(2)   RITPW2          JP IF (ITAUTR) NOT REACH YET
00119           00DE  8140               LD      A1,SAVA1        RESTORE A 1
                00E0  0062 R
00120           00E2  8240               LD      A2,SAVA2        RESTORE A 2
                00E4  0064 R
00121           00E6  8340               LD      A3,SAVA3        RESTORE A 3
                00E8  0066 R
00122           00EA  8440               LD      A4,SAVA4        RESTORE A 4
                00EC  0068 R
00123           00EE  8540               LD      A5,SAVA5        RESTORE A 5
                00F0  006A R
00124           00F2  8640               LD      A6,SAVA6        RESTORE A 6
                00F4  006C R
00125           00F6  80C0               LD      A8,SAVA8        RESTORE A 8
                00F8  006E R
00126           00FA  81C0               LD      A9,SAVA9        RESTORE A 9
                00FC  0070 R
00127           00FE  83C0               LD      A11,SAVA11      RESTORE A 11
                0100  0072 R
00128           0102  84C0               LD      A12,SAVA12      RESTORE A 12
                0104  0074 R
00129           0106  87C0               LD      A15,SAVA15      RESTORE A 15
                0108  0076 R
00130           010A  0700               LDK     A7,0
00131           010C  8741               ST      A7,FLPOW        RESET FLPOW
                010E  0078 R
00132           0110  20EF               RIT     X'17'
00133           0112  F03E               RTN     A15             RETURN
```

```
00134                          EJECT
00135  0114                    MEMSTK  RES     10
00136                          STKP    EQU     *-2
00137  J128  0000              MEMSIZ  DATA    0               MEMORY SIZE
00138  012A  0000              TSTNUM  DATA    0               TEST NUMBER
00139  012C                    ACTADD  RES     1               ACTUAL ADDRESS
00140  012E                    FALGAM  RES     1               IF > 0 : ALPHA COMPUTER
00141                          *                               IF = 0 : GAMMA COMPUTER
00142                          *                               IF < 0 : ALPHA COMPUTER MEMORY MOS
00143  0130  0100              LOOP11  DATA    X'100'
00144  0132  0000              PASCT1  DATA    0               COUNTER 1
00145  0134  0000              PASCT2  DATA    0               COUNTER 2
```

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00146                                   EJECT
00147
00148                           ******  *  **********************
00149                           **
00150                           *       SCTN1   SECTION 1  BASE TEST
00151                           **
00152                           ******  ******  **********************
00153                           SCTN1   EQU     *
00154                           **
00155                           *       TSTN1   WRITE AND READ 0
00156                           **
00157                           BGTST   EQU     *
00158  0136  8241                       ST      A2,FALGAM
       0138  012E R
00159  013A  8141                       ST      A1,MEMSIZ
       013C  0128 R
00160  013E  8320                       LDKL    A3,X'207F'
       0140  207F
00161  0142  3AE1                       SRC1    A2
00162  0144  5600  0144                 RF(6)   BGTST1          JP IF HALT
00163  0146  8320                       LDKL    A3,X'5F02'
       0148  5F02
00164                           BGTST1  EQU     *
00165  014A  8341                       ST      A3,HALT1
       014C  0000 R 014A
00166  014E  8341                       ST      A3,HALT2
       0150  0000 R 014E
00167  0152  8341                       ST      A3,HALT3
       0154  0000 R 0152
00168  0156  8341                       ST      A3,HALT4
       0158  0000 R 0156
00169  015A  0100                       LDK     A1,0
00170  015C  8141                       ST      A1,FLPOW        RESET FLPOW
       015E  0078 R
00171  0160  8141                       ST      A1,PASCT1
       0162  0132 R
00172  0164  8141                       ST      A1,PASCT2
       0166  0134 R
00173  0168  4100                       WIM     A1
00174                           TSTN1   EQU     *
00175  016A  0101                       LDK     A1,1
00176  016C  87A0                       LDKL    A15,STKP
       016E  0126 R
00177  0170  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       0172  0000 R 0170
00178  0174  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
00179
00180                           **
00181                           *       TSTN2   WRITE AND READ 1
00182                           **
00183                           TSTN2   EQU     *
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00164  0176  0102                    LDK     A1,2
00165  0178  87A0                    LD      A15,STKP
       017A  0126 R
00166  017C  F7A1                    CF      A15,RDORHR      TO COMMON SHUNTING
       017E  0000 R - 0170
00167  0180  5700                    RF(7)   *+2             PASS IN ORDER TO DEBUGG.
```

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00188                                   EJECT
00189
00190                           ******  *  **********************
00191                           **
00192                           *       SCTN2   SECTION 2   DAMIER
00193                           **
00194                           ******  ******  **********************
00195
00196                           SCTN2   EQU     *
00197                           **
00198                           *       TSTN3   WRITE AND READ  X'AAAA',X'5555',X'AAAA', ETC
00199                           **
00200                           TSTN3   EQU     *
00201  0182  0103                       LDK     A1,3
00202  0184  87A0                       LDKL    A15,STKP
       0186  0126 R
00203  0188  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       018A  0000 R  017C
00204  018C  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00205                           **
00206                           *       TSTN4   WRITE AND READ  X'5555',X'AAAA',X'5555', ETC
00207                           **
00208
00209                           TSTN4   EQU     *
00210  018E  0104                       LDK     A1,4
00211  0190  87A0                       LDKL    A15,STKP
       0192  0126 R
00212  0194  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       0196  0000 R  0188
00213  0198  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
```

```
00214                                   EJECT
00215
00216                           ******  **********************
00217                           **
00218                           *       SCTN3   SECTION 3   WALKING COMPLEMENT
00219                           **
00220                           ******  ******  **********************
00221
00222                           SCTN3   EQU     *
00223                           **
00224                           *       TSTN5   16 PATTERNS INTO EACH ADDRESS. X'0001',X'0002',....X'8000'
00225                           **
00226                           TSTN5   EQU     *
00227  019A  0510                       LDK     A5,16
00228                           TSTN51  EQU     *
00229  019C  0105                       LDK     A1,5
00230  019E  87A0                       LDKL    A15,STKP
       01A0  0126 R
00231  01A2  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01A4  0000 R  0194
00232  01A6  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00233  01A8  9520                       ADKL    A5,-1
       01AA  FFFF
00234  01AC  5912                       RB(1)   TSTN51          JP IF TEST WITH 16 CONF. NOT FINISH
00235  01AE  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00236                           **
00237                           *       TSTN6   16 PATTERNS FOR EACH ADDRESS: X'FFFE',X'FFFD'....X'7FFF'.
00238                           **
00239
00240                           TSTN6   EQU     *
00241  01B0  0510                       LDK     A5,16
00242                           TSTN61  EQU     *
00243  01B2  0106                       LDK     A1,6
00244  01B4  87A0                       LDKL    A15,STKP
       01B6  0126 R
00245  01B8  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01BA  0000 R  01A2
00246  01BC  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00247  01BE  9520                       ADKL    A5,-1
       01C0  FFFF
00248  01C2  5912                       RB(1)   TSTN61          JP IF TEST WITH 16 CONF. NOT FINISH
00249  01C4  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
```

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00250                                   EJECT
00251
00252                           ******  **  **********************
00253                           **
00254                           *       SCTN4   SECTION 4       ADDRESS TEST
00255                           **
00256                           ******  ******  **********************
00257
00258                           SCTN4   EQU     *
00259                           **
00260                           *       TSTN7   ORDERLINESS INCREASE, WRITING THE VALUE OF THE ADDRESS
00261                           *                 INTO EACH ADDRESS,THEN CHECK EACH ADDRESS IMMEDIATLY
00262                           **
00263                           TSTN7   EQU     *
00264  01C6  0107                      LDK     A1,7
00265  01C8  87A0                      LDKL    A15,STKP
       01CA  0126 R
00266  01CC  F7A1                      CF      A15,RDORWR      TO COMMON SHUNTING
       01CE  0000 R  01B6
00267  01D0  5700                      RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00268                           **
00269                           *       TSTN8   ORDERLINESS INCREASE, READING THE CONTENTS OF EACH ADDRESS
00270                           **
00271
00272                           TSTN8   EQU     *
00273  01D2  0108                      LDK     A1,8
00274  01D4  87A0                      LDKL    A15,STKP
       01D6  0126 R
00275  01D8  F7A1                      CF      A15,RDORWR      TO COMMON SHUNTING
       01DA  0000 R  01CC
00276  01DC  5700                      RF(7)   *+2             PASS IN ORDER TO DEBUGG.
```

```
00277                                   EJECT
00278
00279                           **
00280                           *       TST.    ORDERLINESS DECREASE, WRITING THE V UE OF THE ADDRESS+2
00281                           *               INTO EACH ADDRESS,THEN CHECK EACH ADDRESS IMMEDIATLY
00282                           **
00283
00284                           TSTN9   EQU     *
00285  01DE  0109                       LDK     A1,9
00286  01E0  87A0                       LDKL    A15,STKP
       01E2  0126 R
00287  01E4  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01E6  0000 R  01D8
00288  01E8  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
00289                           **
00290                           *       TSTN10  ORDERLINESS DECREASE. READING THE CONTENTS OF EACH ADDRESS
00291                           **
00292
00293                           TSTN10  EQU     *
00294  01EA  010A                       LDK     A1,10
00295  01EC  87A0                       LDKL    A15,STKP
       01EE  0126 R
00296  01F0  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01F2  0000 R  01E4
00297  01F4  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
```

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00277                                   EJECT
00278
00279                           **
00280                           *       TST.    ORDERLINESS DECREASE, WRITING THE V _UE OF THE ADDRESS+2
00281                           *               INTO EACH ADDRESS,THEN CHECK EACH ADDRESS IMMEDIATLY
00282                           **
00283
00284                           TSTN9   EQU     *
00285  01DE  0109                       LDK     A1,9
00286  01E0  87A0                       LDKL    A15,STKP
       01E2  0126 R
00287  01E4  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01E6  0000 R  01D8
00288  01E8  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
00289                           **
00290                           *       TSTN10  ORDERLINESS DECREASE. READING THE CONTENTS OF EACH ADDRESS
00291                           **
00292
00293                           TSTN10  EQU     *
00294  01EA  010A                       LDK     A1,10
00295  01EC  87A0                       LDKL    A15,STKP
       01EE  0126 R
00296  01F0  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       01F2  0000 R  01E4
00297  01F4  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
```

```
00298                                   EJECT
00299
00300
00301                           ******  *  **********************
00302                           **
00303                           *       SCTN5   SECTION 5   ENDURANCE TEST
00304                           **
00305                           ******  ******  **********************
00306
00307                           SCTN5   EQU     *
00308
00309                           **
00310                           *       TSTN11  WRITING N TIMES, INTO MEMORY WITH THE VALUE X'FFFF',
00311                           *               THEN WRITING ONLY ONE TIME X'0000'. THEN CHECK
00312                           **
00313                           TSTN11  EQU     *
00314  01F6  84C0                       LD      A12,LOOP11
       01F8  0130 R
00315  01FA  8220                       LDKL    A2,X'FFFF'
       01FC  FFFF
00316  01FE  010B                       LDK     A1,11
00317  0200  87A0                       LDKL    A15,STKP
       0202  0126 R
00318  0204  F7A1                       CF      A15,SUBR11
       0206  0000 R  0204
00319  0208  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       020A  0000 R  01F0
00320  020C  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00321                           **
00322                           *       TSTN12  WRITING N TIMES, INTO MEMORY WITH THE VALUE X'0000',
00323                           *               THEN WRITING ONLY ONE TIME X'FFFF'. THEN CHECK
00324                           **
00325
00326                           TSTN12  EQU     *
00327  020E  84C0                       LD      A12,LOOP11
       0210  0130 R
00328  0212  0200                       LDK     A2,0
00329  0214  010C                       LDK     A1,12
00330  0216  87A0                       LDKL    A15,STKP
       0218  0126 R
00331  021A  F7A1                       CF      A15,SUBR11
       021C  0000 R  0204
00332  021E  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       0220  0000 R  0208
00333  0222  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
```

```
00334                                   EJECT
00335
00336                           ******  **  **********************
00337                           **
00338                           *       SCTN6   WORST CASE PATTERN TESTS
00339                           **
00340                           ******  ******  **********************
00341
00342                           SCTN6   EQU     *
00343                           **
00344                           *       TSTN13  WORST CASE = 0
00345                           **
00346                           TSTN13  EQU     *
00347  0224  010D                       LDK     A1,13
00348  0226  87A0                       LDKL    A15,STKP
       0228  0126 R
00349  022A  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       022C  0000 R  021E
00350  022E  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
00351
00352                           **
00353                           *       TSTN14  WORST CASE = 1
00354                           **
00355                           TSTN14  EQU     *
00356  0230  010E                       LDK     A1,14
00357  0232  87A0                       LDKL    A15,STKP
       0234  0126 R
00358  0236  F7A1                       CF      A15,RDORWR      TO COMMON SHUNTING
       0238  0000 R  022A
00359  023A  5700                       RF(7)   **2             PASS IN ORDER TO DEBUGG.
00360  023C  9041                       IM PASCT1
       023E  0132 R
00361  0240  5200      0240             RF(2)   TSTLOP          JP IF (PASCT1) = X'8000'
00362  0242  0100                       LDK     A1,0
00363  0244  8141                       ST      A1,PASCT1
       0246  0132 R
00364  0248  9041                       IM      PASCT2
       024A  0134 R
00365                           TSTLOP  EQU     *
00366  024C  8F20                       ABL     TSTN1
       024E  016A R
```

```
00367                                   EJECT
00368
00369                           ******  **  **********************
00370                           **
00371                           *       RDORWR - COMMON INITIALIZATION FOR TEST 1 TO
00372                           **
00373                           ******  ******  **********************
00374
00375                           RDORWR  EQU     *
00376  0250  80A0                       LDKL    A8,ENDTST
       0252  0000 R  0250
00377  0254  8141                       ST      A1,TSTNUM
       0256  012A R
00378  0258  3901                       SLA1    A1
00379  025A  5700                       RF(7)   *+2             - PASS IN ORDER TO DEBUGG.
00380  025C  8244                       LD      A2,PATTAB-2,A1
       025E  0000 R  025C
00381  0260  8F44                       ABI     SUBRWR-2,A1
       0262  0000 R  0260
```

```
00382                                   EJECT
00383
00384                           ******  ************************
00385                           **
00386                           *       PATTAB  PATTERN TABLE
00387                           **
00388                           ******  ******  ************************
00389
00390                           PATTAB  EQU     *
00391  0264  0000                       DATA    X'0000'         TEST  1
00392  0266  FFFF                       DATA    X'FFFF'         TEST  2
00393  0268  AAAA                       DATA    X'AAAA'         TEST  3
00394  026A  5555                       DATA    X'5555'         TEST  4
00395  026C  8000                       DATA    X'8000'         TEST  5
00396  026E  7FFF                       DATA    X'7FFF'         TEST  6
00397  0270  0500                       DATA    X'0500'         TEST  7
00398  0272  0500                       DATA    X'0500'         TEST  8
00399  0274  0500                       DATA    X'0500'         TEST  9
00400  0276  0500                       DATA    X'0500'         TEST 10
00401  0278  0000                       DATA    X'0000'         TEST 11
00402  027A  FFFF                       DATA    X'FFFF'         TEST 12
00403  027C  FFFF                       DATA    X'FFFF'         TEST 13  GAMMA
00404  027E  0000                       DATA    X'0000'         TEST 14 - GAMMA
00405  0280  FFFF                       DATA    X'FFFF'
00406  0282  FF00                       DATA    X'FF00'         TEST 13  ALPHA
00407  0284  00FF                       DATA    X'00FF'         TEST 14  ALPHA
00408  0286  FF00                       DATA    X'FF00'
00409
00410                           ******  ******  ************************
00411                           **
00412                           *       SUBRWR  WRITING SUBROUTINE TABLE
00413                           **
00414                           ******  ******  ************************
00415
00416                           SUBRWR  EQU     *
00417  0288  0000 R  0288               DATA    SUBRW1          WRITING  TEST 1
00418  028A  0000 R  0288               DATA    SUBRW1          WRITING  TEST 2
00419  028C  0000 R  028C               DATA    SUBRW3          WRITING  TEST 3
00420  028E  0000 R  028C               DATA    SUBRW3          WRITING  TEST 4
00421  0290  0000 R  0290               DATA    SUBRW5          WRITING  TEST 5
00422  0292  0000 R  0290               DATA    SUBRW5          WRITING  TEST 6
00423  0294  0000 R  0294               DATA    SUBRW7          WRITING AND READING  TEST 7
00424  0296  0000 R  0294               DATA    SUBRW7          READING  TEST 8
00425  0298  0000 R  0298               DATA    SUBRW9          WRITING AND READING  TEST 9
00426  029A  0000 R  0298               DATA    SUBRW9          READING  TEST 10
00427  029C  0000 R  028A               DATA    SUBRW1          WRITING  TEST 11
00428  029E  0000 R  029C               DATA    SUBRW1          WRITING  TEST 12
00429  02A0  0000 R  02A0               DATA    SUBR13          WRITING  TEST 13
00430  02A2  0000 R  02A0               DATA    SUBR13          WRITING  TEST 14
```

```
00431                                   EJECT
00432
00433
00434                          ******  **  ************************
00435                          **
00436                          *       SUBCK   READING SUBROUTINE TABLE
00437                          **
00438                          ******  ******  ************************
00439
00440                          SUBCK   EQU     *
00441  02A4  0000 R  02A4               DATA    SUBCK1          READING  TEST 1
00442  02A6  0000 R  02A4               DATA    SUBCK1          READING  TEST 2
00443  02A8  0000 R  02A8               DATA    SUBCK3          READING  TEST 3
00444  02AA  0000 R  02A8               DATA    SUBCK3          READING  TEST 4
00445  02AC  0000 R  02AC               DATA    SUBCK5          READING  TEST 5
00446  02AE  0000 R  02AC               DATA    SUBCK5          READING  TEST 6
00447  02B0  0000                       DATA    0               UNUSED
00448  02B2  0000                       DATA    0               UNUSED
00449  02B4  0000                       DATA    0               UNUSED
00450  02B6  0000                       DATA    0               UNUSED
00451  02B8  0000 R  02A6               DATA    SUBCK1          READING  TEST 11
00452  02BA  0000 R  02B8               DATA    SUBCK1          READING  TEST 12
00453  02BC  0000 R  02BC               DATA    SUBC13          READING  TEST 13
00454  02BE  0000 R  02BC               DATA    SUBC13          READING  TEST 14
```

```
00455                                   EJECT
00456
00457                           ******  **  **********************
00458                           **
00459                           *       SUBRW1  WRITING FOR TEST 1,2,3,4,5,6,11,12
00460                           **
00461                           ******  ******  **********************
00462
00463                           SUBRW1  EQU     *
00464  02C0  90A0                       ADKL    A8,2
       02C2  0002
00465                           SUBW11  EQU     *
00466  02C4  80C1                       ST      A8,ACTADD
       02C6  012C R
00467  02C8  8261                       ST*     A2,ACTADD
       02CA  012C R
00468  02CC  E8C0                       CW      A8,MEMSIZ
       02CE  0128 R
00469  02D0  8C44                       ABI(4)  SUBRWR-2,A1
       02D2  0286 R
00470  02D4  80A0                       LDKL    A8,ENDTST
       02D6  0000 R  0250
00471  02D8  8244                       LD      A2,PATTAB-2,A1
       02DA  0262 R
00472  02DC  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00473  02DE  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00474  02E0  8F44                       ABI     SUBCK-2,A1
       02E2  02A2 R
```

```
00475                                   EJECT
00476
00477                           ******  *  **********************
00478                           **
00479                           *       SUBCK1  READING  FOR TEST 1,2,3,4,5,6,11,12
00480                           **
00481                           ******  ******  **********************
00482
00483                           SUBCK1  EQU     *
00484  02E4  90A0                       ADKL    A8,2
       02E6  0002
00485                           SUCK1   EQU     *
00486  02E8  80C1                       ST      A8,ACTADD
       02EA  012C R
00487  02EC  8460                       LD*     A4,ACTADD
       02EE  012C R
00488  02F0  EC08                       CWR     A4,A2
00489  02F2  5000    02F2       HALT1   RF(0)   SUCK2           JP IF CHECK OK
00490  02F4  207F                       HLT                     STOP ON ERROR
00491  02F6  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00492  02F8  8F20                       ABL     ERRTRT          TO ERROR TREATMENT
       02FA  0000 R  02F8
00493                           SUCK2   EQU     *
00494  02FC  E8C0                       CW      A8,MEMSIZ
       02FE  0128 R
00495  0300  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00496  0302  8C44                       ABI(4)  SUBCK-2,A1
       0304  02A2 R
00497  0306  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00498  0308  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00499  030A  F03E                       RTN     A15             RETURN
```

```
00500                                  EJECT
00501
00502                                  ******  **  **********************
00503                                  **
00504                                  *       ERRTRT  ERROR TREATMENT
00505                                  **
00506                                  ******  ******  **********************
00507
00508                                  ERRTRT  EQU     *
00509  030C  6261                             ST*     A2,ACTADD
       030E  012C R
00510  0310  90A0                             ADKL    A8,-2
       0312  FFFE
00511  0314  5700                             RF(7)   **2             PASS IN ORDER TO DEBUGG.
00512  0316  8F44                             ABI     SUBCK-2,A1
       0318  02A2 R
00513
00514                                  ******  ******  **********************.
00515                                  **
00516                                  *       SUBRW3  WRITING FOR TEST 3 AND 4
00517                                  **
00518                                  ******  ******  **********************
00519
00520                                  SUBRW3  EQU     *
00521  031A  3AE1                             SRC1    A2
00522  031C  5700                             RF(7)   **2             PASS IN ORDER TO DEBUGG.
00523  031E  8F20                             ABL     SUBRW1
       0320  02C0 R
00524
00525                                  ******  ******  **********************
00526                                  **
00527                                  *       SUBCK3  READING FOR TEST 3 AND 4
00528                                  **
00529                                  ******  ******  **********************
00530
00531                                  SUBCK3  EQU     *
00532  0322  3AE1                             SRC1    A2
00533  0324  5700                             RF(7)   **2             PASS IN ORDER TO DEBUGG.
00534  0326  8F20                             ABL     SUBCK1
       0328  02E4 R
```

```
00535                                   EJECT
00536
00537                           ******  **  ******************************
00538                           **
00539                           *       SUBRW5  WRITING FOR TEST 5 AND 6
00540                           **
00541                           ******  ******  ******************************
00542
00543                           SUBRW5  EQU     *
00544  032A  8244                      LD      A2,PATTAB-2,A1
       032C  0262 R
00545  032E  5700                      RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00546  0330  8614                      LDR     A6,A5
00547                           SUBW51  EQU     *
00548  0332  9620                      ADKL    A6,-1
       0334  FFFF
00549  0336  5D78                      RB(5)   SUBRW1          JP IF PATTERN REACH.
00550  0338  3AE1                      SRC1    A2
00551  033A  5F0A                      RB(7)   SUBW51
00552
00553                           ******  ******  ******************************
00554                           **
00555                           *       SUBCK5  READING FOR TEST 5 AND 6.
00556                           **
00557                           ******  ******  ******************************
00558
00559                           SUBCK5  EQU     *
00560  033C  8244                      LD      A2,PATTAB-2,A1
       033E  0262 R
00561  0340  5700                      RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00562  0342  8614                      LDR     A6,A5
00563                           SUBC51  EQU     *
00564  0344  9620                      ADKL    A6,-1
       0346  FFFF
00565  0348  5D66                      RB(5)   SUBCK1          JP IF PATTERN REACH.
00566  034A  3AE1                      SRC1    A2
00567  034C  5F0A                      RB(7)   SUBC51
```

```
00568                                   EJECT
00569
00570                           ******  **  **********************
00571                           **
00572                           *       SUBRW7  WRITING AND READING FOR TEST 7, READING ONLY FOR TEST 8
00573                           **
00574                           ******  ******  **********************
00575
00576                                   SUBRW7  EQU     *
00577  034E  90A0                              ADKL    A8,2
       0350  0002
00578  0352  80C1                              ST      A8,ACTADD
       0354  012C R
00579  0356  8240                              LD      A2,TSTNUM
       0358  012A R
00580  035A  EA20                              CWK     A2,8
       035C  0008
00581  035E  5000      035E                    RF(0)   SUBR71          JP IF TEST 8
00582  0360  80E1                              ST*     A6,ACTADD
       0362  012C R
00583  0364  5700                              RF(7)   *+2             PASS IN ORDER TO DEBUGG,
00584  0366  5700                              RF(7)   *+2             PASS IN ORDER TO DEBUGG,
00585                                   SUBR71  EQU     *
00586  0368  8460                              LD*     A4,ACTADD
       036A  012C R
00587  036C  EC02                              CWR     A4,A8
00588  036E  5000      036E                    RF(0)   SUBR72          JP IF (ADDRESS) # VALUE OF THIS ADDRESS
00589  0370  207F              HALT2           HLT                     (ADDRESS) # VALUE OF THIS ADDRESS
00590  0372  90A0                              ADKL    A8,-2
       0374  FFFE
00591  0376  5F2A                              RB(7)   SUBRW7
00592                           SUBR72  EQU     *
00593  0378  E8C0                              CW      A8,MEMSIZ
       037A  0128 R
00594  037C  5C30                              RB(4)   SUBRW7          JP IF MEMORY TEST NOT FINISH
00595  037E  5700                              RF(7)   *+2             PASS IN ORDER TO DEBUGG,
00596  0380  5700                              RF(7)   *+2             PASS IN ORDER TO DEBUGG,
00597  0382  F03E                              RTN     A15             RETURN
```

```
00598                                    EJECT
00599
00600                          ******    **.   **********************
00601                          **
00602                          *         SUBRW9  WRITING AND READING FOR TEST 9. READING ONLY FOT TEST 10
00603                          **
00604                          ******    ******  **********************
00605
00606                          SUBRW9    EQU     *
00607  0384  80C0                       LD      A8,MEMSIZ
       0386  0128 R
00608  0388  80C1                       ST      A8,ACTADD
       038A  012C R
00609                          SUBR91    EQU     *
00610  038C  80C0                       LD      A8,ACTADD
       038E  012C R
00611  0390  90A0                       ADKL    A8,-2
       0392  FFFE
00612  0394  80C1                       ST      A8,ACTADD
       0396  012C R
00613  0398  8240                       LD      A2,TSTNUM
       039A  012A R
00614  039C  90A0                       ADKL    A8,2
       039E  0002
00615  03A0  EA20                       CWK     A2,10
       03A2  000A
00616  03A4  5000  03A4                 RF(0)   SUBR92          JP IF TEST 10
00617  03A6  80E1                       ST*     A8,ACTADD
       03A8  012C R
00618  03AA  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00619                          SUBR92    EQU     *
00620  03AC  8460                       LD*     A4,ACTADD
       03AE  012C R
00621  03B0  EC02                       CWR     A4,A8
00622  03B2  5000  03D2                 RF(0)   SUBR93          JP IF (ADDRESS) # VALUE OF THIS ADDRESS+2
00623  03B4  207F                HALT3  HLT                     (ADDRESS) # VALUE OF THIS ADDRESS+2
00624  03B6  0302                       LDK     A3,2
00625  03B8  9341                       ADS     A3,ACTADD
       03BA  012C R
00626  03BC  5F32                       RB(7)   SUBR91
00627                          SUBR93    EQU     *
00628  03BE  E8A0                       CWK     A8,ENDTST+2
       03C0  0000 R  02D4
00629  03C2  5C38                       RB(4)   SUBR91          JP IF MEMORY TEST NOT FINISH
00630  03C4  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00631  03C6  5700                       RF(7)   *+2             PASS IN ORDER TO DEBUGG.
00632  03C8  F03E                       RTN     A15             RETURN
```

```
00633                                   EJECT
00634
00635                           ******  **  **********************
00636                           **
00637                           *       SUBR11  WRITING N TIMES FOR TEST 11 AND 12
00638                           **
00639                           ******  ******  **********************
00640
00641                           SUBR11  EQU     *
00642  03CA  80A0                       LDKL    A8,ENDTST
       03CC  0000 R - 03DE
00643                           SUB111  EQU     *
00644  03CE  90A0                       ADKL    A8,2
       03D0  0002
00645  03D2  80C1                       ST      A8,ACTADD
       03D4  012C R
00646  03D6  8261                       ST*     A2,ACTADD
       03D8  012C R
00647  03DA  E8C0                       CW      A8,MEMSIZ
       03DC  0128 R
00648  03DE  5C12                       RB(4)   SUB111
00649  03E0  94A0                       ADKL    A12,-1
       03E2  FFFF
00650  03E4  5C1C                       RB(4)   SUBR11
00651  03E6  F03E                       RTN     A15             RETURN
```

```
00652                                   EJECT
00653
00654                           ******  **      **********************
00655                           **
00656                           *       SUBR13  WRITING FOR TEST 13 AND 14
00657                           **
00658                           ******  ******  **********************
00659
00660  03E8  00C0                WORST1  DATA    X'00C0'         WORST CASE FOR GAMMA
00661  03EA  0200                WORST2  DATA    X'0200'         WORST CASE FOR ALPHA
00662  03EC                      RDFLG   RES     1               READING FLAG
00663                           SUBR13  EQU     *
00664  03EE  8141                        ST      A1,RDFLG
       03F0  03EC R
00665                           SUBC13  EQU     *
00666  03F2  90A0                        ADKL    A8,2
       03F4  0002
00667  03F6  80C1                        ST      A8,ACTADD
       03F8  012C R
00668  03FA  8182                        LDR     A9,A8
00669  03FC  82C0                        LD      A10,FALGAM
       03FE  012E R
00670  0400  5000    0400                RF(0)   SUB133          JP IF GAMMA COMPUTER
00671  0402  A1C0                        AN      A9,WORST2
       0404  03EA R
00672  0406  5000  0406                  RF(0)   SUB139          JP IF WORST CASE ALPHA
00673  0408  8244                        LD      A2,PATTAB+4,A1
       040A  0268 R
00674  040C  5700    040C                RF(7)   SUB138
00675                           SUB131  EQU     *
00676  040E  8244                        LD      A2,PATTAB-2,A1
       0410  0262 R
00677                           SUB138  EQU     *
00678  0412  83C0                        LD      A11,RDFLG
       0414  03EC R
00679  0416  5500  0416                  RF(5)   SUB134          JP IF READING
00680  0418  8261                        ST*     A2,ACTADD
       041A  012C R
00681                           SUB135  EQU     *
00682  041C  E8C0                        CH      A8,MEMSIZ
       041E  0128 R
00683  0420  8C44                        ABI(4)  SUBRWR-2,A1
       0422  0286 R
00684                           SUB136  EQU     *
00685  0424  0400                        LDK     A4,0
00686  0426  8441                        ST      A4,RDFLG
       0428  03EC R
00687  042A  80A0                        LDKL    A8,ENDTST
       042C  0000 R  03CA
00688  042E  8244                        LD      A2,PATTAB-2,A1
       0430  0262 R
```

```
00689  0432  8F44                    ABI     SUBCK=2,A1
       0434  02A2 R
00690                        SUB132  EQU     *
00691  0436  8244                    LD      A2,PATTAB,A1
       0438  0264 R
00692  043A  5F2A                    RB(7)   SUB138
00693                        SUB134  EQU     *
00694  043C  8460                    LD*     A4,ACTADD
       043E  012C R
00695  0440  EC08                    CWR     A4,A2
00696  0442  5000            0442    RF(0)   SUB137          JP IF READING OK
00697  0444  207F            HALT4   HLT                     HALT ON ERROR
00698  0446  8F20                    ABL     ERRTRT
       0448  030C R
00699                        SUB137  EQU     *
00700  044A  E8C0                    CW      A8,MEMSIZ
       044C  0128 R
00701  044E  8C44                    ABI(4)  SUBCK=2,A1
       0450  02A2 R
00702  0452  F03E                    RTN     A15             RETURN
00703                        SUB133  EQU     *
00704  0454  A1C0                    AN      A9,WORST1
       0456  03E0 R
00705  0458  5824                    RB(0)   SUB132          JP IF WORST CASE
00706  045A  E9C0                    CW      A9,WORST1
       045C  03E8 R
00707  045E  582A                    RB(0)   SUB132          JP IF WORST CASE
00708  0460  8244                    LD      A2,PATTAB-2,A1
       0462  0262 R
00709  0464  5F58                    RB(7)   SUB131
00710                        SUB139  EQU     *
00711  0466  8244                    LD      A2,PATTAB+6,A1
       0468  026A R
00712  046A  5F5A                    RB(7)   SUB138
00713                        ENDTST  EQU     *
00714                                END
ASS.ERR. 00000
```

SYMBOL	**VALUE*		**SYMBOL**	**VALUE*		**SYMBOL**	**VALUE*	
SUB137	044A	R	SUB132		R	SUB136	0424	UN
SUB1?	041C	UNUSED	SUB134		R	SUB131	040E	R
SUB13.	0412	R	SUB139	04a6	R	SUB133	0454	R
RDFLG	03EC	R	WORST2	03EA	R	WORST1	03E8	R
SUB111	03CE	R	SUBR93	038E	R	SUBR92	03AC	R
SUBR91	038C	R	SUBR72	0378	R	SUBR71	0368	R
SUBC51	0344	R	SUBW51	0332	R	ERRTRT	030C	R
SUCK2	02FC	R	SUCK1	02E8	UNUSED	SUBW11	02C4	UNUSED
SUBC13	03F2	R	SUBCK5	033C	R	SUBCK3	0322	R
SUBCK1	02E4	R	SUBCK	02A4	R	SUBR13	03EE	R
SUBRW9	0384	R	SUBRW7	034E	R	SUBRW5	032A	R
SUBRW3	031A	R	SUBRW1	02C0	R	SUBRWR	0288	R
PATTAB	0264	R	ENDTST	046C	R	TSTLOP	024C	R
TSTN14	0230	UNUSED	TSTN13	0224	UNUSED	SCTN6	0224	UNUSED
TSTN12	020E	UNUSED	SUBR11	03CA	R	TSTN11	01F6	UNUSED
SCTN5	01F6	UNUSED	TSTN10	01EA	UNUSED	TSTN9	01DE	UNUSED
TSTN8	01D2	UNUSED	TSTN7	01C6	UNUSED	SCTN4	01C6	UNUSED
TSTN61	01B2	R	TSTN6	01B0	UNUSED	TSTN51	019C	R
TSTN5	019A	UNUSED	SCTN3	019A	UNUSED	TSTN4	018E	UNUSED
TSTN3	0182	UNUSED	SCTN2	0182	UNUSED	TSTN2	0176	UNUSED
RDORWR	0250	R	TSTN1	016A	R	HALT4	0444	R
HALT3	0384	R	HALT2	0370	R	HALT1	02F4	R
BGTST1	014A	R	BGTST	0136	UNUSED	SCTN1	0136	UNUSED
PASCT2	0134	R	PASCT1	0132	R	LOOP11	0130	R
FALGAM	012E	R	ACTADD	012C	R	TSTNUM	012A	R
MEMSIZ	0128	R	STKP	0126	R	MEMSTK	0114	UNUSED
RITPW2	00D0	R	RITPW1	00C2	R	ITAUTR	007C	R
ITPWF	007A	R	FLPOW	0078	R	SAVA15	0076	R
SAVA12	0074	R	SAVA11	0072	R	SAVA9	0070	R
SAVA8	006E	R	SAVA6	006C	R	SAVA5	006A	R
SAVA4	0068	R	SAVA3	0066	R	SAVA2	0064	R
SAVA1	0062	R	CTN1	0060	R	RITPW	007E	R
ITPOWF	0040	UNUSED	A15	000F	A	A14	000D	UNUSED
A13	000B	UNUSED	A12	0009	A	A11	0007	A
A10	0005	A	A9	0003	A	A8	0001	A
A7	000E	A	A6	000C	A	A5	000A	A
A4	0008	A	A3	0006	A	A2	0004	A
A1	0002	A						