```
0001  * NAME: AB16-CCT4   DOC 70180658000 REV H                                  0001
0002  *                                                                          0002
0003  * DESCRIPTION: H316, DDP-516/716 CENTRAL PROCESSOR TEST                    0003
0004  *                                                                          0004
0005  *                                                                          0005
0006  * REVISION HISTORY:                                                       0006
0007  *    REV        DATE            ECO NO.                                   0007
0008  *                                                                          0008
0009  *     H        04-24-73                                                   0009
0010  *     G        08-29-72                                                   0010
0011  *     F        03-08-72                                                   0011
0012  *     E        06-02-71          9597                                     0012
0013  *     D        03-31-71          9394   (016-CCT4)                        0013
0014  *     C        02-06/70          7929   (016-CCT3)                        0014
0015  *     B        05-27-69          7098                                     0015
0016  *     A         --                --                                      0016
0017  *                                                                          0017
0018  *                                                                          0018
0019  *                                                                          0019
0020  *                                                                          0020
0021  *                                                                          0021
0022  *                                                                          0022
0023  *                                                                          0023
0024  *                                                                          0024
0025  *                                                                          0025
0026  *                                                                          0026
0027  *                                                                          0027
0028  *                                                                          0028
0029  *                                                                          0029
0030  * COPYRIGHT 1973 BY HONEYWELL INFORMATION SYSTEMS INC.                     0030
0031  *                                                                          0031
0032  * XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX 0032
0033  *                                                                          0033
0034       EJCT                                                                0034
```

APPROVED REVISION
REV. "H"
ECO NO N/A
DATE 21 JUNE 73


```
0035  * PURPOSE                                                                 0035
0036  *                                                                         0036
0037  *    COMPREHENSIVE TEST OF STANDARD INSTRUCTION SET FOR HONEYWELL 316,    0037
0038  *    516 AND 716 COMPUTERS                                                0038
0039  *                                                                         0039
0040  *                                                                         0040
0041  *    THIS PROGRAM IS INTENDED TO BE DISTRIBUTED IN A BINARY               0041
0042  *    (SELF-LOADING) FORM.  EITHER PAL-AP (FOR PAPER TAPE) OR PALC         0042
0043  *    (FOR CARDS) FORMAT IS SUITABLE. THE LINKED TEXT LOADER               0043
0044  *    CANNOT BE USED.  THE PROGRAM IS COMPLETE AS LOADED AND NO            0044
0045  *    EXTERNAL LIBRARIES ARE REQUIRED.                                     0045
0046  *                                                                         0046
0047  *                                                                         0047
0048  * RESTRICTIONS                                                            0048
0049  *                                                                         0049
0050  *    NONE                                                                 0050
0051  *                                                                         0051
0052  *                                                                         0052
0053  * STORAGE                                                                 0053
0054  *                                                                         0054
0055  *    USES AND TESTS ALL OF THE COMPUTER MEMORY, UPTO 32K.                 0055
0056  *                                                                         0056
0057  *                                                                         0057
0058  * TIME                                                                    0058
0059  *                                                                         0059
0060  *    APPROXIMATE TIME FOR ONE PASS (SW.1 RESET)                           0060
0061  *                                                                         0061
0062  *    716  -  2.0 MINUTES                                                  0062
0063  *    516  -  2.5 MINUTES                                                  0063
0064  *    316  -  4.0 MINUTES                                                  0064
0065  *                                                                         0065
0066  *                                                                         0066
0067  * METHOD                                                                  006
0068  *                                                                         0C
0069  *    LOAD THE PROGRAM AND START EXECUTION AT '1000.                       0^
0070  *                                                                         0.
0071  *    THE AB16-CCT4 TEST PROGRAM IS A STAND-ALONE PROGRAM CONS             0
```

```
0072    *    OF SUBROUTINES WHICH HAVE BEEN BOUND TOGETHER BY A CONTROL          0072
0073    *    ROUTINE.  THE SUBROUTINES HAVE BEEN DIVIDED INTO SEVEN SECTOR       0073
0074    *    TESTS.  THE FIRST FIVE SECTOR TESTS ARE RUN IN PLACE FIRST AND      0074
0075    *    THEN THE PROGRAM DETERMINES IF CPU IS 716.  IF IT IS, THE PROGRAM   0075
0076    *    IS INITIALIZED TO HANDLE 7 SECTOR TESTS.  IF IT IS A 316 OR         0076
0077    *    A 516, ONLY THE FIRST 5 SECTOR TESTS ARE INITIALIZED.  IN EITHER    0077
0078    *    CASE, THE TESTS ARE RELOCATED TO HIGHER SECTORS AND RUN THERE.      0078
0079    *    AFTER EACH END-OF-PASS, A PASS COUNT IS TYPED AND THE TESTS ARE     0079
0080    *    RESTARTED AUTOMATICALLY.                                            0080
0081    *                                                                        0081
0082    *    SETTING OF SENSE SWITCH 1 ALLOWS TO RUN THE TESTS IN PLACE.         0082
0083    *    ON SUCCESSFUL RUN IN PLACE, A CR IS OUTPUT TO THE TELETYPE AND      0083
0084    *    THE PROGRAM CONTINUES TO EXECUTE IN PLACE.                          0084
0085    *                                                                        0085
0086    *    RESETTING OF SENSE SWITCH 1 WILL REINITIALISE THE PROGRAM TO        0086
0087    *    RUN THE TESTS IN ALL SECTORS, AND THE ABOVE TIMES WILL APPLY.       0087
0088    *                                                                        0088
0089    *                                                                        0089
0090    *    IF THE PROGRAM DETERMINES THAT THE MEMORY SIZE IS LARGER THAN       0090
0091    *    16K, THEN AFTER EXECUTION OF THE TESTS IN ALL SECTORS UPTO 37,      0091
0092    *    THE FIRST FIVE (OR SEVEN) SECTORS CONTAINING THE MAIN PROGRAM ARE   0092
0093    *    RELOCATED TO THE UPPER HALF OF MEMORY STARTING AT '40000 AND        0093
0094    *    CONTROL IS TRANSFERRED TO THE EXECUTIVE IN THE 40TH SECTOR.         0094
0095    *    AFTER THE TESTS HAVE RUN IN THE UPPER  HALF OF MEMORY, CONTROL      0095
0096    *    IS AGAIN TRANSFERRED TO THE LOW 16K WHERE THE MAIN PROGRAM RESIDES  0096
0097    *    PERMANENTLY.                                                        0097
0098    *                                                                        0098
0099    *                                                                        0099
0100    *    SENSE SWITCH USE                                                    0100
0101    *                                                                        0101
0102    *          SENSE SWITCH 1 - SET:   TESTS IN PLACE AND OUTPUTS A CR ON    0102
0103    *                                  COMPLETION OF TESTS AND STARTS AGAIN  0103
0104    *                                                                        0104
0105    *                          RESET:  PROGRAM RELOCATES ITSELF AND TESTS    0105
0106    *                                  RUN IN ALL SECTORS CONTINUOUSLY.      0106
0107    *                                                                        0107
0108    *          SENSE SWITCH 2 - SET:   PGM HALTS AFTER EACH E.O.P            0108
```



```
0109    *                                                                        0109
0110    *                          RESET: NOT USED                               0110
0111    *                                                                        0111
0112    *          SENSE SWITCH 3 - NOT USED                                     0112
0113    *                                                                        0113
0114    *          SENSE SWITCH 4 - NOT USED                                     0114
0115    *                                                                        0115
0116    *                                                                        0116
0117    *    THE SENSE SWITCH TEST IS PERFORMED BY SETTING THE SENSE SWITCH      0117
0118    *    AND THEN PRESSING THE START BUTTON. CHECK A REG FOR RESULTS.        0118
0119    *    A REG WILL SHOW BITS 1, 2, 3 OR 4 CORRESPONDING TO THE SWITCHES     0119
0120    *    SET. THUS IF BITS 2 AND 4 ARE ON THEN SWITCHES 2 AND 4 ARE SET.     0120
0121    *    IF NO BITS ARE ON THEN NO SWITCHES ARE SUPPOSED TO BE SET.          0121
0122    *    OR, IF YOU SET ANY SWITCH, THE LIGHT MUST COME ON, ELSE IT IS A     0122
0123    *    POSITIVE SWITCH FAILURE.                                            0123
0124    *    CHANGE EACH SENSE SWITCH FROM THE RESET CONDITION TO THE SET        0124
0125    *    CONDITION AND THEN BACK TO RESET STATE, OBSERVING THE A REG         0125
0126    *    EVERY TIME.  AFTER EACH CHANGE OF POSITION THE START BUTTON MUST    0126
0127    *    BE PRESSED.  THIS WILL OCCUR EIGHT TIMES                            0127
0128    *                                                                        0128
0129    *    FOR H716, PFI/ARS FEATURE IS STANDARD AND AS SUCH, A TEST           0129
0130    *    HAS BEEN INCLUDED TO USE IT. THAT IS ANY TIME WHILE THE CPU         0130
0131    *    IS IN RUN MODE, YOU MAY SHUT THE MACHINE OFF AND BRING IT UP        0131
0132    *    AGAIN IN A FEW SECONDS, AND THE PROGRAM WILL AUTOMATICALLY          0132
0133    *    RESTART FROM LOC. 'STR2'.                                           0133
0134    *                                                                        0134
0135    *                                                                        0135
0136    *    ERROR INDICATIONS                                                   0136
0137    *                                                                        0137
0138    *    THE PROGRAM STOPS WHEREVER IT FINDS AN ERROR.  LOCATION '777        0138
0139    *    CONTAINS THE TEST NO. WHICH SHOWED THE FAILURE.  GOING TO THE       0139
0140    *    TEST IN THE LISTING  WOULD PIN-POINT THE EXACT LOCATION OF THE      0140
0141    *    ERROR IN CASE THE TEST WAS BEING RUN IN SOME HIGHER SECTOR.         0141
0142    *    IF THE TEST WAS RUNNING IN A SECTOR HIGHER THAN '40 AT THE          0142
0143    *    TIME OF ERROR, THEN LOCATION '40777 WILL GIVE THE TEST NO.          0143
0144    *                                                                        0144
0145    *                                                                        0145
```

```
0146                    *     INSTRUCTION TEST ARRANGEMENT:                                          0146
0147                    *                                                                            0147
0148                    *     ALL THE TESTS HAVE BEEN DIVIDED INTO SEVEN GROUPS                      0148
0149                    *     AND EACH GROUP HAS BEEN PLACED IN A SEPARATE SECTOR.  SECTOR           0149
0150                    *     ZERO CONTAINS THE CONTROL PROGRAM WHILE SECTORS 1 THROUGH 7            0150
0151                    *     CONTAIN THE 35 TESTS.  THESE SECTOR TESTS ARE RUN SEQUENTIALLY.        0151
0152                    *     BELOW ARE THE TESTS AS GROUPED IN VARIOUS SECTORS:                     0152
0153                    *                                                                            0153
0154                    *               TEST NO.   DESCRIPTION                          REFERENCE    0154
0155                    *                                                                            0155
0156                    *     SECTOR 1:   '14      GENERIC INSTRUCTIONS TEST            GENO        0156
0157                    *                 '17      LOCATION '0' AND XREG TRACTION       XRG0        0157
0158                    *                 '13      ADDITION TEST                        ADDS        0158
0159                    *                 '15      SENSE SWITCH TEST                    SWCH        0159
0160                    *                 '40      ADDER TEST 1                         ADD1        0160
0161                    *                                                                            0161
0162                    *     SECTOR 2:   '41      ADDER TEST 2                         ADD2        0162
0163                    *                 '42      ADDER TEST 3                         ADD3        0163
0164                    *                 '03      ADD-SUBTRACT TEST                    ADSB        0164
0165                    *                 '100     INDIRECT ADDRESSING TEST             INDA        0165
0166                    *                 '01      IMA INSTRUCTION TEST                 IMAA        0166
0167                    *                 '07      IAB INSTRUCTION TEST                 IABA        0167
0168                    *                 '05      IRS INSTRUCTION TEST                 IRSX        0168
0169                    *                 '02      ERA INSTRUCTION TEST                 ERAA        0169
0170                    *                 '04      ANA INSTRUCTION TEST                 ANAA        0170
0171                    *                 '06      CAS INSTRUCTION TEST                 CASA        0171
0172                    *                 '10      HALF WORD INSTRUCTIONS TEST          HWDT        0172
0173                    *                                                                            0173
0174                    *     SECTOR 3:   '11      STX AND LDX INST TEST                XREG        0174
0175                    *                 '12      INK, OTK INSTRUCTIONS TEST           KEYS        0175
0176                    *                 '60      ARS INSTRUCTION TEST                 ARSA        0176
0177                    *                 '61      ALS INSTRUCTION TEST                 ALSA        0177
0178                    *                 '62      LGL INSTRUCTION TEST                 LGLA        0178
0179                    *                 '63      LGR INSTRUCTION TEST                 LGRA        0179
0180                    *                 '64      ALR INSTRUCTION TEST                 ALRA        0180
0181                    *                 '65      ARR INSTRUCTION TEST                 ARRA        0181
0182                    *                 '66      LRS INSTRUCTION TEST                 LRSA        0182
```



```
0183                    *                                                                            0183
0184                    *     SECTOR 4:   '67      LLS INSTRUCTION TEST                 LLSA        0184
0185                    *                 '70      LLL INSTRUCTION TEST                 LLLA        0185
0186                    *                 '71      LRL INSTRUCTION TEST                 LRLA        0186
0187                    *                 '72      LLR INSTRUCTION TEST                 LLRA        0187
0188                    *                 '73      LRR INSTRUCTION TEST                 LRRA        0188
0189                    *                 '74      GENERAL SHIFTS TEST                  SFTA        0189
0190                    *                                                                            0190
0191                    *     SECTOR 5:   '16      ENB, INH INSTRUCTIONS TEST           IRUP        0191
0192                    *                 '101     S.P. MULTIPLY CAPABILITY TEST        MPYT        0192
0193                    *                 '102     S.P. DIVIDE CAPABILITY TEST          DIVT        0193
0194                    *                                                                            0194
0195                    *     SECTOR 6:   '103     716 INSTRUCTIONS TEST PART I         X13T        0195
0196                    *                                                                            0196
0197                    *     SECTOR 7:   '104     716 INSTRUCTIONS TEST PART II        X7IT        0197
0198                    *                                                                            0198
0199                    *                                                                            0199
0200                    ******************************************************************************0200
0201                    *                                                                            0201
0202                    *                                                                            0202
0203                    *                                                                            0203
0204                         CF7                                                                     0204
0205                         SETB  '102                                                              0205
0206                    *                                                                            0206
0207                         ORG   '120                                                              0207
0208                    *                                                                            0208
0209 00120   101000    NSRT NOP                    PATCH POINT                                      0209
0210 00121  -0 02 00445      LDA*  DMSG                                                             0210
0211 00122   0 10 00402      JST   TYPE            TYPE PROGRAM IDENTIFICATION                      0211
0212 00123   0 02 00520      LDA   ='130260                                                         0212
0213 00124   0 04 02747      STA   CNT5            INITIALIZE PASS COUNT                            0213
0214 00125   0 04 02750      STA   CNT5+1                                                           0214
0215 00126   0 02 00517      LDA   ='100063                                                         0215
0216 00127   0 04 00064      STA   '64             DAC* '63 AT LOC. '64                             0216
0217 00130  -0 10 00456      JST*  MOOV            SET UP FOR PI                                    0217
0218 00131   000013         DEC   11              INTERRUPT HANDLING ROUTINE                       0218
0219 00132   0 000064       DAC   '64                                                              0219
```

```
0220 00133   0 000065        DAC   '65                                                          0220
0221 00134   0 02 00516       LDA   ='177760                                                    0221
0222 00135   74 0120          SMK   '120          SET THE PI MASK                               0222
0223 00136  -0 10 00436       JST*  ONE           RUN THE FIRST                                 0223
0224 00137  -0 10 00437       JST*  TWO           FIVE SECTOR TESTS                             0224
0225 00140  -0 10 00440       JST*  THRI          BEFORE GOING TO CP                            0225
0226 00141  -0 10 00441       JST*  FOUR          IDENTIFICATION ROUTINE                        0226
0227 00142  -0 10 00442       JST*  FIVE                                                        0227
0228 00143   0 02 00460       LDA   DHSC                                                        0228
0229 00144   0 04 00215       STA   NXMV          INITIALIZE NXMV INSTRUCTION                   0229
0230 00145  -0 10 00447 IN00  JST*  HSCD          DETERMINE HIGHEST SECTOR AND TIME COMPENSAT   0230
0231                        *                     JST* HSCD BECOMES 'NOP' AFTER 1ST EXECUTION   0231
0232 00146  -0 01 00446       JMP*  X13S          TYPE CP TYPE AND MEMORY SIZE - BECOMES        0232
0233                        *                     A 'NOP' LATER                                 0233
0234 00147   101000          NOP                 HLT IF NEEDED                                 0234
0235 00150   0 02 00464       LDA   HISC          GET HIGHEST SECTOR                            0235
0236 00151   0 07 00515       SUB   ='40          TEST IF OVER '40 SECTORS                      0236
0237 00152   101400          SMI                 SKIP IF LESS THAN '40 SECTORS                 0237
0238 00153   0 01 00300       JMP   EA01          MORE THAN '40 SECTORS, GO TO EXT ROUT.        0238
0239 00154   0 02 00464       LDA   HISC                                                        0239
0240 00155   0 07 00514 IN01  SUB   =5            (SUB =7 IF CP IS 716)                         0240
0241 00156   100400          SPL                                                               0241
0242 00157   000000          HLT                 ERROR - SAID MEMORY IS LESS THAN 4K           0242
0243 00160   140407          TCA                                                               0243
0244 00161   0 04 00465       STA   HSCT          NEG COUNTER FOR ADDILIONAL SECTORS            0244
0245                        *                                                                 0245
0246                        *                                                                 0246
0247 00162   000011    STR2  DXA                                                               0247
0248 00163   0 01 00164       JMP   *+1           NORMAL ADDRESSING                             0248
0249 00164  -0 10 00436       JST*  ONE           TEST GROUP 1                                  0249
0250 00165  -0 10 00437       JST*  TWO           TEST GROUP 2                                  0250
0251 00166  -0 10 00440       JST*  THRI          TEST GROUP 3                                  0251
0252 00167  -0 10 00441       JST*  FOUR          TEST GROUP 4                                  0252
0253 00170  -0 10 00442       JST*  FIVE          TEST GROUP 5                                  0253
0254 00171  -0 10 00443 IN02  JST*  SIX           TEST GROUP 6 - NOP IF CP IS NOT 716           0254
0255 00172  -0 10 00444       JST*  SEVN          TEST GROUP 7 - NOP IF CP IS NOT 716           0255
0256 00173   101020          SS1                 IF SENSE SW.1 IS SET, TEST IN PLACE           0256
```



```
0257 00174   0 01 00200       JMP   *+4           IF RESET, JUMP AROUND FOR FULL TESTING        0257
0258 00175   0 02 00467       LDA   DCCR          TYPE CR FOR EOP IN PLACE                      0258
0259 00176   0 10 00402       JST   TYPE                                                        0259
0260 00177   0 01 00162 IN08  JMP   STR2          GO AND TEST IN PLACE                          0260
0261 00200   101000          NOP                 BECOMES 'JST EOPI' IF CP IS 716 AND MEM 4K    0261
0262 00201   101000          NOP                 BECOMES 'JMP STR2' IF CP IS 716 AND MEM 4K    0262
0263 00202   101000          NOP                                                               0263
0264 00203   101000          NOP                                                               0264
0265 00204   101000          NOP                                                               0265
0266 00205   101000          NOP                                                               0266
0267 00206   101000    IN09  NOP                 IF CP IS 716 AND MEMORY 20K, THEN AFTER       0267
0268                        *                     THE PROGRAM HAS MOVED TO THE 40TH SECTOR,     0268
0269                        *                     THE ABOVE 'NOP' BECOMES A 'JMP MVEB',         0269
0270                        *                     I.E. NO RELOCATION IS POSSIBLE IN THE         0270
0271                        *                     UPPER BANK WITH ONLY 20K OF MEMORY            0271
0272 00207   0 02 00513       LDA   ='1000        STORE SECTOR                                  0272
0273 00210   0 04 00430       STA   PNT1          LENGTH AT POINTER 1                           0273
0274 00211   0 02 00512 IN03  LDA   ='6000        (LDA ='10000 IF CP IS 716)                    0274
0275 00212   0 04 00431       STA   PNT2          STORE NEXT HIGHER SECTOR AT POINTER 2         0275
0276                        *                                                                 0276
0277 00213   0 02 00511 IN04  LDA   =-5          (LDA =-7 IF CP IS 716)                        0277
0278 00214   0 04 00427       STA   CN02          NO. OF SECTORS FOR TEST                       0278
0279 00215   0 02 00465 NXMV  LDA   HSCT          PUT ADDITIONAL SECTORS                        0279
0280 00216   0 04 00426       STA   CN01          AT CN01                                       0280
0281 00217   0 02 00430       LDA   PNT1          GET TEST SECTOR                               0281
0282 00220   0 04 00230       STA   DC01          STORE AT 'FROM' ADDRESS                       0282
0283 00221   0 02 00431       LDA   PNT2          GET HIGHER TEST SECTOR ADDRESS                0283
0284 00222   0 04 00231       STA   DC02          STORE AT 'TO' ADDRESS                         0284
0285 00223   0 04 00237       STA   DC03                                                        0285
0286 00224   0 06 00510       ADD   =1                                                          0286
0287 00225   0 04 00240       STA   DC04                                                        0287
0288 00226  -0 10 00456 MV01  JST*  MOOV          MOVE ONE THOUSAND                             0288
0289 00227   001000          OCT   1000          WORD BLOCK TEST SECTOR                        0289
0290 00230   0 000000  DC01  DAC   **            FROM HERE                                     0290
0291 00231   0 000000  DC02  DAC   **            TO HERE                                       0291
0292 00232  -0 10 00231       JST*  DC02          GO TO TEST IN HIGHER SECTOR                   0292
0293 00233   140040          CRA                                                               0293
```

```
0294 00234  -0 04 00237        STA*  DC03                                          0294
0295 00235  -0 10 00456        JST*  MOOV      ZERO OUT SECTOR JUST TESTED         0295
0296 00236   000777            OCT   777       NO. OF WORDS                        0296
0297 00237   0 000000   DC03  DAC   **        FROM 'HERE'                         0297
0298 00240   0 000000   DC04  DAC   **        TO 'HERE'                           0298
0299 00241   0 02 00231        LDA   DC02                                          0299
0300 00242   0 06 00513        ADD   ='1000    MODIFY FOR NEXT HIGHER SECTOR       0300
0301 00243   0 12 00426        IRS   CN01      DID WE TEST IN ALL THE SECTORS      0301
0302 00244   0 01 00222        JMP   MV01-4    NO, TEST IN THE NEXT SECTOR         0302
0303 00245   0 02 00430        LDA   PNT1      YES, MODIFY FOR NEXT                0303
0304 00246   0 06 00513        ADD   ='1000    TEST SECTOR TO BE EXECUTED          0304
0305 00247   0 04 00430        STA   PNT1      IN HIGHER SECTORS                   0305
0306 00250   0 12 00427        IRS   CN02      DID WE FINISH ALL TEST SECTORS      0306
0307 00251   0 01 00215        JMP   NXMV      NO, DO NEXT SECTOR                  0307
0308                     *                                                        0308
0309 00252   0 02 00424        LDA   EFL1      TEST EXT MODE FLAG 1                0309
0310 00253   100040            SZE                                               0310
0311 00254   0 01 00310        JMP   MVEA      IF SET, GO FOR TRANSFER TO '40 SECTOR 0311
0312 00255   0 02 00425        LDA   EFL2      TEST EXT FLAG 2                     0312
0313 00256   100040            SZE                                               0313
0314 00257   0 01 00330 D20L   JMP   MVEB      IF SET, GO TO LOWER HALF            0314
0315 00260   0 10 00335        JST   EOPI      PASS COUNT TYPEOUT                  0315
0316 00261   0 01 00162        JMP   STR2      REPEAT TESTS                        0316
0317                     *                                                        0317
0318                     *                                                        0318
0319                           EXD                                               0319
0320 00262   0 02 42747 RECY   LDA   CNT5+'40000  BRING THE CURRENT               0320
0321 00263   0 04 02747        STA   CNT5        PASS COUNT FROM UPPER            0321
0322 00264   0 02 42750        LDA   CNT5+'40001  BANK TO LOWER BANK              0322
0323 00265   0 04 02750        STA   CNT5+1                                       0323
0324                           LXD                                               0324
0325 00266   000011            DXA                                               0325
0326 00267   0 01 00270        JMP   *+1         NORMAL ADDRESSING                 0326
0327 00270   0 10 00335 IN10   JST   EOPI        END OF PASS TYPE OUT              0327
0328 00271   100010            SR2               IF SW.2 SET, HALT                 0328
0329 00272   000000            HLT                                               0329
0330 00273   140040            CRA                                               0330
```



```
0331 00274   0 04 00425        STA   EFL2                                        0331
0332 00275   0 02 00215        LDA   NXMV      MODIFY ADDRESS                    0332
0333 00276   0 07 00510        SUB   =1        FOR                               0333
0334 00277   0 04 00215        STA   NXMV      LOWER BANK                        0334
0335                     *                                                      0335
0336                     *                                                      0336
0337 00300   0 12 00424 EA01   IRS   EFL1      SET EXT MODE FLAG 1               0337
0338 00301   0 02 00506 IN07   LDA   =-26      (LDA =-24 IF CP IS 716) - SET UP TO TEST 0338
0339 00302   0 04 00465        STA   HSCT      IN THE FIRST '37 SECTORS          0339
0340 00303   0 02 00464        LDA   HISC      INITIALIZE TO TEST IN SECTORS HIGHER 0340
0341 00304   0 07 00505 IN05   SUB   ='45      THAN '45  (OR '47 IF CP IS 716)   0341
0342 00305   140407            TCA                                             0342
0343 00306   0 04 00466        STA   HSCT+1                                      0343
0344 00307   0 01 00162        JMP   STR2      GO TO MAIN TEST ROUTINE           0344
0345                     *                                                      0345
0346                     *                                                      0346
0347 00310   140040   MVEA     CRA             GO-TO-UPPER-MEMORY ROUTINE        0347
0348 00311   0 04 00424        STA   EFL1      RESET EXT MODE FLAG 1             0348
0349 00312   0 12 00425        IRS   EFL2      SET EXT FLAG 2                    0349
0350 00313   0 12 00215        IRS   NXMV      MODIFY ADDR FOR UPPER BANK        0350
0351 00314   0 02 00504        LDA   ='140063                                    0351
0352 00315   0 04 00063        STA   '63                                         0352
0353 00316   000013            EXA                                             0353
0354 00317  -0 10 00456        JST*  MOOV      MOVE THE TESTS TO 40TH SECTOR     0354
0355 00320   006000   IN06     OCT   6000      ('10000 IF CP IS 716)             0355
0356 00321   000000            OCT   0                                         0356
0357 00322   0 040000          DAC   '40000                                      0357
0358                           EXD                                             0358
0359 00323   0 01 40325        JMP   MVEB+'37775  HERE IT GOES TO 40TH SECTOR   0359
0360                           LXD                                             0360
0361                     *                                                     0361
0362                     *                                                     0362
0363 00324   0 005733   D20K   DAC   S47R      ADDRESS OF ROUTINE TO MODIFY PROGRAM 0363
0364                     *                     IF CP IS 716 AND MEMORY 20K.    0364
0365 00325   000011            DXA                                             0365
0366 00326   0 01 00327        JMP   *+1       NORMAL MODE                       0366
0367 00327  -0 01 00324        JMP*  D20K      TEST IF CP IS 716 AND MEMORY IS 20K 0367
```

```
0368 00330   000013      MVEB EXA                    GO-TO-LOWER-MEMORY ROUTINE                0368
0369 00331   0 02 00334        LDA   *+3                                                        0369
0370 00332   0 03 00507        ANA   ='176777         STRIP THE SECTOR BIT                      0370
0371 00333   0 04 00334        STA   *+1                                                        0371
0372 00334   0 01 00262        JMP   RECY             HERE IT GOES TO ZERO SECTOR               0372
0373                          *                                                                0373
0374                          *                                                                0374
0375                          *                                                                0375
0376                          *                                                                0376
0377                          *      END OF PASS ROUTINE                                       0377
0378                          *                                                                0378
0379 00335   0 000000    EOPI DAC   **                 END-OF-PASS ROUT.                         0379
0380 00336   0 02 00435        LDA   PCRT                                                       0380
0381 00337   0 04 00434        STA   CNTX                                                       0381
0382 00340   0 10 00347        JST   ST5                                                        0382
0383 00341   0 01 00343        JMP   *+2                                                        0383
0384 00342   0 10 00347        JST   ST5                                                        0384
0385 00343   101000           NOP                                                              0385
0386 00344   0 02 02742        LDA   MES2                                                       0386
0387 00345   0 10 00402        JST   TYPE             TYPE PASS COUNT                           0387
0388 00346  -0 01 00335        JMP*  EOPI             RETURN                                    0388
0389                          *                                                                0389
0390                          *                                                                0390
0391 00347   0 000000    ST5  DAC   **                                                         0391
0392 00350  -0 02 00434        LDA*  CNTX             LOAD UNITS + TENS                         0392
0393 00351   0 03 00503        ANA   ='377            AND CHECK FOR 09                          0393
0394 00352   0 05 00502        ERA   ='271            AND 99 COUNTS DEC                         0394
0395 00353   100040           SZE                                                              0395
0396 00354   0 01 00372        JMP   INC1             COUNT LESS THAN 09                        0396
0397 00355  -0 02 00434        LDA*  CNTX                                                       0397
0398 00356   0 03 00501        ANA   ='177400                                                   0398
0399 00357   0 05 00500        ERA   ='134400                                                   0399
0400 00360   100040           SZE                                                              0400
0401 00361   0 01 00375        JMP   INC2             COUNT LESS THAN 99                        0401
0402 00362   0 02 00520        LDA   ='130260                                                   0402
0403 00363  -0 04 00434        STA*  CNTX                                                       0403
0404 00364   0 02 00434        LDA   CNTX             SET UP FOR SECOND                         0404
```



```
0405 00365   0 07 00510        SUB   =1               PASS THRU IF COUNT                        0405
0406 00366   0 04 00434        STA   CNTX             EQUAL TO DEC 99                           0406
0407 00367   0 12 00347        IRS   ST5                                                        0407
0408 00370  -0 01 00347        JMP*  ST5                                                        0408
0409 00371   000000           HLT                                                              0409
0410 00372  -0 12 00434  INC1  IRS*  CNTX             INC UNITS OR HUNDREDS                     0410
0411 00373  -0 01 00347        JMP*  ST5                                                        0411
0412 00374   000000           HLT                                                              0412
0413 00375  -0 02 00434  INC2  LDA*  CNTX             INC TENS OR THOUSANDS                     0413
0414 00376   0 03 00501        ANA   ='177400                                                   0414
0415 00377   0 06 00477        ADD   ='660                                                      0415
0416 00400  -0 04 00434        STA*  CNTX                                                       0416
0417 00401  -0 01 00347        JMP*  ST5                                                        0417
0418                          *                                                                0418
0419                          *      GENERAL TYPE ROUTINE                                      0419
0420                          *                                                                0420
0421 00402   0 000000    TYPE DAC   **                 TYPE ROUT                                 0421
0422 00403   0 04 00432        STA   TS2              SAVE MSG ADRS                             0422
0423 00404  -0 02 00432        LDA*  TS2              GET WORD COUNT                            0423
0424 00405   0 04 00433        STA   TS3                                                        0424
0425 00406   34 0104           SKS   '104             TEST FOR ASR BUSY                         0425
0426 00407   0 01 00406        JMP   *-1                                                        0426
0427 00410   14 0104           OCP   '104             ENABLE, OUTPUT MODE                       0427
0428 00411   0 12 00432  PRCH  IRS   TS2              BUMP ADDR FOR NEXT WORD OF MSG.           0428
0429 00412  -0 02 00432        LDA*  TS2                                                        0429
0430 00413   0416 70          ALR   8                                                          0430
0431 00414   74 0004          OTA   '4               OUTPUT 1-8 IN ASCII                       0431
0432 00415   0 01 00414        JMP   *-1                                                        0432
0433 00416  -0 02 00432        LDA*  TS2                                                        0433
0434 00417   74 0004          OTA   '4               OUTPUT 9-16                               0434
0435 00420   0 01 00417        JMP   *-1                                                        0435
0436 00421   0 12 00433        IRS   TS3              SKIP AFTER LAST WORD                      0436
0437 00422   0 01 00411        JMP   PRCH             PRINT NEXT WORD                           0437
0438 00423  -0 01 00402        JMP*  TYPE                                                       0438
0439                          *                                                                0439
0440 00424   000000     EFL1 BSZ   1                                                          0440
0441 00425   000000     EFL2 BSZ   1                                                          0441
```

```
 443 00426  000000      CN01 BSZ   1                                    0442
 443 00427  000000      CN02 BSZ   1                                    0443
0444 00430  000000      PNT1 BSZ   1                                    0444
0445 00431  000000      PNT2 BSZ   1                                    0445
0446 00432  000000      TS2  BSZ   1                                    0446
0447 00433  000000      TS3  BSZ   1                                    0447
0448 00434  000000      CNTX BSZ   1                                    0448
0449 00435  0 002750    PCRT DAC   CNT5+1                               0449
0450 00436  0 001004    ONE  DAC   TS01                                 0450
0451 00437  0 002000    TWO  DAC   TS02                                 0451
0452 00440  0 003000    THRI DAC   TS03                                 0452
0453 00441  0 004000    FOUR DAC   TS04                                 0453
 454 00442  0 005000    FIVE DAC   TS05                                 0454
0455 00443  0 006000    SIX  DAC   TS06                                 0455
0456 00444  0 007000    SEVN DAC   TS07                                 0456
0457 00445  0 005562    DMSG DAC   MESS                                 0457
0458 00446  0 005615    X13S DAC   X13R                                 0458
0459 00447  0 005527    HSCD DAC   HSEC                                 0459
0460 00450  0 07 00476  SUB7 SUB   =7                                   0460
0461 00451  0 02 00475  LDM7 LDA   =-7                                  0461
0462 00452  0 02 00474  LD10 LDA   =*10000                              0462
0463 00453  0 07 00473  SB47 SUB   =*47                                 0463
0464 00454  010000      OTNT OCT   10000                                0464
 465 00455  177634      CNTY DEC   -100                                 0465
 466 00456  0 004715    MOOV DAC   MOVE                                 0466
 467 00457  0 02 00472  LM24 LDA   =-24                                 0467
 468 00460  0 02 00465  DHSC LDA   HSCT                                 0468
 469                    *                                               0469
 470 00461  000000      TMP1 BSZ   3                                    0470
0471 00464  000000      HISC BSZ   1                                    0471
0472 00465  000000      HSCT BSZ   2                                    0472
0473                    *                                               0473
0474 00467  0 000470    DCCR DAC   *+1                                  0474
0475 00470  177777           DEC   -1                                   0475
0476 00471  106615           OCT   106615                               0476
 477                    *                                               0477
0478 00472  177750           FIN                                        0478
```



```
      00473  000047
      00474  010000
      00475  177771
      00476  000007
      00477  000660
      00500  134400
      00501  177400
      00502  000271
      00503  000377
      00504  140063
      00505  000045
      00506  177746
      00507  176777
      00510  000001
      00511  177773
      00512  006000
      00513  001000
      00514  000005
      00515  000040
      00516  177760
      00517  100063
      00520  130260

0479                   *                                               0479
0480         000521    HERE EQU   *                                    0480
0481                   *                                               0481
0482                   *                                               0482
0483                   *                                               0483
0484                   *                                               0484
0485                   *                                               0485
0486                        ORG   *1000                                0486
0487                   *                                               0487
0488 01000   0 01 00120       JMP   NSRT          GO TO NEW (REAL) START 0488
0489                   *                                               0489
0490                   *                                               0490
0491                   *    TEST GROUPS: GENERICS, ADDS, SWITCHES, ADDERS 0491
0492                   *                                               0492
```

```
0493 01001   0 02 01000      LDA   *-1              GET THE RETURN ADDR                          0493
0494 01002   0 04 01004      STA   *+2              STORE IT AT THE RIGHT SPOT                   0494
0495 01003   100000          SKP                    START SECTOR 1 TESTS                         0495
0496 01004   0 000000   TS01 DAC   **               SECTOR 1 TESTS                               0496
0497 01005   101000          NOP                                                                 0497
0498 01006   0 10 01016      JST   GENO             '14 - GENERICS TEST                          0498
0499 01007   0 10 01322      JST   XRGO             '17  -  LOC.0 AND XREG TRACTION              0499
0500 01010   0 10 01341      JST   ADDS             '13 - ADDS                                   0500
0501 01011   0 10 01546      JST   SWCH             '15 - SWITCHES TEST                          0501
0502 01012   0 10 01672      JST   ADD1             '40 - ADDER TEST 1                           0502
0503 01013   101000          NOP                                                                 0503
0504 01014  -0 01 01004      JMP*  TS01             RETURN                                       0504
0505                   *                                                                        0505
0506                   *                                                                        0506
0507                   *      TEST T014 - GENERICS                                              0507
0508                   *                                                                        0508
0509 01015   000014          OCT   14               TEST NO.                                     0509
0510 01016   0 000000   GENO DAC   **               GENERICS TEST                                0510
0511 01017   0 02 01015      LDA   *-2              LOAD TEST NO.                                0511
0512 01020   0 04 00777      STA   '777             STORE AT '777                                0512
0513 01021   140040          CRA                                                                 0513
0514 01022   140500          SSM                    TESTING SSM (A='000000)                      0514
0515 01023   101040          SNZ                                                                 0515
0516 01024   000000          HLT                    ERROR                                        0516
0517 01025   101400          SMI                    TESTING SMI (A='100000)                      0517
0518 01026   000000          HLT                    ERROR                                        0518
0519 01027   140024          CHS                    TESTING CHS (A='100000)                      0519
0520 01030   100040          SZE                                                                 0520
0521 01031   000000          HLT                    ERROR                                        0521
0522 01032   140040          CRA                    ZERO'S TO A REGISTER                         0522
0523 01033   140401          CMA                    -(A) TO (A) (A='177777)                      0523
0524 01034   140100          SSP                    TESTING SSP (A=077777)                       0524
0525 01035   101400          SMI                    TEST WITH SMI                                0525
0526 01036   0 01 01040      JMP   *+2                                                           0526
0527 01037   000000          HLT                    ERROR                                        0527
0528 01040   140200          RCB                    RESET "C" BIT                                0528
0529 01041   0 06 01774      ADD   ='40000          SHOULD SET "C" BIT                           0529
```



```
0530 01042   101001          SSC                    TESTING "C" BIT                              0530
0531 01043   000000          HLT                    ERROR                                        0531
0532 01044   140200          RCB                    RESET "C" BIT                                0532
0533 01045   100001          SRC                    TEST "C" BIT                                 0533
0534 01046   000000          HLT                    ERROR                                        0534
0535 01047   140600          SCB                    SET "C" BIT                                  0535
0536 01050   101001          SSC                    SKIP IF "C" BIT SET                          0536
0537 01051   000000          HLT                    ERROR                                        0537
0538 01052   140500          SSM                    1 TO A1                                      0538
0539 01053   140320          CSA                    A1 TO C 0 TO A1                              0539
0540 01054   100400          SPL                    SKIP IF A1=0                                 0540
0541 01055   000000          HLT                    ERROR                                        0541
0542 01056   101001          SSC                    SKIP IF C=1                                  0542
0543 01057   000000          HLT                    ERROR                                        0543
0544 01060   140200          RCB                    0 TO C                                       0544
0545 01061   000043          INK                    C TO A1                                      0545
0546 01062   100400          SPL                    SKIP IF A1=0                                 0546
0547 01063   000000          HLT                    ERROR                                        0547
0548 01064   140500          SSM                    1 TO A1                                      0548
0549 01065   171020          OTK                    A1 TO C                                      0549
0550 01066   140040          CRA                    0 TO A1-A16                                  0550
0551 01067   000011          DXA                                                                 0551
0552 01070   0 01 01071      JMP   *+1              NORMAL MODE                                  0552
0553 01071   101001          SSC                    SKIP IF C=1                                  0553
0554 01072   000000          HLT                    ERROR                                        0554
0555 01073   140320          CSA                    A1 TO C 0 TO A1                              0555
0556 01074   140401          CMA                    1 TO A1-A16                                  0556
0557 01075   140100          SSP                                                                 0557
0558 01076   0 06 01773      ADD   =1                                                            0558
0559 01077   140040          CRA                    CLEAR A REG.                                 0559
0560 01100   100040          SZE                    SKIP IF (A)=0                                0560
0561 01101   000000          HLT                    ERROR                                        0561
0562 01102   101001          SSC                    SKIP IF C=1                                  0562
0563 01103   000000          HLT                    ERROR                                        0563
0564 01104   140320          CSA                    A1 TO C 0 TO A1                              0564
0565 01105   0 02 01772      LDA   ='125252         TEST PATTERN                                 0565
0566 01106   0414 77         LGL   1                A1 TO C                                      0566
```

```
0567 01107  101001          SSC                 SKIP IF SET                    0567
0568 01110  000000          HLT                 ERROR                          0568
0569 01111  0414 77         LGL   1             A1 TO C                        0569
0570 01112  100001          SRC                 SKIP IF RESET                  0570
0571 01113  000000          HLT                 ERROR                          0571
0572 01114  0414 77         LGL   1             A1 TO C                        0572
0573 01115  101001          SSC                 SKIP IF SET                    0573
0574 01116  000000          HLT                 ERROR                          0574
0575 01117  0414 77         LGL   1             A1 TO C                        0575
0576 01120  100001          SRC                 SKIP IF RESET                  0576
0577 01121  000000          HLT                 ERROR                          0577
0578 01122  0404 72         LGR   6             A16 TO C                       0578
0579 01123  101001          SSC                 SKIP IF RESET                  0579
0580 01124  000000          HLT                 ERROR                          0580
0581 01125  0404 77         LGR   1             A16 TO C                       0581
0582 01126  100001          SRC                 SKIP IF RESET                  0582
0583 01127  000000          HLT                 ERROR                          0583
0584 01130  0404 77         LGR   1             A16 TO C                       0584
0585 01131  101001          SSC                 SKIP IF SET                    0585
0586 01132  000000          HLT                 ERROR                          0586
0587 01133  0404 77         LGR   1             A16 TO C                       0587
0588 01134  100001          SRC                 SKIP IF RESET                  0588
0589 01135  000000          HLT                 ERROR                          0589
0590 01136  0 02 01771      LDA   ='63146       TEST PATTERN                   0590
0591 01137  0415 77         ALS   1             A1 TO C                        0591
0592 01140  101001          SSC                 SKIP IF SET                    0592
0593 01141  000000          HLT                 ERROR                          0593
0594 01142  0415 77         ALS   1             A1 TO C                        0594
0595 01143  100001          SRC                 SKIP IF RESET                  0595
0596 01144  000000          HLT                 ERROR                          0596
0597 01145  0415 77         ALS   1             A1 TO C                        0597
0598 01146  101001          SSC                 SKIP IF SET                    0598
0599 01147  000000          HLT                 ERROR                          0599
0600 01150  0415 77         ALS   1             A1 TO C                        0600
0601 01151  100001          SRC                 ERROR                          0601
0602 01152  000000          HLT                                                0602
0603 01153  0 02 01770      LDA   ='152525      TEST PATTERN                   0603
```



```
0604 01154  000201          IAB                 PLACE IN B REG.                0604
0605 01155  0401 77         LRS   1             B16 TO C                       0605
0606 01156  101001          SSC                 SKIP IF SET                    0606
0607 01157  000000          HLT                 ERROR                          0607
0608 01160  0401 77         LRS   1             B16 TO C                       0608
0609 01161  100001          SRC                 SKIP IF RESET                  0609
0610 01162  000000          HLT                 ERROR                          0610
0611 01163  0401 77         LRS   1             B16 TO C                       0611
0612 01164  101001          SSC                 SKIP IF SET                    0612
0613 01165  000000          HLT                                                0613
0614 01166  0401 77         LRS   1             B16 TO C                       0614
0615 01167  100001          SRC                 SKIP IF RESET                  0615
0616 01170  000000          HLT                 ERROR                          0616
0617 01171  0 02 01770      LDA   ='152525      TEST PATTERN                   0617
0618 01172  101100          SLN                 SKIP IF A16=1                  0618
0619 01173  000000          HLT                 ERROR                          0619
0620 01174  100100          SLZ                 SKIP IF A16=0                  0620
0621 01175  0 01 01177      JMP   *+2                                          0621
0622 01176  000000          HLT                 ERROR                          0622
0623 01177  0414 77         LGL   1             CHANGE A16 TO ZERO             0623
0624 01200  101100          SLN                 SKIP IF A16=1                  0624
0625 01201  0 01 01203      JMP   *+2                                          0625
0626 01202  000000          HLT                 ERROR                          0626
0627 01203  100100          SLZ                 SKIP IF A16=0                  0627
0628 01204  000000          HLT                 ERROR                          0628
0629 01205  100000          SKP                 UNCONDITIONAL SKIP             0629
0630 01206  000000          HLT                 ERROR                          0630
0631 01207  140040          CRA                 ZERO'S TO A REGISTER           0631
0632 01210  100100          SLZ                 TEST SLZ (A='000000)           0632
0633 01211  000000          HLT                 ERROR                          0633
0634 01212  100400          SPL                 TEST SPL (A='000000)           0634
0635 01213  000000          HLT                 ERROR                          0635
0636 01214  0 02 01767      LDA   ='177777      LOAD A REG WITH ALL ONES       0636
0637 01215  100040          SZE                 TESTING SZE (A='177777)        0637
0638 01216  0 01 01220      JMP   *+2                                          0638
0639 01217  000000          HLT                 ERROR                          0639
0640 01220  101040          SNZ                 TESTING SNZ(A='177777)         0640
```

```
0641 01221  000000          HLT                          ERROR                                    0641
0642 01222  100400          SPL                          TESTING SPL(A='177777)                   0642
0643 01223  0 01 01225      JMP   *+2                                                             0643
0644 01224  000000          HLT                          ERROR                                    0644
0645 01225  101400          SMI                          TESTING SMI (A='177777)                  0645
0646 01226  000000          HLT                          ERROR                                    0646
0647 01227  0 02 01766      LDA   ='100000               SET BIT ONLY                             0647
0648 01230  100400          SPL                          TESTING   SPL                            0648
0649 01231  0 01 01233      JMP   *+2                                                             0649
0650 01232  000000          HLT                          ERROR                                    0650
0651 01233  101400          SMI                          SMI                                      0651
0652 01234  000000          HLT                          ERROR                                    0652
0653 01235  100040          SZE                          SZE                                      0653
0654 01236  0 01 01240      JMP   *+2                                                             0654
0655 01237  000000          HLT                          ERROR                                    0655
0656 01240  101040          SNZ                          SNZ                                      0656
0657 01241  000000          HLT                          ERROR                                    0657
0658 01242  0 02 01774      LDA   ='40000                TESTING SNZ WITH BIT 2                   0658
0659 01243  101040          SNZ                                                                   0659
0660 01244  000000          HLT                          ERROR                                    0660
0661 01245  0 02 01765      LDA   ='20000                TESTING SNZ WITH BIT 3                   0661
0662 01246  101040          SNZ                                                                   0662
0663 01247  000000          HLT                          ERROR                                    0663
0664 01250  0 02 01764      LDA   ='10000                TESTING SNZ WITH BIT 4                   0664
0665 01251  101040          SNZ                                                                   0665
0666 01252  000000          HLT                          ERROR                                    0666
0667 01253  0 02 01763      LDA   ='4000                 TESTING SNZ WITH BIT 5                   0667
0668 01254  101040          SNZ                                                                   0668
0669 01255  000000          HLT                          ERROR                                    0669
0670 01256  0 02 01762      LDA   ='2000                 TESTING SNZ WITH BIT 6                   0670
0671 01257  101040          SNZ                                                                   0671
0672 01260  000000          HLT                          ERROR                                    0672
0673 01261  0 02 01761      LDA   ='1000                 TESTING SNZ WITH BIT 7                   0673
0674 01262  101040          SNZ                                                                   0674
0675 01263  000000          HLT                          ERROR                                    0675
0676 01264  0 02 01760      LDA   ='400                  TESTING SNZ WITH BIT 8                   0676
0677 01265  101040          SNZ                                                                   0677
```



```
0678 01266  000000          HLT                          ERROR                                    0678
0679 01267  0 02 01757      LDA   ='200                  TESTING SNZ WITH BIT 9                   0679
0680 01270  101040          SNZ                                                                   0680
0681 01271  000000          HLT                          ERROR                                    0681
0682 01272  0 02 01756      LDA   ='100                  TESTING SNZ WITH BIT 10                  0682
0683 01273  101040          SNZ                                                                   0683
0684 01274  000000          HLT                          ERROR                                    0684
0685 01275  0 02 01755      LDA   ='40                   TESTING SNZ WITH BIT 11                  0685
0686 01276  101040          SNZ                                                                   0686
0687 01277  000000          HLT                          ERROR                                    0687
0688 01300  0 02 01754      LDA   ='20                   TESTING SNZ WITH BIT 12                  0688
0689 01301  101040          SNZ                                                                   0689
0690 01302  000000          HLT                          ERROR                                    0690
0691 01303  0 02 01753      LDA   ='10                   TESTING SNZ WITH BIT 13                  0691
0692 01304  101040          SNZ                                                                   0692
0693 01305  000000          HLT                          ERROR                                    0693
0694 01306  0 02 01752      LDA   ='4                    TESTING SNZ WITH BIT 14                  0694
0695 01307  101040          SNZ                                                                   0695
0696 01310  000000          HLT                          ERROR                                    0696
0697 01311  0 02 01751      LDA   ='2                    TESTING SNZ WITH BIT 15                  0697
0698 01312  101040          SNZ                                                                   0698
0699 01313  000000          HLT                          ERROR                                    0699
0700 01314  0 02 01773      LDA   ='1                    TESTING SNZ WITH BIT 16                  0700
0701 01315  101040          SNZ                                                                   0701
0702 01316  000000          HLT                          ERROR                                    0702
0703 01317  140040-         CRA                                                                   0703
0704 01320  -0 01 01016      JMP*  GENO                                                            0704
0705                    *                                                                         0705
0706                    *                                                                         0706
0707                    *    LOCATION '0' AND X-REG TRACTION                                      0707
0708                    *                                                                         0708
0709 01321  000017          OCT   17                                                              0709
0710 01322  0 000000   XRGO DAC   **                                                              0710
0711 01323  0 02 01321      LDA   *-2                                                             0711
0712 01324  0 04 00777      STA   '777                   STORE TEST NO.                           0712
0713 01325  0 04 00000      STA   0                      STORE A NO. AT ZERO                      0713
0714 01326  0 15 01543      STX   TEMP                   STORE CONTENTS OF X AT TEMP              0714
```

```
0715 01327   0 05 01543      ERA   TEMP        IS TEMP=A                                          0715
0716 01330   100040         SZE                                                                  0716
0717 01331   000000         HLT               X AND LOC.0 DIFFERED                               0717
0718 01332   0 35 01322     LDX   XRG0        STORE DATA WORD AT X                               0718
0719 01333   0 02 00000     LDA   0           LOAD CONTENTS OF ZERO IN A                         0719
0720 01334   0 05 01322     ERA   XRG0        COMPARE WITH ORIG. WORD                            0720
0721 01335   100040         SZE               MUST COMPARE                                       0721
0722 01336   000000         HLT               ERROR - X-REG AND LOC.0 DIFFERED                   0722
0723 01337   -0 01 01322    JMP*  XRG0        RETURN                                             0723
0724                 *                                                                          0724
0725                 *                                                                          0725
0726                 *                       SUBROUTINE  T013  ADDER TEST NO.1                  0726
0727                 *                                                                          0727
0728 01340   000013         OCT   13                                                             0728
0729 01341   0 000000   ADDS DAC   **          ADDS TEST                                          0729
0730 01342   0 02 01340     LDA   *-2         LOAD TEST NO.                                      0730
0731 01343   0 04 00777     STA   '777        STORE AT '777                                      0731
0732 01344   140040         CRA               ZERO'S TO (A)                                      0732
0733 01345   100040         SZE               SKIP IF ZERO                                       0733
0734 01346   000000         HLT               ERROR                                              0734
0735 01347   140401         CMA               ONE'S COMPLEMENT OF (A) TO (A)=177777              0735
0736 01350   141206         AOA               (A)+1 TO (A)=000000                                0736
0737 01351   100040         SZE               SKIP IF ZERO                                       0737
0738 01352   000000         HLT               ERROR                                              0738
0739 01353   140401         CMA               ONE'S COMPLEMENT OF (A) TO (A)=177777              0739
0740 01354   140040         CRA               ZERO'S TO (A)=000000                               0740
0741 01355   100040         SZE               SKIP IF (A)=000000                                 0741
0742 01356   000000         HLT               ERROR                                              0742
0743 01357   140401         CMA               ONE'S COMPLEMENT OF (A) TO (A)=177777              0743
0744 01360   0 06 01773     ADD   =1          (A)+(M) TO (A)=000000                              0744
0745 01361   100040         SZE               SKIP IF (A)=000000                                 0745
0746 01362   000000         HLT               ERROR                                              0746
0747 01363   140401         CMA               ONE'S COMPLEMENT OF (A) TO (A)=177777              0747
0748 01364   140407         TCA               TWO'S COMPLEMENT OF (A) TO (A)=000001              0748
0749 01365   0 06 01767     ADD   ='177777    (A)+(M) TO (A)=000000                              0749
0750 01366   100040         SZE               SKIP IF (A)=000000                                 0750
0751 01367   000000         HLT               ERROR                                              0751
```



```
0752 01370   0 02 01767     LDA   ='177777    (M) TO (A)=177777                                  0752
0753 01371   0 06 01773     ADD   =1          (A)+(M) TO (A)=000000                              0753
0754 01372   100040         SZE               SKIP IF (A)=000000                                 0754
0755 01373   000000         HLT               ERROR                                              0755
0756 01374   0 02 01750     LDA   ='052525    □M$ TO (A)=052525                                  0756
0757 01375   0 06 01750     ADD   ='052525    (A) + (M) TO (A)=125252                            0757
0758 01376   0 06 01747     ADD   ='052526    (A)+(M) TO (A)=000000                              0758
0759 01377   100040         SZE               SKIP IF (A)=000000                                 0759
0760 01400   000000         HLT               ERROR                                              0760
0761 01401   140401         CMA               -(A) TO (A)=177777                                 0761
0762 01402   0 04 01543     STA   TEMP        (A) TO (M) =177777                                 0762
0763 01403   140407         TCA               -(A)+1 TO (A)=000001                               0763
0764 01404   0 06 01543     ADD   TEMP        (A)+(M) TO (A)=000000                              0764
0765 01405   100040         SZE               SKIP IF (A)=0000000                                0765
0766 01406   000000         HLT               ERROR                                              0766
0767 01407   0 02 01750     LDA   ='052525    (M) TO (A)='052525                                 0767
0768 01410   0 06 01772     ADD   ='125252    (M)+(A) TO (A)=177776                              0768
0769 01411   0 06 01773     ADD   =1                                                             0769
0770 01412   100040         SZE               SKIP IF (A)='000000                                0770
0771 01413   000000         HLT               ERROR                                              0771
0772 01414   0 02 01772     LDA   ='125252    (M) TO (A)='125252                                 0772
0773 01415   0 06 01750     ADD   ='052525    (M)+(A) TO (A)=177776                              0773
0774 01416   0 06 01773     ADD   =1                                                             0774
0775 01417   100040         SZE               SKIP IF (A)='000000                                0775
0776 01420   000000         HLT               ERROR                                              0776
0777 01421   140040         CRA               ZERO'S TO (A)='000000                              0777
0778 01422   0 04 01544     STA   LOCT        (A) TO (M)='000000                                 0778
0779 01423   0 35 01544     LDX   LOCT        (M) TO (X)='000000                                 0779
0780 01424   140401         CMA               ONE'S COMPLEMENT OF (A) TO (A)='1777777            0780
0781 01425   0 15 01545     STX   LOCT+1      (X) TO (M)                                         0781
0782 01426   0 02 01545     LDA   LOCT+1      (M) TO (A)='000000                                 0782
0783 01427   100040         SZE               SKIP IF (A)='000000                                0783
0784 01430   000000         HLT               ERROR                                              0784
0785 01431   140401         CMA               ONE'S COMPLEMENT OF(A) TO (A)=177777               0785
0786 01432   0 04 01544     STA   LOCT        (A) TO (M)='177777                                 0786
0787 01433   0 35 01544     LDX   LOCT        (M) TO (X)='177777                                 0787
0788 01434   140040         CRA               ZERO'S TO (A)='000000                              0788
```

```
0789 01435   0 15 01545      STX   LOCT+1          (X) TO (M)='177777                          0789
0790 01436   0 02 01545      LDA   LOCT+1          (M) TO (A)='177777                          0790
0791 01437   0 06 01773      ADD   =1              (A)+(M) TO (A)='000000                      0791
0792 01440   100040          SZE                   SKIP IF (A)='000000                         0792
0793 01441   000000          HLT                   ERROR                                       0793
0794 01442   0 02 01772      LDA   ='125252                                                    0794
0795 01443   0 04 01544      STA   LOCT                                                        0795
0796 01444   0 35 01544      LDX   LOCT                                                        0796
0797 01445   0 15 01545      STX   LOCT+1                                                      0797
0798 01446   140040          CRA                                                             0798
0799 01447   0 02 01545      LDA   LOCT+1                                                      0799
0800 01450   0 07 01772      SUB   ='125252                                                    0800
0801 01451   100040          SZE                                                             0801
0802 01452   000000          HLT                   ERROR                                       0802
0803 01453   0 02 01750      LDA   ='052525                                                    0803
0804 01454   0 04 01544      STA   LOCT                                                        0804
0805 01455   0 35 01544      LDX   LOCT                                                        0805
0806 01456   0 15 01545      STX   LOCT+1                                                      0806
0807 01457   140040          CRA                                                             0807
0808 01460   0 02 01545      LDA   LOCT+1                                                      0808
0809 01461   0 07 01750      SUB   ='052525        (A)-(M) TO (A)='000000                      0809
0810 01462   100040          SZE                   SKIP IF (A)='000000                         0810
0811 01463   000000          HLT                   ERROR                                       0811
0812 01464   140040          CRA                   ZERO'S TO (A)                               0812
0813 01465   000201          IAB                   INTERCHANGE (A) AND (B)                     0813
0814 01466   140040          CRA                   ZERO'S TO (A)                               0814
0815 01467   140401          CMA                   ONE' COMPLEMENT OF (A) TO (A)='177777       0815
0816 01470   000201          IAB                   INTERCHANGE (A) AND (B)                     0816
0817 01471   100040          SZE                   SKIP IF (A)='000000                         0817
0818 01472   000000          HLT                   ERROR                                       0818
0819 01473   0 02 01772      LDA   ='125252        (M) TO (A)='125252                          0819
0820 01474   000201          IAB                   INTERCHANGE (A) AND (B)                     0820
0821 01475   0 06 01773      ADD   =1              (A)+(M) TO (A)='000000                      0821
0822 01476   100040          SZE                   SKIP IF (A)='000000                         0822
0823 01477   000000          HLT                   ERROR                                       0823
0824 01500   0 02 01750      LDA   ='052525        (M) TO (A)                                  0824
0825 01501   000201          IAB                   INTERCHANGE (A) AND (B)                     0825
```



```
0826 01502   0 06 01747      ADD   ='052526        (A)+(M) TO (A)='000000                      0826
0827 01503   100040          SZE                   SKIP IF (A)='000000                         0827
0828 01504   000000          HLT                   ERROR                                       0828
0829 01505   000201          IAB                   INTERCHANGE (A) AND (B)                     0829
0830 01506   0 06 01746      ADD   ='125253        (A)+(M) TO (A)                              0830
0831 01507   100040          SZE                                                             0831
0832 01510   000000          HLT                   ERROR                                       0832
0833 01511   0 35 01745      LDX   =-64            (M) TO (X)                                  0833
0834 01512   0 02 01772      LDA   ='125252        (M) TO (A)                                  0834
0835 01513   1 04 01643      STA   TEMP+64,1       (M)+64+(-X) INDEXING                        0835
0836 01514   0 02 01747      LDA   ='052526        (M) TO (A)                                  0836
0837 01515   1 06 01643      ADD   TEMP+64,1       (M)+64+(-X) INDEXING                        0837
0838 01516   100040          SZE                                                             0838
0839 01517   000000          HLT                   ERROR                                       0839
0840 01520   0 10 00756      JST   BSCT            GO TEST INDEXING IN BASE SECTOR             0840
0841 01521   0 02 01756      LDA   =64             (M) TO (A)                                  0841
0842 01522   0 04 01543      STA   TEMP            (A) TO (M)                                  0842
0843 01523   0 02 01744      LDA   ='070707        (M) TO (A)                                  0843
0844 01524  -0 04 01543      STA*  TEMP            (A) TO (M) INDIRECT                         0844
0845 01525   0 02 01743      LDA   ='107071        (M) TO (A)                                  0845
0846 01526  -0 06 01543      ADD*  TEMP            (M)+(A) INDIRECT                            0846
0847 01527   100040          SZE                                                             0847
0848 01530   000000          HLT                   ERROR                                       0848
0849 01531   0 35 01745      LDX   =-64            (M) TO (X)                                  0849
0850 01532   0 02 01742      LDA   =65             (M) TO (A)                                  0850
0851 01533   0 04 01543      STA   TEMP            (A) TO (M)                                  0851
0852 01534   0 02 01750      LDA   ='052525        DATA                                        0852
0853 01535  -1 04 01643      STA*  TEMP+64,1                                                   0853
0854 01536   0 02 01746      LDA   ='125253        DATA                                        0854
0855 01537  -1 06 01643      ADD*  TEMP+64,1       (M)+(A) TO (A) INDEXING, INDIRECT           0855
0856 01540   100040          SZE                                                             0856
0857 01541   000000          HLT                   ERROR                                       0857
0858 01542  -0 01 01341      JMP*  ADDS            RETURN TO MONTOR                            0858
0859                 *                                                                       0859
0860 01543   000000    TEMP  BSZ   1                                                         0860
0861 01544   000000    LOCT  BSZ   1                                                         0861
0862                 *                                                                       0862
```

```
0863                    *
0864                    *
0865                    *     TEST T015 - SENSE SWITCH TEST
0866                    *
0867 01545  000015          OCT   15            TEST NO.
0868 01546  0 000000   SWCH DAC   **            SWITCHES TEST
0869 01547  0 02 01545      LDA   *-2           LOAD TEST NO.
0870 01550  0 04 00777      STA   '777          STORE AT '777
0871 01551  101000         NOP                 KILL TEST LOCATION
0872 01552  0 02 02723      LDA   MES3          MESSAGE COUNT
0873 01553  0 10 00402      JST   TYPE          TO TYPE OUT
0874 01554  0 02 01775      LDA   =-9           PASS COUNT
0875 01555  0 04 01670      STA   TSST          COUNTER
0876 01556  000013         EXA
0877 01557  0 10 01560      JST   ADLO          DETERMINE LOCATION
0878 01560  0 000000   ADLO DAC   **            FOR INTERRUPT
0879 01561  000011         DXA                 NORMAL ADDRESSING
0880 01562  0 01 01563      JMP   *+1
0881 01563  0 02 01560      LDA   ADLO          *
0882 01564  0 06 01753      ADD   =8
0883 01565  0 04 00063      STA   '63
0884 01566  140040         CRA
0885 01567  0 01 01574      JMP   HERR          *
0886 01570  0 000000        DAC   **            INTERRUPT ENTRY
0887 01571  000000         HLT                 START BUTTON INTERRUPT
0888 01572  000011         DXA
0889 01573  0 01 01574      JMP   *+1
0890 01574  101036     HERR SSS               TEST SENSE SWITCHES
0891 01575  0 01 01606      JMP   SR10
0892 01576  100036         SSR                 TEST IF ALL RESET
0893 01577  0 01 01601      JMP   SS10
0894 01600  000000         HLT                 ERROR
0895 01601  101020     SS10 SS1               TEST SENSE SWITCH 1
0896 01602  0 01 01606      JMP   SR10          RESET
0897 01603  100020         SR1                 SET
0898 01604  0 01 01612      JMP   SS1A          SET
0899 01605  000000         HLT                 ERROR
```



```
0900 01606  100020     SR10 SR1               TEST FOR RESET
0901 01607  000000          HLT               ERROR
0902 01610  0 03 01741       ANA   ='070000    CHANGE A REG
0903 01611  0 01 01614      JMP   SS20         TO NEXT SS TEST
0904 01612  0 03 01741 SS1A ANA   ='070000    CHANGE A REG TO
0905 01613  0 05 01766       ERA   ='100000    STATUS OF SENSE SWITCH
0906 01614  101010     SS20 SS2               TEST SENSE SWITCH 2
0907 01615  0 01 01621      JMP   SR20         RESET
0908 01616  100010         SR2                SET
0909 01617  0 01 01625      JMP   SS2A         SETUP A REG
0910 01620  000000         HLT                ERROR
0911 01621  100010     SR20 SR2               TEST FOR RESET
0912 01622  000000         HLT                ERROR
0913 01623  0 03 01740      ANA   ='130000     UPDATE A REG
0914 01624  0 01 01627      JMP   SS30         TO TEST NEXT SENSE SWITCH
0915 01625  0 03 01740 SS2A ANA   ='130000     CHANGE STATUS OF
0916 01626  0 05 01774      ERA   ='040000     A REG
0917 01627  101004     SS30 SS3               TEST SENSE SWITCH 3
0918 01630  0 01 01634      JMP   SR30         RESET
0919 01631  100004         SR3                SET
0920 01632  0 01 01640      JMP   SS3A         SET UP A REG
0921 01633  000000         HLT                ERROR
0922 01634  100004     SR30 SR3               TEST FOR RESET
0923 01635  000000         HLT                ERROR
0924 01636  0 03 01737      ANA   ='150000     CHANGE STATUS OF "A" REG.
0925 01637  0 01 01642      JMP   SS40         TO TEST NEXT SENSE SWITCH
0926 01640  0 03 01737 SS3A ANA   ='150000     UPDATE STATUS OF
0927 01641  0 05 01765      ERA   ='20000      "A" REG
0928 01642  101002     SS40 SS4               TEST SENSE SWITCH 4
0929 01643  0 01 01647      JMP   SR40         RESET
0930 01644  100002         SR4                SET
0931 01645  0 01 01653      JMP   SS4A         SET UP "A" REG.
0932 01646  000000         HLT                ERROR
0933 01647  100002     SR40 SR4               TEST FOR RESET
0934 01650  000000         HLT                ERROR
0935 01651  0 03 01736      ANA   ='160000     CHANGE STATUS OF "A" REG.
0936 01652  0 01 01655      JMP   TEWL         TO WAIT LOOP
```

```
0937 01655   0 03 01736 SS4A ANA   =*160000          UPDATE STATUS OF                    0937
0938 01654   0 05 01764       ERA   =*010000          "A" REG.                            0938
0939 01655   0 12 01670 TEWL IRS   TSST              TEST COUNTER                        0939
0940 01656   0 01 01660       JMP   HERS              CONTINUE TEST                       0940
0941 01657   0 01 01663       JMP   TYPW              RETURN TO MAIN LOOP                 0941
0942 01660   000401     HERS ENB                     ENABLE INTERRUPTS                   0942
0943 01661   101000     HERT NOP                     WAIT FOR *START BUTTON*             0943
0944 01662   0 01 01661       JMP   HERT              INTERRUPTS                          0944
0945 01663   0 02 02751 TYPW LDA   MES4                                                 0945
0946 01664   0 10 00402       JST   TYPE                                                 0946
0947 01665   0 02 01667       LDA   *+2                                                  0947
0948 01666   0 04 01551       STA   SWCH+3                                               0948
0949 01667  -0 01 01546       JMP*  SWCH              RETURN                              0949
0950                     *                                                              0950
0951 01670   000000     TSST BSZ   1                                                    0951
0952                     *                                                              0952
0953                     *                                                              0953
0954                     *                                                              0954
0955                     *                                                              0955
0956                     *     TEST T040 - ADDERS TEST - GENERATE CARRY BUT NO SKIP CARRY 0956
0957                     *                                                              0957
0958 01671   000040           OCT   40                TEST NO.                            0958
0959 01672   0 000000   ADD1 DAC   **                ADDER TEST 1                        0959
0960 01673   0 02 01671       LDA   *-2               LOAD TEST NO.                       0960
0961 01674   0 04 00777       STA   *777              STORE AT *777                       0961
0962 01675   101000           NOP                   KILL TEST LOCATION                  0962
0963 01676   0 02 00455       LDA   CNTY                                                 0963
0964 01677   0 04 01735       STA   TAAV              INITIALIZE TEST COUNT               0964
0965 01700   140040           CRA                                                        0965
0966 01701   140500     TAAB SSM                     SET SIGN BIT                        0966
0967 01702   0 04 01733       STA   TAAZ              **                                  0967
0968 01703   140200           RCB                   **                                  0968
0969 01704   0 02 01733       LDA   TAAZ              ADD BIT ONE TO                      0969
0970 01705   0 06 01733       ADD   TAAZ              BIT ONE, OVER FLOW                  0970
0971 01706   101001           SSC                   SHOULD OCCUR OTHERWISE              0971
0972 01707   000000           HLT                   ERROR                               0972
0973 01710   101040           SNZ                   A REG SHOULD BE ZERO                0973
```



```
0974 01711   0 01 01713       JMP   TAAC                                               0974
0975 01712   000000           HLT                   ERROR                               0975
0976 01713   0 02 01733 TAAC LDA   TAAZ              SHIFT FLOATING BIT ONE PLACE        0976
0977 01714   0 04 01734       STA   TAAY              TO THE RIGHT                        0977
0978 01715   0404 77          LGR   1                 **                                  0978
0979 01716   0 04 01733       STA   TAAZ              **                                  0979
0980 01717   101040           SNZ                   CHECK IF SHIFTED OUT OF A           0980
0981 01720   0 01 01730       JMP   TAAE              YES END OF INNER LOOP               0981
0982 01721   140200           RCB                   NO RESET C BIT                      0982
0983 01722   0 02 01733       LDA   TAAZ              ADD FLOATING BIT TO                 0983
0984 01723   0 06 01733       ADD   TAAZ              ITSELF AND CHECK WITH               0984
0985 01724   0 11 01734       CAS   TAAY              KNOWN RESULT                        0985
0986 01725   0 01 01727       JMP   *+2               ERROR                               0986
0987 01726   0 01 01713       JMP   TAAC              OK RETURN TO TEST NEXT POSITION     0987
0988 01727   000000           HLT                   ERROR                               0988
0989 01730   0 12 01735 TAAE IRS   TAAV              INCREMENT PASS COUNTER              0989
0990 01731   0 01 01701       JMP   TAAB              NOT FINISHED, REPEAT TEST           0990
0991 01732  -0 01 01672       JMP*  ADD1                                               0991
0992                     *                                                              0992
0993 01733   0 00 00000 TAAZ PZE                                                        0993
0994 01734   0 00 00000 TAAY PZE                                                        0994
0995 01735   0 00 00000 TAAV PZE                                                        0995
0996                     *                                                              0996
0997 01736   160000           FIN                                                       0997
     01737   150000
     01740   130000
     01741   070000
     01742   000101
     01743   107071
     01744   070707
     01745   177700
     01746   125253
     01747   052526
     01750   052525
     01751   000002
     01752   000004
     01753   000010
```

```
01754   000020
01755   000040
01756   000100
01757   000200
01760   000400
01761   001000
01762   002000
01763   004000
01764   010000
01765   020000
01766   100000
01767   177777
01770   152525
01771   063146
01772   125252
01773   000001
01774   040000
01775   177767

0998                    *                                                       0998
0999                    *                                                       0999
1000                    *                                                       1000
1001                         ORG   '2000                                       1001
1002                    *                                                       1002
1003 02000   0 000000   TS02 DAC   **          SECTOR 2 TESTS                   1003
1004 02001   101000          NOP                                               1004
1005 02002   0 10 02020      JST   ADD2        '41 - ADDER TEST 2 - SKIP CARRY  1005
1006 02003   0 10 02113      JST   ADD3        '42 - ADDER TEST 3 - C BIT       1006
1007 02004   0 10 02175      JST   ADSB        '3  - ADD-SUBTRACT TEST          1007
1008 02005   0 10 02230      JST   INDA        '100- INDIRECT ADDRESSING        1008
1009 02006   0 10 02323      JST   IMAA        '1  - IMA TEST                   1009
1010 02007   0 10 02362      JST   IABA        '7  - IAB TEST                   1010
1011 02010   0 10 02421      JST   IRSX        '5  - IRS TEST                   1011
1012 02011   0 10 02464      JST   ERAA        '2  - ERA TEST                   1012
1013 02012   0 10 02521      JST   ANAA        '4  - ANA TEST                   1013
1014 02013   0 10 02563      JST   CASA        '6  - CAS TEST                   1014
1015 02014   0 10 02624      JST   HWDT        '10 - HALF WORD INST TEST        1015
```



```
1016 02015   101000          NOP                                               1016
1017 02016  -0 01 02000      JMP*  TS02        RETURN TO EXEC                   1017
1018                    *                                                       1018
1019                    *                                                       1019
1020                    *    TEST T041 - ADDER SKIP CARRY                       1020
1021                    *    THIS ROUTINE CHECKS FOR THE GENERATION OF          1021
1022                    *    SKIP CARRY IN ALL POSITIONS                        1022
1023                    *                                                       1023
1024 02017   000041          OCT   41          TEST NO.                        1024
1025 02020   0 000000   ADD2 DAC   **          ADDERS TEST 2 - SKIP CARRY      1025
1026 02021   0 02 02017      LDA   *-2         LOAD TEST NO.                   1026
1027 02022   0 04 00777      STA   '777        STORE AT '777                   1027
1028 02023   101000          NOP               KILL TEST LOCATION              1028
1029 02024   0 02 00455      LDA   CNTY                                        1029
1030 02025   0 04 02050      STA   TABZ        INITIALIZE TEST COUNT           1030
1031 02026   140040          CRA               **                              1031
1032 02027   0 04 02047      STA   TABY        **                              1032
1033 02030   0 02 02051 TABB LDA   TXBA        ADD FIRST PARAMETER TO          1033
1034 02031   0 06 02052      ADD   TXBB        SECOND PARAMETER AND COMPARE    1034
1035 02032   0 11 02053    • CAS   TXBC        RESULTS WITH PRECALCULATED VALUE 1035
1036 02033   0 01 02035      JMP   *+2         ERROR                           1036
1037 02034   100000          SKP                                               1037
1038 02035   000000          HLT               ERROR                           1038
1039 02036   0 02 02054      LDA   TXBE        USE SECOND SET                  1039
1040 02037   0 06 02055      ADD   TXBF        OF PARAMETERS AND               1040
1041 02040   0 11 02056      CAS   TXBG        CHECK RESULTS                   1041
1042 02041   0 01 02043      JMP   *+2         ERROR                           1042
1043 02042   100000          SKP                                               1043
1044 02043   000000          HLT               ERROR                           1044
1045 02044   0 12 02050      IRS   TABZ        INCREMENT LOOP COUNTER          1045
1046 02045   0 01 02067      JMP   TXBJ        NOT FINISHED GO ADJUST PARAMETERS 1046
1047 02046  -0 01 02020      JMP*  ADD2        RETURN                          1047
1048 02047   0 00 00000 TABY PZE                                               1048
1049 02050   0 00 00000 TABZ PZE                                               1049
1050 02051   057353     TXBA OCT   57353                                       1050
1051 02052   041051     TXBB OCT   41051                                       1051
1052 02053   120424     TXBC OCT   120424                                      1052
```

```
1053 02054   077373      TXBE OCT   77373                                          1053
1054 02055   001011      TXBF OCT   1011                                           1054
1055 02056   100404      TXBG OCT   100404                                         1055
1056 02057   0 00 00000  TXBP PZE                                                  1056
1057 02060   057353           OCT   57353          TEST DATA                      1057
1058 02061   041051           OCT   41051          ****                           1058
1059 02062   120424           OCT   120424         ****                           1059
1060 02063   077373           OCT   77373          ****                           1060
1061 02064   001011           OCT   1011           ****                           1061
1062 02065   100404           OCT   100404         ****                           1062
1063 02066   0 00 00000  TXBD PZE                                                  1063
1064 02067   0 02 02763  TXBJ LDA   =-6           THIS ROUTINE CYCLES THE TEST   1064
1065 02070   0 04 00000       STA   0              DATA (SIX VALUES) ONE PLACE    1065
1066 02071   1 02 02066  TXBK LDA   TXBD,1        TO THE RIGHT TO GENERATE       1066
1067 02072   000201           IAB                  TWO SETS OF 16 DIFFERENT       1067
1068 02073   1 02 02066       LDA   TXBD,1         VALUES TO CHECK CARRY          1068
1069 02074   0402 77          LRR   1              PROPAGATION                    1069
1070 02075   1 04 02066       STA   TXBD,1         **                             1070
1071 02076   1 04 02057       STA   TXBP,1         **                             1071
1072 02077   0 12 00000       IRS   0              **                             1072
1073 02100   0 01 02071       JMP   TXBK           **                             1073
1074 02101   0 02 02052       LDA   TXBB           **                             1074
1075 02102   101100           SLN                  **                             1075
1076 02103   0 05 02762       ERA   =1               **                           1076
1077 02104   0 04 02052       STA   TXBB           **                             1077
1078 02105   0 02 02055       LDA   TXBF           **                             1078
1079 02106   101100           SLN                  **                             1079
1080 02107   0 05 02762       ERA   =1               **                           1080
1081 02110   0 04 02055       STA   TXBF           **                             1081
1082 02111   0 01 02030       JMP   TABB           RETURN TO LOOP                 1082
1083                  *                                                          1083
1084                  *          ROUTINE T042      ACO 17                         1084
1085                  *          THIS ROUTINE CHECKS FOR PROPER FUNCTIONING      1085
1086                  *          OF THE ACO17 INPUT TO THE ADDERS.  THE          1086
1087                  *          INSTRUCTIONS USED TO DO THE CHECKING            1087
1088                  *          ARE IRS, ACA, TCA                               1088
1089                  *                                                          1089
```



```
1090 02112   000042           OCT   42           TEST NO.                       1090
1091 02113   0 000000   ADD3 DAC   **           C BIT TEST                     1091
1092 02114   0 02 02112       LDA   *-2          LOAD TEST NO.                  1092
1093 02115   0 04 00777       STA   '777         STORE AT '777                  1093
1094 02116   101000           NOP                KILL TEST LOCATION             1094
1095 02117   0 02 00455       LDA   CNTY                                        1095
1096 02120   0 04 02172       STA   TACN           **                             1096
1097 02121   0 04 02173       STA   TACP           **                             1097
1098 02122   0 04 02167       STA   TACK           **                             1098
1099 02123   0 04 02170       STA   TACL           **                             1099
1100 02124   0 04 02171       STA   TACM           **                             1100
1101 02125   0 02 02167  TACB LDA   TACK           INCREMENT CHECK VALUE BY       1101
1102 02126   0 06 02762       ADD   =1             ADDING ONE                     1102
1103 02127   0 04 02167       STA   TACK           **                             1103
1104 02130   101400           SMI                TEST IF LOOP FINISHED          1104
1105 02131  -0 01 02113       JMP*  ADD3           RETURN                         1105
1106 02132   0 12 02170       IRS   TACL           INCREMENT BY IRS INSTRUCTION   1106
1107 02133   0 02 02170       LDA   TACL           CHECK RESULTS AGAINST CHECK    1107
1108 02134   0 05 02167       ERA   TACK           VALUE                          1108
1109 02135   101040           SNZ                                               1109
1110 02136   0 01 02140       JMP   TACC           TO NEXT INSTRUCTION            1110
1111 02137   000000           HLT                  ERROR                          1111
1112 02140   0 02 02171  TACC LDA   TACM           TEST USING ACA INSTRUCTIONS    1112
1113 02141   140600           SCB                  SET C BIT TO ONE               1113
1114 02142   141216           ACA                  ADD ONE TO A REG USING ACA     1114
1115 02143   0 04 02171       STA   TACM           CHECK RESULTS AGAINST          1115
1116 02144   0 05 02167       ERA   TACK           CHECK VALUE                    1116
1117 02145   101040           SNZ                                               1117
1118 02146   0 01 02150       JMP   TACD           TO NEXT INSTRUCTION            1118
1119 02147   000000           HLT                  ERROR                          1119
1120 02150   0 02 02172  TACD LDA   TACN           CHECK OF TCA INSTRUCTIONS      1120
1121 02151   0 05 02761       ERA   =-'1           COMPLEMENT TEST VALUE          1121
1122 02152   140407           TCA                  PERFORM TWO'S COMPLEMENT       1122
1123 02153   0 04 02172       STA   TACN           **                             1123
1124 02154   0 05 02167       ERA   TACK           CHECK RESULTS                  1124
1125 02155   101040           SNZ                  AGAINST CHECK VALUE            1125
1126 02156   0 01 02160       JMP   TACJ           TO NEXT INSTRUCTION            1126
```

```
1127 02157   000000          HLT                        ERROR                                          1127
1128 02160   0 02 02173 TACJ LDA   TACP                 CHECK OF AOA INSTRUCTION                       1128
1129 02161   141206          AOA                        ADD 1 TO AOA TEST VALUE                        1129
1130 02162   0 04 02173      STA   TACP                 STORE FOR NEXT PASS AND                        1130
1131 02163   0 05 02167      ERA   TACK                 CHECK RESULT USING CHECK                       1131
1132 02164   101040          SNZ                        VALUE                                          1132
1133 02165   0 01 02125      JMP   TACB                 RETURN FOR NEXT ITERATION                      1133
1134 02166   000000          HLT                        ERROR                                          1134
1135                 *                                                                                 1135
1136 02167   0 00 00000 TACK PZE                                                                       1136
1137 02170   0 00 00000 TACL PZE                                                                       1137
1138 02171   0 00 00000 TACM PZE                                                                       1138
1139 02172   0 00 00000 TACN PZE                                                                       1139
1140 02173   0 00 00000 TACP PZE                                                                       1140
1141                 *                                                                                 1141
1142                 *                                                                                 1142
1143                 *          SUBROUTINE T003   ADD AND SUB                                          1143
1144                 *          THIS SUBROUTINE CHECKS FOR PROPER OPERATION OF                         1144
1145                 *          THE ADD AND SUBTRACT INSTRUCTION                                       1145
1146                 *                                                                                 1146
1147                 *                                                                                 1147
1148 02174   000003          OCT   3                    TEST NO.                                       1148
1149 02175   0 000000   ADSB DAC   **                   ADD-SUBTRACT                                   1149
1150 02176   0 02 02174      LDA   *-2                  LOAD TEST NO.                                  1150
1151 02177   0 04 00777      STA   '777                 STORE AT '777                                  1151
1152 02200   101000          NOP                        KILL TEST LOCATION                             1152
1153 02201   0 02 00455      LDA   CNTY                 INITIALIZE TEST COUNT                          1153
1154 02202   0 04 00000      STA   0                    **                                             1154
1155 02203   1 02 02203 TBAB LDA   *,1                  PICK UP DATA WORD                              1155
1156 02204   0 04 02225      STA   TBAX                 SAVE FOR LATER USE                             1156
1157 02205   0415 77         ALS   1                    MULTIPLY BY TWO                                1157
1158 02206   0 04 02226      STA   TBAY                 USING SHIFT                                    1158
1159 02207   0 02 02225      LDA   TBAX                 ADD DATA WORD TO                               1159
1160 02210   0 06 02225      ADD   TBAX                 ITSELF AND CHECK RESULTS                       1160
1161 02211   0 11 02226      CAS   TBAY                 AGAINST DATA TIMES 2                           1161
1162 02212   0 01 02214      JMP   *+2                  ERROR                                          1162
1163 02213   0 01 02215      JMP   *+2                  PROPER ADD                                     1163
```



```
1164 02214   000000          HLT                        ERROR                                          1164
1165 02215   0 07 02225      SUB   TBAX                 SUBTRACT DATA FROM SUM                         1165
1166 02216   0 11 02225      CAS   TBAX                 AND CHECK AGAINST ORIGINAL                     1166
1167 02217   0 01 02221      JMP   *+2                  ERROR                                          1167
1168 02220   0 01 02222      JMP   *+2                  PROPER SUBTRACT                                1168
1169 02221   000000          HLT                        ERROR                                          1169
1170 02222   0 12 00000      IRS   0                    INCREMENT INDEX AND                            1170
1171 02223   0 01 02203      JMP   TBAB                 RETURN FOR NEXT PASS                           1171
1172 02224  -0 01 02175      JMP*  ADSB                 RETURN                                         1172
1173 02225   0 00 00000 TBAX PZE                                                                       1173
1174 02226   0 00 00000 TBAY PZE                                                                       1174
1175                 *                                                                                 1175
1176                 *          SUBROUTINE T100   INDIRECT ADDRESSING CHECK                            1176
1177                 *          THIS SUBROUTINE CHECKS MOST OF THE INSTRUCTIONS                        1177
1178                 *          FOR THE ABILITY TO USE AN INDIRECT ADDRESS.                            1178
1179                 *          THE INDIRECT ADDRESS IS CHECKED AT ALL LEVELS                          1179
1180                 *          BETWEEN 1 AND 5                                                        1180
1181                 *                                                                                 1181
1182 02227   000100          OCT   100                  TEST NO.                                       1182
1183 02230   0 000000   INDA DAC   **                   INDIRECT ADDRESSING                            1183
1184 02231   0 02 02227      LDA   *-2                  LOAD TEST NO.                                  1184
1185 02232   0 04 00777      STA   '777                 STORE AT '777                                  1185
1186 02233   101000          NOP                        KILL TEST LOCATION                             1186
1187 02234   140040          CRA                        INITIALIZE                                     1187
1188 02235   0 04 00000      STA   0                    **                                             1188
1189 02236   0 02 00455      LDA   CNTY                 INITIALIZE TEST COUNT                          1189
1190 02237   0 04 02321      STA   THAZ                 **                                             1190
1191 02240   101000          NOP                                                                       1191
1192 02241   101000          NOP                                                                       1192
1193 02242   101000          NOP                                                                       1193
1194 02243   101000          NOP                                                                       1194
1195 02244   0 02 02763      LDA   =-6                   **                                             1195
1196 02245   0 04 02320      STA   THAT                 **                                             1196
1197 02246  -1 02 02312 THAB LDA*  THAV+1,1             CHECK THE (LDA) INSTRUCTIONS                   1197
1198 02247   0 05 02311      ERA   THAV                 FOR ABILITY TO INDIRECT ADDRESS                1198
1199 02250   100040          SZE                                                                       1199
1200 02251   000000          HLT                        ERROR                                          1200
```

```
1201 02252   0 C2 C2311       LDA   THAV            CHECK (ERA) INSTRUCTIONS FOR                1201
1202 02253  -1 C5 02312       ERA*  THAV+1,1        ABILITY TO INDIRECT ADDRESS                 1202
1203 02254   100040           SZE                                                               1203
1204 02255   000000           HLT                   ERROR                                       1204
1205 02256   0 02 02761       LDA   =-'1            CHECK (ANA) INSTRUCTION FOR                 1205
1206 02257  -1 03 02312       ANA*  THAV+1,1        ABILITY TO INDIRECT ADDRESS                 1206
1207 02260   0 05 02311       ERA   THAV                                                        1207
1208 02261   100040           SZE                                                               1208
1209 02262   000000           HLT                   ERROR                                       1209
1210 02263   140040           CRA                   CHECK (ADD) INSTRUCTION FOR                 1210
1211 02264  -1 06 02312       ADD*  THAV+1,1        ABILITY TO INDIRECT ADDRESS                 1211
1212 02265   0 05 02311       ERA   THAV                                                        1212
1213 02266   100040           SZE                                                               1213
1214 02267   000000           HLT                   ERROR                                       1214
1215 02270   0 02 02311       LDA   THAV            CHECK (CAS) INSTRUCTION FOR                 1215
1216 02271  -1 11 02312       CAS*  THAV+1,1        ABILITY TO INDIRECT ADDRESS                 1216
1217 02272   0 01 02274       JMP   *+2                                                         1217
1218 02273   100000           SKP                                                               1218
1219 02274   000000           HLT                   ERROR                                       1219
1220 02275   0 12 00000       IRS   0               INCREMENT INDEX                             1220
1221 02276   0 12 02320       IRS   THAT            INC LOOP COUNTER NO.1                       1221
1222 02277   0 01 02246       JMP   THAB            RETURN FOR NEXT ITERATION                   1222
1223 02300   140040           CRA                   REINITIALIZE                                1223
1224 02301   0 04 00000       STA   0               *                                           1224
1225 02302   0 02 02760       LDA   =-5                   *                                   1225
1226 02303   0 04 02320       STA   THAT            *                                           1226
1227 02304   0 12 02321       IRS   THAZ            INC LOOP COUNTER NO.2                       1227
1228 02305   0 01 02246       JMP   THAB            REPEAT                                      1228
1229 02306   101000           NOP                                                               1229
1230 02307   101000           NOP                                                               1230
1231 02310  -0 01 02230       JMP*  INDA            RETURN                                      1231
1232 02311   1 000012   THAV  DAC   10,1            INDIRECT ADDRESSING CHAIN                   1232
1233 02312   0 002311         DAC   THAV                                                        1233
1234 02313  -0 002312         DAC*  *-1             **                                          1234
1235 02314  -0 002313         DAC*  *-1             **                                          1235
1236 02315  -0 002314         DAC*  *-1             **                                          1236
1237 02316  -0 002315         DAC*  *-1             **                                          1237
```



```
1238 02317  -0 002316         DAC*  *-1                                                        1238
1239                         *                                                                 1239
1240 02320   000000     THAT  BSZ   1                                                           1240
1241 02321   000000     THAZ  BSZ   1                                                           1241
1242                         *                                                                 1242
1243                         *                                                                 1243
1244                         *          SUBROUTINE T001   IMA                                  1244
1245                         *          THIS SUBROUTINE CHECKS THE PROPER OPERATION OF THE      1245
1246                         *          IMA INSTRUCTION VARIOUS PATTERNS ARE INTERCHANGED       1246
1247                         *          WITH CORE AND THE RESULTS CHECKED                      1247
1248                         *                                                                 1248
1249 02322   000001          OCT   1               TEST NO.                                    1249
1250 02323   0 000000  IMAA  DAC   **              IMA TEST                                    1250
1251 02324   0 02 02322      LDA   *-2             LOAD TEST NO.                               1251
1252 02325   0 04 00777      STA   '777            STORE AT '777                               1252
1253 02326   101000          NOP                   KILL TEST LOCATION                          1253
1254 02327   140040          CRA                   INITIALIZE                                  1254
1255 02330   0 04 00000      STA   0                                                           1255
1256 02331   0 02 00455      LDA   CNTY                                                        1256
1257 02332   0 04 02357      STA   T1AX            INITIALIZE TEST COUNT                       1257
1258 02333   1 02 01000      LDA   512,1           PICK UP FIRST WORD                          1258
1259 02334   0 04 02356      STA   T1AQ                                                        1259
1260 02335   0 04 02360      STA   T1AZ            TO INITIALIZE LOOP                          1260
1261 02336   0 12 00000 T1AB IRS   0               INCREMENT INDEX REGISTER                    1261
1262 02337   0 12 02357      IRS   T1AX            AND PRESS COUNTER                           1262
1263 02340   0 01 02342      JMP   *+2             PROCESS                                     1263
1264 02341  -0 01 02323      JMP*  IMAA            RETURN                                      1264
1265 02342   1 02 01000      LDA   512,1           PICK UP DATA                                1265
1266 02343   0 13 02360      IMA   T1AZ            INTERCHANGE WITH TEST                       1266
1267 02344   0 05 02356      ERA   T1AQ            COMPARE A REG                               1267
1268 02345   100040          SZE                                                               1268
1269 02346   000000          HLT                   ERROR                                       1269
1270 02347   0 02 02360      LDA   T1AZ            CHECK FOR PROPER                            1270
1271 02350   1 05 01000      ERA   512,1           STORAGE DURING IMA                          1271
1272 02351   100040          SZE                   INSTRUCTION                                 1272
1273 02352   000000          HLT                   ERROR                                       1273
1274 02353   1 02 01000      LDA   512,1           PICK UP NEXT TEST                           1274
```

```
1275 02354   0 04 02356       STA   T1AC            DATA, STORE AND RETURN                    1275
1276 02355   0 01 02336       JMP   T1AB            FOR NEXT PASS                             1276
1277                    *                                                                      1277
1278 02356   0 00 00000 T1AQ  PZE                                                             1278
1279 02357   0 00 00000 T1AX  PZE                                                             1279
1280 02360   0 00 00000 T1AZ  PZE                                                             1280
1281                    *                                                                      1281
1282                    *                                                                      1282
1283                    *         SUBROUTINE T007          IAB                                 1283
1284                    *         THIS ROUTINE CHECKS THE PROPER OPERATION                     1284
1285                    *         OF THE IAB INSTRUCTION USING 1000 RANDOM                     1285
1286                    *         VALUES. FAILING BITS ARE DISPLAYED IN THE                    1286
1287                    *         B REGISTER                                                   1287
1288                    *                                                                      1288
1289 02361   000007             OCT   7               TEST NO.                                  1289
1290 02362   0 000000   IABA    DAC   **              IAB TEST                                  1290
1291 02363   0 02 02361         LDA   *-2             LOAD TEST NO.                             1291
1292 02364   0 04 00777         STA   '777            STORE AT '777                             1292
1293 02365   101000             NOP                   KILL TEST LOCATION                        1293
1294 02366   140040             CRA                   INITIALIZE                                1294
1295 02367   0 04 00000         STA   0               **                                        1295
1296 02370   0 02 00455         LDA   CNTY                                                      1296
1297 02371   0 04 02415         STA   IABX            INITIALIZE TEST COUNT                     1297
1298 02372   1 02 01000         LDA   512,1           INITIALIZE FOR                            1298
1299 02373   0 04 02417 IABB    STA   IABW            BEGINNING OF LOOP                         1299
1300 02374   0400 60            LRL   16              LONG SHIFT RIGHT                          1300
1301 02375   0 12 00000         IRS   0               INCREMENT INDEX REGISTER                  1301
1302 02376   0 12 02415         IRS   IABX            INCREMENT COUNTER                         1302
1303 02377   0 01 02401         JMP   *+2             AND TEST.  CONTINUE IF MORE               1303
1304 02400  -0 01 02362         JMP*  IABA            RETURN                                    1304
1305 02401   1 02 01000         LDA   512,1           PICK UP RANDOM VALUE                      1305
1306 02402   0 04 02416         STA   IABV            AND SAVE FOR NEXT ITERATION CHECK         1306
1307 02403   000201             IAB                   INTERCHANGE A REG AND B REG               1307
1308 02404   0 05 02417         ERA   IABW            CHECK FOR PROPER A REG VALUE              1308
1309 02405   100040             SZE                                                             1309
1311 02406   000000             HLT                   ERROR                                     1310
1311 02407   0410 60            LLL   16              BRING B REG TO A REG                      1311
```



```
1312 02410   0 05 02416         ERA   IABV            CHECK FOR PROPER B REG VALUE              1312
1313 02411   100040             SZE                   MUST COMPARE                              1313
1314 02412   000000             HLT                   ERROR                                     1314
1315 02413   0 02 02416         LDA   IABV            GET CHECK VALUE FOR NEXT ITERATION        1315
1316 02414   0 01 02373         JMP   IABB            RETURN FOR NEXT                           1316
1317                    *                                                                      1317
1318 02415   0 00 00000 IABX    PZE                                                             1318
1319 02416   0 00 00000 IABV    PZE                                                             1319
1320 02417   0 00 00000 IABW    PZE                                                             1320
1321                    *                                                                      1321
1322                    *                                                                      1322
1323                    *                                                                      1323
1324                    *         SUBROUTINE T005    IRS                                       1324
1325                    *         THIS ROUTINE CHECKS THE ABILITY TO                           1325
1326                    *         STEP FROM ZERO.  PREMATURE SKIPS ARE CHECKED                 1326
1327                    *         FOR AS WELL AS THE SKIPPING WHEN INCREMENTING                1327
1328                    *         TO ZERO                                                      1328
1329                    *                                                                      1329
1330 02420   000005             OCT   5               TEST NO.                                  1330
1331 02421   0 000000   IRSX    DAC   **              IRS TEST                                  1331
1332 02422   0 02 02420         LDA   *-2             LOAD TEST NO.                             1332
1333 02423   0 04 00777         STA   '777            STORE AT '777                             1333
1334 02424   101000             NOP                   KILL TEST LOCATION                        1334
1335 02425   140040             CRA                                                             1335
1336 02426   0 04 02461         STA   TPYA                                                      1336
1337 02427   0 02 02462         LDA   PTRN                                                      1337
1338 02430   000201             IAB                                                             1338
1339 02431   140040             CRA                                                             1339
1340 02432   141206     IRSD    AOA                                                           1340
1341 02433   000201             IAB                                                             1341
1342 02434   0 12 02461         IRS   TPYA                                                    1342
1343 02435   0 01 02442         JMP   IRSA                                                    1343
1344 02436   000201             IAB                                                           1344
1345 02437   100040             SZE                                                           1345
1346 02440   000000             HLT                   ERROR                                   1346
1347 02441  -0 01 02421         JMP*  IRSX            RETURN                                  1347
1348 02442   0 11 02462 IRSA    CAS   PTRN                                                    1348
```

```
1349 02443   0 01 02445       JMP   *+2                                          1349
1350 02444   0 01 02446       JMP   IRSB                                         1350
1351 02445   000000           HLT                    ERROR                       1351
1352 02446   000201     IRSB  IAB                                                1352
1353 02447   101040           SNZ                                                1353
1354 02450   000000           HLT                    ERROR                       1354
1355 02451   0 11 02461       CAS   TPYA                                         1355
1356 02452   0 01 02454       JMP   *+2                                          1356
1357 02453   0 01 02455       JMP   IRSG                                         1357
1358 02454   000000           HLT                    ERROR                       1358
1359 02455   000201     IRSG  IAB                                                1359
1360 02456   0 02 02462       LDA   PTRN                                         1360
1361 02457   000201           IAB                                                1361
1362 02460   0 01 02432       JMP   IRSD                                         1362
1363                    *                                                       1363
1364 02461   0 00 00000 TPYA  PZE                                                1364
1365 02462   052525     PTRN  OCT   52525                                        1365
1366                    *                                                       1366
1367                    *                                                       1367
1368                    *                                                       1368
1369                    *          SUBROUTINE T002   ERA                        1369
1370                    *          THIS SUBROUTINE CHECKS FOR THE PROPER        1370
1371                    *          OPERATION AT THE ERA INSTRUCTION. RANDOM DATA 1371
1372                    *          WORDS ARE SELECTED AND AN EXCLUSIVE OR WITH  1372
1373                    *          ITSELF IS PERFORMED WHICH SHOULD RESULT IN ZERO 1373
1374                    *          AN EXCLUSIVE OR IS THE MADE WITH ITS ONE'S   1374
1375                    *          COMPLEMENT RESULTING IN ALL ONE'S            1375
1376                    *                                                       1376
1377 02463   000002           OCT   2                TEST NO.                    1377
1378 02464   0 000000   ERAA  DAC   **               ERA TEST                    1378
1379 02465   0 02 02463       LDA   *-2              LOAD TEST NO.               1379
1380 02466   0 04 00777       STA   '777             STORE AT '777               1380
1381 02467   101000           NOP                    KILL TEST LOCATION          1381
1382 02470   140040           CRA                    INITIALIZE                  1382
1383 02471   0 04 00000       STA   0                **                          1383
1384 02472   0 02 00455       LDA   CNTY             INITIALIZE TEST COUNT       1384
1385 02473   0 04 02516       STA   T2AY             **                          1385
```



```
1386 02474   0 12 00000 T2AB  IRS   0                                          1386
1387 02475   1 02 01000       LDA   512.1            PICK UP DATA                1387
1388 02476   0 04 02517       STA   T2XZ             AND STORE FOR TEST          1388
1389 02477   140401           CMA                    COMPLEMENT AND              1389
1390 02500   0 04 02515       STA   T2AX             STORE FOR CHECK             1390
1391 02501   0 05 02517       ERA   T2XZ             EXCLUSIVE OR DATA AND COMPLEMENT 1391
1392 02502   0 04 02514       STA   T2AW             RESULTS SHOULD BE ALL ONES  1392
1393 02503   0 12 02514       IRS   T2AW             CHECK BY INCREMENTING TO ZERO 1393
1394 02504   000000           HLT                    ERROR                       1394
1395 02505   0 02 02517       LDA   T2XZ             EXCLUSIVE OR DATA WITH ITSELF 1395
1396 02506   0 05 02517       ERA   T2XZ             RESULTS SHOULD BE ZERO      1396
1397 02507   100040           SZE                                                1397
1398 02510   000000           HLT                    ERROR                       1398
1399 02511   0 12 02516       IRS   T2AY             INCREMENT COUNTER           1399
1400 02512   0 01 02474       JMP   T2AB             RETURN FOR NEXT PASS        1400
1401 02513  -0 01 02464       JMP*  ERAA             RETURN                      1401
1402                    *                                                       1402
1403 02514   0 00 00000 T2Aw  PZE                                                1403
1404 02515   0 00 00000 T2AX  PZE                                                1404
1405 02516   0 00 00000 T2AY  PZE                                                1405
1406 02517   0 00 00000 T2XZ  PZE                                                1406
1407                    *                                                       1407
1408                    *                                                       1408
1409                    *                                                       1409
1410                    *          SUBROUTINE T004   ANA                        1410
1411                    *                                                       1411
1412 02520   000004           OCT   4                TEST NO.                    1412
1413 02521   0 000000   ANAA  DAC   **               ANA TEST                    1413
1414 02522   0 02 02520       LDA   *-2              LOAD TEST NO.               1414
1415 02523   0 04 00777       STA   '777             STORE AT '777               1415
1416 02524   101000           NOP                    KILL TEST LOCATION          1416
1417 02525   0 02 00455       LDA   CNTY             INITIALIZE TEST COUNT       1417
1418 02526   0 04 00000       STA   0                **                          1418
1419 02527   1 02 02527 ANAB  LDA   *.1                                          1419
1420 02530   0 04 02561       STA   TBBY                                         1420
1421 02531   0 02 02557       LDA   TBBS             AN ODD ALTERNATING PATTERN  1421
1422 02532   0 03 02560       ANA   TBBT             IS ADDED WITH EVEN ALTERNATING 1422
```

```
1423 02533   100040          SZE                                                    1423
1424 02534   000000          HLT             ERROR                                  1424
1425 02535   0 02 02561      LDA   TBBY      RANDOM DATA IS ADDED WITH              1425
1426 02536   0 03 02761      ANA   =-'1      ALL ONES AND THE RESULT                1426
1427 02537   0 11 02561      CAS   TBBY      SHOULD BE ORIGINAL DATA                1427
1428 02540   0 01 02542      JMP   *+2       ERROR                                  1428
1429 02541   0 01 02543      JMP   TBNE      TO NEXT TEST                           1429
1430 02542   000000          HLT             ERROR                                  1430
1431 02543   0 02 02761 TBNE LDA   =-'1      ALL ONES IS THEN ADDED WITH            1431
1432 02544   0 03 02561      ANA   TBBY      RANDOM DATA AND RESULTS                1432
1433 02545   0 05 02561      ERA   TBBY      SHOULD BE ORIGINAL DATA                1433
1434 02546   101040          SNZ             TEST FOR ERROR                         1434
1435 02547   0 01 02551      JMP   TBBD                                             1435
1436 02550   000000          HLT             ERROR                                  1436
1437 02551   0 02 02557 TBBD LDA   TBBS      INITIALIZE FOR NEXT PASS               1437
1438 02552   0 13 02560      IMA   TBBT      **                                     1438
1439 02553   0 04 02557      STA   TBBS      **                                     1439
1440 02554   0 12 00000      IRS   0         INCREMENT INDEX                        1440
1441 02555   0 01 02527      JMP   ANAB      AND RETURN                             1441
1442 02556  -0 01 02521      JMP*  ANAA      RETURN                                 1442
1443                 *                                                            1443
1444 02557   125252     TBBS OCT   125252                                         1444
1445 02560   052525     TBBT OCT   52525                                          1445
1446 02561   000000     TBBY BSZ   1                                              1446
1447                 *                                                            1447
1448                 *                                                            1448
1449                 *                                                            1449
1450                 *                                                            1450
1451                 *           ROUTINE T006       CAS                           1451
1452                 *           THIS ROUTINE CHECKS FOR PROPER                   1452
1453                 *           SKIPPING IN ALL THREE CONDITIONS                 1453
1454                 *                                                            1454
1455 02562   000006          OCT   6         TEST NO.                             1455
1456 02563   0 000000 CASA   DAC   **        CAS TEST                             1456
1457 02564   0 02 02562      LDA   *-2       LOAD TEST NO.                        1457
1458 02565   0 04 00777      STA   '777      STORE AT '777                        1458
1459 02566   101000          NOP             KILL TEST LOCATION                   1459
```



```
1460 02567   14 040          CRA                                                  1460
1461 02570   0 04 00000      STA   0         INITIALIZE                           1461
1462 02571   0 02 00455      LDA   CNTY      INITIALIZE TEST COUNT                1462
1463 02572   0 04 02622      STA   CASX      **                                   1463
1464 02573   1 02 01000 CASB LDA   512.1     CAS CHECK FOR EQUAL                  1464
1465 02574   1 11 01000      CAS   512.1     **                                   1465
1466 02575   000000          HLT             ERROR                                1466
1467 02576   0 01 02600      JMP   *+2       OK                                   1467
1468 02577   000000          HLT             ERROR                                1468
1469 02600   141206          AOA             CAS CHECK WITH A GREATER VALUE       1469
1470 02601   0 11 02757      CAS   ='100000  ELIMINATE VARIABLE DATA              1470
1471 02602   0 01 02604      JMP   *+2       IF EQUAL TO 77777                    1471
1472 02603   0 01 02616      JMP   CASN      **                                   1472
1473 02604   1 11 01000      CAS   512.1                                          1473
1474 02605   0 01 02610      JMP   *+3                                            1474
1475 02606   000000          HLT             ERROR                                1475
1476 02607   000000          HLT             ERROR                                1476
1477 02610   0 07 02756      SUB   =2        CAS CHECK WITH A SMALLER VALUE       1477
1478 02611   100001          SRC             VALUE                                1478
1479 02612   0 01 02616      JMP   CASN                                           1479
1480 02613   1 11 01000      CAS   512.1                                          1480
1481 02614   000000          HLT             ERROR                                1481
1482 02615   000000          HLT             ERROR                                1482
1483 02616   0 12 00000 CASN IRS   0                                            1483
1484 02617   0 12 02622      IRS   CASX                                         1484
1485 02620   0 01 02573      JMP   CASB                                         1485
1486 02621  -0 01 02563      JMP*  CASA        RETURN                             1486
1487                 *                                                          1487
1488 02622   000000     CASX BSZ   1                                            1488
1489                 *                                                          1489
1490                 *                                                          1490
1491                 *                                                          1491
1492                 *                       SUBROUTINE  T010  HALF WORD INSTRUCTIONS 1492
1493                 *           HALF WORD INSTRUCTION TESTS                    1493
1494                 *                                                          1494
1495                 *           TEST CAL INST. - EVEN BITS                     1495
1496                 *                                                          1496
```

```
1497 02623   000010          OCT   10              TEST NO.                          1497
1498 02624   0 000000  HWDT  DAC   **              HALF WORD TEST                    1498
1499 02625   0 02 02623      LDA   *-2             LOAD TEST NO.                     1499
1500 02626   0 04 00777      STA   '777            STORE AT '777                     1500
1501 02627   101000          NOP                   KILL TEST LOCATION                1501
1502 02630   0 02 02713      LDA   CON1            EVEN BITS                         1502
1503 02631   141050          CAL                   ZERO A1 - A8                      1503
1504 02632   0 05 02715      ERA   CON3            MASK FOR ERROR                    1504
1505 02633   100040          SZE                                                     1505
1506 02634   000000          HLT                   ERROR                             1506
1507                 *                                                              1507
1508                 *         TEST CAL INST. - ODD BITS                            1508
1509                 *                                                              1509
1510 02635   0 02 02714      LDA   CON2            ODD BITS                          1510
1511 02636   141050          CAL                   ZERO A1 - A8                      1511
1512 02637   0 05 02716      ERA   CON4            MASK FOR ERROR                    1512
1513 02640   100040          SZE                   TEST FOR ERROR                    1513
1514 02641   000000          HLT                   ERROR                             1514
1515                 *                                                              1515
1516                 *         TEST CAR INST. - EVEN BITS                           1516
1517                 *                                                              1517
1518 02642   0 02 02713      LDA   CON1            EVEN BITS                         1518
1519 02643   141044          CAR                   ZERO A9 - A16                     1519
1520 02644   0 05 02717      ERA   CON5            MASK FOR ERROR                    1520
1521 02645   100040          SZE                   TEST FOR ERROR                    1521
1522 02646   000000          HLT                   ERROR                             1522
1523                 *                                                              1523
1524                 *         TEST CAR INST. - ODD BITS                            1524
1525                 *                                                              1525
1526 02647   0 02 02714      LDA   CON2            ODD BITS                          1526
1527 02650   141044          CAR                   ZERO A9-A16                       1527
1528 02651   0 05 02720      ERA   CON6            MASK FOR ERROR                    1528
1529 02652   100040          SZE                   TEST FOR ERROR                    1529
1530 02653   000000          HLT                   ERROR                             1530
1531                 *                                                              1531
1532                 *         TEST ICA INST.                                       1532
1533                 *                                                              1533
```



```
1534 02654   0 02 02721      LDA   CON7            LEFT EVEN BITS-RIGHT ODD BITS     1534
1535 02655   141340          ICA                   LEFT ODD BITS-RIGHT EVEN BITS     1535
1536 02656   0 05 02722      ERA   CON8            MASK FOR ERROR                    1536
1537 02657   100040          SZE                   TEST FOR ERROR                    1537
1538 02660   000000          HLT                   ERROR                             1538
1539 02661   0 02 02722      LDA   CON8            LEFT ODD BITS-RIGHT EVEN BITS     1539
1540 02662   141340          ICA                   LEFT EVEN BITS-RIGHT ODD BITS     1540
1541 02663   0 05 02721      ERA   CON7            MASK FOR ERROR                    1541
1542 02664   100040          SZE                   TEST FOR ERROR                    1542
1543 02665   000000          HLT                   ERROR                             1543
1544                 *                                                              1544
1545                 *         TEST ICL INST.                                       1545
1546                 *                                                              1546
1547 02666   0 02 02721      LDA   CON7            LEFT EVEN BITS-RIGHT ODD BITS     1547
1548 02667   141140          ICL                   LEFT CLEAR-RIGHT EVEN BITS        1548
1549 02670   0 05 02715      ERA   CON3            MASK FOR ERROR                    1549
1550 02671   100040          SZE                   TEST FOR ERROR                    1550
1551 02672   000000          HLT                   ERROR                             1551
1552 02673   0 02 02722      LDA   CON8            LEFT ODD BITS-RIGHT EVEN BITS     1552
1553 02674   141140          ICL                   LEFT CLEAR-RIGHT ODD BITS         1553
1554 02675   0 05 02716      ERA   CON4            MASK FOR ERROR                    1554
1555 02676   100040          SZE                   TEST FOR ERROR                    1555
1556 02677   000000          HLT                   ERROR                             1556
1557                 *                                                              1557
1558                 *         TEST ICR INST.                                       1558
1559                 *                                                              1559
1560 02700   0 02 02721      LDA   CON7            LEFT EVEN BITS-RIGHT ODD BITS     1560
1561 02701   141240          ICR                   LEFT ODD BITS-RIGHT CLEAR         1561
1562 02702   0 05 02720      ERA   CON6            MASK FOR ERROR                    1562
1563 02703   100040          SZE                   TEST FOR ERROR                    1563
1564 02704   000000          HLT                   ERROR                             1564
1565 02705   0 02 02722      LDA   CON8            LEFT ODD BITS-RIGHT EVEN BITS     1565
1566 02706   141240          ICR                   LEFT EVEN BITS-RIGHT CLEAR        1566
1567 02707   0 05 02717      ERA   CON5            MASK FOR ERROR                    1567
1568 02710   100040          SZE                   TEST FOR ERROR                    1568
1569 02711   000000          HLT                   ERROR                             1569
1570 02712  -0 01 02624      JMP*  HWDT                                             1570
```

```
1571                        *                                                                   1571
1572                        *                                                                   1572
1573                        *          CONSTANTS                                                1573
1574                        *                                                                   1574
1575 02713   052525         CON1 OCT   52525          EVEN BITS                                1575
1576 02714   125252         CON2 OCT   125252         ODD BITS                                 1576
1577 02715   000125         CON3 OCT   125            LEFT CLEAR-RIGHT EVEN BITS               1577
1578 02716   000252         CON4 OCT   252            LEFT CLEAR - RIGHT ODD BITS              1578
1579 02717   052400         CON5 OCT   52400          LEFT EVEN BITS - RIGHT CLEAR             1579
1580 02720   125000         CON6 OCT   125000         LEFT ODD BITS  - RIGHT CLEAR             1580
1581 02721   052652         CON7 OCT   52652          LEFT EVEN BITS - RIGHT ODD BITS          1581
1582 02722   125125         CON8 OCT   125125         LEFT ODD BITS - RIGHT EVEN BITS          1582
1583                        *                                                                   1583
1584 02723   0 002724       MES3 DAC   *+1                                                     1584
1585 02724   177763              DEC   -13                                                     1585
1586 02725   106612              OCT   106612                                                  1586
1587 02726   151705              BCI   12,SENS SW TO A REG 8 TIMES                             1587
     02727   147323
     02730   120323
     02731   153640
     02732   152317
     02733   120301
     02734   120322
     02735   142707
     02736   120270
     02737   120324
     02740   144715
     02741   142723
1588                        *                                                                   1588
1589 02742   0 002743       MES2 DAC   *+1                                                     1589
1590 02743   177773              DEC   -5                                                      1590
1591 02744   106612              OCT   106612                                                  1591
1592 02745   153323              BCI   2,PS                                                   1592
     02746   120240
1593 02747   130260         CNT5 BCI   2,0000                                                  1593
     02750   130260
1594 02751   0 002752       MES4 DAC   *+1                                                     1594
```



```
1595 02752   177775              DEC   -3                                                    1595
1596 02753   106612              OCT   106612                                                1596
1597 02754   142317              BCI   2,DONE                                               1597
     02755   147305
1598                        *                                                                 1598
1599 02756   000002              FIN                                                         1599
     02757   100000
     02760   177773
     02761   177777
     02762   000001
     02763   177772

1600                        *                                                                 1600
1601                        *                                                                 1601
1602                        *                                                                 1602
1603                        *                                                                 1603
1604                        *                                                                 1604
1605                             ORG   '3000                                                  1605
1606                        *                                                                 1606
1607 03000   0 000000       TS03 DAC   **             SECTOR 3 TESTS                          1607
1608 03001   0 10 03726          JST   PFIS           PFI SET-UP - BECOMES A 'NOP' LATER      1608
1609                        *                        ALSO MODIFIES KEYS TEST IF CP IS 716    1609
1610 03002   101000              NOP                                                         1610
1611 03003   0 10 03017          JST   XREG           '11 - XREG AND LOC.0 TEST               1611
1612 03004   0 10 03160          JST   KEYS           '12 - INK, OTK TEST                     1612
1613 03005   0 10 03224          JST   ARSA           '60 - ARS INST TEST                     1613
1614 03006   0 10 03300          JST   ALSA           '61 - ALS                               1614
1615 03007   0 10 03346          JST   LGLA           '62 - LGL                               1615
1616 03010   0 10 03414          JST   LGRA           '63 - LGR                               1616
1617 03011   0 10 03470          JST   ALRA           '64 - ALR                               1617
1618 03012   0 10 03536          JST   ARRA           '65 - ARR                               1618
1619 03013   0 10 03627          JST   LRSA           '66 - LRS                               1619
1620 03014   101000              NOP                                                         1620
1621 03015   -0 01 03000         JMP*  TS03           RETURN TO EXEC                          1621
1622                        *                                                                 1622
1623                        *                                                                 1623
1624                        *                                                                 1624
```

```
1625                    *                          SUBROUTINE  T011  X REG. INSTRUCTIONS                1625
1626                    *          STORE AND LOAD INDEX INSTRUCTION TESTS                               1626
1627                    *                                                                               1627
1628                    *          TEST STX INST.                                                       1628
1629                    *                                                                               1629
1630 03016   000011          OCT   11              TEST NO.                                            1630
1631 03017   0 000000   XREG DAC   **              X REGISTER TEST                                     1631
1632 03020   0 02 03016        LDA   *-2            LOAD TEST NO.                                       1632
1633 03021   0 04 00777        STA   '777           STORE AT '777                                       1633
1634 03022   101000            NOP                  KILL TEST LOCATION                                  1634
1635 03023   0 02 00455        LDA   CNTY           INITIALIZE THE                                      1635
1636 03024   0 04 00000        STA   '0             INDEX REGISTER AND                                  1636
1637 03025   0 04 00771        STA   WORK+1          WORKING LOC NO. 2                                   1637
1638 03026   0 15 00770 TST1   STX   WORK          XFER INDEX REG TO WORKING LOC. NO. 1 AND            1638
1639 03027   0 02 00770        LDA   WORK           THEN TO "A" REGISTER                                1639
1640 03030   0 05 00771        ERA   WORK+1         MASK FOR ERROR                                      1640
1641 03031   100040            SZE                  TEST FOR ERROR                                      1641
1642 03032   000000            HLT                  ERROR                                               1642
1643 03033   0 12 00000        IRS   '0             ADD 1 TO INDEX REG                                  1643
1644 03034   101000            NOP                  NOTHING                                             1644
1645 03035   0 12 00771        IRS   WORK+1         ADD 1 TO WORKING LOC NO. 2                          1645
1646 03036   0 01 03026        JMP   TST1           REPEAT WITH INCREMENTED VALUE                       1646
1647                    *                                                                               1647
1648                    *          TEST STX INST. WITH INDIRECT ADDRESSING                              1648
1649                    *                                                                               1649
1650 03037   0 02 00455        LDA   CNTY                                                               1650
1651 03040   0 04 00000        STA   0              INITIALIZE TEST COUNT                               1651
1652 03041   0 04 00771        STA   WORK+1                                                             1652
1653 03042  -0 15 00766 TST2   STX*  STIR          XFER INDEX REG TO WORKING LOC NO. 1 AND             1653
1654 03043   0 02 00770        LDA   WORK           THEN TO "A" REGISTER                                1654
1655 03044   0 05 00771        ERA   WORK+1         MASK FOR ERROR                                      1655
1656 03045   100040            SZE                  TEST FOR ERROR                                      1656
1657 03046   000000            HLT                  ERROR                                               1657
1658 03047   0 12 00000        IRS   '0             ADD 1 TO INDEX REG                                  1658
1659 03050   101000            NOP                  NOTHING                                             1659
1660 03051   0 12 00771        IRS   WORK+1         ADD 1 TO WORKING LOC NO. 2                          1660
1661 03052   0 01 03042        JMP   TST2           REPEAT WITH INCREMENTED VALUE                       1661
```



```
1662                    *                                                                               1662
1663                    *     TEST  LDX INSTRUCTION                                                     1663
1664                    *                                                                               1664
1665 03053   0 02 00455        LDA   CNTY                                                               1665
1666 03054   0 04 00770        STA   WORK           FIRST NUMBER                                        1666
1667 03055   0 02 03777        LDA   ='52525                                                            1667
1668 03056   0 04 00771        STA   WORK+1         SECOND NUMBER                                       1668
1669 03057   0 02 00770 XR01   LDA   WORK                                                              1669
1670 03060   0 04 00000        STA   0              STORE FIRST NO. AT ZERO                             1670
1671 03061   0 35 00771        LDX   WORK+1         LOAD SECOND NO. INTO X-REG.                         1671
1672 03062   0 02 00000        LDA   0              LOAD FROM ZERO - SB SECOND NO.                      1672
1673 03063   0 05 00771        ERA   WORK+1         XOR WITH SECOND NO.                                 1673
1674 03064   100040            SZE                                                                      1674
1675 03065   000000            HLT                  ERROR - ZERO AND X-REG DID NOT AGREE                1675
1676 03066   0 12 00771        IRS   WORK+1                                                            1676
1677 03067   101000            NOP                                                                      1677
1678 03070   0 12 00770        IRS   WORK                                                              1678
1679 03071   0 01 03057        JMP   XR01                                                               1679
1680                    *                                                                               1680
1681 03072   0 02 00455        LDA   CNTY                                                               1681
1682 03073   0 04 00770        STA   WORK           INITIALIZE                                          1682
1683 03074   0 35 00770 XR02   LDX   WORK          LOAD FIRST NO. INTO X-REG.                          1683
1684 03075   0 02 00771        LDA   WORK+1         LOAD A WITH SECOND NO.                              1684
1685 03076   0 04 00000        STA   0              STORE SECOND NO. AT ZERO                            1685
1686 03077   0 15 00772        STX   WORK+2         STORE FROM X-REG AT WORK+2                          1686
1687 03100   0 02 00772        LDA   WORK+2         WORK+2 SHOULD HAVE SECOND NO.                       1687
1688 03101   0 05 00771        ERA   WORK+1         XOR WITH SECOND NO.                                 1688
1689 03102   100040            SZE                                                                      1689
1690 03103   000000            HLT                  ERROR - X-REG AND ZERO DID NOT AGREE                1690
1691 03104   0 12 00771        IRS   WORK+1                                                            1691
1692 03105   101000            NOP                                                                      1692
1693 03106   0 12 00770        IRS   WORK                                                              1693
1694 03107   0 01 03074        JMP   XR02                                                               1694
1695                    *                                                                               1695
1696                    *          TEST LDX INST. WITH INDIRECT ADDRESSING                              1696
1697                    *                                                                               1697
1698 03110   0 02 00455        LDA   CNTY                                                               1698
```

```
1699 03111   0 04 00771        STA   WORK+1            INITIALIZE                                          1699
1700 03112   140040            CRA                                                                       1700
1701 03113   0 04 00772  TST4  STA   WORK+2                                                             1701
1702 03114  -0 35 00767        LDX*  LDIR               XFER WORKING LOC NO. 3 TO INDEX REG AND           1702
1703 03115   0 15 00770        STX   WORK               THEN TO WORKING LOC NO. 1 AND                     1703
1704 03116   0 02 00770        LDA   WORK               THEN TO "A" REGISTER                              1704
1705 03117   0 05 00772        ERA   WORK+2             MASK                                              1705
1706 03120   100040           SZE                      TEST FOR ERROR                                    1706
1707 03121   000000           HLT                      ERROR                                             1707
1708 03122   0 02 00000       LDA   '0                 XFER LOC 0 TO "A" REGISTER                        1708
1709 03123   0 05 00772       ERA   WORK+2             MASK                                              1709
1710 03124   100040           SZE                      TEST FOR ERROR                                    1710
1711 03125   000000           HLT                      ERROR                                             1711
1712 03126   0 12 00772       IRS   WORK+2             ADD 1 TO WORKING LOC NO. 3                        1712
1713 03127   101000           NOP                      NOTHING                                           1713
1714 03130   0 12 00771       IRS   WORK+1             ADD 1 TO WORKING LOC NO. 2                        1714
1715 03131   0 01 03113       JMP   TST4               REPEAT WITH INCREMENTED VALUE                     1715
1716                     *                                                                              1716
1717                     *                                                                              1717
1718                     *     TEST X-REG FOR INDEXING                                                  1718
1719                     *                                                                              1719
1720 03132   0 10 03133       JST   *+1                FORM ADDR FOR COMPARING INDEXING                  1720
1721 03133   0 000000         DAC   **                                                                  1721
1722 03134   0 02 03133       LDA   *-1                                                                 1722
1723 03135   0 06 03776       ADD   =7                                                                  1723
1724 03136   0 04 00770       STA   WORK               STORE AT POINTER                                  1724
1725 03137   0 02 00455       LDA   CNTY                                                                1725
1726 03140   0 04 03156       STA   CN03               SET UP A LOOP COUNT                               1726
1727 03141   0 35 03775       LDX   =-'200                                                              1727
1728 03142   1 02 03342  INDX  LDA   *+'200,1          LOAD A WITH DATA WORD                             1728
1729 03143  -0 05 00770       ERA*  WORK               COMPARE WITH THE SAME WORD                        1729
1730 03144   100040           SZE                                                                       1730
1731 03145   000000           HLT                      INDEXING DID NOT FORM RIGHT ADDRESS               1731
1732 03146   0 12 00770       IRS   WORK               GOOD - INCREMENT POINTER                          1732
1733 03147   101000           NOP                                                                       1733
1734  03150  0 12 00000       IRS   0                  BUMP INDEX PARAMETER                              1734
1735  03151  101000           NOP                                                                       1735
```



```
1736 03152   0 12 03156       IRS   CN03               ARE WE FINISHED                                   1736
1737 03153   0 01 0 142       JMP   INDX               NO, DO ANOTHER TIME                               1737
1738 03154   000021           RMP                      RESET PARITY FLOP IF SET.                         1738
1739 03155  -0 01 03017       JMP*  XREG               RETURN                                            1739
1740                     *                                                                              1740
1741 03156   000000     CN03  BSZ   1                                                                   1741
1742                     *                                                                              1742
1743                     *                                                                              1743
1744                     *                                                                              1744
1745                     *                            SUBROUTINE  T012  KEYS--INK,OTK                   1745
1746                     *          INPUT AND OUTPUT KEY INSTRUCTION TESTS                              1746
1747                     *                                                                              1747
1748                     *          TEST INK INST.                                                      1748
1749                     *                                                                              1749
1750 03157   000012           OCT   12                 TEST NO.                                          1750
1751 03160   0 000000   KEYS  DAC   **                 KEYS TEST                                         1751
1752 03161   0 02 03157       LDA   *-2                LOAD TEST NO.                                     1752
1753 03162   0 04 00777       STA   '777               STORE AT '777                                     1753
1754 03163   101000           NOP                      KILL TEST LOCATION                                1754
1755 03164   140040           CRA                                                                       1755
1756 03165   000201           IAB                                                                       1756
1757 03166   140040           CRA                                                                       1757
1758 03167   000201           IAB                      CLEAR SHIFT COUNT                                 1758
1759 03170   171020           OTK                                                                       1759
1760 03171   140200           RCB                      RESET "C" BIT                                     1760
1761 03172   0 02 03774       LDA   ='177777                                                            1761
1762 03173   000043           INK                      INPUT KEYS                                        1762
1763 03174   0 03 03773  KEY1  ANA   ='157777          BECOMES  ANA ='177577  IF CP IS 716              1763
1764 03175   100040           SZE                      KEYS SHOULD BE ZERO                               1764
1765 03176   000000           HLT                      ERROR  -  SOME BITS SET, CHECK A-REG              1765
1766 03177   140600           SCB                      SET "C" BIT                                       1766
1767 03200   000043           INK                      INPUT KEYS                                        1767
1768 03201   0 03 03222       ANA   CON9               MASK FOR A1                                       1768
1769 03202   101400           SMI                      TEST FOR ERROR                                    1769
1770 03203   000000           HLT                      ERROR                                             1770
1771                     *                                                                              1771
1772                     *          TEST OTK INST.                                                      1772
```

```
1773                        *
1774 03204   0 02 03772       LDA   ='077777
1775 03205   141206            AOA                    ADD ONE TO (A) THIS SHOULD SET THE C BIT
1776 03206   140040            CPA                    CLEAR "A" REG
1777 03207   171020            OTK                    OUTPUT KEYS
1778 03210   100001            SRC                    TEST FOR ERROR
1779 03211   000000            HLT                    ERROR
1780 03212   140024            CHS                    SET A1
1781 03213   171020            OTK                    OUTPUT KEYS
1782 03214   101001            SSC                    TEST FOR ERROR
1783 03215   000000            HLT                    ERROR
1784 03216   140200            RCB                    RESET "C" BIT
1785 03217   0400 40           LRL   32
1786 03220  -0 01 03160        JMP*  KEYS             RETURN
1787                        *
1788 03221   0 03 03771 KEY2   ANA   ='177577         MASK OFF BIT 9 FOR PRIV/ENB RUPT FLOP
1789 03222   100000     CON9   OCT   100000
1790                        *
1791                        *
1792                        *
1793                        *
1794                        *          SUBROUTINE T060   ARS
1795                        *
1796 03223   000060         OCT   60                 TEST NO.
1797 03224   0 000000   ARSA DAC   **                ARS TEST
1798 03225   0 02 03223     LDA   *-2                LOAD TEST NO.
1799 03226   0 04 00777     STA   '777               STORE AT '777
1800 03227   101000         NOP                      KILL TEST LOCATION
1801 03230   0 02 00455     LDA   CNTY
1802 03231   0 04 03622     STA   SFTX               INITIALIZE TEST COUNT
1803 03232   0 02 03276 ARSB LDA   ARSS
1804 03233   0 04 03605     STA   SFT                MODIFY SHIFT INSTRUCTION
1805 03234   0 02 03770     LDA   =-15
1806 03235   0 04 00000     STA   0                  SHIFTS COUNTER
1807 03236   140040     ARSD CRA
1808 03237   0 04 03623     STA   SFTY               **
1809 03240   000201         IAB                      **
```



```
1810 03241   1 02 00672       LDA   TSTB,1             **
1811 03242   0 04 03624       STA   SFTZ               **
1812 03243   0 02 00652       LDA   TSTX               CHECK ARS USING
1813 03244   0 10 03603       JST   SHFT               FLOATING ZERO
1814 03245   140040           CRA                      **
1815 03246   000201           IAB                      **
1816 03247   1 02 00713       LDA   TSTC,1             CHECK ARS USING
1817 03250   0 04 03624       STA   SFTZ               ALL ONES POSITIVE
1818 03251   0 02 00673       LDA   TSTV               **
1819 03252   0 10 03603       JST   SHFT               **
1820 03253   140040           CRA                      **
1821 03254   000201           IAB                      CHECK ARS USING
1822 03255   1 02 00734       LDA   TSTD,1             NEGATIVE ALTERNATING PATTERN
1823 03256   0 04 03624       STA   SFTZ               **
1824 03257   0 02 00714       LDA   TSTU               **
1825 03260   0 10 03603       JST   SHFT               **
1826 03261   140040           CRA                      CHECK ARS USING
1827 03262   000201           IAB                      POSITIVE ALTERNATING PATTERN
1828 03263   1 02 00755       LDA   TSTE,1             **
1829 03264   0 04 03624       STA   SFTZ               **
1830 03265   0 02 00735       LDA*  TSTR               **
1831 03266   0 10 03603       JST   SHFT               **
1832 03267   0 12 00000       IRS   0                  INCREMENT INNER LOOP COUNTER
1833 03270   0 01 03274       JMP   ARSG               OFF FOR NEXT SHIFT
1834 03271   0 12 03622       IRS   SFTX
1835 03272   0 01 03232       JMP   ARSB               RETURN FOR NEXT PASS
1836 03273  -0 01 03224       JMP*  ARSA               NO ERRORS. EXIT
1837                        *
1838 03274   0 12 03605 ARSG  IRS   SFT                STEP SHIFT AMOUNT AND
1839 03275   0 01 03236       JMP   ARSD               RETURN FOR NEXT PASS
1840                        *
1841 03276   0405 61    ARSS ARS   15
1842                        *
1843                        *
1844                        *
1845                        *          SUBROUTINE T061   ALS
1846                        *
```

```
1847 03277   000061          OCT   61              TEST NO.                          1847
1848 03300   0 000000  ALSA DAC   **              ALS TEST                          1848
1849 03301   0 02 03277       LDA   *-2             LOAD TEST NO.                     1849
1850 03302   0 04 00777       STA   '777            STORE AT '777                     1850
1851 03303   101000           NOP                   KILL TEST LOCATION                1851
1852 03304   0 02 00455       LDA   CNTY                                              1852
1853 03305   0 04 03622       STA   SFTX            INITIALIZE TEST COUNT             1853
1854 03306   0 02 03344 ALSE  LDA   ALSS                                             1854
1855 03307   0 04 03605       STA   SFT             MODIFY SHIFT INSTRUCTION          1855
1856 03310   0 02 03770       LDA   =-15                                             1856
1857 03311   0 04 00000       STA   0               SHIFTS COUNTER                    1857
1858 03312   0 02 03777 ALSD  LDA   ='52525         CHECK OF ALS USING                1858
1859 03313   0 04 03623       STA   SFTY            ALL ONE PATTERN                   1859
1860 03314   000201           IAB                   **                                1860
1861 03315   1 02 00571       LDA   SKNB,1          **                                1861
1862 03316   0 04 03624       STA   SFTZ            **                                1862
1863 03317   0 02 00571       LDA   SKNB            **                                1863
1864   320   0 10 03603       JST   SHFT            **                                1864
1865 03321   0 02 03777       LDA   ='52525         CHECK OF ALS USING                1865
1866 03322   000201           IAB                   FLOATING ONE BIT                  1866
1867 03323   1 02 00611       LDA   SKNC,1          **                                1867
1868 03324   0 04 03624       STA   SFTZ            **                                1868
1869 03325   0 02 00611       LDA   SKNC            **                                1869
1870 03326   0 10 03603       JST   SHFT            **                                1870
1871 03327   0 02 03777       LDA   ='52525         CHECK OF ALS USING                1871
1872   330   000201           IAB                   ALTERNATING BIT PATTERN           1872
1873 0333    1 02 00551       LDA   SKNA,1          **                                1873
1874 03332   0 04 03624       STA   SFTZ            **                                1874
1875 03333   0 02 00551       LDA   SKNA            **                                1875
1876 0333    0 10 03603       JST   SHFT            **                                1876
1877 0333    0 12 00000       IRS   0               INCREMENT                         1877
1878   33    0 01 03342       JMP   ALSG            GO SET FOR NEXT ITERATION         1878
1879   337   0 12 03622       IRS   SFTX            INCREMENT MAIN COUNTER            1879
1880   34    0 01 03306       JMP   ALSB            RETURN FOR NEXT PASS              1880
1881 03341  -0 01 03300       JMP*  ALSA            EXIT                              1881
1882                    *                                                           1882
1883   342   0 12 03605 ALSG  IRS   SFT             INCREMENT SHIFT AMOUNT            1883
```



```
1884 0334    0 01 03312       JMP   ALSD            AND RETURN FOR NEXT PASS          1884
1885                    *                                                           1885
1886 03344   0415 61    ALSS  ALS   15                                              1886
1887                    *                                                           1887
1888                    *                                                           1888
1889                    *             SUBROUTINE T062   LGL                         1889
1890                    *                                                           1890
1891 03345   000062           OCT   62              TEST NO.                          1891
1892 03346   0 000000  LGLA   DAC   **              LGL TEST                          1892
1893 03347   0 02 03345       LDA   *-2             LOAD TEST NO.                     1893
1894 03350   0 04 00777       STA   '777            STORE AT '777                     1894
1895 03351   101000           NOP                   KILL TEST LOCATION                1895
1896 03352   0 02 00455       LDA   CNTY                                              1896
1897 03353   0 04 03622       STA   SFTX            INITIALIZE TEST COUNT             1897
1898 03354   0 02 03410 LGLB  LDA   LGLS                                             1898
1899 03355   0 04 03605       STA   SFT             MODIFY SHIFT INSTRUCTION          1899
1900 03356   0 02 03770       LDA   =-15                                             1900
1901 03357   0 04 00000       STA   0               SHIFTS COUNTER                    1901
1902 03360   0 02 03777 LGLD  LDA   ='52525         INITIALIZE B REG AND              1902
1903 03361   0 04 03623       STA   SFTY            STORE VALUE FOR LATER             1903
1904 03362   000201           IAB                   CHECK                             1904
1905 03363   1 02 00551       LDA   SKNA,1          STORE FINAL A REG                 1905
1906 0336    0 04 03624       STA   SFTZ            VALUE FOR CHECK                   1906
1907 03365   0 02 00551       LDA   SKNA            INITIALIZE A REG                  1907
1908 03366   0 10 03603       JST   SHFT            GO TO SHIFT AND CHECK ROUTINE     1908
1909 03367   0 02 03777       LDA   ='52525         INITIALIZE                        1909
1910 03370   000201           IAB                   B REG                             1910
1911 03371   1 02 00571       LDA   SKNB,1          A REG VALUE FOR                   1911
1912 03372   0 04 03624       STA   SFTZ            CHECK                             1912
1913 03373   0 02 00571       LDA   SKNB            LOAD DATA                         1913
1914 03374   0 10 03603       JST   SHFT            TO SHIFT AND CHECK                1914
1915 03375   0 02 03777       LDA   ='52525         INITIALIZE                        1915
1916 03376   000201           IAB                   B REG                             1916
1917 03377   1 02 00611       LDA   SKNC,1          FINAL A REG VALUE                 1917
1918 03400   0 04 03624       STA   SFTZ            TO STORAGE FOR CHECK              1918
1919 03401   0 02 00611       LDA   SKNC            INITIALIZE A REG                  1919
1920 03402   0 10 03603       JST   SHFT            TO SHIFT AND CHECK                1920
```

```
1921 03403   0 12 00000       IRS   0              STEP INNEP LOOP COUNTER                    1921
1922 03404   0 01 03411       JMP   LGLG           MOVE GO SET UP                             1922
1923 03405   0 12 03622       IRS   SFTX                                                      1923
1924 03406   0 01 03354       JMP   LGLB           RETURN FOR NEXT PASS                       1924
1925 03407  -0 01 03346       JMP*  LGLA           AND EXIT                                   1925
1926                     *                                                                   1926
1927 03410   0414 61     LGLS LGL   15                                                       1927
1928 03411   0 12 03605  LGLG IRS   SFT            INCREMENT SHIFT AMOUNT                     1928
1929 03412   0 01 03360       JMP   LGLD           AND RETURN TO INNER LOOP                   1929
1930                     *                                                                   1930
1931                     *                                                                   1931
1932                     *          SUBROUTINE T063   LGR                                    1932
1933                     *                                                                   1933
1934 03413   000063          OCT   63             TEST NO.                                   1934
1935 03414   0 000000   LGRA DAC   **             LGR TEST                                   1935
1936 03415   0 02 03413       LDA   *-2            LOAD TEST NO.                              1936
1937 03416   0 04 00777       STA   '777           STORE AT '777                              1937
1938 03417   101000           NOP                  KILL TEST LOCATION                         1938
1939 03420   0 02 00455       LDA   CNTY                                                      1939
1940 03421   0 04 03622       STA   SFTX           INITIALIZE TEST COUNT                      1940
1941 03422   0 02 03466 LGRB  LDA   LGRS                                                     1941
1942 03423   0 04 03605       STA   SFT            MODIFY SHIFT INSTRUCTION                   1942
1943 03424   0 02 03770       LDA   =-15                                                     1943
1944 03425   0 04 00000       STA   0              SHIFTS COUNTER                             1944
1945 03426   0 02 03777 LGRD  LDA   ='52525        INITIALIZE B REG AND B REG                 1945
1946 03427   0 04 03623       STA   SFTY           CHECK CELL                                 1946
1947 03430   000201           IAB                  **                                         1947
1948 03431   0 02 00611       LDA   SKNC           SET A REG CHECK CELL                       1948
1949 03432   0 04 03624       STA   SFTZ           TO PROPER VALUE                            1949
1950 03433   1 02 00611       LDA   SKNC,1         INITIALIZE A REG                           1950
1951 03434   0 10 03603       JST   SHFT           TO SHIFT AND CHECK ROUTINE                 1951
1952 03435   0 02 03777       LDA   ='52525        CHECK OF LGR                               1952
1953 03436   000201           IAB                  WITH ALL ONE PATTERN                       1953
1954 03437   1 02 00714       LDA   TSTU,1         **                                         1954
1955 03440   0 04 03624       STA   SFTZ           **                                         1955
1956 03441   0 02 03774       LDA   =-'1           **                                         1956
1957 03442   0 10 03603       JST   SHFT           **                                         1957
```



```
1958 03443   0 02 03777       LDA   ='52525        CHECK OF LGR                               1958
1959 03444   000201           IAB                  WITH ALTERNATING BITS                      1959
1960 03445   1 02 00756       LDA   TSTE+1,1       **                                         1960
1961 03446   0 04 03624       STA   SFTZ           **                                         1961
1962 03447   0 02 00734       LDA   TSTD           **                                         1962
1963 03450   0 10 03603       JST   SHFT           **                                         1963
1964 03451   0 02 03777       LDA   ='52525        CHECK OF LGR                               1964
1965 03452   000201           IAB                  WITH FLOATING ONE                          1965
1966 03453   0 02 00611       LDA   SKNC           **                                         1966
1967 03454   0 04 03624       STA   SFTZ           **                                         1967
1968 03455   1 02 00611       LDA   SKNC,1         **                                         1968
1969 03456   0 10 03603       JST   SHFT           **                                         1969
1970 03457   0 12 00000       IRS   0                                                         1970
1971 03460   0 01 03464       JMP   LGRG                                                      1971
1972 03461   0 12 03622       IRS   SFTX                                                      1972
1973 03462   0 01 03422       JMP   LGRB                                                      1973
1974 03463  -0 01 03414       JMP*  LGRA                                                      1974
1975                     *                                                                   1975
1976 03464   0 12 03605  LGRG IRS   SFT                                                      1976
1977 03465   0 01 03426       JMP   LGRD                                                      1977
1978 03466   0404 61     LGRS LGR.  15                                                       1978
1979                     *                                                                   1979
1980                     *                                                                   1980
1981                     *          SUBROUTINE T064   ALR                                    1981
1982                     *                                                                   1982
1983 03467   000064          OCT   64             TEST NO.                                   1983
1984 03470   0 000000   ALRA DAC   **             ALR TEST                                   1984
1985 03471   0 02 03467       LDA   *-2            LOAD TEST NO.                              1985
1986 03472   0 04 00777       STA   '777           STORE AT '777                              1986
1987 03473   101000           NOP                  KILL TEST LOCATION                         1987
1988 03474   0 02 00455       LDA   CNTY                                                      1988
1989 03475   0 04 03622       STA   SFTX           INITIALIZE TEST COUNT                      1989
1990 03476   0 02 03534 ALRB  LDA   ALRS                                                     1990
1991 03477   0 04 03605       STA   SFT            MODIFY SHIFT INSTRUCTION                   1991
1992 03500   0 02 03770       LDA   =-15                                                     1992
1993 03501   0 04 00000       STA   0              SHIFTS COUNTER                             1993
1994 03502   0 02 03777 ALRD  LDA   ='52525        CHECK ALR USING                            1994
```

```
1995 03503   0 04 03623       STA   SFTY            FLOATING ZERO BIT
1996 03504   000201           IAB                   **
1997 03505   0 02 00673       LDA   TSTV            **
1998 03506   0 04 03624       STA   SFTZ            **
1999 03507   1 02 00673       LDA   TSTV,1          **
2000 03510   0 10 03603       JST   SHFT            **
2001 03511   0 02 03777       LDA   ='52525         CHECK ALR USING
2002 03512   000201           IAB                   FLOTING ONE BIT
2003 03513   0 02 00631       LDA   SKND            **
2004 03514   0 04 03624       STA   SFTZ            **
2005 03515   1 02 00631       LDA   SKND,1          **
2006 03516   0 10 03603       JST   SHFT            **
2007 03517   0 02 03777       LDA   ='52525         CHECK OF ALR USING
2008 03520   000201           IAB
2009 03521   0 02 00651       LDA   SKNE            A ONE BIT MARKER
2010 03522   0 04 03624       STA   SFTZ            **
2011 03523   1 02 00651       LDA   SKNE,1          **
2012 03524   0 10 03603       JST   SHFT            **
2013 03525   0 12 00000       IRS   0
2014 03526   0 01 03532       JMP   ALRG
2015 03527   0 12 03622       IRS   SFTX
2016 03530   0 01 03476       JMP   ALRB
2017 03531  -0 01 03470       JMP*  ALRA
2018                 *
2019 03532   0 12 03605 ALRG  IRS   SFT
2020 03533   0 01 03502       JMP   ALRD
2021 03534   0416 61    ALRS  ALR   15
2022                 *
2023                 *
2024                 *           SUBROUTINE T065   ARR
2025                 *
2026 03535   000065          OCT   65              TEST NO.
2027 03536   0 000000  ARRA  DAC   **              ARR TEST
2028 03537   0 02 03535      LDA   *-2             LOAD TEST NO.
2029 03540   0 04 00777      STA   '777            STORE AT '777
2030 03541   101000          NOP                   KILL TEST LOCATION
2031 03542   0 02 00455      LDA   CNTY
```



```
2032 03543   0 04 03622       STA   SFTX            INITIALIZE TEST COUNT
2033 03544   0 02 03602 ARRB  LDA   ARRS
2034 03545   0 04 03605       STA   SFT             MODIFY SHIFT INSTRUCTION
2035 03546   0 02 03770       LDA   =-15
2036 03547   0 04 00000       STA   0               SHIFTS COUNTER
2037 03550   0 02 03777 ARRD  LDA   ='52525         CHECK OF ARR USING
2038 03551   0 04 03623       STA   SFTY            FLOATING ZERO BIT
2039 03552   000201           IAB
2040 03553   1 02 00673       LDA   TSTV,1          **
2041 03554   0 04 03624       STA   SFTZ            **
2042 03555   0 02 00673       LDA   TSTV            **
2043 03556   0 10 03603       JST   SHFT            **
2044 03557   0 02 03777       LDA   ='52525         CHECK OF ARR USING
2045 03560   000201           IAB                   FLOATING ONE BIT
2046 03561   1 02 00631       LDA   SKND,1          **
2047 03562   0 04 03624       STA   SFTZ            **
2048 03563   0 02 00631       LDA   SKND            **
2049 03564   0 10 03603       JST   SHFT            **
2050 03565   0 02 03777       LDA   ='52525         CHECK AT ARR USING
2051 03566   000201           IAB                   ALTERNTING  PATTERN WITH
2052 03567   1 02 00651       LDA   SKNE,1          A ONE MARKER BIT
2053 03570   0 04 03624       STA   SFTZ            **
2054 03571   0 02 00651       LDA   SKNE            **
2055 03572   0 10 03603       JST   SHFT            **
2056 03573   0 12 00000       IRS   0               INCREMENT INNER LOOP COUNTER
2057 03574   0 01 03600       JMP   ARRG            AND GO SET NEXT TRY
2058 03575   0 12 03622       IRS   SFTX
2059 03576   0 01 03544       JMP   ARRB            RETURN FOR NEXT PASS
2060 03577  -0 01 03536       JMP*  ARRA            NO ERRORS EXIT
2061                 *
2062 03600   0 12 03605 ARRG  IRS   SFT             INCREMENT SHIFT INSTRUCTION
2063 03601   0 01 03550       JMP   ARRD            AND RETURN FOR NEXT PASS
2064 03602   0406 61    ARRS  ARR   15
2065                 *
2066                 *
2067                 *
2068 03603   0 000000  SHFT  DAC   **              SHIFT AND CHECK ROUTINE
```

```
2069 03604   0 04 03625       STA   SFXY          STORE WORD                                  2069
2070 03605   0 00 00000 SFT   ***                 PROPER SHIFT INSERTED                       2070
2071 03606   0 04 03620       STA   SHFQ          STORE WORD AFTER SHIFT                      2071
2072 03607   0 05 03624       ERA   SFTZ          COMPARE WITH ORIGINAL WORD                  2072
2073 03610   100040           SZE                                                           2073
2074 03611   000000           HLT                 ERROR - DID NOT CHECK.                      2074
2075 03612   000201           IAB                                                           2075
2076 03613   0 04 03621       STA   SHFR                                                    2076
2077 03614   0 05 03623       ERA   SFTY          COMPARE THE 2ND WORD                        2077
2078 03615   100040           SZE                                                           2078
2079 03616   000000           HLT                 ERROR                                       2079
2080 03617   -0 01 03603      JMP*  SHFT                                                    2080
2081                  *                                                                     2081
2082 03620   000000     SHFQ  BSZ   1                                                       2082
2083 03621   000000     SHFR  BSZ   1                                                       2083
2084 03622   000000     SFTX  BSZ   1                                                       2084
2085 03623   000000     SFTY  BSZ   1                                                       2085
2086 03624   000000     SFTZ  BSZ   1                                                       2086
2087 03625   000000     SFXY  BSZ   1                                                       2087
2088                  *                                                                     2088
2089                  *         SUBROUTINE T066          LRS                              2089
2090                  *         THIS ROUTINE CHECKS THE PROPER OPERATION                   2090
2091                  *         OF THE LRS INSTRUCTION USING POSITIVE AND                  2091
2092                  *         NEGATIVE DATA. THE DATA IS ALTERNATING BITS AND            2092
2093                  *         FLOATING ZERO AND ONE PATTERNS                             2093
2094                  *                                                                    2094
2095 03626   000066           OCT   66            TEST NO.                                   2095
2096 03627   0 000000   LRSA  DAC   **            LRS TEST                                   2096
2097 03630   0 02 03626       LDA   *-2                                                      2097
2098 03631   0 04 00777       STA   '777          STORE TEST NO. AT '777                     2098
2099 03632   101000           NOP                 KILL TEST LOCATION                         2099
2100 03633   0 02 00455       LDA   CNTY                                                     2100
2101 03634   0 04 03622       STA   SFTX          INITIALIZE TEST COUNT                      2101
2102 03635   0 02 03770 LRSB  LDA   =-15                                                    2102
2103 03636   0 04 00000       STA   0             SHIFTS COUNTER                             2103
2104 03637   0 02 03724       LDA   LRSS          STORE LRS INST                             2104
2105 03640   0 04 03605       STA   SFT           IN THE SHIFT ROUT.                         2105
```



```
2106 03641   0 02 03774       LDA   =-1           STORE CORRECT                              2106
2107 03642   0 04 03624       STA   SFTZ          A REG AND B REG                            2107
2108 03643   0 04 03623       STA   SFTY          VALUES                                     2108
2109 03644   0 02 03767       LDA   ='100000                                                 2109
2110 03645   000201           IAB                                                            2110
2111 03646   0 02 03725       LDA   TSTA          LOAD TEST WORD '100000                     2111
2112 03647   0 10 03603       JST   SHFT          GO TO SHIFT ROUT                           2112
2113 03650   140040           CRA                                                            2113
2114 03651   0 04 03624       STA   SFTZ                                                     2114
2115 03652   0 04 03623       STA   SFTY                                                     2115
2116 03653   0 02 03772       LDA   ='77777       CHANGE PATTERN                             2116
2117 03654   000201           IAB                                                            2117
2118 03655   0 02 03772       LDA   ='77777                                                  2118
2119 03656   0 10 03603       JST   SHFT          TEST ROUTINE                               2119
2120 03657   0 02 03774 LRSH  LDA   =-1                                                     2120
2121 03660   0 04 03624       STA   SFTZ                                                     2121
2122 03661   1 02 00672       LDA   TSTB,1                                                   2122
2123 03662   0 04 03623       STA   SFTY                                                     2123
2124 03663   0 02 03767       LDA   ='100000                                                 2124
2125 03664   000201           IAB                                                            2125
2126 03665   0 02 00652       LDA   TSTX          PATTERN '137777                            2126
2127 03666   0 10 03603       JST   SHFT          GO AND TEST                                2127
2128 03667   1 02 00713       LDA   TSTC,1                                                   2128
2129 03670   0 04 03623       STA   SFTY                                                     2129
2130 03671   140040           CRA                                                            2130
2131 03672   0 04 03624       STA   SFTZ                                                     2131
2132 03673   000201           IAB                                                            2132
2133 03674   0 02 00673       LDA   TSTV          GET PATTERN '7777                          2133
2134 03675   0 10 03603       JST   SHFT          GO TO TEST ROUT                            2134
2135 03676   1 02 00734       LDA   TSTD,1                                                   2135
2136 03677   0 04 03623       STA   SFTY                                                     2136
2137 03700   0 02 03774       LDA   =-1                                                      2137
2138 03701   0 04 03624       STA   SFTZ                                                     2138
2139 03702   0 02 03767       LDA   ='100000                                                 2139
2140 03703   000201           IAB                                                            2140
2141 03704   0 02 00714       LDA   TSTU          PATTERN '125252                            2141
2142 03705   0 10 03603       JST   SHFT          TEST ROUT                                  2142
```

```
2143 03706   1 02 00755      LDA   TSTE,1                                    2143
2144 03707   0 04 03623      STA   SFTY                                      2144
2145 03710   140040          CRA                                             2145
2146 03711   0 04 03624      STA   SFTZ                                      2146
2147 03712   000201          IAB                                             2147
2148 03713   0 02 00735      LDA   TSTR          LOAD PATTERN '52525       2148
2149 03714   0 10 03603      JST   SHFT          TEST ROUT.                2149
2150 03715   0 12 00000      IRS   0             ALL SHIFTS CHECKED        2150
2151 03716   0 01 03722      JMP   LRSG          NO, CHANGE SHIFT COUNT    2151
2152 03717   0 12 03622      IRS   SFTX          ARE WE FINISHED           2152
2153 03720   0 01 03635      JMP   LRSB          NO, TEST MORE             2153
2154 03721  -0 01 03627      JMP*  LRSA                                      2154
2155                        *                                               2155
2156 03722   0 12 03605 LRSG IRS   SFT                                       2156
2157 03723   0 01 03657      JMP   LRSH                                      2157
2158                        *                                               2158
2159 03724   0401 42    LRSS LRS   30                                        2159
2160 03725   100000     TSTA OCT   100000                                    2160
2161                        *                                               2161
2162                        *                                               2162
2163                        *     POWER FAILURE RUPT SET UP ROUTINE         2163
2164                        *                                               2164
2165 03726   0 000000   PFIS DAC   **                                        2165
2166 03727   0 02 03744      LDA   PFIB          LOAD DAC OF PFI RUPT ROUT 2166
2167 03730   0 04 00060      STA   '60           STORE AT '60              2167
2168 03731   0 02 03752      LDA   PFID          GET DAC OF RESTART ROUT   2168
2169 03732   0 04 00052      STA   '52           STORE AT '52              2169
2170 03733   0 02 03766      LDA   ='101000                                2170
2171 03734   0 04 03001      STA   TS03+1                                  2171
2172 03735   0 02 03774      LDA   =-1           TEST IF CP IS 716         2172
2173 03736   0 04 00002      STA   2             STORE IN B-REG            2173
2174 03737   0 12 00002      IRS   2             MUST SKIP IF CP IS 716    2174
2175 03740  -0 01 03726      JMP*  PFIS          NOT 716, RETURN           2175
2176 03741   0 02 03221      LDA   KEY2          CP IS 716, MODIFY KEY1 INSTRUCTION 2176
2177 03742   0 04 03174      STA   KEY1                                    2177
2178 03743  -0 01 03726      JMP*  PFIS          RETURN                    2178
2179                        *                                               2179
```



```
2180 03744   0 003745   PFIB DAC   *+1                                      2180
2181 03745   0 000000        DAC   **            PF RUPT ENTRY             2181
2182 03746   0 02 03751      LDA   PFIC          JMP* '52                  2182
2183 03747   0 04 00000      STA   0                                       2183
2184 03750   000000         HLT                                           2184
2185                        *                                             2185
2186 03751  -0 01 00052 PFIC JMP*  '52           DUMMY INSTR.              2186
2187                        *                                             2187
2188 03752   0 003753   PFID DAC   *+1                                     2188
2189 03753  -0 10 00773      JST*  DLAY          1.5 SECOND DELAY FOR ASR TO COME UP 2189
2190 03754   0 02 03757      LDA   DPFM                                    2190
2191 03755   0 10 00402      JST   TYPE                                    2191
2192 03756   0 01 00162      JMP   STR2                                    2192
2193                        *                                             2193
2194 03757   0 003760   DPFM DAC   *+1                                     2194
2195 03760   177773         DEC   -5                                      2195
2196 03761   106612         OCT   106612                                  2196
2197 03762   150306         BCI   4,PFI/ARS                               2197
     03763   144657
     03764   140722
     03765   151640
2198                        *                                             2198
2199                        *                                             2199
2200 03766   101000         FIN                                           2200
     03767   100000
     03770   177761
     03771   177577
     03772   077777
     03773   157777
     03774   177777
     03775   177600
     03776   000007
     03777   052525

2201                        *                                             2201
2202                        *                                             2202
2203                        *                                             2203
```

```
2204                    *
2205                    *
2206                    *
2207                          ORG   '4000
2208                    *
2209 04000   0 000000   TS04 DAC   **              SECTOR 4 TESTS
2210 04001   101000          NOP
2211 04002   0 10 04013      JST   LLSA            '67 - LLS INST TEST
2212 04003   0 10 04070      JST   LLLA            '70 - LLL
2213 04004   0 10 04170      JST   LRLA            '71 - LRL
2214 04005   0 10 04253      JST   LLRA            '72 - LLR
2215 04006   0 10 04323      JST   LRRA            '73 - LRR
2216 04007   0 10 04416      JST   SFTA            '74 - GEN. SHIFTS
2217 04010   101000          NOP
2218 04011   -0 01 04000     JMP*  TS04            RETURN
2219                    *
2220                    *
2221                    *     SUBROUTINE T067 LLS
2222                    *     THIS ROUTINE CHECKS THE PROPER OPERATION OF THE
2223                    *     LLS INSTRUCTION USING POSITIVE AND NEGATIVE DATA.
2224                    *     THE DATA IS ALTERNATING BITS, ZEROS AND ONES
2225                    *     PATTERNS.
2226                    *
2227 04012   000067         OCT   67              TEST NO.
2228 04013   0 000000 LLSA DAC   **              LLS TEST
2229 04014   0 02 04012     LDA   *-2
2230 04015   0 04 00777     STA   '777            STORE TEST NO. AT '777
2231 04016   101000         NOP                   KILL TEST LOCATION
2232 04017   0 02 00455     LDA   CNTY
2233 04020   0 04 04407     STA   SXTX            INITIALIZE TEST COUNT
2234 04021   0 02 04066 LLSB LDA   LLSS            STORE LLS INST
2235 04022   0 04 04374     STA   SFTT            IN THE SHIFT ROUTINE
2236 04023   0 02 04770     LDA   =-15            INITIALIZE
2237 04024   0 04 00000     STA   0               SHIFT COUNTER FOR 15 SHIFTS
2238 04025   1 02 04634 LLSC LDA   SKNH,1         TEST LLS INST WITH
2239 04026   0 04 04414     STA   SFZZ            ALL ONES IN A-REG
2240 04027   1 02 04614     LDA   SKNG,1          AND ZEROS IN B-REG
```



```
2241 04030   0 04 04413     STA   SFYY
2242 04031   0 02 04614     LDA   SKNG            '77777
2243 04032   000201         IAB                   POSITIVE SIGN IN B-REG
2244 04033   140040         CRA
2245 04034   0 10 04372     JST   SHXT            TO SHIFT AND CHECK ROUTINE
2246 04035   1 02 00631     LDA   SKND,1
2247 04036   0 03 04767     ANA   =1
2248 04037   0 04 04414     STA   SFZZ
2249 04040   1 02 04654     LDA   SKNJ,1
2250 04041   0 04 04413     STA   SFYY
2251 04042   0 02 04654     LDA   SKNJ            '100001
2252 04043   000201         IAB                   WITH NEGATIVE SIGN IN B-REG
2253 04044   140040         CRA
2254 04045   0 10 04372     JST   SHXT            TO SHIFT AND CHECK ROUTINE
2255 04046   1 02 00551     LDA   SKNA,1
2256 04047   0 03 04614     ANA   SKNG
2257 04050   0 04 04413     STA   SFYY            ALTERNATE ONES AND
2258 04051   1 02 04674     LDA   SKNK,1          ZEROS
2259 04052   0 04 04414     STA   SFZZ
2260 04053   0 02 00735     LDA   TSTR            '52525
2261 04054   000201         IAB                   ALTERNATE BITS IN B REG
2262 04055   140040         CRA
2263 04056   0 10 04372     JST   SHXT            TO SHIFT AND CHECK ROUTINE
2264 04057   0 12 00000     IRS   0               DID WE USE ALL SHIFTS
2265 04060   0 01 04064     JMP   LLSG            NO, MODIFY NO. OF SHIFTS
2266 04061   0 12 04407     IRS   SXTX            ARE WE DONE
2267 04062   0 01 04021     JMP   LLSB            NO, TEST MOVE
2268 04063   -0 01 04013    JMP*  LLSA            RETURN
2269                    *
2270 04064   0 12 04374 LLSG IRS   SFTT            MODIFY NO. OF SHIFTS
2271 04065   0 01 04025      JMP   LLSC
2272                    *
2273 04066   0411 61    LLSS LLS   15
2274                    *
2275                    *
2276                    *     SUBROUTINE   T070   LLL
2277                    *
```

```
2278 04067   000070          OCT   70              TEST NO                          2278
2279 04070   0 000000  LLLA DAC   **              LLL TEST                         2279
2280 04071   0 02 04067       LDA   *-2                                           2280
2281 04072   0 04 00777       STA   '777           STORE TEST NO AT '777            2281
2282 04073   101000           NOP                 KILL TEST LOCATION               2282
2283 04074   140600           SCB                 SET C BIT                        2283
2284 04075   0 02 04767       LDA   =1                                            2284
2285 04076   000201           IAB                 INTERCHANGE A AND B              2285
2286 04077   0410 41          LLL   31                                            2286
2287 04100   100001           SRC                 C BIT MUST BE RESET              2287
2288 04101   000000           HLT                 ERROR                            2288
2289 04102   101400           SMI                 A=100000                         2289
2290 04103   000000           HLT                 ERROR                            2290
2291 04104   0 02 04767       LDA   =1                                            2291
2292 04105   000201           IAB                 INTERCHANGE A AND B              2292
2293 04106   0410 40          LLL   32            C BIT MUST BE SET, A=0           2293
2294 04107   101001           SSC                                                  2294
2295 04110   000000           HLT                 ERROR                            2295
2296 04111   100040           SZE                                                  2296
2297 04112   000000           HLT                 ERROR                            2297
2298 04113   0 02 04767       LDA   =1                                            2298
2299 04114   000201           IAB                                                  2299
2300 04115   0410 37          LLL   33            C=0, A=0                         2300
2301 04116   100001           SRC                                                  2301
2302 04117   000000           HLT                 ERROR                            2302
2303 04120   100040           SZE                                                  2303
2304 04121   000000           HLT                 ERROR                            2304
2305 04122   0 02 00455       LDA   CNTY                                          2305
2306 04123   0 04 04407       STA   SXTX          INITIALIZE TEST COUNT            2306
2307 04124   0 02 04166 LLLB  LDA   LLLS          STORE LLL INST                   2307
2308 04125   0 04 04374       STA   SFTT          IN THE SHIFT ROUTINE             2308
2309 04126   0 02 04770       LDA   =-15          INITIALIZE SHIFT                 2309
2310 04127   0 04 00000       STA   0             COUNTER FOR 15 SHIFTS            2310
2311 04130   1 02 00571 LLLC  LDA   SKNB,1        TEST LLL USING AN ALL            2311
2312 04131   0 04 04413       STA   SFYY          ONES PATTERN IN B REG            2312
2313 04132   1 02 04634       LDA   SKNH,1        AND ZEROS IN A REG               2313
2314 04133   0 04 04414       STA   SFZZ                                           2314
```



```
2315 04134   0 02 00571       LDA   SKNB          '177777                          2315
2316 04135   000201           IAB                 B REG ALL ONES                   2316
2317 04136   140040           CRA                 A REG ZEROS                      2317
2318 04137   0 10 04372       JST   SHXT          TO SHIFT AND CHECK ROUTINE       2318
2319 04140   1 02 00551       LDA   SKNA,1        TEST LLL USING AN                2319
2320 04141   0 04 04413       STA   SFYY          ALTERNATING PATTERN              2320
2321 04142   1 02 04675       LDA   SKNK+1,1                                       2321
2322 04143   0 04 04414       STA   SFZZ                                          2322
2323 04144   0 02 00551       LDA   SKNA          '52525                           2323
2324 04145   000201           IAB                 ALTERNATE BITS IN B REG          2324
2325 04146   140040           CRA                 ZEROS IN A REG                   2325
2326 04147   0 10 04372       JST   SHXT          TO SHIFT AND CHECK ROUTINE       2326
2327 04150   1 02 00611       LDA   SKNC,1                                         2327
2328 04151   0 04 04413       STA   SFYY                                          2328
2329 04152   0 02 00611       LDA   SKNC          =1                               2329
2330 04153   000201           IAB                 FLOATING 1 BIT IN B REG          2330
2331 04154   140040           CRA                 ZERO IN A REG                    2331
2332 04155   0 04 04414       STA   SFZZ                                          2332
2333 04156   0 10 04372       JST   SHXT          TO SHIFT AND CHECK ROUTINE       2333
2334 04157   0 12 00000       IRS   0             USED ALL SHIFTS                  2334
2335 04160   0 01 04164       JMP   LLLG          NO, MODIFY AND DO SOME MORE      2335
2336 04161   0 12 04407       IRS   SXTX          ARE WE DONE                      2336
2337 04162   0 01 04124       JMP   LLLB          NO, TEST MORE                    2337
2338 04163  -0 01 04070       JMP*  LLLA          RETURN                           2338
2339                  *                                                          2339
2340 04164   0 12 04374 LLLG  IRS   SFTT          MODIFY SHIFTS                    2340
2341 04165   0 01 04130       JMP   LLLC                                          2341
2342                  *                                                          2342
2343 04166   0410 61    LLLS  LLL   15                                           2343
2344                  *                                                          2344
2345                  *                                                          2345
2346                  *     SUBROUTINE   T071   LRL                              2346
2347                  *                                                          2347
2348 04167   000071           OCT   71            TEST NO.                         2348
2349 04170   0 000000  LRLA   DAC   **            LRL TEST                         2349
2350 04171   0 02 04167       LDA   *-2           STORE TEST NO.                   2350
2351 04172   0 04 00777       STA   '777          AT '777                          2351
```

```
2352 04173   101000           NOP                          KILL TEST LOCATION                    2352
2353 04174   0 02 00455       LDA    CNTY                                                       2353
2354 04175   0 04 04407       STA    SXTX                  INITIALIZE TEST COUNT                2354
2355 04176   0 02 04251 LRLB  LDA    LRLS                  STORE LRL INST                       2355
2356 04177   0 04 04374       STA    SFTT                  AT SHIFT ROUTINE                     2356
2357 04200   0 02 04770       LDA    =-15                  INITIALIZE SHIFT                     2357
2358 04201   0 04 00000       STA    0                     COUNTER FOR 15 SHIFTS                2358
2359 04202   1 02 00714 LRLC  LDA    TSTU,1                TEST LRL INST WITH                   2359
2360 04203   0 04 04414       STA    SFZZ                  ALL ONES IN A REG                    2360
2361 04204   140401           CMA                          AND ZEROS IN B REG                   2361
2362 04205   0 04 04413       STA    SFYY                                                       2362
2363 04206   140040           CRA                                                               2363
2364 04207   000201           IAB                          ZEROS IN B REG                       2364
2365 04210   0 02 00571       LDA    SKNB                  '177777                              2365
2366 04211   0 10 04372       JST    SHXT                  TO SHIFT AND CHECK ROUTINE           2366
2367 04212   1 02 00755       LDA    TSTE,1                                                     2367
2368 04213   0 04 04414       STA    SFZZ                                                       2368
2369 04214   1 02 04714       LDA    SKNL,1                                                     2369
2370 04215   0 04 04413       STA    SFYY                                                       2370
2371 04216   140040           CRA                                                               2371
2372 04217   000201           IAB                          ZEROS IN B REG                       2372
2373 04220   0 02 00735       LDA    TSTR                  '52525 - ALTERNATE BITS IN A REG     2373
2374 04221   0 10 04372       JST    SHXT                  TO SHIFT AND CHECK ROUTINE           2374
2375 04222   1 02 00734       LDA    TSTD,1                                                     2375
2376 04223   0 04 04413       STA    SFYY                                                       2376
2377 04224   1 02 00713       LDA    TSTC,1                                                     2377
2378 04225   0 04 04414       STA    SFZZ                                                       2378
2379 04226   0 02 00714       LDA    TSTU                  '125252                              2379
2380 04227   000201           IAB                          ALTERNATE BITS IN B REG              2380
2381 04230   0 02 00673       LDA    TSTV                  '77777 IN A REG                      2381
2382 04231   0 10 04372       JST    SHXT                  TO SHIFT AND CHECK ROUTINE           2382
2383 04232   1 02 00673       LDA    TSTV,1                                                     2383
2384 04233   0 04 04413       STA    SFYY                                                       2384
2385 04234   0 02 00673       LDA    TSTV                  '7777 IN A REG                       2385
2386 04235   000201           IAB                          '77777 IN B REG                      2386
2387 04236   1 02 00713       LDA    TSTC,1                                                     2387
2388 04237   0  4 04414       STA    SFZZ                                                       2388
```



```
2389 04240   0 02 00673       LDA    TSTV                                                       2389
2390 04241   0 10 04372       JST    SHXT                  TO SHIFT AND CHECK ROUTINE           2390
2391 04242   0 12 00000       IRS    0                     USED ALL SHIFTS                      2391
2392 04243   0 01 04247       JMP    LRLG                  NO, MODIFY AND TEST AGAIN            2392
2393 04244   0 12 04407       IRS    SXTX                  ARE WE FINISHED                      2393
2394 04245   0 01 04176       JMP    LRLB                  NO, TEST MORE                        2394
2395 04246  -0 01 04170       JMP*   LRLA                  RETURN                               2395
2396                  *                                                                        2396
2397 04247   0 12 04374 LRLG  IRS    SFTT                  MODIFY SHIFT COUNT                   2397
2398 04250   0 01 04202       JMP    LRLC                                                       2398
2399                  *                                                                        2399
2400 04251   0400 61    LRLS  LRL    15                                                         2400
2401                  *                                                                        2401
2402                  *                                                                        2402
2403                  *      SUBROUTINE   T072   LLR                                           2403
2404                  *                                                                        2404
2405 04252   000072           OCT    72                    TEST NO.                             2405
2406 04253   0 000000  LLRA   DAC    **                    LLR TEST                             2406
2407 04254   0 02 04252       LDA    *-2                   STORE TEST NO.                       2407
2408 04255   0 04 00777       STA    '777                  AT '777.                             2408
2409 04256   101000           NOP                          KILL TEST LOCATION                   2409
2410 04257   0 02 00455       LDA    CNTY                                                       2410
2411 04260   0 04 04407       STA    SXTX                  INITIALIZE TEST COUNT                2411
2412 04261   0 02 04321 LLRB  LDA    LLRS                  STORE LLR INST                       2412
2413 04262   0 04 04374       STA    SFTT                  IN THE SHIFT ROUTINE                 2413
2414 04263   0 02 04770       LDA    =-15                  INITIALIZE SHIFT                     2414
2415 04264   0 04 00000       STA    0                     COUNT TO 15                          2415
2416 04265   0 02 00673 LLRC  LDA    TSTV                  TEST LLR INST                        2416
2417 04266   0 04 04414       STA    SFZZ                  USING FLOATING ZERO BIT              2417
2418 04267   0 04 04413       STA    SFYY                                                       2418
2419 04270   1 02 00673       LDA    TSTV,1                **                                   2419
2420 04271   000201           IAB                          **                                   2420
2421 04272   1 02 00673       LDA    TSTV,1                **                                   2421
2422 04273   0 10 04372       JST    SHXT                  TO SHIFT AND CHECK ROUTINE           2422
2423 04274   0 02 00631       LDA    SKND                  TEST LLR USING                       2423
2424 04275   0 04 04414       STA    SFZZ                  FLOATING ONE BIT                     2424
2425 04276   0 04 04413       STA    SFYY                                                       2425
```

```
2426 04277   1 02 00631       LDA   SKND,1          **                                    2426
2427 04300   000201            IAB                   **                                    2427
2428 04301   1 02 00631       LDA   SKND,1          **                                    2428
2429 04302   0 10 04372       JST   SHXT            TO SHIFT AND CHECK ROUTINE            2429
2430 04303   0 02 00651       LDA   SKNE            TEST LLR USING                        2430
2431 04304   0 04 04414       STA   SFZZ            AN ALTERNATING PATTERN                2431
2432 04305   0 04 04413       STA   SFYY            WITH A ONE BIT MARKER                 2432
2433 04306   1 02 00651       LDA   SKNE,1          **                                    2433
2434 04307   000201           IAB                   **                                    2434
2435 04310   1 02 00651       LDA   SKNE,1          **                                    2435
2436 04311   0 10 04372       JST   SHXT            TO SHIFT AND CHECK ROUTINE            2436
2437 04312   0 12 00000       IRS   0               USED ALL SHIFTS                       2437
2438 04313   0 01 04317       JMP   LLRG            NO, MODIFY AND TEST AGAIN             2438
2439 04314   0 12 04407       IRS   SXTX            ARE WE DONE                           2439
2440 04315   0 01 04261       JMP   LLRB            NO, TEST MORE                         2440
2441 04316  -0 01 04253       JMP*  LLRA                                                  2441
2442                     *                                                               2442
2443 04317   0 12 04374 LLRG  IRS   SFTT                                                  2443
2444 04320   0 01 04265       JMP   LLRC                                                  2444
2445                     *                                                               2445
2446 04321   0412 61     LLRS LLR   15                                                   2446
2447                     *                                                               2447
2448                     *                                                               2448
2449                     *                                                               2449
2450                     *     SUBROUTINE   T073   LRR                                   2450
2451                     *                                                               2451
2452 04322   000073           OCT   73              TEST NO.                              2452
2453 04323   0 000000    LRRA DAC   **              LRR TEST                              2453
2454 04324   0 02 04322       LDA   *-2             STORE TEST NO.                        2454
2455 04325   0 04 00777       STA   '777            AT '777                               2455
2456 04326   101000           NOP                   KILL TEST LOCATION                    2456
2457 04327   0 02 00455       LDA   CNTY                                                  2457
2458 04330   0 04 04407       STA   SXTX            INITIALIZE TEST COUNT                 2458
2459 04331   0 02 04371 LRRB  LDA   LRRS            STORE LRR INST                        2459
2460 04332   0 04 04374       STA   SFTT            IN THE SHIFT ROUTINE                  2460
2461 04333   0 02 04770       LDA   =-15            INITIALIZE SHIFT                      2461
2462 04334   0 04 00000       STA   0               COUNT TO 15                           2462
```



```
2463 04335   1 02 00673 LRRC  LDA   TSTV,1          TEST LRR INST USING                   2463
2464 04336   0 04 04414       STA   SFZZ            A FLOATING ZERO PATTERN               2464
2465 04337   0 04 04413       STA   SFYY                                                  2465
2466 04340   0 02 00673       LDA   TSTV                                                  2466
2467 04341   000201           IAB                   '77777 IN B REG                       2467
2468 04342   0 02 00673       LDA   TSTV            '77777 IN A REG                       2468
2469 04343   0 10 04372       JST   SHXT            TO SHIFT AND CHECK ROUTINE            2469
2470 04344   1 02 00631       LDA   SKND,1          TEST WITH FLOATING ONE PATTERN        2470
2471 04345   0 04 04414       STA   SFZZ                                                  2471
2472 04346   0 04 04413       STA   SFYY                                                  2472
2473 04347   0 02 00631       LDA   SKND                                                  2473
2474 04350   000201           IAB                   '100000 IN B REG                      2474
2475 04351   0 02 00631       LDA   SKND            '100000 IN A REG                      2475
2476 04352   0 10 04372       JST   SHXT            TO SHIFT AND CHECK ROUTINE            2476
2477 04353   1 02 00651       LDA   SKNE,1                                                2477
2478 04354   0 04 04414       STA   SFZZ                                                  2478
2479 04355   0 04 04413       STA   SFYY                                                  2479
2480 04356   0 02 00651       LDA   SKNE            '125252 PATTERN                       2480
2481 04357   000201           IAB                   IN B REG                              2481
2482 04360   0 02 00651       LDA   SKNE            '125252 IN A REG                      2482
2483 04361   0 10 04372       JST   SHXT            TO SHIFT AND CHECK ROUTINE            2483
2484 04362   0 12 00000       IRS   0               USED ALL SHIFTS                       2484
2485 04363   0 01 04367       JMP   LRRG            NO, MODIFY AND TEST AGAIN             2485
2486 04364   0 12 04407       IRS   SXTX            ARE WE DONE                           2486
2487 04365   0 01 04331       JMP   LRRB            NO, TEST MORE                         2487
2488 04366  -0 01 04323       JMP*  LRRA            RETURN                                2488
2489                     *                                                               2489
2490 04367   0 12 04374 LRRG  IRS   SFTT            MODIFY SHIFT COUNT                    2490
2491 04370   0 01 04335       JMP   LRRC                                                  2491
2492                     *                                                               2492
2493 04371   0402 61     LRRS LRR   15                                                   2493
2494                     *                                                               2494
2495                     *                                                               2495
2496                     *                                                               2496
2497 04372   0 000000    SHXT DAC   **              SHIFT ROUTINE                         2497
2498 04373   0 04 04412       STA   SFXX                                                  2498
2499 04374   0 00 00000  SFTT ***                   SHIFT INSTRUCTION TO BE INSERTED      2499
```

```
2500 04374   0 04 04410        STA   SFQQ              A REG AFTER SHIFTS                2500
2501 04375   0 05 04414        ERA   SFZZ              SHOULD COMPARE EXACTLY            2501
2502 04376   100040           SZE                                                       2502
2503 04377   000000           HLT                     ERROR                             2503
2504 04400   000201           IAB                                                       2504
2505 04401   0 04 04411        STA   SFRR              B REG AFTER SHIFTS                2505
2506 04402   0 05 04413        ERA   SFYY              SHOULD COMPARE EXACTLY            2506
2507 04403   100040           SZE                                                       2507
2508 04404   000000           HLT                     ERROR                             2508
2509 04405   -0 01 04372      JMP*  SHXT                                                2509
2510                 *                                                                 2510
2511 04406   000000     SXTX  BSZ   1                                                   2511
2512 04407   000000     SFQQ  BSZ   1                                                   2512
2513 04410   000000     SFRR  BSZ   1                                                   2513
2514 04411   000000     SFXX  BSZ   1                                                   2514
2515 04412   000000     SFYY  BSZ   1                                                   2515
2516 04413   000000     SFZZ  BSZ   1                                                   2516
2517                 *                                                                 2517
2518                 *                                                                 2518
2519                 *                                                                 2519
2520                 *     SUBROUTINE   T074   SHIFTS GENERAL                          2520
2521                 *                                                                 2521
2522 04414   000074           OCT   74                TEST NO.                          2522
2523 04415   0 000000   SFTA  DAC   **                                                  2523
2524 04416   0 02 04414       LDA   *-2               STORE TEST NO.                    2524
2525 04417   0 04 00777       STA   '777              AT '777                           2525
2526 04420   101000           NOP                     KILL TEST LOCATION                2526
2527 04421   0 02 00455       LDA   CNTY                                                2527
2528 04422   0 04 04406       STA   SXTX              INITIALIZE TEST COUNT             2528
2529 04423   140040           CRA                                                       2529
2530 04424   0 04 00000       STA   0                                                   2530
2531 04425   0 02 04566       LDA   RRST                                                2531
2532 04426   0 04 04570       STA   INDR                                                2532
2533 04427   -0 02 04570      LDA*  INDR                                                2533
2534 04430   0 04 04572       STA   SFFX                                                2534
2535 04431   0 12 04570 STTL  IRS   INDR                                                2535
2536 04432   -0 02 04570      LDA*  INDR                                                2536
```



```
2537 04433   0 04 04571       STA   SFFY                                              2537
2538 04434   0 02 04766       LDA   =-11                                              2538
2539 04435   0 04 00000       STA   0                                                 2539
2540 04436   0 12 00000 STTJ  IRS   0                                                 2540
2541 04437   0 01 04442       JMP   *+2                                               2541
2542 04440   0 01 04545       JMP   STTK                                              2542
2543 04441   1 01 04454       JMP   JPTB,1                                            2543
2544 04442   0 01 04455       JMP   STTA                                              2544
2545 04443   0 01 04455       JMP   STTA                                              2545
2546 04444   0 01 04467       JMP   STTC                                              2546
2547 04445   0 01 04474       JMP   STTD                                              2547
2548 04446   0 01 04462       JMP   STTB                                              2548
2549 04447   0 01 04455       JMP   STTA                                              2549
2550 04450   0 01 04462       JMP   STTB                                              2550
2551 04451   0 01 04455       JMP   STTA                                              2551
2552 04452   0 01 04501       JMP   STTE                                              2552
2553 04453   0 01 04516       JMP   STTF                                              2553
2554 04454   0 00 00000 JPTB  PZE                                                     2554
2555 04455   0 02 04571 STTA  LDA   SFFY                                              2555
2556 04456   0 04 04414       STA   SFZZ                                              2556
2557 04457   0 02 04572       LDA   SFFX                                              2557
2558 04460   0 04 04413       STA   SFYY                                              2558
2559 04461   0 01 04535       JMP   STTH                                              2559
2560 04462   0 02 04571 STTB  LDA   SFFY                                              2560
2561 04463   0 04 04413       STA   SFYY                                              2561
2562 04464   0 02 04572       LDA   SFFX                                              2562
2563 04465   0 04 04414       STA   SFZZ                                              2563
2564 04466   0 01 04535       JMP   STTH                                              2564
2565 04467   140040     STTC  CRA                                                     2565
2566 04470   0 04 04413       STA   SFYY                                              2566
2567 04471   0 02 04572       LDA   SFFX                                              2567
2568 04472   0 04 04414       STA   SFZZ                                              2568
2569 04473   0 01 04535       JMP   STTH                                              2569
2570 04474   140040     STTD  CRA                                                     2570
2571 04475   0 04 04414       STA   SFZZ                                              2571
2572 04476   0 02 04571       LDA   SFFY                                              2572
2573 04477   0 04 04413       STA   SFYY                                              2573
```

```
2574 04501   0 01 04536        JMP   STTH                              2574
2575 04502   0 02 04572 STTE   LDA   SFFX                              2575
2576 04503   0 03 04765        ANA   ='100000                          2576
2577 04504   0 04 04413        STA   SFYY                              2577
2578 04505   0 02 04572        LDA   SFFX                              2578
2579 04506   0 03 04764        ANA   ='77777                           2579
2580 04507   0 04 04414        STA   SFZZ                              2580
2581 04510   0 02 04571        LDA   SFFY                              2581
2582 04511   101100           SLN                                     2582
2583 04512   0 01 04536        JMP   STTH                              2583
2584 04513   0 02 04414        LDA   SFZZ                              2584
2585 04514   140500           SSM                                     2585
2586 04515   0 04 04414        STA   SFZZ                              2586
2587 04516   0 01 04536        JMP   STTH                              2587
2588 04517   0 02 04571 STTF   LDA   SFFY                              2588
2589 04520   0 03 04764        ANA   ='77777                           2589
2590 04521   0 04 04413        STA   SFYY                              2590
2591 04522   0 02 04572        LDA   SFFX                              2591
2592 04523   0 03 04765        ANA   ='100000                          2592
2593 04524   0 05 04413        ERA   SFYY                              2593
2594 04525   0 04 04413        STA   SFYY                              2594
2595 04526   0 02 04571        LDA   SFFY                              2595
2596 04527   100400           SPL                                     2596
2597 04530   0 01 04534        JMP   STTG                              2597
2598 04531   140040           CRA                                     2598
2599 04532   0 04 04414        STA   SFZZ                              2599
2600 04533   0 01 04536        JMP   STTH                              2600
2601 04534   0 02 04763 STTG   LDA   =-'1                             2601
2602 04535   0 04 04414        STA   SFZZ                              2602
2603 04536   0 02 04572 STTH   LDA   SFFX                              2603
2604 04537   000201           IAB                                     2604
2605 04540   1 02 04566        LDA   SFTB,1                            2605
2606 04541   0 04 04374        STA   SFTT                              2606
2607 04542   0 02 04571        LDA   SFFY                              2607
2608 04543   0 10 04372        JST   SHXT                              2608
2609 04544   0 01 04437        JMP   STTJ                              2609
2610 04545   0 02 04570 STTK   LDA   INDR                              2610
```



```
2611 04546   0 05 04573        ERA   NDTS                              2611
2612 04547   101040           SNZ                                     2612
2613 04550  -0 01 04416        JMP*  SFTA                              2613
2614 04551   0 02 04571        LDA   SFFY                              2614
2615 04552   0 04 04572        STA   SFFX                              2615
2616 04553   0 01 04432        JMP   STTL                              2616
2617                  *                                              2617
2618 04554   0416 60          ALR   16                                2618
2619 04555   0406 60          ARR   16                                2619
2620 04556   0410 60          LLL   16                                2620
2621 04557   0400 60          LRL   16                                2621
2622 04560   0412 60          LLR   16                                2622
2623 04561   0412 40          LLR   32                                2623
2624 04562   0402 60          LRR   16                                2624
2625 04563   0402 40          LRR   32                                2625
2626 04564   0411 61          LLS   15                                2626
2627 04565   0401 61          LRS   15                                2627
2628 04566   0 00 00000 SFTB   PZE                                   2628
2629 04567   001000     RRST   OCT   1000                            2629
2630 04570   0 00 00000 INDR   PZE                                   2630
2631 04571   0 00 00000 SFFY   PZE                                   2631
2632 04572   0 00 00000 SFFX   PZE                                   2632
2633 04573   002000     NDTS   OCT   2000                            2633
2634 04574   125252     IXC1   OCT   125252                          2634
2635                  *                                              2635
2636                  *                                              2636
2637 04575   000000           OCT   0                                 2637
2638 04576   040000           OCT   40000                             2638
2639 04577   060000           OCT   60000                             2639
2640 04600   070000           OCT   70000                             2640
2641 04601   074000           OCT   74000                             2641
2642 04602   076000           OCT   76000                             2642
2643 04603   077000           OCT   77000                             2643
2644 04604   077400           OCT   77400                             2644
2645 04605   077600           OCT   77600                             2645
2646 04606   077700           OCT   77700                             2646
2647 04607   077740           OCT   77740                             2647
```

```
2648 04610   077760          OCT   77760                                  2648
2649 04611   077770          OCT   77770                                  2649
2650 04612   077774          OCT   77774                                  2650
2651 04613   077776          OCT   77776                                  2651
2652 04614   077777    SKNG  OCT   77777                                  2652
2653 04615   077777          OCT   77777                                  2653
2654 04616   037777          OCT   37777                                  2654
2655 04617   017777          OCT   17777                                  2655
2656 04620   007777          OCT   7777                                   2656
2657 04621   003777          OCT   3777                                   2657
2658 04622   001777          OCT   1777                                   2658
2659 04623   000777          OCT   777                                    2659
2660 04624   000377          OCT   377                                    2660
2661 04625   000177          OCT   177                                    2661
2662 04626   000077          OCT   77                                     2662
2663 04627   000037          OCT   37                                     2663
2664 04630   000017          OCT   17                                     2664
2665 04631   000007          OCT   7                                      2665
2666 04632   000003          OCT   3                                      2666
2667 04633   000001          OCT   1                                      2667
2668 04634   000000    SKNH  OCT   0                                      2668
2669 04635   100000          OCT   100000                                 2669
2670 04636   140000          OCT   140000                                 2670
2671 04637   120000          OCT   120000                                 2671
2672 04640   110000          OCT   110000                                 2672
2673 04641   104000          OCT   104000                                 2673
2674 04642   102000          OCT   102000                                 2674
2675 04643   101000          OCT   101000                                 2675
2676 04644   100400          OCT   100400                                 2676
2677 04645   100200          OCT   100200                                 2677
2678 04646   100100          OCT   100100                                 2678
2679 04647   100040          OCT   100040                                 2679
2680 04650   100020          OCT   100020                                 2680
2681 04651   100010          OCT   100010                                 2681
2682 04652   100004          OCT   100004                                 2682
2683 04653   100002          OCT   100002                                 2683
2684 04654   100001    SKNJ  OCT   100001                                 2684
```

Honeywell HONEYWELL INFORMATION SYSTEMS LTD PROGRAM DOCUMENTATION


```
2685 04655   052525          OCT   52525                                  2685
2686 04656   025252          OCT   25252                                  2686
2687 04657   012525          OCT   12525                                  2687
2688 04660   005252          OCT   5252                                   2688
2689 04661   002525          OCT   2525                                   2689
2690 04662   001252          OCT   1252                                   2690
2691 04663   000525          OCT   525                                    2691
2692 04664   000252          OCT   252                                    2692
2693 04665   000125          OCT   125                                    2693
2694 04666   000052          OCT   52                                     2694
2695 04667   000025          OCT   25                                     2695
2696 04670   000012          OCT   12                                     2696
2697 04671   000005          OCT   5                                      2697
2698 04672   000002          OCT   2                                      2698
2699 04673   000001          OCT   1                                      2699
2700 04674   000000    SKNK  OCT   0                                      2700
2701 04675   125252          OCT   125252                                 2701
2702 04676   052524          OCT   52524                                  2702
2703 04677   125250          OCT   125250                                 2703
2704 04700   052520          OCT   52520                                  2704
2705 04701   125240          OCT   125240                                 2705
2706 04702   052500          OCT   52500                                  2706
2707 04703   125200          OCT   125200                                 2707
2708 04704   052400          OCT   52400                                  2708
2709 04705   125000          OCT   125000                                 2709
2710 04706   052000          OCT   52000                                  2710
2711 04707   124000          OCT   124000                                 2711
2712 04710   050000          OCT   50000                                  2712
2713 04711   120000          OCT   120000                                 2713
2714 04712   040000          OCT   40000                                  2714
2715 04713   100000          OCT   100000                                 2715
2716 04714   000000    SKNL  OCT   0                                      2716
2717               *                                                      2717
2718               *                                                      2718
2719               *                                                      2719
2720               *     MOVE WORDS ROUTINE                               2720
2721               *                                                      2721
```

```
2722 04715   0 000000   MOVE DAC   **              ENTRY POINT                                  2722
2723 04716  -0 02 04715       LDA*  *-1            GET NO. OF WORDS TO BE MOVED                 2723
2724 04717   101000           NOP                                                             2724
2725 04720   140407           TCA                                                             2725
2726 04721   0 04 00461       STA   TMP1           WORD COUNTER                                 2726
2727 04722   0 12 04715       IRS   MOVE                                                      2727
2728 04723  -0 02 04715       LDA*  MOVE           GET 'FROM' ADDRESS                           2728
2729 04724   0 04 00462       STA   TMP1+1                                                    2729
2730 04725   0 12 04715       IRS   MOVE                                                      2730
2731 04726  -0 02 04715       LDA*  MOVE           GET 'TO' ADDRESS                             2731
2732 04727   0 04 00463       STA   TMP1+2                                                    2732
2733 04730   0 12 04715       IRS   MOVE           BUMP FOR RETURN                              2733
2734 04731  -0 02 00462       LDA*  TMP1+1         GET THE WORD FROM 'FROM' ADDRESS             2734
2735 04732  -0 04 00463       STA*  TMP1+2         STORE IT AT THE 'TO' ADDRESS                 2735
2736 04733   0 12 00462       IRS   TMP1+1         MODIFY POINTER                               2736
2737 04734   0 12 00463       IRS   TMP1+2         MODIFY POINTER                               2737
2738 04735   0 12 00461       IRS   TMP1           ARE WE DONE                                  2738
2739 04736   0 01 04731       JMP   *-5            NO, MOVE MORE WORDS                          2739
2740 04737   101000           NOP                                                             2740
2741 04740  -0 01 04715       JMP*  MOVE           RETURN                                       2741
2742                    *                                                                    2742
2743 04741   0 004742  MMSZ DAC   *+1                                                        2743
2744 04742   120264           BCI   8, 4 8121620242832                                        2744
     04743   120270
     04744   130662
     04745   130666
     04746   131260
     04747   131264
     04750   131270
     04751   131662
2745 04752   0 004753  MESS DAC   *+1                                                        2745
2746 04753   177771           DEC   -7                                                        2746
2747 04754   120240           BCI   6,   MMSZ **K                                             2747
     04755   120315
     04756   146723
     04757   155240
     04760   125252
```



```
     04761   145640
2748 04762   106612           OCT   106612                                                  2748
2749                    *                                                                    2749
2750 04763   177777           FIN                                                             2750
     04764   077777
     04765   100000
     04766   177765
     04767   000001
     04770   177761

2751                    *                                                                    2751
2752                    *                                                                    2752
2753                    *                                                                    2753
2754                         ORG   '5000                                                     2754
2755                    *                                                                    2755
2756 05000   0 000000   TS05 DAC   **              TEST GROUP 5                                 2756
2757 05001   101000           NOP                                                             2757
2758 05002   0 10 05010       JST   IRUP           ENB, INH TEST                                2758
2759 05003   0 10 05167       JST   MPYT           S.P. MULTIPLICATION TEST                     2759
2760 05004   0 10 05241       JST   DIVT           S.P. DIVISION TEST                           2760
2761 05005   101000           NOP                                                             2761
2762 05006  -0 01 05000       JMP*  TS05           RETURN FROM SECTOR TESTS                     2762
2763                    *                                                                    2763
2764                    *                                                                    2764
2765                    *                                                                    2765
2766                    *                                                                    2766
2767                    *    SUBROUTINE T016  -  INH AND ENB TEST                            2767
2768                    *                                                                    2768
2769 05007   000016           OCT   16             TEST NO.                                     2769
2770 05010   0 000000   IRUP DAC   **                                                        2770
2771 05011   0 02 05007       LDA   *-2                                                       2771
2772 05012   0 04 00777       STA   '777           STORE TEST NO. AT '777                       2772
2773 05013   101000           NOP                                                             2773
2774 05014   000013           EXA                                                             2774
2775 05015   0 10 05016       JST   *+1                                                       2775
2776 05016   0 000000   IRP1 DAC   **                                                        2776
2777 05017   0 02 05016       LDA   *-1            FLUSH ANY PI RUPTS                           2777
```

```
2778 05020   000011          DXA                                                  2778
2779 05021   0 01 05022      JMP   *+1                                            2779
2780 05022   0 06 05772      ADD   ='10                                           2780
2781 05023   0 04 00063      STA   '63                                            2781
2782 05024   000401          ENB                                                  2782
2783 05025   100000          SKP                                                  2783
2784 05026   0 000000        DAC   **       PI RUPT ENTRY IF ANY                  2784
2785 05027   000011          DXA                                                  2785
2786 05030   0 01 05031      JMP   *+1      NORMAL MODE                           2786
2787 05031   140040          CRA                                                  2787
2788 05032   74 0020         SMK   '20      RESET MASK                            2788
2789 05033   0 02 05016      LDA   IRP1                                           2789
2790 05034   0 06 05771      ADD   ='25                                           2790
2791 05035   0 04 00063      STA   '63                                            2791
2792 05036   000401          ENB                                                  2792
2793 05037   101000          NOP                                                  2793
2794 05040   101000          NOP            SHOULD BE NO RUPTS WITHOUT MASK       2794
2795 05041   001001          INH                                                  2795
2796 05042   0 01 05045      JMP   *+3                                            2796
2797                 *                                                           2797
2798 05043   0 000000        DAC   **       RUPT ENTRY                            2798
2799 05044   000000          HLT            ERROR - GOT RUPT WITHOUT MASK         2799
2800                 *                                                           2800
2801 05045   000013          EXA                                                  2801
2802 05046   0 10 05047      JST   *+1                                            2802
2803 05047   0 000000        DAC   **                                             2803
2804 05050   0 02 05047      LDA   *-1                                            2804
2805 05051   000011          DXA                                                  2805
2806 05052   0 01 05053      JMP   *+1      NORMAL MODE                           2806
2807 05053   0 06 05770      ADD   ='12                                           2807
2808 05054   0 04 00063      STA   '63      UNEXPECTED RUPTS                      2808
2809 05055   0 02 05767      LDA   ='40                                           2809
2810 05056   74 0020         SMK   '20      SET THE MASK                          2810
2811 05057   101000          NOP                                                  2811
2812 05060   0 01 05063      JMP   *+3      JUMP AROUND UNEXPECTED RUPT HALT      2812
2813                 *                                                           2813
2814 05061   0 000000        DAC   **       GOT UNEXPECTED RUPT                   2814
```



```
2815 05062   000000          HLT            WITHOUT 'ENB'                         2815
2816                 *                                                           2816
2817 05063   000013          EXA                                                  2817
2818 05064   0 10 05065      JST   *+1                                            2818
2819 05065   0 000000        DAC   **                                             2819
2820 05066   0 02 05065      LDA   *-1                                            2820
2821 05067   000011          DXA                                                  2821
2822 05070   0 01 05071      JMP   *+1      NORMAL MODE                           2822
2823 05071   0 06 05766      ADD   ='23                                           2823
2824 05072   0 04 00063      STA   '63      SET FOR RUPT                          2824
2825 05073   140040          CRA                                                  2825
2826 05074   0 04 05163      STA   IENL     SET UP IRS TEST LOCATION              2826
2827 05075   0 04 05162      STA   ASRB                                           2827
2828 05076   001001          INH            INHIBIT RUPTS                         2828
2829 05077   34 0104    BUST SKS   '104     ASR BUSY                              2829
2830 05100   0 01 05156      JMP   ASNR     GO TO WAIT                            2830
2831 05101   14 0104    SASO OCP   '104     SET ASR IN OUTPUT MODE                2831
2832 05102   34 0104         SKS   '104                                          2832
2833 05103   0 01 05102      JMP   *-1      WAIT TILL NOT BUSY                    2833
2834 05104   000401          ENB            ENABLE INTERRUPTS                     2834
2835 05105   0 12 05163      IRS   IENL     MUST INTERRUPT AFTER IRS              2835
2836 05106   000000     HALT HLT            ERROR - RUPT DID NOT OCCUR            2836
2837 05107   0 01 05111      JMP   *+2                                            2837
2838                 *                                                           2838
2839 05110   0 000000        DAC   **       ENTRY POINT                           2839
2840 05111   0 02 05110      LDA   *-1      CHECK IF 'RUPT JST' STORED            2840
2841 05112   000011          DXA                                                  2841
2842 05113   0 01 05114      JMP   *+1      NORMAL MODE                           2842
2843 05114   0 03 05765      ANA   ='777    CORRECT ADDRESS                       2843
2844 05115   0 04 05164      STA   ITMP                                           2844
2845 05116   0 02 05165      LDA   DHLT     GET ADDRESS OF HALT                   2845
2846 05117   0 03 05765      ANA   ='777                                          2846
2847 05120   0 05 05164      ERA   ITMP     COMPARE WITH RUPT ADDRESS             2847
2848 05121   100040          SZE            MUST SKIP                             2848
2849 05122   000000          HLT            ERROR - ADDRESSES DID NOT MATCH       2849
2850 05123   0 02 05163      LDA   IENL     TEST IF IRS WAS COMPLETED             2850
2851 05124   101040          SNZ            MUST BE NON-ZERO                      2851
```

```
2852 05125   000000          HLT                    ERROR - IRS DID NOT TAKE                2852
2853 05126   000013          EXA                    EXTEND MODE                             2853
2854 05127   0 10 05130      JST   *+1                                                      2854
2855 05130   0 000000        DAC   **                                                       2855
2856 05131   0 02 05130      LDA   *-1              SET UP FOR                              2856
2857 05132   000011          DXA                                                            2857
2858 05133   0 01 05134      JMP   *+1              NORMAL MODE                             2858
2859 05134   0 06 05764      ADD   ='16                                                     2859
2860 05135   0 04 00063      STA   '63                                                      2860
2861 05136   14 0004         OCP   '4               PUT ASR IN INPUT MODE                   2861
2862 05137   14 0104         OCP   '104             PUT ASR IN OUTPUT MODE                  2862
2863 05140   34 0104         SKS   '104                                                     2863
2864 05141   0 01 05140      JMP   *-1              WAIT TILL NOT BUSY                      2864
2865 05142   000401          ENB                    ENABLE RUPTS                            2865
2866 05143   001001          INH                    INHIBIT RUPTS                           2866
2867 05144   101000          NOP                    RUPTS SHOULD NOT OCCUR                  2867
2868 05145   0 01 05150      JMP   *+3              JUMP AROUND ERROR HALT                  2868
2869                 *                                                                     2869
2870 05146   0 000000        DAC   **               ERROR RUPT ENTRY                        2870
2871 05147   000000          HLT                    INH NOT EXECUTED                        2871
2872                 *                                                                     2872
2873 05150   140040          CRA                                                            2873
2874 05151   74 0020         SMK   '20              RESET MASK                              2874
2875 05152   000011          DXA                                                            2875
2876 05153   0 01 05154      JMP   *+1              SET NORMAL MODE                         2876
2877 05154   101000          NOP                                                            2877
2878 05155   -0 01 05010     JMP*  IRUP             RETURN                                  2878
2879                 *                                                                     2879
2880 05156   0 12 05162 ASNR IRS   ASRB             INCREMENT COUNTER                       2880
2881 05157   0 01 05077      JMP   BUST             SEE IF ASR STILL BUSY                   2881
2882 05160   000000          HLT                    ASR NOT READY AFTER                     2882
2883 05161   0 01 05101      JMP   SASO             250 MILLISECOND DELAY                   2883
2884                 *                                                                     2884
2885 05162   000000    ASRB  BSZ   1                                                        2885
2886 05163   000000    IENL  BSZ   1                                                        2886
2887 05164   000000    ITMP  BSZ   1                                                        2887
2888 05165   0 005106  DHLT  DAC   HALT                                                   2888
```



```
2889                 *                                                                     2889
2890                 *                                                                     2890
2891                 *                                                                     2891
2892                 *                                                                     2892
2893                 *     SUBROUTINE T101                                                 2893
2894                 *     TEST SINGLE PRECISION MULTIPLY CAPABILITY                       2894
2895                 *                                                                     2895
2896 05166   000101          OCT   101              TEST NO.                                2896
2897 05167   0 000000  MPYT  DAC   **                                                     2897
2898 05170   0 02 05166      LDA   *-2                                                      2898
2899 05171   0 04 00777      STA   '777             STORE TEST NO. AT '777                  2899
2900 05172   101000          NOP                                                            2900
2901 05173   0 02 00455      LDA   CNTY                                                     2901
2902 05174   0 04 05237      STA   MDCT             INITIALIZE TEST COUNT                   2902
2903 05175   0 02 05763      LDA   ='77555          INITIALIZE THE                          2903
2904 05176   0 04 05233      STA   X001             FIRST TWO                               2904
2905 05177   0 04 05213      STA   MPY3                                                     2905
2906 05200   0 02 05762      LDA   ='7701           FIELDS                                  2906
2907 05201   0 04 05234      STA   X002                                                     2907
2908 05202   0 04 05205      STA   MPY2                                                     2908
2909 05203   0 02 05233 MPY1 LDA   X001                                                     2909
2910 05204   0 10 05303      JST   MPY              GO TO MULTIPLY ROUTINE                  2910
2911 05205   0 000000  MPY2  DAC   **               SECOND FIELD                            2911
2912 05206   0 04 05235      STA   Y001             STORE THE                               2912
2913 05207   000201          IAB                    RESULT                                  2913
2914 05210   0 04 05236      STA   Y002                                                     2914
2915 05211   0 02 05234      LDA   X002             REVERSE THE MULTIPLIER                  2915
2916 05212   0 10 05303      JST   MPY              AND THE MULTIPLICAND                    2916
2917 05213   0 000000  MPY3  DAC   **               AND MULTIPLY AGAIN                      2917
2918 05214   0 05 05235      ERA   Y001             COMPARE WITH PREVIOUS RESULT            2918
2919 05215   100040          SZE                                                            2919
2920 05216   000000          HLT                    ERROR                                   2920
2921 05217   000201          IAB                    GET B REG AND COMPARE                   2921
2922 05220   0 05 05236      ERA   Y002                                                     2922
2923 05221   100040          SZE                                                            2923
2924 05222   000000          HLT                    ERROR                                   2924
2925 05223   0 02 05233      LDA   X001             MODIFY THE FIRST FIELD                  2925
```

```
2926 05224   0 06 05761      ADD   =105                                          2926
2927 05225   0 04 05233      STA   X001                                          2927
2928 05226   0 04 05213      STA   MPY3                                          2928
2929 05227   0 12 05237      IRS   MDCT            ARE WE FINISHED             2929
2930 05230   0 01 05203      JMP   MPY1            NO, DO NEXT MULTIPLICATION  2930
2931 05231   101000          NOP                                                 2931
2932 05232  -0 01 05167      JMP*  MPYT            RETURN                      2932
2933                        *                                                   2933
2934 05233   000000     X001 BSZ   1                                             2934
2935 05234   000000     X002 BSZ   1                                             2935
2936 05235   000000     Y001 BSZ   1                                             2936
2937 05236   000000     Y002 BSZ   1                                             2937
2938 05237   000000     MDCT BSZ   1                                             2938
2939                        *                                                   2939
2940                        *                                                   2940
2941                        *                                                   2941
2942                        *     SUBROUTINE  T102                              2942
2943                        *     TEST SINGLE PRECISION DIVIDE CAPABILITY       2943
2944                        *                                                   2944
2945                        *                                                   2945
2946 05240   000102         OCT   102             TEST NO.                    2946
2947 05241   0 000000   DIVT DAC   **                                          2947
2948 05242   0 02 05240     LDA   *-2                                           2948
2949 05243   0 04 00777     STA   '777            STORE TEST NO. AT '777      2949
2950 05244   101000         NOP                                                 2950
2951 05245   0 02 00455     LDA   CNTY                                          2951
2952 05246   0 04 05237     STA   MDCT            INITIALIZE TEST COUNT       2952
2953 05247   0 02 05760     LDA   =30000          INITIALIZE THE              2953
2954 05250   0 04 05233     STA   X001            TWO FIELDS                  2954
2955 05251   0 04 05262     STA   DIV2                                          2955
2956 05252   0 02 05757     LDA   =12345                                        2956
2957 05253   0 04 05234     STA   X002                                          2957
2958 05254   0 04 05257     STA   DIV1+2                                        2958
2959                        *                                                   2959
2960 05255   0 02 05233 DIV1 LDA   X001            MULTIPLIER                  2960
2961 05256   0 10 05303     JST   MPY             GO TO MULTIPLY ROUT         2961
2962 05257   0 000000       DAC   **              MULTIPLICAND                2962
```



```
2963 05260   101000         NOP                 RESULT IS IN A AND B REGS   2963
2964 05261   0 10 05417     JST   DIV           DIVIDE ROUTINE              2964
2965 05262   0 000000   DIV2 DAC   **            DIVISOR                     2965
2966 05263   000000         HLT                 ERROR HALT                  2966
2967 05264   101000         NOP                 OPTIONAL HALT               2967
2968 05265   0 05 05234     ERA   X002          COMPARE QUOTIENT WITH 2ND FIELD 2968
2969 05266   100040         SZE                                             2969
2970 05267   000000         HLT                 ERROR IN DIVIDE             2970
2971 05270   000201         IAB                 TEST REMAINDER              2971
2972 05271   100040         SZE                 SHOULD BE ZERO              2972
2973 05272   000000         HLT                 ERROR                       2973
2974 05273   0 02 05233     LDA   X001          MODIFY THE FIRST FIELD      2974
2975 05274   0 06 05756     ADD   =25                                         2975
2976 05275   0 04 05233     STA   X001                                        2976
2977 05276   0 04 05262     STA   DIV2                                        2977
2978 05277   0 12 05237     IRS   MDCT            ARE WE FINISHED             2978
2979 05300   0 01 05255     JMP   DIV1            NO, DO THE NEXT DIVISION    2979
2980 05301   101000         NOP                                             2980
2981 05302  -0 01 05241     JMP*  DIVT            RETURN                      2981
2982                        *                                               2982
2983                        *                                               2983
2984                        *                                               2984
2985                        *     MULTIPLICATION ROUTINE                    2985
2986                        *                                               2986
2987 05303   0 000000   MPY  DAC   **              ENTRY                       2987
2988 05304   101400         SMI                 CHECK SIGN OF MULTIPLIER    2988
2989 05305   0 01 05317     JMP   MPYB          POSTIVE                     2989
2990 05306   140407         TCA                 NEGATIVE TWO'S COMPLEMENT   2990
2991 05307   000201         IAB                 MULTIPLIER IN B REGISTER    2991
2992 05310  -0 02 05303     LDA*  MPY           LOAD MULTIPLICAND           2992
2993 05311   101400         SMI                 CHECK SIGN                  2993
2994 05312   0 01 05324     JMP   MPYC          POSTIVE                     2994
2995 05313   140407         TCA                 NEGATIVE TWO'S COMPLEMENT   2995
2996 05314   0 10 05340 MPYA JST   MPYS          EXIT TO PERFORM MULTIPLICATION 2996
2997 05315   0 12 05303     IRS   MPY           INCREMENT FOR RETURN        2997
2998 05316  -0 01 05303     JMP*  MPY           EXIT                        2998
2999                        *                                               2999
```

```
3000 05317   000201      MPYB  IAB                    PLACE MULTIPLIER IN B REG                    3000
3001 05320  -0 02 05303         LDA*  MPY                                                         3001
3002 05321   101400            SMI                    CHECK SIGN OF MULTIPLICAND                   3002
3003 05322   0 01 05314       JMP   MPYA             MULTIPLICAND PLUS, GO TO MULTIPLY            3003
3004 05323   140407            TCA                                                                 3004
3005 05324   0 10 05340 MPYC  JST   MPYS             NEGATIVE-2'S COMPLEMENT RESULT               3005
3006 05325   140200            RCB                    RESET C BIT                                  3006
3007 05326   140401            CMA                    ONE'S COMPLEMENT HI-ORDER                    3007
3008 05327   000201            IAB                                                                 3008
3009 05330   140407            TCA                    TWO'S COMPLEMENT LOW ORDER                   3009
3010 05331   101040            SNZ                    IS RESULT ZERO                               3010
3011 05332   140600            SCB                    INSERT 1 FOR CARRY IN                        3011
3012 05333   140100            SSP                    RESET MSB TO ZERO                            3012
3013 05334   000201            IAB                    HI-ORDER TO A, LOW ORDER TO B                3013
3014 05335   141216            ACA                                                                 3014
3015 05336   0 12 05303        IRS   MPY              INCREMENT FOR RETURN                         3015
3016 05337  -0 01 05303        JMP*  MPY              EXIT                                         3016
3017                     *                                                                        3017
3018                     *     MULTIPLICATION SUBROUTINE FOR POSTIVE VALUES                       3018
3019                     *                                                                        3019
3020 05340   0 000000    MPYS  DAC   **               ENTRANCE                                     3020
3021 05341   0 04 05403        STA   COMM             STORE MULTIPLICAND                           3021
3022 05342   000201            IAB                    MULTIPLIER IN A MULTIPLICAND IN B.           3022
3023 05343   0 04 05404        STA   COMM+1           STORE MULTIPLIER                             3023
3024 05344   0 05 05403        ERA   COMM             IF NEG. MINUS LARGEST NEGATIVE NUMBER        3024
3025 05345   100400            SPL                    IF ZERO NORMAL OR BOTH ARE LARGEST NEG NO.   3025
3026 05346   0 01 05375        JMP   MLNN             LARGEST NEG NO. IS PRESENT, MULT. IN B       3026
3027 05347   000201            IAB                    TEST MULTIPLICAND FOR LNN, IF NEG            3027
3028 05350   101400            SMI                    BOTH OPERANDS ARE LNN CK FOR BOTH 1.00000.   3028
3029 05351   0 01 05353        JMP   *+2                                                           3029
3030 05352   0 01 05371        JMP   MPYN             RESULT WILL BE ZERO LNN*LNN                  3030
3031                     *                            IN A                                        3031
3032 05353   0 02 05404        LDA   COMM+1           NORMAL, MULTIPLY OPERANDS LOAD MULTIPLIER     3032
3033 05354   000201            IAB                    MULTIPLIER IN B                              3033
3034 05355   0 02 05755        LDA   =-15                                                          3034
3035 05356   0 04 05404        STA   COMM+1           LOOP COUNTER                                 3035
3036 05357   140040            CRA                    CLEAR A REGISTER                             3036
```



```
3037 05360   0400 77          LRL   1                SHIFT TO RIGHT                               3037
3038 05361   100001            SRC                    EXAMINE RIGHT MOST BIT                       3038
3039 05362   0 06 05403        ADD   COMM             ADD MULTIPLICAND                             3039
3040 05363   0 12 05404        IRS   COMM+1           CONTROL LOOP                                 3040
3041 05364   0 01 05360        JMP   *-4              RECYCLE                                      3041
3042 05365   0400 77          LRL   1                                                             3042
3043 05366   0414 77          LGL   1                PUT 0 IN SIGN ORDER OF A REGISTER            3043
3044 05367   0400 77          LRL   1                MOVE 0 TO SIGN OF B REGISTER                 3044
3045 05370  -0 01 05340        JMP*  MPYS                                                          3045
3046 05371   140040    MPYN  CRA                    RETURN ZERO RESULT                           3046
3047 05372   000201            IAB                    ZERO IN B                                    3047
3048 05373   0 02 05403        LDA   COMM             -1 IN A                                      3048
3049 05374   0 01 05315        JMP   MPYA+1           RESULT CANNOT BE REPRESENTED ABORT WITH -1.   3049
3050                     *                                                                        3050
3051 05375   140040    MLNN  CRA                    CLEAR B                                      3051
3052 05376   000201            IAB                                                                 3052
3053 05377   101400            SMI                    CHECK MULTIPLICAND = MINUS LARGEST NEG. NO.  3053
3054 05400  -0 01 05340        JMP*  MPYS             EXIT WITH MULTIPLICAND IN A MULT. IS LNN     3054
3055 05401   0 02 05404        LDA   COMM+1           MULTIPLICAND IS LNN, LOAD MULTIPLIER IN A    3055
3056 05402  -0 01 05340        JMP*  MPYS             EXIT, MULTIPLICAND IS LNN                    3056
3057                     *                                                                        3057
3058                     *                                                                        3058
3059 05403   000000    COMM  BSZ   2                                                               3059
3060 05405   000000          BSZ   10                                                              3060
3061                     *                                                                        3061
3062                     *                                                                        30 2
3063                     *                                                                        3063
3064                     *                                                                        3064
3065                     *     DIVIDE ROUTINE                                                     3065
3066                     *                                                                        3066
3067 05417   0 000000    DIV   DAC   **               ENTRY                                        3067
3068 05420   101400            SMI                    CHECK SIGN OF DIVIDEND                       3068
3069 05421   0 01 05455        JMP   DIVB                                                          3069
3070 05422   140200            RCB                    RESET C BIT                                  3070
3071 05423   140401            CMA                    ONE'S COMPLEMENT HI-ORDER                    3071
3072 05424   000201            IAB                                                                 3072
3073 05425   140407            TCA                    TWO'S COMPLEMENT LOW ORDER                   3073
```

```
3074 05426   101040          SNZ                    IF LOWER ORDER=0                                  3074
3075 05427   140600          SCB                    MUST TWO'S COMPLEMENT HI-ORDER                    3075
3076 05430   140100          SSP                    SET B SIGN PLUS                                   3076
3077 05431   000201          IAB                                                                      3077
3078 05432   141216          ACA                                                                      3078
3079 05433   101400          SMI                    IS NUMERATOR LARGEST NEGATIVE NUMBER              3079
3080 05434   0 01 05436      JMP   *+2              NO CONTINUE , NORMAL                              3080
3081 05435   0 01 05453      JMP   DIVZ             ERROR EXIT ILLEGAL DIVIDE                         3081
3082 05436   0 04 05525      STA   COMN+1                                                             3082
3083 05437  -0 02 05417      LDA*  DIV              CHECK SIGN OF DIVISOR                             3083
3084 05440   101400          SMI                                                                      3084
3085 05441   0 01 05462      JMP   DIVC                                                               3085
3086 05442   140407          TCA                    TWO'S COMPLEMENT DIVISOR                          3086
3087 05443   101400          SMI                    TEST FOR LARGEST NEGATIVE NUMBER                  3087
3088 05444   0 01 05450      JMP   DIVA             DIVIDE DIVIDEND , DIVISOR SAME SIGN               3088
3089 05445   0 02 05525      LDA   COMN+1                                                            3089
3090 05446   000201          IAB                                                                      3090
3091 05447   0 01 05451      JMP   DIVX                                                               3091
3092 05450   0 10 05475 DIVA JST   DIVS             DIVIDE IF DIVISOR AND DIV SAME SIGN               3092
3093 05451   0 12 05417 DIVX IRS   DIV              INCREMENT FOR NORMAL RETURN                       3093
3094 05452   000201          IAB                    QUOTIENT IN A REG, REMAINDER IN B                 3094
3095 05453   0 12 05417 DIVZ IRS   DIV              ERROR EXIT                                        3095
3096 05454  -0 01 05417      JMP*  DIV              EXIT                                              3096
3097                 *                                                                               3097
3098 05455   0 04 05525 DIVB STA   COMN+1           STORE MOST SIGNIF. HALF OF DIVIDEND               3098
3099 05456  -0 02 05417      LDA*  DIV              CHECK SIGN OF DIVISOR                             3099
3100 05457   101400          SMI                    COMPLEMENT ON NEGATIVE                            3100
3101 05460   0 01 05450      JMP   DIVA             DIVIDE OPERANDS ARE OF SAME SIGN                  3101
3102 05461   140407          TCA                    TWOS COMPLEMENT                                   3102
3103 05462   101400      DIVC SMI                   CHECK DENOMINATOR FOR LARGEST NEGATIVE NO.        3103
3104 05463   0 01 05467      JMP   DIVN             NOT LNN                                           3104
3105 05464   0 02 05525      LDA   COMN+1           RESULT SIGN WILL BE NEGATIVE                      3105
3106 05465   000201          IAB                    RESULT IS NUMERATOR                               3106
3107 05466   0 01 05470      JMP   *+2              BY PASS DIVIDE COMPLEMENT RESULT                  3107
3108 05467   0 10 05475 DIVN JST   DIVS             DIVIDE                                            3108
3109                 *    RETURN HERE ON NEGATIVE RESULT                                             3109
3110 05470   000201          IAB                    COMPLEMENT QUOTIENT AND REMAINDER                 3110
```



```
3111 05471   140407          TCA                                                                      3111
3112 05472   000201          IAB                                                                      3112
3113 05473   140407          TCA                                                                      3113
3114 05474   0 01 05451      JMP   DIVX             EXIT                                              3114
3115                 *                                                                               3115
3116                 *    DIVIDE ROUTINE WITH HIGH ORDER DIVIDEND IN                                 3116
3117                 *    COMMON +1,LOW ORDER DIVIDEND IN B REG AND                                  3117
3118                 *    DIVISOR IN A REGISTER                                                      3118
3119                 *                                                                               3119
3120 05475   000000     DIVS HLT                                                                     3120
3121 05476   0 04 05524      STA   COMN             SAVE DIVISOR                                      3121
3122 05477   0 02 05755      LDA   =-15                                                               3122
3123 05500   0 04 05526      STA   COMN+2           LOOP COUNTER                                      3123
3124 05501   0410 77         LLL   1                MOVE LOW ORDER LEFT 1                             3124
3125 05502   0 02 05525      LDA   COMN+1           LOAD HI ORDER                                     3125
3126 05503   0 11 05524      CAS   COMN             COMPARE DIVIDEND AND DIVISOR                      3126
3127 05504   0 01 05453      JMP   DIVZ             DIVIDEND GTR THAN OR                              3127
3128 05505   0 01 05453      JMP   DIVZ             EQUAL TO GO TO ERROR RETURN                       3128
3129                 *      LOOP FOR DIVISION                                                        3129
3130 05506   0412 77    DIVY LLR   1                MOVE DIVIDEND 1 POSITION TO THE LEFT              3130
3131 05507   100400          SPL                    TEST SIGN POSITION FOR SPILL                      3131
3132 05510   0 01 05515      JMP   DIVU             MINUS SUBTRACT DIVIDEND IS GREATER                3132
3133 05511   0 11 05524      CAS   COMN             COMPARE DIVIDEND AND DIVISOR                      3133
3134 05512   0 01 05515      JMP   DIVU             IF GREATER SUBTRACT                               3134
3135 05513   0 01 05515      JMP   DIVU             EQUAL SUBTRACT                                    3135
3136 05514   0 01 05517      JMP   DIVH             INDEX AND LOOP                                    3136
3137 05515   0 07 05524 DIVU SUB   COMN                                                             3137
3138 05516   140500          SSM                    PUT-1-BIT IN QUOTIENT LOOP                        3138
3139 05517   0 12 05526 DIVH IRS   COMN+2                                                           3139
3140 05520   0 01 05506      JMP   DIVY                                                             3140
3141 05521   0412 77         LLR   1                RESET SIGN BITS                                   3141
3142 05522   0404 77         LGR   1                                                                  3142
3143 05523  -0 01 05475      JMP*  DIVS                                                             3143
3144                 *                                                                               3144
3145 05524   000000     COMN BSZ   3                                                                  3145
3146                 *                                                                               3146
3147                 *                                                                               3147
```

```
3148                        *                                                                    3148
3149                        *     DETERMINE HIGHEST SECTOR IN MEMORY                             3149
3150                        *                                                                    3150
3151 05527   0 000000   HSEC DAC   **                                                           3151
3152 05530   000013          EXA                                                                3152
3153 05531   140040          CRA                                                                3153
3154 05532   0 04 00462      STA   TMP1+1                                                       3154
3155 05533   0 06 05773 HSE1 ADD   ='10000                                                     3155
3156 05534   0 12 00462      IRS   TMP1+1                                                       3156
3157 05535   0 04 00461      STA   TMP1                                                        3157
3158 05536  -0 04 00461      STA*  TMP1                                                       3158
3159 05537   140040          CRA                                                              3159
3160 05540   0 04 00000      STA   0                                                          3160
3161 05541  -0 02 00461      LDA*  TMP1                                                       3161
3162 05542   100040          SZE                       HIGHEST ADDRESS REACHED                3162
3163 05543   0 01 05533      JMP   HSE1                IF NOT, DO ANOTHER TIME                3163
3164 05544   000021          RMP                                                              3164
3165 05545   0 02 00461      LDA   TMP1                                                       3165
3166 05546   0 07 05754      SUB   =1                  HIGHEST ADDRESS                        3166
3167 05547   0404 67         LGR   9                                                          3167
3168 05550   0 04 00464      STA   HISC                HIGHEST SECTOR                         3168
3169                        *                                                                3169
3170 05551   0 02 00521      LDA   CNTZ                DAC OF TIME COMPENS. TABLE             3170
3171 05552   0 06 00462      ADD   TMP1+1                                                     3171
3172 05553   0 04 00462      STA   TMP1+1                                                     3172
3173 05554  -0 02 00462      LDA*  TMP1+1              GET THE COMPENS. FACTOR                3173
3174 05555   0 04 00455      STA   CNTY                                                       3174
3175 05556   0 02 05753      LDA   ='101000                                                   3175
3176 05557   0 04 00145      STA   IN00                                                       3176
3177 05560  -0 01 05527      JMP*  HSEC                                                     3177
3178                        *                                                                3178
3179 05561   123567     PATX OCT   123567                                                   3179
3180 05562   0 005563   MESS DAC   *+1                                                      3180
3181 05563   177757          DEC   -17                                                      3181
3182 05564   106612          OCT   106612,106612                                            3182
     05565   106612                                                                         
3183 05566   140702          BCI   6,AB16-CCT4                                              3183
```



```
     05567   130666
     05570   126703
     05571   141724
     05572   132240
     05573   120240
3184 05574   140720          BCI   6,APR 24, 73                                             3184
     05575   151240
     05576   131264
     05577   126240
     05600   133663
     05601   120240
3185 05602   151305          BCI   3,REV H                                                  3185
     05603   153240
     05604   144240
3186 05605   0 005606   MES1 DAC   *+1                                                      3186
3187 05606   177772          DEC   -6                                                       3187
3188 05607   106612          OCT   106612                                                   3188
3189 05610   141720          BCI   5,CP IS **16                                            3189
     05611   120311
     05612   151640
     05613   125252
     05614   130666
3190                        *                                                                3190
3191                        *                                                                3191
3192                        *     TEST IF CP IS 716 AND MODIFY PROGRAM IF IT IS               3192
3193                        *                                                                3193
3194 05615   0 02 05561 X13R LDA   PATX                                                      3194
3195 05616   000201          IAB                       PUT INTO B REG                         3195
3196 05617   0 02 05561      LDA   PATX                GET THE WORD AGAIN                     3196
3197 05620   0 05 00002      ERA   2                   XOR WITH LOC.2                         3197
3198 05621   101040          SNZ                       TEST FURTHER FOR 716                   3198
3199 05622   0 01 05705      JMP   X135                IF ZERO, CP IS 716                     3199
3200 05623   0 02 05752      LDA   =-1                 LOAD -1 INTO A                         3200
3201 05624   0 12 00001      IRS   1                   IF CP IS 716, SHOULD SKIP NEXT INSTRUCTION 3201
3202 05625   100000          SKP                       TEST MORE                              3202
3203 05626   0 01 05705      JMP   X135                CP IS 716                              3203
3204                        *                                                                3204
```

```
3205 05627   140040          CRA                                                3205
3206 05630   0 04 00461      STA   TMP1        RESET THE COUNTER                3206
3207 05631   34 0104         SKS   '104                                         3207
3208 05632   0 01 05631      JMP   *-1         WAIT TILL NOT BUSY               3208
3209 05633   14 0104         OCP   '104        PUT ASR IN OUTPUT MODE           3209
3210 05634   74 0004         OTA   4                                            3210
3211 05635   000000          HLT               ERROR                            3211
3212 05636   74 0004         OTA   4                                            3212
3213 05637   100000          SKP                                                3213
3214 05640   0 01 05644      JMP   *+4                                          3214
3215 05641   0 12 00461      IRS   TMP1                                         3215
3216 05642   0 01 05636      JMP   *-4                                          3216
3217 05643   000000          HLT               OVERFLOW ERROR                   3217
3218 05644   101000          NOP                                                3218
3219 05645   0 02 05753      LDA   ='101000      NOP                              3219
3220 05646   0 04 00171      STA   IN02                                         3220
3221 05647   0 04 00172      STA   IN02+1                                       3221
3222 05650   0 02 00461      LDA   TMP1                                         3222
3223 05651   0 11 05751      CAS   =11900                                       3223
3224 05652   0 01 05703      JMP   X134        CP IS 516                        3224
3225 05653   101000          NOP                                                3225
3226 05654   0 02 05750      LDA   =A 3        CP IS 316                        3226
3227 05655   0 04 05613 X133 STA   MES1+6                                       3227
3228 05656   0 02 05605      LDA   MES1                                         3228
3229 05657   0 10 00402      JST   TYPE        PRINT CP TYPE                    3229
3230 05660   140040          CRA               ROUTINE TO TYPE MEMORY SIZE      3230
3231 05661   0 04 00461      STA   TMP1                                         3231
3232 05662   0 02 00464      LDA   HISC                                         3232
3233 05663   0 06 05754      ADD   =1                                           3233
3234 05664   0 07 05772      SUB   ='10                                         3234
3235 05665   101040          SNZ                                                3235
3236 05666   0 01 05671      JMP   *+3                                          3236
3237 05667   0 12 00461      IRS   TMP1                                         3237
3238 05670   0 01 05664      JMP   *-4                                          3238
3239 05671   0 02 00461      LDA   TMP1                                         3239
3240 05672   0 06 04741      ADD   MMSZ                                         3240
3241 05673   0 04 00461      STA   TMP1                                         3241
```



```
3242 05674  -0 02 00461      LDA*  TMP1                                         3242
3243 05675   0 04 04760      STA   MES5+6                                       3243
3244 05676   0 02 04752      LDA   MES5                                         3244
3245 05677   0 10 00402      JST   TYPE        TYPE MEMORY SIZE                 3245
3246 05700   0 02 05753      LDA   ='101000                                     3246
3247 05701   0 04 00146      STA   IN00+1                                       3247
3248 05702   0 01 00146      JMP   IN00+1                                       3248
3249                 *                                                        3249
3250 05703   0 02 05747 X134 LDA   =A 5        CP IS 516                        3250
3251 05704   0 01 05655      JMP   X133                                         3251
3252                 *                                                        3252
3253 05705   0 02 00450 X135 LDA   SUB7        MODIFY FOR 716 CP TESTS          3253
3254 05706   0 04 00155      STA   IN01                                         3254
3255 05707   0 02 00452      LDA   LD10        LDA ='10000                      3255
3256 05710   0 04 00211      STA   IN03                                         3256
3257 05711   0 02 00451      LDA   LDM7        LDA =-7                          3257
3258 05712   0 04 00213      STA   IN04                                         3258
3259 05713   0 02 00453      LDA   SB47        SUB ='47                         3259
3260 05714   0 04 00304      STA   IN05                                         3260
3261 05715   0 02 00454      LDA   OTNT        ='10000                          3261
3262 05716   0 04 00320      STA   IN06                                         3262
3263 05717   0 02 00457      LDA   LM24        LDA =-24                         3263
3264 05720   0 04 00301      STA   IN07                                         3264
3265 05721   0 02 00464      LDA   HISC                                         3265
3266 05722   0 07 05772      SUB   ='10                                         3266
3267 05723   101400          SMI               IF NEG., MEM IS ONLY 4K, MODIFY  3267
3268 05724   0 01 05731      JMP   *+5                                          3268
3269 05725   0 02 00270      LDA   IN10                                         3269
3270 05726   0 04 00200      STA   IN08+1                                       3270
3271 05727   0 02 00177      LDA   IN08                                         3271
3272 05730   0 04 00201      STA   IN08+2                                       3272
3273 05731   0 02 05746      LDA   =A 7                                         3273
3274 05732   0 01 05655      JMP   X133                                         3274
3275                 *                                                        3275
3276                 *                                                        3276
3277                 *    TEST IF CP IS 716 AND MEMORY 20K AND IF SO, MODIFY PROGRAM  327
3278                 *    FOR UPPER HALF                                      3278
```

```
3279                        *
3280 05733   0 02 05752 S47R LDA   =-1
3281 05734   0 12 00001      IRS   1              WILL SKIP IF CP IS 716
3282 05735   0 01 00162      JMP   STR2           CP IS NOT 716, NO MODIFICATION
3283 05736   0 02 00464      LDA   HISC           CHECK IF MEMORY IS 20K
3284 05737   0 07 05745      SUB   ='47
3285 05740   100040          SZE
3286 05741   0 01 00162      JMP   STR2           OVER 20K, NO MODIFICATION
3287 05742   0 02 00257      LDA   D20L           MODIFY PROGRAM
3288 05743   0 04 00206      STA   IN09
3289 05744   0 01 00162      JMP   STR2           GO TO TEST
3290                        *
3291                        *
3292                        *
3293                        *
3294 05745   000047          FIN
     05746   120267
     05747   120265
     05750   120263
     05751   027174
     05752   177777
     05753   101000
     05754   000001
     05755   177761
     05756   000031
     05757   030071
     05760   072460
     05761   000151
     05762   007701
     05763   077555
     05764   000016
     05765   000777
     05766   000023
     05767   000040
     05770   000012
     05771   000025
     05772   000010
```



```
     05773   010000

3295                        *
3296                        *
3297                        *
3298                        *     716 TESTS PART I
3299                        *
3300                              ORG   '6000
3301                        *
3302 06000   0 000000   TS06 DAC   **
3303 06001   101000           NOP
3304 06002   0 10 06006      JST   X13T           GO TO 716 TESTS
3305 06003   101000           NOP
3306 06004   -0 01 06000     JMP*  TS06           RETURN
3307                        *
3308                        *
3309                        *
3310 06005   000103         OCT   103
3311 06006   0 000000   X13T DAC   **
3312 06007   0 02 06005      LDA   *-2
3313 06010   0 04 00777      STA   '777           SAVE THE TEST NO.
3314 06011   101000          NOP
3315                        *
3316                        *
3317                        *     A REG AND LOC.1 TRACTION
3318                        *
3319 06012   0 02 06756      LDA   =-2
3320 06013   0 12 00001      IRS   1              A=-1
3321 06014   0 06 06755      ADD   =1             A=0
3322 06015   100040          SZE
3323 06016   000000          HLT                  ERROR
3324 06017   0 02 06754      LDA   =-1
3325 06020   0 12 00001      IRS   1              A=0, MUST SKIP
3326 06021   000000          HLT                  ERROR
3327 06022   100040          SZE
3328 06023   000000          HLT                  ERROR
3329 06024   0 12 00001      IRS   1              A=1
```

```
3330 06025   0 12 00001      IRS   1              A=2                          3330
3331 06026   0 07 06753      SUB   =2             A=0                          3331
3332 06027   100040          SZE                                               3332
3333 06030   000000          HLT                  ERROR                        3333
3334                 *                                                        3334
3335                 *                                                        3335
3336                 *    B REG AND LOC.2 TRACTION                            3336
3337                 *                                                        3337
3338 06031   0 02 06756      LDA   =-2                                         3338
3339 06032   000201          IAB                  B=-2, (2)=-2                 3339
3340 06033   0 12 00002      IRS   2              B=-1, (2)=-1                 3340
3341 06034   000201          IAB                  A=-1                         3341
3342 06035   0 11 06754      CAS   =-1                                        3342
3343 06036   100000          SKP                                               3343
3344 06037   100000          SKP                  CORRECT, SKIP                3344
3345 06040   000000          HLT                  ERROR                        3345
3346 06041   000201          IAB                  B=-1, (2)=-1                 3346
3347 06042   0 12 00002      IRS   2              (2)=0                        3347
3348 06043   000000          HLT                  ERROR, DID NOT SKIP          3348
3349 06044   000201          IAB                  A=0                          3349
3350 06045   100040          SZE                                               3350
3351 06046   000000          HLT                  ERROR                        3351
3352 06047   0 02 06754      LDA   =-1                                        3352
3353 06050   0 04 00002      STA   2              (2)=-1 AND B=-1              3353
3354 06051   000201          IAB                  (A)=-1 AND (1)=-1            3354
3355 06052   0 12 00001      IRS   1              (1)=0                        3355
3356 06053   000000          HLT                  ERROR                        3356
3357 06054   100040          SZE                                               3357
3358 06055   000000          HLT                  ERROR                        3358
3359                 *                                                        3359
3360 06056   0 02 00455      LDA   CNTY                                        3360
3361 06057   0 04 06222      STA   X602                                        3361
3362 06060   0 02 06752      LDA   ='10           STORE ADDR AT X601           3362
3363 06061   0 04 06221      STA   X601                                        3363
3364 06062  -0 02 06221 X13A LDA*  X601                                       3364
3365 06063   000201          IAB                  SHIFT TO B REG               3365
3366 06064   140040          CRA                                               3366
```



```
3367 06065   0 02 00002      LDA   2              GET DATA FROM B REG THRU LOC.2 3367
3368 06066  -0 05 06221      ERA*  X601                                       3368
3369 06067   100040          SZE                                               3369
3370 06070   000000          HLT                  ERROR                        3370
3371 06071  -0 02 06221      LDA*  X601                                       3371
3372 06072   0 04 00002      STA   2              STORE AT LOC.2               3372
3373 06073   0 02 06754      LDA   =-1            LOAD A WITH ALL ONES         3373
3374 06074   000201          IAB                  SHIFT B REG TO A             3374
3375 06075  -0 05 06221      ERA*  X601                                       3375
3376 06076   100040          SZE                  SHOULD BE ZERO               3376
3377 06077   000000          HLT                  ERROR                        3377
3378 06100   0 12 06221      IRS   X601                                       3378
3379 06101   100000          SKP                                               3379
3380 06102   000000          HLT                  ERROR  -  TOO BIG LOOP       3380
3381 06103   0 12 06222      IRS   X602                                       3381
3382 06104   0 01 06062      JMP   X13A           NO, REPEAT WITH NEXT WORD    3382
3383                 *                                                        3383
3384                 *                                                        3384
3385                 *    STACK TOP AND LOC.3 TEST                            3385
3386                 *                                                        3386
3387 06105   0 02 00455      LDA   CNTY                                        3387
3388 06106   0 04 00000      STA   0                                           3388
3389 06107   1 02 06107 X13B LDA   *,1                                        3389
3390 06110   0 04 00003      STA   3              STORE AT STACK TOP           3390
3391 06111   140040          CRA                                               3391
3392 06112   0 02 00003      LDA   3              GET WORD FROM 3              3392
3393 06113   1 05 06107      ERA   X13B,1                                      3393
3394 06114   100040          SZE                                               3394
3395 06115   000000          HLT                  ERROR  -  DATA CHANGED       3395
3396 06116   0 12 00000      IRS   0              MODIFY ADDRESS, ARE WE DONE  3396
3397 06117   0 01 06107      JMP   X13B           NO, TEST NEXT WORD           3397
3398                 *                                                        3398
3399 06120   0 02 06754      LDA   =-1                                         3399
3400 06121   0 04 00003      STA   3              TRY IRS 3                    3400
3401 06122   0 12 00003      IRS   3                                           3401
3402 06123   000000          HLT                  ERROR - DID NOT SKIP         3402
3403 06124   0 02 00455      LDA   CNTY                                        3403
```

```
3404 06125   0 04 00003       STA   3              LOOP COUNT                          3404
3405 06126   0 35 06751       LDX   =0                                                3405
3406 06127   0 12 00000       IRS   0              INCREMENT BOTH 0 AND               3406
3407 06130   0 12 00003       IRS   3              3 AND CHECK IF THEY TRACK          3407
3408 06131   0 01 06127       JMP   *-2                                               3408
3409 06132   0 02 00455       LDA   CNTY                                              3409
3410 06133   140407           TCA                                                     3410
3411 06134   0 05 00000       ERA   0              MUST COMPARE                       3411
3412 06135   100040           SZE                                                     3412
3413 06136   000000           HLT                  ERROR                              3413
3414                  *                                                              3414
3415                  *                                                              3415
3416                  *    CHECK S MODE                                              3416
3417                  *                                                              3417
3418 06137   000017           XFS                  SET S MODE                         3418
3419 06140   000043           INK                  INPUT THE KEYS                     3419
3420 06141   0 03 06225       ANA   BIT4           ='10000                            3420
3421 06142   101040           SNZ                                                     3421
3422 06143   000000           HLT                  ERROR - BIT 4 NOT SET              3422
3423 06144   000015           XFX                  SET X MODE                         3423
3424 06145   000043           INK                                                     3424
3425 06146   0 03 06225       ANA   BIT4                                             3425
3426 06147   100040           SZE                                                     3426
3427 06150   000000           HLT                  ERROR - BIT 4 DID NOT GET RESET    3427
3428 06151   0 02 06225       LDA   BIT4                                             3428
3429 06152   171020           OTK                  SET BIT 4                          3429
3430 06153   140040           CRA                                                     3430
3431 06154   000043           INK                                                     3431
3432 06155   0 03 06225       ANA   BIT4           AND WITH BIT4                      3432
3433 06156   101040           SNZ                                                     3433
3434 06157   000000           HLT                  ERROR - BIT4 DID NOT GET SET       3434
3435 06160   140040           CRA                                                     3435
3436 06161   171020           OTK                  RESET BIT4                         3436
3437 06162   000043           INK                                                     3437
3438 06163   0 03 06225       ANA   BIT4                                             3438
3439 06164   100040           SZE                                                     3439
3440 06165   000000           HLT                  ERROR - BIT4 DID NOT GET RESET     3440
```



```
3441                  *                                                              3441
3442                  *                                                              3442
3443                  *    CHECK X MODE                                              3443
3444                  *                                                              3444
3445 06166   000015           XFX                  SET X MODE                         3445
3446 06167   0 35 06750       LDX   =-3                                               3446
3447 06170   0 02 00766       LDA   STIR                                              3447
3448 06171   0 04 06223       STA   PNTR           STORE ADDR OF WORK AT POINTER      3448
3449 06172   0 02 06747       LDA   ='52525        FILL THREE WORD BUFFER             3449
3450 06173  -0 04 06223       STA*  PNTR           WITH KNOWN DATA                    3450
3451 06174   0 06 06746       ADD   ='135                                             3451
3452 06175   0 12 06223       IRS   PNTR                                              3452
3453 06176   0 12 00000       IRS   0                                                 3453
3454 06177   0 01 06173       JMP   *-4                                               3454
3455                  *                                                              3455
3456                  *                                                              3456
3457                  *    TEST S MODE FOR INDEXING                                  3457
3458                  *                                                              3458
3459 06200   000017           XFS                  SET S MODE                         3459
3460 06201   0 35 06750       LDX   =-3                                               3460
3461 06202   0 02 06754       LDA   =-1                                               3461
3462 06203   0 04 00003       STA   3              STORE =-1 AT 3                     3462
3463 06204   0 02 00766       LDA   STIR           LOAD ADDRESS OF WORK               3463
3464 06205   0 04 06223       STA   PNTR           STORE AT POINTER                   3464
3465 06206   1 02 00771 X13C  LDA   WORK+1,1        INDEX FROM S                       3465
3466 06207  -0 05 06223       ERA*  PNTR           XOR WITH DATA                      3466
3467 06210   100040           SZE                                                     3467
3468 06211   000000           HLT                  ERROR - DATA DID NOT AGREE         3468
3469 06212   0 12 00000       IRS   0              X-REG FOR COUNTING, ARE WE DONE    3469
3470 06213   100000           SKP                  NO, SKIP                           3470
3471 06214   0 01 06231       JMP   X13D           YES, JUMP AROUND                   3471
3472 06215   0 12 06223       IRS   PNTR           MODIFY                             3472
3473 06216   0 12 00003       IRS   3                                                 3473
3474 06217   101000           NOP                                                     3474
3475 06220   0 01 06206       JMP   X13C           CHECK NEXT WORD                    3475
3476                  *                                                              3476
3477 06221   000000     X601  BSZ   1                                                3477
```

```
3478 06222   000000      X602 BSZ   1                                                    3478
3479 06223   000000      PNTR BSZ   1                                                    3479
3480 06224   020000      BIT3 OCT   20000          EXTEND MODE BIT                       3480
3481 06225   010000      BIT4 OCT   10000          S MODE BIT                            3481
3482 06226   024000      BT35 OCT   24000          EXTEND MODE AND RUPT MASK BITS        3482
3483 06227   000000      HADD BSZ   1              HIGH ADDRESS BEFORE OVERFLOW          3483
3484 06230   000000      LADD BSZ   1              LOW ADDRESS BEFORE UNDERFLOW          3484
3485                     *                                                               3485
3486                     *                                                               3486
3487                     *     TEST IRS 3 (POP), LDA 5 (POP A) AND STA 4 (PUSH A).       3487
3488                     *                                                               3488
3489 06231   101000      X13D NOP                                                        3489
3490 06232   0 02 06745         LDA   ='21                                              3490
3491 06233   0 04 00003         STA   3              INITIALIZE STACK                   3491
3492 06234   0 12 00003         IRS   3              POP STACK                          3492
3493 06235   0 02 00003         LDA   3              GET STACK                          3493
3494 06236   0 05 06744         ERA   ='22           SHOULD COMPARE                     3494
3495 06237   100040             SZE                                                     3495
3496 06240   000000             HLT                  IRS 3 (POP) FAILED                 3496
3497 06241   0 01 06245         JMP   *+4                                               3497
3498                     *                                                               3498
3499 06242   052525             OCT   52525                                             3499
3500 06243   125253      N1     OCT   125253                                          3500
3501 06244   000000             BSZ   1                                                 3501
3502                     *                                                               3502
3503 06245   0 10 06246         JST   *+1            FORM REFERENCE ADDRESS             3503
3504 06246   0 000000           DAC   **                                                3504
3505 06247   0 02 06246         LDA   *-1                                               3505
3506 06250   0 03 06743         ANA   ='37777        STRIP INDEX BIT                    3506
3507 06251   0 07 06742         SUB   =3                                                3507
3508 06252   0 04 00003         STA   3              INITIALIZE STACK TO N1              3508
3509 06253   0 02 00005         LDA   5              POP A - ADDR IS N1 AND STACK GOES TO N1+1  3509
3510 06254   0 06 06242         ADD   N1-1                                              3510
3511 06255   100040             SZE                                                     3511
3512 06256   000000             HLT                  LDA 5 (POP A) FAILED               3512
3513                     *                                                               3513
3514 06257   024003             POP                  STACK IS N1+2                      3514
```



```
3515 06260   0 02 06242         LDA   N1-1                                              3515
3516 06261   0 04 00004         STA   4              PUSH A, ADDR IS N1+1 AND STACK IS N1+1  3516
3517 06262   0 02 06243         LDA   N1                                                3517
3518 06263   0 06 06244         ADD   N1+1                                              3518
3519 06264   100040             SZE                                                     3519
3520 06265   000000             HLT                  STA 4 (PUSH A) FAILED              3520
3521 06266   140040             CRA                                                     3521
3522 06267   0 04 06244         STA   N1+1           CLEAR WORKING LOCATION             3522
3523                     *                                                               3523
3524                     *                                                               3524
3525                     *                                                               3525
3526                     *                                                               3526
3527                     *     TEST  LDA* 3, LDA* 4, LDA* 5                              3527
3528                     *                                                               3528
3529 06270   101000             NOP                                                     3529
3530 06271   000015             XFX                  PUT IN X MODE                      3530
3531 06272   0 10 06273         JST   *+1                                               3531
3532 06273   0 000000           DAC   **                                                3532
3533 06274   0 02 06273         LDA   *-1                                               3533
3534 06275   0 03 06743         ANA   ='37777        STRIP BITS 1 AND 2                 3534
3535 06276   0 06 06741         ADD   =5                                                3535
3536 06277   0 01 06303         JMP   *+4                                               3536
3537 06300   052525      X6AA   OCT   52525                                           3537
3538 06301   125253             OCT   125253                                          3538
3539 06302   000000             BSZ   1                                                 3539
3540 06303   010003             STAQ  S              STACK HAS ADDR OF X6AA             3540
3541 06304   -0 02 00003        LDA*  3              TESTING LDA* 3                     3541
3542 06305   0 06 06301         ADD   *-4                                               3542
3543 06306   100040             SZE                                                     3543
3544 06307   000000             HLT                  LDA* 3 FAILED                      3544
3545                     *                                                               3545
3546 06310   024003             POP                  STACK HAS ADDR OF X6AA+1           3546
3547 06311   004003             LDAQ  S                                                 3547
3548 06312   0 04 06302         STA   X6AA+2                                            3548
3549 06313   024003             POP                                                     3549
3550 06314   024003             POP                  STACK HAS ADDR OF X6AA+3           3550
3551 06315   -0 02 00004        LDA*  4              TESTING  LDA* 4          S=X6AA+2  3551
```

```
3552 06316   0 06 06300       ADD   X6AA
3553 06317   100040           SZE
3554 06320   000000           HLT                    LDA* 4  FAILED
3555                     *
3556 06321  -0 02 00005       LDA*  5                ADDR IS X6AA+2 AND STACK GOES TO X6AA+3
3557 06322   0 06 06300       ADD   X6AA
3558 06323   100040           SZE
3559 06324   000000           HLT                    LDA* 5 FAILED
3560                     *
3561                     *
3562                     *
3563                     *     TEST JMP 4 AND JMP 5
3564                     *
3565 06325   101000           NOP
3566 06326   0 10 06327       JST   *+1              FIND A REFERENCE LOC IN THE SAME SECTOR
3567 06327   0 000000         DAC   **
3568 06330   101000           NOP
3569 06331   0 02 06327       LDA   *-2
3570 06332   0 03 06743       ANA   ='37777          STRIP BITS 1 AND 2
3571 06333   0 06 06740       ADD   ='13
3572 06334   0 04 00003       STA   3                STACK IS N2
3573                     *
3574 06335   0 01 00004       JMP   4                FIRST JMP 4  -  S=N2-1
3575 06336   000000           HLT
3576 06337   0 01 06343       JMP   *+4
3577 06340   0 01 00004       JMP   4                THIRD JMP 4  -  S=N2-3
3578 06341   0 01 00004       JMP   4                SECOND JMP 4  -  S=N2-2
3579 06342   000000       N2  HLT
3580 06343   101000           NOP
3581 06344   004003           LDAQ  S
3582 06345   0 06 06737       ADD   ='12
3583 06346   014003           STAQ  S                STACK IS N3
3584 06347   0 01 00005       JMP   5                FIRST JMP 5, ADDR IS N3, S=N3+1
3585 06350   000000           HLT
3586 06351   0 01 00005   N3  JMP   5                SECOND JMP 5 - ADDR=N3+1 AND S=N3+2
3587 06352   100000           SKP
3588 06353   000000           HLT
```



```
3589                     *
3590                     *
3591                     *     TEST JST 4 (PUSH P)
3592                     *
3593 06354   101000           NOP
3594 06355   0 02 00003       LDA   3                STACK IS N3+2
3595 06356   0 06 06752       ADD   ='10
3596 06357   0 04 00003       STA   3                STACK IS N4
3597 06360   0 01 06364       JMP   *+4
3598 06361   000000       X603 BSZ  1                SECOND JST 4 PUTS P+1 (N4+7) HERE
3599 06362   000000           BSZ   1                FIRST JST 4 PUTS P+1 (N4+2) HERE
3600 06363   000000       N4  HLT
3601 06364   0 10 00004       JST   4                FIRST JST 4  -  S=N4-1
3602 06365  -0 02 06362       LDA*  N4-1             GET THE CONTENTS
3603 06366   0 05 06365       ERA   *-1              COMPARE WITH THE ORIGINAL
3604 06367   100040           SZE
3605 06370   000000           HLT                    FIRST JST 4 FAILED
3606 06371   0 10 00004       JST   4                SECOND JST 4  -  S=N4-2
3607 06372  -0 02 06361       LDA*  X603
3608 06373   0 05 06372       ERA   *-1
3609 06374   100040           SZE
3610 06375   000000           HLT                    SECOND JST 4 FAILED
3611                     *
3612                     *
3613                     *     TEST JMP* 4
3614                     *
3615 06376   101000           NOP
3616 06377   0 02 00003       LDA   3                S=N4-2
3617 06400   0 06 06736       ADD   ='24
3618 06401   0 04 00003       STA   3                STACK IS N5
3619 06402   0 01 06405       JMP   *+3
3620 06403   000000       X604 BSZ  1                GETS N5+9
3621 06404   000000           BSZ   1                GETS N5+6
3622 06405   0 06 06735   N5  ADD   =6
3623 06406   0 04 06404       STA   N5-1
3624 06407   0 06 06742       ADD   =3
3625 06410   0 04 06403       STA   X604
```

```
3626 06411  -0 01 00004      JMP*  4              FIRST JMP* 4  -  S=N5-1                    3626
3627 06412   000000         HLT                                                             3627
3628 06413   101000         NOP                   FIRST JMP* 4 COMES HERE                   3628
3629 06414  -0 01 00004      JMP*  4              SECOND JMP* 4  -  S=N5-2                   3629
3630 06415   000000         HLT                                                             3630
3631 06416   101000         NOP                   SECOND JMP* 4 COMES HERE                  3631
3632                *                                                                       3632
3633                *                                                                       3633
3634                *    TEST JMP* 5                                                        3634
3635                *                                                                       3635
3636 06417   004003         LDAQ  S                                                         3636
3637 06420   0 06 06734     ADD   ='20                                                      3637
3638 06421   010003         STAQ  S               STACK IS X605                             3638
3639 06422   0 01 06425     JMP   *+3                                                       3639
3640 06423   000000   X605  BSZ   1               GETS N6                                   3640
3641 06424   000000         BSZ   1               GETS N6+2                                 3641
3642 06425   0 06 06737     ADD   ='12                                                      3642
3643 06426   0 04 06423     STA   X605                                                      3643
3644 06427   0 06 06753     ADD   ='2                                                       3644
3645 06430   0 04 06424     STA   X605+1                                                    3645
3646 06431   101000         NOP                                                           3646
3647 06432  -0 01 00005      JMP*  5               FIRST JMP* 5  -  ADDR=X605, S=X605+1      3647
3648 06433   000000         HLT                                                             3648
3649 06434   000000         HLT                                                           3649
3650 06435   101000   N6    NOP                   FIRST JMP* 5 COMES HERE                   3650
3651 06436  -0 01 00005      JMP*  5              SECOND JMP* 5  -  ADDR=X605+1, S=X605+2    3651
3652 06437   0 02 00005     LDA   5               SECOND JMP* 5 COMES HERE                  3652
3653 06440   0 05 06425     ERA   X605+2                                                    3653
3654 06441   100040         SZE                                                           3654
3655 06442   000000         HLT                   STACK FAILED                              3655
3656                *                                                                       3656
3657                *                                                                       3657
3658                *                                                                       3658
3659                *                                                                       3659
3660                *                                                                       3660
3661                *    CHECK FOR CORRECT DATA WORD - PUSH OPERATION                       3661
3662                *                                                                       3662
```



```
3663 06443   0 35 06733     LDX   =-500           INITIALIZE COUNT                          3663
3664 06444   0 02 06732     LDA   ='1777          CHANGE IT LATER WITH '5777                3664
3665 06445   0 04 00003     STA   3               STORE AT STACK TOP                        3665
3666 06446   0 07 06755     SUB   =1                                                        3666
3667 06447   0 04 06223     STA   PNTR            STORE AT POINTER                          3667
3668 06450   000013         EXA                                                           3668
3669 06451   0 10 06452     JST   *+1             SET UP FOR                                3669
3670 06452   0 000000       DAC   **              UNEXPECTED RUPT                           3670
3671 06453   0 02 06452     LDA   *-1                                                       3671
3672 06454   0 06 06745     ADD   ='21                                                      3672
3673 06455   0 04 00057     STA   '57                                                       3673
3674 06456   000011         DXA                                                           3674
3675 06457   0 01 06460     JMP   *+1             NORMAL MODE                               3675
3676 06460   0 02 00004 X13I LDA  4                                                        3676
3677 06461  -0 05 06223     ERA*  PNTR                                                    3677
3678 06462   100040         SZE                                                           3678
3679 06463   000000         HLT                   ERROR - DATA DID NOT AGREE                3679
3680 06464   0 12 00000     IRS   0               ARE WE DONE                               3680
3681 06465   100000         SKP                   NO, SKIP                                  3681
3682 06466   0 01 06475     JMP   X13J            YES, JUMP OUT                             3682
3683 06467   0 02 06223     LDA   PNTR            MODIFY                                    3683
3684 06470   0 07 06755     SUB   =1                                                        3684
3685 06471   0 04 06223     STA   PNTR                                                      3685
3686 06472   0 01 06460     JMP   X13I            GO AND TEST NEXT WORD                     3686
3687                *                                                                       3687
3688 06473   0 000000       DAC   **              UNEXPECTED RUPT                           3688
3689 06474   000000         HLT                   ERROR                                     3689
3690                *                                                                       3690
3691                *                                                                       3691
3692                *                                                                       3692
3693                *    CHECK FOR CORRECT DATA WORD - POP  OPERATION                       3693
3694                *                                                                       3694
3695 06475   0 35 06733 X13J LDX   =-500           INITIALIZE COUNT                          3695
3696 06476   000013         EXA                                                           3696
3697 06477   0 10 06500     JST   *+1             SET UP FOR                                3697
3698 06500   0 000000       DAC   **              UNEXPECTED RUPT                           3698
3699 06501   0 02 06500     LDA   *-1                                                       3699
```

```
3700 06502   0 06 06744       ADD   ='22                                          3700
3701 06503   0 04 00057       STA   '57                                           3701
3702 06504   000011           DXA                                                 3702
3703 06505   0 01 06506       JMP   *+1          NORMAL MODE                      3703
3704 06506   0 02 06731       LDA   ='1006                                        3704
3705 06507   0 04 00003       STA   3                                             3705
3706 06510   0 04 06223       STA   PNTR                                          3706
3707 06511   0 02 00005 X13K  LDA   5                                             3707
3708 06512  -0 05 06223       ERA*  PNTR                                          3708
3709 06513   100040           SZE                                                 3709
3710 06514   000000           HLT                ERROR - DATA DID NOT AGREE       3710
3711 06515   0 12 00000       IRS   0            ARE WE DONE                      3711
3712 06516   100000           SKP                NO, SKIP                         3712
3713 06517   0 01 06524       JMP   X13L         YES, JUMP OUT                    3713
3714 06520   0 12 06223       IRS   PNTR         MODIFY                           3714
3715 06521   0 01 06511       JMP   X13K         GO AND TEST NEXT WORD            3715
3716                      *                                                      3716
3717 06522   0 000000         DAC   **           UNEXPECTED RUPT                  3717
3718 06523   000000           HLT                ERROR                            3718
3719                      *                                                      3719
3720                      *                                                      3720
3721                      *     RUPT TEST FOR OVERFLOW                           3721
3722                      *                                                      3722
3723 06524   0 35 06730 X13L  LDX   =-512        COUNTER FOR ALL POSSIBLE OVERFLOW CASES  3723
3724 06525   0 02 06727       LDA   ='100                                         3724
3725 06526   0 04 06227       STA   HADD         GOING TO '77 WILL CAUSE AN OVERFLOW  3725
3726 06527   0 04 00003       STA   3            AND AN INTERRUPT IF MASK IS SET.  3726
3727 06530   0 02 06226       LDA   BT35                                          3727
3728 06531   171020           OTK                SET EXTEND MODE AND RUPT MASK    3728
3729 06532   0 01 06533       JMP   *+1                                           3729
3730 06533   0 10 06534       JST   *+1          SET UP FOR                       3730
3731 06534   0 000000         DAC   **           EXPECTED RUPT                    3731
3732 06535   0 02 06534       LDA   *-1                                           3732
3733 06536   0 06 06735       ADD   =6                                            3733
3734 06537   0 04 00057       STA   '57                                           3734
3735 06540   0 02 00004       LDA   4                                             3735
3736 06541   000000           HLT                ERROR - DID NOT GO TO RUPT       3736
```



```
3737                      *                                                      3737
3738 06542   0 000000         DAC   **           EXPECTED RUPT                    3738
3739 06543   0 02 06224       LDA   BIT3                                          3739
3740 06544   171020           OTK                RESET RUPT MASK BUT LEAVE EXTEND MODE  3740
3741 06545   0 01 06546       JMP   *+1                                           3741
3742 06546   0 10 06547       JST   *+1                                           3742
3743 06547   0 000000         DAC   **                                            3743
3744 06550   0 02 06547       LDA   *-1                                           3744
3745 06551   0 06 06737       ADD   ='12                                          3745
3746 06552   0 04 00057       STA   '57                                           3746
3747 06553   000011           DXA                                                 3747
3748 06554   0 01 06555       JMP   *+1          NORMAL MODE                      3748
3749 06555   0 02 06727       LDA   ='100                                         3749
3750 06556   0 04 00003       STA   3                                             3750
3751 06557   0 02 00004       LDA   4            LOAD FROM STACK TOP AND PUSH     3751
3752 06560   0 01 06563       JMP   *+3          JUMP AROUND                      3752
3753                      *                                                      3753
3754 06561   0 000000         DAC   **           UNEXPECTED RUPT                  3754
3755 06562   000000           HLT                ERROR                            3755
3756 06563   0 12 00000       IRS   0            CHECKED ALL POSSIBLE OVFLO CASES  3756
3757 06564   100000           SKP                NO, SKIP TO MODIFY               3757
3758 06565   0 01 06571       JMP   *+4          YES, GO AROUND                   3758
3759 06566   0 02 06227       LDA   HADD                                          3759
3760 06567   0 06 06727       ADD   ='100                                         3760
3761 06570   0 01 06526       JMP   X13L+2       TRY ANOTHER OVFLO POINT          3761
3762                      *                                                      3762
3763                      *                                                      3763
3764 06571   101000           NOP                                                 3764
3765 06572   0 35 06726       LDX   =-20                                          3765
3766 06573   0 02 06725       LDA   ='120                                         3766
3767 06574   0 04 00003       STA   3            STORE ADDR AT STACK TOP          3767
3768 06575   0 02 06226       LDA   BT35                                          3768
3769 06576   171020           OTK                SET RUPT MASK AND EXTEND MODE    3769
3770 06577   000013           EXA                                                 3770
3771 06600   0 10 06601       JST   *+1          SET UP FOR                       3771
3772 06601   0 000000         DAC   **           EXPECTED RUPT                    3772
3773 06602   0 02 06601       LDA   *-1                                           3773
```

```
3774 06603   0 06 06737       ADD   ='12                                          3774
3775 06604   0 04 00057       STA   '57                                           3775
3776 06605   000011           DXA                                                 3776
3777 06606   0 01 06607       JMP   *+1          NORMAL MODE                      3777
3778 06607   0 02 00004       LDA   4            LOAD FROM STACK TOP AND PUSH     3778
3779 06610   0 12 00000       IRS   0            ARE WE FINISHED, DID WE GET RUPT 3779
3780 06611   0 01 06607       JMP   *-2          NO, GET ANOTHER WORD             3780
3781 06612   000000           HLT                FINISHED, ERROR: DID NOT GET RUPT3781
3782                  *                                                          3782
3783                  *                                                          3783
3784 06613   0 000000         DAC   **           EXPECTED RUPT                    3784
3785 06614   101000           NOP                                                 3785
3786 06615   000011           DXA                                                 3786
3787 06616   0 01 06617       JMP   *+1          NORMAL MODE                      3787
3788                  *                                                          3788
3789                  *                                                          3789
3790                  *    RUPT TEST FOR UNDERFLOW                               3790
3791                  *                                                          3791
3792 06617   0 35 06730 X13M LDX   =-512         COUNTER FOR UNDERFLOW TEST       3792
3793 06620   0 02 06724       LDA   ='77                                          3793
3794 06621   0 04 06230       STA   LADD                                          3794
3795 06622   0 04 00003       STA   3            STORE ADDR AT STACK TOP          3795
3796 06623   0 02 06226       LDA   BT35                                          3796
3797 06624   171020           OTK                SET RUPT MASK AND EXTEND MODE    3797
3798 06625   0 01 06626       JMP   *+1                                           3798
3799 06626   000013           EXA                                                 3799
3800 06627   0 10 06630       JST   *+1          SET UP FOR                       3800
3801 06630   0 000000         DAC   **           EXPECTED RUPT                    3801
3802 06631   0 02 06630       LDA   *-1                                           3802
3803 06632   0 06 06723       ADD   =7                                            3803
3804 06633   0 04 00057       STA   '57                                           3804
3805 06634   0 02 00005       LDA   5                                             3805
3806 06635   000000           HLT                MAKE A NOP FOR THE TIME          3806
3807 06636   000000           HLT                ERROR - DID NOT GET RUPT         3807
3808                  *                                                          3808
3809 06637   0 000000         DAC   **           EXPECTED RUPT                    3809
3810 06640   0 02 06224       LDA   BIT3                                          3810
```



```
3811 06641   171020           OTK                RESET RUPT MASK BUT LEAVE EXTEND MODE 3811
3812 06642   0 10 06643       JST   *+1          SET UP FOR                       3812
3813 06643   0 000000         DAC   **           UNEXPECTED RUPT                  3813
3814 06644   0 02 06643       LDA   *-1                                           3814
3815 06645   0 06 06740       ADD   ='13                                          3815
3816 06646   0 04 00057       STA   '57                                           3816
3817 06647   000011           DXA                                                 3817
3818 06650   0 01 06651       JMP   *+1          NORMAL MODE                      3818
3819 06651   0 02 06724       LDA   ='77                                          3819
3820 06652   0 04 00003       STA   3            STORE ADDR AT STACK TOP          3820
3821 06653   0 02 00005       LDA   5            LOAD FROM STACK TOP AND POP      3821
3822 06654   101000           NOP                                                 3822
3823 06655   0 01 06660       JMP   *+3          JUMP AROUND                      3823
3824                  *                                                          3824
3825 06656   0 000000         DAC   **           UNEXPECTED RUPT                  3825
3826 06657   000000           HLT                ERROR                            3826
3827 06660   0 12 00000       IRS   0            CHECKED ALL POSSIBLE UNDFLO CASES3827
3828 06661   100000           SKP                                                 3828
3829 06662   0 01 06666       JMP   *+4                                           3829
3830 06663   0 02 06230       LDA   LADD         MODIFY FOR NEXT                  3830
3831 06664   0 06 06727       ADD   ='100        UNDERFLOW POINT                  3831
3832 06665   0 01 06621       JMP   X13M+2                                        3832
3833                  *                                                          3833
3834 06666   101000           NOP                                                 3834
3835 06667   0 35 06726       LDX   =-20                                          3835
3836 06670   0 02 06722       LDA   ='160                                         3836
3837 06671   0 04 00003       STA   3                                             3837
3838 06672   0 02 06226       LDA   BT35                                          3838
3839 06673   171020           OTK                SET RUPT MASK AND EXTEND MODE    3839
3840 06674   0 10 06675       JST   *+1          SET UP FOR                       3840
3841 06675   0 000000         DAC   **           EXPECTED RUPT                    3841
3842 06676   0 02 06675       LDA   *-1                                           3842
3843 06677   0 06 06737       ADD   =10                                           3843
3844 06700   0 04 00057       STA   '57                                           3844
3845 06701   000011           DXA                                                 3845
3846 06702   0 01 06703       JMP   *+1          NORMAL MODE                      3846
3847 06703   0 02 00005       LDA   5            LOAD FROM STACK TOP AND POP      3847
```

```
3848 06704   0 12 00000      IRS   0              ARE WE DONE, DID WE GET RUPT                    3848
3849 06705   0 01 06703      JMP   *-2            NO, GET ANOTHER WORD                            3849
3850 06706   000000         HLT                  FINISHED BUT RUPT DID NOT OCCUR                 3850
3851                 *                                                                           3851
3852 06707   0 000000       DAC   **             EXPECTED RUPT                                   3852
3853 06710   0 02 06721     LDA   ='53           SET UP FOR UNEXPECTED                           3853
3854 06711   0 04 00057     STA   '57            OVERFLOW/UNDERFLOW RUPTS                        3854
3855 06712   140040         CRA                                                                  3855
3856 06713   0 04 00053     STA   '53                                                           3856
3857 06714   0 04 00054     STA   '54                                                           3857
3858 06715   171020         OTK                  RESET THE MASK                                  3858
3859 06716   0 01 06717     JMP   *+1                                                          3859
3860 06717   101000         NOP                                                                  3860
3861 06720   -0 01 06006    JMP*  X13T           RETURN                                          3861
3862                 *                                                                           3862
3863 06721   000053         FIN                                                                  3863
     06722   000160
     06723   000007
     06724   000077
     06725   000120
     06726   177754
     06727   000100
     06730   177000
     06731   001006
     06732   001777
     06733   177014
     06734   000020
     06735   000006
     06736   000024
     06737   000012
     06740   000013
     06741   000005
     06742   000003
     06743   037777
     06744   000022
     06745   000021
     06746   000135
```



```
     06747   052525
     06750   177775
     06751   000000
     06752   000010
     06753   000002
     06754   177777
     06755   000001
     06756   177776

3864                 *                                                                           3864
3865                 *                                                                           3865
3866                 *    716 TESTS PART II                                                      3866
3867                 *                                                                           3867
3868                      ORG   '7000                                                           3868
3869                 *                                                                           3869
3870 07000   0 000000  TS07 DAC   **                                                           3870
3871 07001   101000         NOP                                                                  3871
3872 07002   0 10 07006     JST   X71T                                                           3872
3873 07003   101000         NOP                                                                  3873
3874 07004   -0 01 07000    JMP*  TS07             RETURN                                        3874
3875                 *                                                                           3875
3876                 *                                                                           3876
3877 07005   000104         OCT   104                                                            3877
3878 07006   0 000000  X71T DAC   **                                                           3878
3879 07007   0 02 07005     LDA   *-2                                                            3879
3880 07010   0 04 00777     STA   '777             SAVE THE TEST NO.                             3880
3881                 *                                                                           3881
3882                 *                                                                           3882
3883                 *    TEST THAT AN INTERRUPT IS INHIBITED FOR AT LEAST TWO INSTRUCTIONS       3883
3884                 *    AFTER A 'JST'                                                          3884
3885                 *                                                                           3885
3886 07011   101000         NOP                                                                  3886
3887 07012   0 02 07547     LDA   ='40                                                           3887
3888 07013   74 0020        SMK   '20              SET ASR MASK                                  3888
3889 07014   000013         EXA                                                                  3889
3890 07015   0 10 07016     JST   *+1              SET UP FOR RUPT                               3890
3891 07016   0 000000       DAC   **                                                           3891
```

```
3892 07017   0 02 07016      LDA   *-1                                          3892
3893 07020   000011          DXA                                               3893
3894 07021   0 01 07022      JMP   *+1          NORMAL MODE                    3894
3895 07022   0 06 07546      ADD   ='26                                        3895
3896 07023   0 04 00063      STA   '63                                         3896
3897 07024   14 0104         OCP   '104         GET OUTPUT MODE                3897
3898 07025   34 0104         SKS   '104                                       3898
3899 07026   0 01 07025      JMP   *-1          WAIT TILL NOT BUSY             3899
3900 07027   140040          CRA                                               3900
3901 07030   000401          ENB                ENABLE RUPTS                   3901
3902 07031   0 10 07032      JST   *+1          THIS GIVES TWO MORE INSTR BEFORE RUPT 3902
3903 07032   0 000000        DAC   **                                          3903
3904 07033   0 02 07545      LDA   =1           FIRST INSTRUCTION              3904
3905 07034   0 10 07035      JST   *+1          SECOND INSTRUCTION BUT IS JST  3905
3906 07035   0 000000        DAC   **           SO WE GET TWO MORE INSTRUCTIONS 3906
3907 07036   0 02 07544      LDA   =2           FIRST INSTRUCTION              3907
3908 07037   0 10 07040      JST   *+1          SECOND INSTRUCTION BUT JST     3908
3909 07040   0 000000        DAC   **           SO WE GET TWO MORE INSTRUCTIONS 3909
3910 07041   0 02 07543      LDA   =3           FIRST INSTRUCTION              3910
3911 07042   001001          INH                SECOND INSTRUCTION - NO RUPTS ALLOWED 3911
3912 07043   0 01 07046      JMP   *+3                                         3912
3913                 *                                                       3913
3914 07044   0 000000        DAC   **                                          3914
3915 07045   000000          HLT                WRONG RUPT - CHECK A REGISTER  3915
3916                 *                                                       3916
3917 07046   000013          EXA                                               3917
3918 07047   0 10 07050      JST   *+1          SET UP FOR ANOTHER RUPT        3918
3919 07050   0 000000        DAC   **                                          3919
3920 07051   0 02 07050      LDA   *-1                                         3920
3921 07052   000011          DXA                                               3921
3922 07053   0 01 07054      JMP   *+1          NORMAL MODE                    3922
3923 07054   0 06 07542      ADD   ='22                                        3923
3924 07055   0 04 00063      STA   '63          STORE RETURN ADDRESS           3924
3925 07056   0 35 07541      LDX   =0                                          3925
3926 07057   140040          CRA                                               3926
3927 07060   000401          ENB                ENABLE RUPTS                   3927
3928 07061   0 10 07062      JST   *+1          JST SHOULD GIVE TWO FREE INSTRUCTIONS 3928
```



```
3929 07062   0 000000        DAC   **                                          3929
3930 07063   0 12 00000      IRS   0            FIRST INSTRUCTION - DOES NOT C OUNT 3930
3931 07064   0 12 00000      IRS   0            SECOND INSTRUCTION - DOES NOT COUNT 3931
3932 07065   0 12 00000      IRS   0            THIRD INSTRUCTION - DOES NOT COUNT 3932
3933 07066   0 02 07545      LDA   =1           FOURTH INSTRUCTION - REALLY THE FIRST 3933
3934 07067   0 02 07544      LDA   =2           FIFTH INSTRUCTION - REALLY SECOND INSTR. 3934
3935 07070   0 02 07543      LDA   =3           SIXTH INSTRUCTION              3935
3936 07071   000000          HLT                DID NOT GO TO RUPT             3936
3937                 *                                                       3937
3938 07072   0 000000        DAC   **           RUPT ENTRY                     3938
3939 07073   000011          DXA                                               3939
3940 07074   0 01 07075      JMP   *+1          NORMAL MODE                    3940
3941 07075   0 07 07544      SUB   =2                                         3941
3942 07076   100040          SZE                                               3942
3943 07077   000000          HLT                DID NOT RUPT AFTER FIVE INSTRUCTIONS 3943
3944                 *                          CHECK A-REG                    3944
3945                 *                                                       3945
3946                 *                                                       3946
3947                 *    TEST JMP/JST TRACE RUPTS                           3947
3948                 *                                                       3948
3949 07100   101000          NOP                                               3949
3950 07101   000013          EXA                                               3950
3951 07102   0 10 07103      JST   *+1          SET UP FOR RUPT                3951
3952 07103   0 000000        DAC   **                                          3952
3953 07104   0 02 07103      LDA   *-1                                         3953
3954 07105   0 06 07540      ADD   ='14                                        3954
3955 07106   0 04 00056      STA   '56                                         3955
3956 07107   000011          DXA                                               3956
3957 07110   0 01 07111      JMP   *+1                                         3957
3958 07111   0 02 07506      LDA   BIT8         SET RUPT MASK                  3958
3959 07112   171020          0TK                                               3959
3960 07113   0 01 07114      JMP   *+1          ONE FREE JUMP                  3960
3961 07114   0 01 07115      JMP   *+1          MUST GO TO RUPT                3961
3962 07115   000000          HLT                                               3962
3963 07116   000000          HLT                DID NOT GET RUPT               3963
3964                 *                                                       3964
3965 07117   0 000000        DAC   **           RUPT ENTRY                     3965
```

```
3966 07120  -0 02 07117      LDA*  *-1                                          3966
3967 07121   100040          SZE                                               3967
3968 07122   000000          HLT                  ERROR, DID NOT GET FREE JUMP 3968
3969                   *                                                       3969
3970 07123   000013          EXA                                               3970
3971 07124   0 10 07125      JST   *+1            SET UP FOR NEXT RUPT         3971
3972 07125   0 000000        DAC   **                                          3972
3973 07126   0 02 07125      LDA   *-1                                         3973
3974 07127   0 06 07540      ADD   =12                                         3974
3975 07130   0 04 00056      STA   '56                                         3975
3976 07131   000011          DXA                                               3976
3977 07132   0 01 07133      JMP   *+1                                         3977
3978 07133   0 02 07506      LDA   BIT8                                        3978
3979 07134   171020          OTK                  SET RUPT MASK                3979
3980 07135   0 01 07136      JMP   *+1            ONE FREE JUMP                3980
3981 07136   0 10 07137      JST   *+1            MUST GO TO RUPT              3981
3982 07137   0 000000        DAC   **                                          3982
3983 07140   000000          HLT                  ERROR, DID NOT GO TO RUPT    3983
3984                   *                                                       3984
3985 07141   0 000000        DAC   **             RUPT ENTRY                   3985
3986 07142  -0 02 07141      LDA*  *-1                                         3986
3987 07143   100040          SZE                                               3987
3988 07144   000000          HLT                  RUPT ON WRONG JST            3988
3989                   *                                                       3989
3990                   *                                                       3990
3991                   *    TEST THAT AFTER AN OTK INSTRUCTION AN INTERRUPT IS HELD OFF, IF 3991
3992                   *    THERE IS NO JUMP INSTRUCTION IN THE MEANTIME, FOR AT LEAST 3992
3993                   *    52 +/- 2 USECS. IN THAT CASE BIT 6 (THE DEFAULT BIT) IS SET. 3993
3994                   *                                                       3994
3995 07145   101000          NOP                                               3995
3996 07146   34 0104         SKS   '104                                        3996
3997 07147   0 01 07146      JMP   *-1                                         3997
3998 07150   14 0104         OCP   '104                                        3998
3999 07151   000013          EXA                                               3999
4000 07152   0 10 07153      JST   *+1            SET UP FOR                   4000
4001 07153   0 000000        DAC   **             ASR INTERRUPT                4001
4002 07154   0 02 07153      LDA   *-1                                         4002
```



```
4003 07155   0 06 07546      ADD   ='26           FORM RUPT ADDRESS            4003
4004 07156   000011          DXA                                               4004
4005 07157   0 01 07160      JMP   *+1            NORMAL MODE                  4005
4006 07160   0 04 00063      STA   '63            STORE AT '63                 4006
4007 07161   0 02 07547      LDA   ='40                                        4007
4008 07162   74 0020         SMK   '20            SET ASR MASK                 4008
4009 07163   000043          INK                                               4009
4010 07164   171020          OTK                                               4010
4011 07165   000401          ENB                                               4011
4012 07166   0 02 07537      LDA   =-11                                        4012
4013 07167   0 10 07432      JST   WAIT           52 +/- 2 USECS FROM ENB TO NOP BEFORE INH 4013
4014 07170   0 000000        DAC   **                                          4014
4015 07171   101000          NOP                                               4015
4016 07172   101000          NOP                                               4016
4017 07173   101000          NOP                                               4017
4018 07174   101000          NOP                                               4018
4019 07175   001001          INH                                               4019
4020 07176   101000          NOP                                               4020
4021 07177   101000          NOP                                               4021
4022 07200   0 01 07205      JMP   OTKU                                        4022
4023                   *                                                       4023
4024 07201   0 000000        DAC   **             RUPT ENTRY.                  4024
4025 07202   000011          DXA                                               4025
4026 07203   0 01 07204      JMP   *+1                                         4026
4027 07204   000000          HLT                  RUPT TOOK LESS THAN 52 +/- 2 USECS. 4027
4028                   *                                                       4028
4029 07205   101000      OTKU NOP                                              4029
4030 07206   000013          EXA                                               4030
4031 07207   0 10 07210      JST   *+1            SET UP FOR RUPT RETURN       4031
4032 07210   0 000000        DAC   **                                          4032
4033 07211   0 02 07210      LDA   *-1                                         4033
4034 07212   000011          DXA                                               4034
4035 07213   0 01 07214      JMP   *+1            NORMAL MODE                  4035
4036 07214   0 06 07536      ADD   ='20                                        4036
4037 07215   0 04 00063      STA   '63                                         4037
4038 07216   000043          INK                                               4038
4039 07217   171020          OTK                                               4039
```

```
4040 07220   000401          ENB                                                    4040
4041 07221   0 02 07535      LDA   =-23                                            4041
4042 07222   0 10 07432      JST   WAIT          96 +/- 3 USECS FROM ENB TO NOP BEFORE INH  4042
4043 07223   0 000000        DAC   **                                             4043
4044 07224   101000          NOP                                                  4044
4045 07225   001001          INH                                                  4045
4046 07226   000000          HLT                 DID NOT GO TO RUPT WITHIN 96 +/- 3 USECS.  4046
4047 07227   100000          SKP                                                  4047
4048                 *                                                           4048
4049 07230   0 000000        DAC   **            RUPT ENTRY                       4049
4050 07231   000043          INK                                                  4050
4051 07232   0 03 07505      ANA   BIT6                                           4051
4052 07233   101040          SNZ                                                  4052
4053 07234   000000          HLT                 DEFAULT BIT NOT SET              4053
4054                 *                                                           4054
4055                 *   TEST THAT STACK OVERFLOW RUPT WILL BE HELD OFF FOR 52 +/- 2 USECS.  4055
4056                 *   IF NO JMP IS USED AFTER AN OTK                           4056
4057                 *                                                           4057
4058 07235   101000          NOP                                                  4058
4059 07236   140040          CRA                                                  4059
4060 07237   0 04 07432      STA   WAIT          CLEAR INDEX BIT IF SET           4060
4061 07240   0 02 07534      LDA   ='77                                          4061
4062 07241   0 04 00003      STA   3                                            4062
4063 07242   0 02 07533      LDA   ='4000        OVERFLOW MASK BIT                4063
4064 07243   171020          OTK                                                  4064
4065 07244   0 01 07245      JMP   *+1                                          4065
4066 07245   000013          EXA                                                  4066
4067 07246   0 10 07247      JST   *+1           SET UP FOR STACK OVERFLOW RUPT   4067
4068 07247   0 000000        DAC   **                                           4068
4069 07250   0 02 07247      LDA   *-1                                          4069
4070 07251   0 06 07532      ADD   ='32                                         4070
4071 07252   0 04 00057      STA   '57                                          4071
4072 07253   0 06 07543      ADD   =3                                           4072
4073 07254   0 04 07300      STA   OTK1                                         4073
4074 07255   000011          DXA                                                  4074
4075 07256   0 01 07257      JMP   *+1           NORMAL MODE                      4075
4076 07257   000043          INK                 INPUT KEYS                       4076
```



```
4077 07260   171020          OTK                                                  4077
4078 07261   0 12 00003      IRS   3             CAUSE STACK OVERFLOW RUPT        4078
4079 07262   0 02 07531      LDA   =-10                                          4079
4080 07263   0 10 07432      JST   WAIT          52 +/- 2 USECS FROM IRS 3 TO STA '57  4080
4081 07264   0 000000        DAC   **                                           4081
4082 07265   000013          EXA                                                  4082
4083 07266   0 02 00000      LDA   0             DUMMY                            4083
4084 07267   0 02 07300      LDA   OTK1                                         4084
4085 07270   0 04 00057      STA   '57                                          4085
4086 07271   0 02 07531      LDA   =-10                                         4086
4087 07272   0 10 07432      JST   WAIT          57 CYCLES FROM LDA =-12 TO NOP BEFORE HLT  4087
4088 07273   0 000000        DAC   **                                           4088
4089 07274   000000          HLT                 NO RUPT WITHIN 96 +/- 3 USECS.   4089
4090 07275   101000          NOP                                                  4090
4091 07276   101000          NOP                                                  4091
4092 07277   0 01 07305      JMP   *+6                                          4092
4093                 *                                                           4093
4094 07300   000000    OTK1  BSZ   1                                            4094
4095                 *                                                           4095
4096 07301   0 000000        DAC   **            RUPT ENTRY                       4096
4097 07302   000000          HLT                 GOT RUPT BEFORE 52 +/- 2 USECS   4097
4098 07303   100000          SKP                                                  4098
4099                 *                                                           4099
4100 07304   0 000000        DAC   **            CORRECT RUPT ENTRY               4100
4101 07305   101000          NOP                                                  4101
4102 07306   0 02 00003      LDA   3                                            4102
4103 07307   0 07 07530      SUB   ='100                                        4103
4104 07310   100040          SZE                                                  4104
4105 07311   000000          HLT                 STACK DID NOT INCREMENT          4105
4106 07312   000043          INK                                                  4106
4107 07313   0 03 07505      ANA   BIT6          DEFAULT BIT MUST BE SET          4107
4108 07314   101040          SNZ                                                  4108
4109 07315   000000          HLT                 DEFAULT BIT NOT SET              4109
4110                 *                                                           4110
4111                 *                                                           4111
4112                 *   CAUSE REAL TIME CLOCK INTERRUPT AND THEN STACK O/FLOW INTERRUPT  4112
4113                 *   AND VERIFY THAT THE 2ND RUPT IS INHIBITED FOR 52 +/- 2 MICRO-  4113
```

```
4114                    *     SECONDS IF NO JMP INSTRUCTION IS ENCOUNTERED WITHIN THAT TIME.          4114
4115                    *     ALSO TEST THAT BIT 9 OF THE INPUT KEYS (PRIV/ENB FLOP BIT) IS          4115
4116                    *     SET ON RUPT OCCURRING WITH ENB TRUE AND GETS RESET ON NEXT             4116
4117                    *     PRIVILEGED RUPT REQUIRING NO 'ENB'.                                    4117
4118                    *                                                                            4118
4119 07316  101000           NOP                                                                    4119
4120 07317  140040           CRA                                                                    4120
4121 07320  0 04 07432       STA   WAIT          CLEAR INDEX BIT IF SET                             4121
4122 07321  0 02 07527       LDA   =-2                                                              4122
4123 07322  0 04 00061       STA   '61                                                              4123
4124 07323  000011           DXA                                                                    4124
4125 07324  0 01 07325       JMP   *+1           NORMAL MODE                                        4125
4126 07325  0 02 07545       LDA   =1                                                               4126
4127 07326  74 0020          SMK   '20           SET RTC RUPT MASK                                  4127
4128 07327  0 02 07534       LDA   ='77                                                             4128
4129 07330  0 04 00003       STA   3             INITIALIZE STACK                                   4129
4130 07331  0 02 07533       LDA   ='4000                                                           4130
4131 07332  171020           OTK                 SET STACK OVERFLOW RUPT MASK                       4131
4132 07333  0 01 07334       JMP   *+1                                                              4132
4133 07334  000013           EXA                                                                    4133
4134 07335  0 10 07336       JST   *+1           SET UP FOR OVERFLOW RUPT RETURN                    4134
4135 07336  0 000000         DAC   **                                                               4135
4136 07337  0 02 07336       LDA   *-1                                                              4136
4137 07340  0 06 07526       ADD   ='12                                                             4137
4138 07341  0 04 00057       STA   '57                                                              4138
4139 07342  0 06 07525       ADD   =4                                                               4139
4140 07343  0 04 07345       STA   *+2                                                              4140
4141 07344  100000           SKP                                                                    4141
4142 07345  000000     X797  BSZ   1                                                              4142
4143 07346  101000           NOP                                                                    4143
4144 07347  0 01 07366       JMP   X798                                                             4144
4145                    *                                                                          4145
4146 07350  0 000000         DAC   **            OVERFLOW RUPT RETURN                               4146
4147 07351  101000           NOP                                                                    4147
4148 07352  000000           HLT                 GOT RUPT BEFORE 52 +/- 2 USECS.                    4148
4149 07353  100000           SKP                                                                    4149
4150                    *                                                                          4150
```



```
4151 07354  0 000000         DAC   **            OVERFLOW RUPT RETURN                               4151
4152 07355  000043           INK                                                                    4152
4153 07356  0 03 07505       ANA   BIT6          SEPARATE BIT 6                                     4153
4154 07357  101040           SNZ                 MUST BE SET                                        4154
4155 07360  000000           HLT                 DEFAULT BIT NOT SET                                4155
4156 07361  000043           INK                                                                    4156
4157 07362  0 03 07507       ANA   BIT9                                                           4157
4158 07363  100040           SZE                 MUST BE ZERO                                       4158
4159 07364  000000           HLT                 PRIV/ENB FLOP DID NOT GET RESET                    4159
4160 07365  0 01 07441       JMP   X799                                                           4160
4161                    *                                                                          4161
4162                    *                                                                          4162
4163 07366  101000     X798  NOP                 ALREADY IN EXTD MODE                               4163
4164 07367  0 10 07370       JST   *+1           SET UP FOR RTC INTERRUPT                           4164
4165 07370  0 000000         DAC   **                                                               4165
4166 07371  0 02 07370       LDA   *-1                                                              4166
4167 07372  0 06 07524       ADD   ='13                                                             4167
4168 07373  000011           DXA                                                                    4168
4169 07374  0 01 07375       JMP   *+1           NORMAL MODE                                        4169
4170 07375  0 04 00063       STA   '63                                                              4170
4171 07376  000401           ENB                 ENABLE RUPTS                                       4171
4172 07377  14 0020          OCP   '20           START THE CLOCK                                    4172
4173 07400  0 02 00061       LDA   '61                                                              4173
4174 07401  0 01 07400       JMP   *-1           WAIT FOR RTC RUPT                                  4174
4175 07402  000000           HLT                                                                    4175
4176                    *                                                                          4176
4177 07403  0 000000         DAC   **            RTC RUPT ENTRY                                     4177
4178 07404  14 0220          OCP   '220          STOP THE CLOCK                                     4178
4179 07405  101000           NOP                                                                    4179
4180 07406  000043           INK                                                                    4180
4181 07407  0 03 07507       ANA   BIT9          SEPARATE BIT 9                                     4181
4182 07410  101040           SNZ                 MUST BE SET                                        4182
4183 07411  000000           HLT                 PRIV/ENB FLOP NOT SET                              4183
4184 07412  0 02 00005       LDA   5             CAUSE STACK UNDERFLOW                              4184
4185 07413  101000           NOP                                                                    4185
4186 07414  0 02 07541       LDA   =0            DUMMY INST                                         4186
4187 07415  0 02 07541       LDA   =0            DUMMY INST                                         4187
```

```
4189 07416   0 02 07523      LDA   =-8                                          4188
4189 07417   0 10 07432      JST   WAIT          52 +/- 2 USECS FROM OCP '220 TO STA '57   4189
4190 07420   0 000000        DAC   **            GOOD RETURN                    4190
4191 07421   0 02 07345      LDA   X797                                         4191
4192 07422   0 04 00057      STA   '57           SET UP FOR RUPT RETURN         4192
4193 07423   0 02 07531      LDA   =-10                                         4193
4194 07424   0 10 07432      JST   WAIT          57 CYCLE DELAY UNTIL HLT       4194
4195 07425   0 000000        DAC   **                                           4195
4196 07426   000000          HLT                 NO RUPT WITHIN 96 +/- 3 USECS. 4196
4197 07427   101000          NOP                                              4197
4198 07430   101000          NOP                                              4198
4199 07431   0 01 07441      JMP   X799                                        4199
4200                 *                                                        4200
4201                 *                                                        4201
4202                 *     BASIC 10 CYCLE DELAY. 5 CYCLE DELAY FOR EACH COUNT OVER 1.  4202
4203                 *                                                        4203
4204 07432   0 000000   WAIT DAC   **                                         4204
4205 07433   100000         SKP                                              4205
4206 07434   0 000000       DAC   **                                         4206
4207 07435   141206         AOA                                              4207
4208 07436   100040         SZE                                              4208
4209 07437   0 10 07434     JST   *-3                                        4209
4210 07440  -0 10 07432     JST*  WAIT          RETURN                       4210
4211                 *                                                        4211
4212                 *                                                        4212
4213                 *                                                        4213
4214                 *     CAUSE AN INTERRUPT TO RESET PMI                    4214
4215                 *                                                        4215
4216 07441   101000     X799 NOP                                             4216
4217 07442   001001          INH                 INHIBIT RUPTS                4217
4218 07443   0 02 07534      LDA   ='77                                       4218
4219 07444   0 04 00003      STA   3             INITIALIZE STACK FOR UNDERFLOW 4219
4220 07445   0 02 07533      LDA   ='4000                                     4220
4221 07446   171020          OTK                                              4221
4222 07447   0 01 07450      JMP   *+1           SET UNDERFLOW RUPT MASK BIT  4222
4223 07450   000013          EXA                                              4223
4224 07451   0 10 07452      JST   *+1           FORM RUPT RETURN ADDRESS     4224
```



```
4225 07452   0 000000        DAC   **                                         4225
4226 07453   0 02 07452      LDA   *-1                                        4226
4227 07454   0 06 07540      ADD   ='14                                       4227
4228 07455   0 04 00057      STA   '57           SET UP FOR RUPT RETURN       4228
4229 07456   000011          DXA                                              4229
4230 07457   0 01 07460      JMP   *+1           NORMAL MODE                  4230
4231 07460   101000          NOP                                              4231
4232 07461   0 12 00003      IRS   3             CAUSE STACK UNDERFLOW BY 'IRS' INSTRUCTION  4232
4233 07462   101000          NOP                                              4233
4234 07463   101000          NOP                                              4234
4235 07464   000000          HLT                 DID NOT GO TO RUPT           4235
4236 07465   100000          SKP                                              4236
4237                 *                                                        4237
4238                 *                                                        4238
4239 07466   0 000000        DAC   **            RUPT ENTRY                   4239
4240 07467   000011          DXA                                              4240
4241 07470   0 01 07471      JMP   *+1           NORMAL MODE                  4241
4242 07471   0 02 07522      LDA   =-1           PUT ALL ONES IN 'A'          4242
4243 07472   000043          INK                                              4243
4244 07473   0 03 07521      ANA   ='20200                                    4244
4245 07474   100040          SZE                                              4245
4246 07475   000000          HLT                 SOME BITS SET  -  CHECK A-REG  4246
4247                 *                                                        4247
4248 07476   140040          CRA                                              4248
4249 07477   74 0020         SMK   '20                                        4249
4250 07500   171020          OTK                                              4250
4251 07501   0 01 07502      JMP   *+1           CLEAR ALL RUPT CONDITIONS    4251
4252 07502   101000          NOP                                              4252
4253 07503   101000          NOP                                              4253
4254 07504  -0 01 07006      JMP*  X7IT          END SECTOR 7 TESTS, RETURN   4254
4255                 *                                                        4255
4256 07505   002000     BIT6 OCT   2000          SUPPRESS RUPT DEFAULT FLOP BIT  4256
4257 07506   000400     BIT8 OCT   400           JMP/JST TRACE RUPT MASK BIT  4257
4258 07507   000200     BIT9 OCT   200           PRIVILEGED/ENB RUPT FLOP BIT 4258
4259                 *                                                        4259
4260                 *                                                        4260
4261                 *     1.5 SECOND DELAY ROUTINE                           4261
```

```
4262                        *                                                    4262
4263 07510   0 000000   DLY  DAC   **                                           4263
4264 07511   0 35 07520      LDX   =-6                                          4264
4265 07512   0 12 07517      IRS   DLY1                                         4265
4266 07513   0 01 07512      JMP   *-1                                          4266
4267 07514   0 12 00000      IRS   0                                            4267
4268 07515   0 01 07512      JMP   *-3                                          4268
4269 07516  -0 01 07510      JMP*  DLY              RETURN                      4269
4270                        *                                                    4270
4271 07517   000000     DLY1 BSZ   1                                            4271
4272                        *                                                    4272
4273 07520   177772         FIN                                                 4273
     07521   020200
     07522   177777
     07523   177770
     07524   000013
     07525   000004
     07526   000012
     07527   177776
     07530   000100
     07531   177766
     07532   000032
     07533   004000
     07534   000077
     07535   177751
     07536   000020
     07537   177765
     07540   000014
     07541   000000
     07542   000022
     07543   000003
     07544   000002
     07545   000001
     07546   000026
     07547   000040

4274                        *                                                    4274
```



```
4275                        *                                                    4275
4276                        *                                                    4276
4277                            ORG   HERE                                      4277
4278                        *                                                    4278
4279                        *   TIME COMPENSATION TABLE FOR VARIOUS COMPUTERS     4279
4280                        *                                                    4280
4281 00521   0 000521   CNTZ DAC   *                                            4281
4282 00522   173620          DEC   -2160            FOR  4K CPU                 4282
4283 00523   177014          DEC   -500             FOR  8K CPU                 4283
4284 00524   177374          DEC   -260             FOR 12K CPU                 4284
4285 00525   177540          DEC   -160             FOR 16K CPU                 4285
4286 00526   177564          DEC   -140             FOR 20K CPU                 4286
4287 00527   177641          DEC   -95              FOR 24K CPU                 4287
4288 00530   177677          DEC   -65              FOR 28K CPU                 4288
4289 00531   177723          DEC   -45              FOR 32K CPU                 4289
4290                        *                                                    4290
4291                        *                                                    4291
4292                        *                                                    4292
4293                        *   TABLES TO BE USED IN SECTOR 3 AND 4 TESTS        4293
4294                        *                                                    4294
4295 00532   100000         OCT   100000                                        4295
4296 00533   040000         OCT   40000                                         4296
4297 00534   120000         OCT   120000                                        4297
4298 00535   050000         OCT   50000                                         4298
4299 00536   124000         OCT   124000                                        4299
4300 00537   052000         OCT   52000                                         4300
4301 00540   125000         OCT   125000                                        4301
4302 00541   052400         OCT   52400                                         4302
4303 00542   125200         OCT   125200                                        4303
4304 00543   052500         OCT   52500                                         4304
4305 00544   125240         OCT   125240                                        4305
4306 00545   052520         OCT   52520                                         4306
4307 00546   125250         OCT   125250                                        4307
4308 00547   052524         OCT   52524                                         4308
4309 00550   125252         OCT   125252                                        4309
4310 00551   052525    SKNA OCT   52525                                        4310
4311 00552   100000         OCT   100000                                        4311
```

```
4312 00553  140000          OCT  140000                              4312
4313 00554  160000          OCT  160000                              4313
4314 00555  170000          OCT  170000                              4314
4315 00556  174000          OCT  174000                              4315
4316 00557  176000          OCT  176000                              4316
4317 00560  177000          OCT  177000                              4317
4318 00561  177400          OCT  177400                              4318
4319 00562  177600          OCT  177600                              4319
4320 00563  177700          OCT  177700                              4320
4321 00564  177740          OCT  177740                              4321
4322 00565  177760          OCT  177760                              4322
4323 00566  177770          OCT  177770                              4323
4324 00567  177774          OCT  177774                              4324
4325 00570  177776          OCT  177776                              4325
4326 00571  177777    SKNB  OCT  177777                              4326
4327 00572  100000          OCT  100000                              4327
4328 00573  040000          OCT  40000                               4328
4329 00574  020000          OCT  20000                               4329
4330 00575  010000          OCT  10000                               4330
4331 00576  004000          OCT  4000                                4331
4332 00577  002000          OCT  2000                                4332
4333 00600  001000          OCT  1000                                4333
4334 00601  000400          OCT  400                                 4334
4335 00602  000200          OCT  200                                 4335
4336 00603  000100          OCT  100                                 4336
4337 00604  000040          OCT  40                                  4337
4338 00605  000020          OCT  20                                  4338
4339 00606  000010          OCT  10                                  4339
4340 00607  000004          OCT  4                                   4340
4341 00610  000002          OCT  2                                   4341
4342 00611  000001    SKNC  OCT  1                                   4342
4343 00612  000001          OCT  1                                   4343
4344 00613  000002          OCT  2                                   4344
4345 00614  000004          OCT  4                                   4345
4346 00615  000010          OCT  10                                  4346
4347 00616  000020          OCT  20                                  4347
4348 00617  000040          OCT  40                                  4348
```



```
4349 00620  000100          OCT  100                                 4349
4350 00621  000200          OCT  200                                 4350
4351 00622  000400          OCT  400                                 4351
4352 00623  001000          OCT  1000                                4352
4353 00624  002000          OCT  2000                                4353
4354 00625  004000          OCT  4000                                4354
4355 00626  010000          OCT  10000                               4355
4356 00627  020000          OCT  20000                               4356
4357 00630  040000          OCT  40000                               4357
4358 00631  100000    SKND  OCT  100000                              4358
4359 00632  125253          OCT  125253                              4359
4360 00633  052527          OCT  052527                              4360
4361 00634  125256          OCT  125256                              4361
4362 00635  052535          OCT  052535                              4362
4363 00636  125272          OCT  125272                              4363
4364 00637  052565          OCT  052565                              4364
4365 00640  125352          OCT  125352                              4365
4366 00641  052725          OCT  052725                              4366
4367 00642  125652          OCT  125652                              4367
4368 00643  053525          OCT  053525                              4368
4369 00644  127252          OCT  127252                              4369
4370 00645  056525          OCT  056525                              4370
4371 00646  135252          OCT  135252                              4371
4372 00647  072525          OCT  072525                              4372
4373 00650  165252          OCT  165252                              4373
4374 00651  152525    SKNE  OCT  152525                              4374
4375 00652  137777    TSTX  OCT  137777                              4375
4376 00653  177777          OCT  177777                              4376
4377 00654  177776          OCT  177776                              4377
4378 00655  177775          OCT  177775                              4378
4379 00656  177773          OCT  177773                              4379
4380 00657  177767          OCT  177767                              4380
4381 00660  177757          OCT  177757                              4381
4382 00661  177737          OCT  177737                              4382
4383 00662  177677          OCT  177677                              4383
4384 00663  177577          OCT  177577                              4384
4385 00664  177377          OCT  177377                              4385
```

```
4386 00665   176777          OCT   176777                                  4386
4387 00666   175777          OCT   175777                                  4387
4388 00667   173777          OCT   173777                                  4388
4389 00670   167777          OCT   167777                                  4389
4390 00671   157777          OCT   157777                                  4390
4391 00672   137777    TSTB  OCT   137777                                  4391
4392 00673   077777    TSTV  OCT   77777                                   4392
4393 00674   000000          OCT   0                                       4393
4394 00675   000001          OCT   1                                       4394
4395 00676   000003          OCT   3                                       4395
4396 00677   000007          OCT   7                                       4396
4397 00700   000017          OCT   17                                      4397
4398 00701   000037          OCT   37                                      4398
4399 00702   000077          OCT   77                                      4399
4400 00703   000177          OCT   177                                     4400
4401 00704   000377          OCT   377                                     4401
4402 00705   000777          OCT   777                                     4402
4403 00706   001777          OCT   1777                                    4403
4404 00707   003777          OCT   3777                                    4404
4405 00710   007777          OCT   7777                                    4405
4406 00711   017777          OCT   17777                                   4406
4407 00712   037777          OCT   37777                                   4407
4408 00713   077777    TSTC  OCT   77777                                   4408
4409 00714   125252    TSTU  OCT   125252                                  4409
4410 00715   177777          OCT   177777                                  4410
4411 00716   177776          OCT   177776                                  4411
4412 00717   177775          OCT   177775                                  4412
4413 00720   177772          OCT   177772                                  4413
4414 00721   177765          OCT   177765                                  4414
4415 00722   177752          OCT   177752                                  4415
4416 00723   177725          OCT   177725                                  4416
4417 00724   177652          OCT   177652                                  4417
4418 00725   177525          OCT   177525                                  4418
4419 00726   177252          OCT   177252                                  4419
4420 00727   176525          OCT   176525                                  4420
4421 00730   175252          OCT   175252                                  4421
4422 00731   172525          OCT   172525                                  4422
```



```
4423 00732   165252          OCT   165252                                  4423
4424 00733   152525          OCT   152525                                  4424
4425 00734   125252    TSTD  OCT   125252                                  4425
4426 00735   052525    TSTR  OCT   52525                                   4426
4427 00736   000000          OCT   0                                       4427
4428 00737   000001          OCT   1                                       4428
4429 00740   000002          OCT   2                                       4429
4430 00741   000005          OCT   5                                       4430
4431 00742   000012          OCT   12                                      4431
4432 00743   000025          OCT   25                                      4432
4433 00744   000052          OCT   52                                      4433
4434 00745   000125          OCT   125                                     4434
4435 00746   000252          OCT   252                                     4435
4436 00747   000525          OCT   525                                     4436
4437 00750   001252          OCT   1252                                    4437
4438 00751   002525          OCT   2525                                    4438
4439 00752   005252          OCT   5252                                    4439
4440 00753   012525          OCT   12525                                   4440
4441 00754   025252          OCT   25252                                   4441
4442 00755   052525    TSTE  OCT   52525                                   4442
4443               *                                                       4443
4444               *                                                       4444
4445               *                                                       4445
4446 00756   0 000000  BSCT  DAC   **                                      4446
4447 00757   0 35 00765      LDX   IXD1          (M) TO (X)                4447
4448 00760   1 02 00074      LDA   60,1          (M) TO (A)  INDEXING      4448
4449 00761   0 06 00774      ADD   =*052526      DATA                      4449
4450 00762   100040          SZE                                           4450
4451 00763   000000          HLT                 ERROR                     4451
4452 00764  -0 01 00756      JMP*  BSCT                                    4452
4453 00765   0 004500  IXD1  DAC   IXC1-60                                 4453
4454               *                                                       4454
4455 00766   0 000770  STIR  DAC   WORK                                    4455
4456 00767   0 000772  LDIR  DAC   WORK+2                                  4456
4457 00770   000000    WORK  BSZ   3                                       4457
4458 00773   0 007510  DLAY  DAC   DLY                                     4458
4459               *                                                       4459
```

```
4460                    *                                                   4460
4461 00774   052526           FIN                                          4461

4462                           END    *1000                                 4462
```

ADD1	001672A	ADD2	002020A	ADD3	002113A	ADD5	001341A
ADLO	001560A	ADSB	002175A	ALRA	003470A	ALRB	003476A
ALRD	003502A	ALRG	003532A	ALRS	003534A	ALSA	003300A
ALSB	003306A	ALSD	003312A	ALSG	003342A	ALSS	003344A
ANAA	002521A	ANAB	002527A	ARRA	003536A	ARRB	003544A
ARRD	003550A	ARRG	003600A	ARRS	003602A	ARSA	003224A
ARSB	003232A	ARSD	003236A	ARSG	003274A	ARSS	003276A
ASNR	005156A	ASRB	005162A	BIT3	006224A	BIT4	006225A
BIT6	007505A	BIT8	007506A	BIT9	007507A	BSCT	000756A
BT35	006226A	BUST	005077A	CASA	002563A	CASB	002573A
CASN	002616A	CASX	002622A	CN01	000426A	CN02	000427A
CN03	003156A	CNT5	002747A	CNTX	000434A	CNTY	000455A
CNTZ	000521A	COMM	005403A	COMN	005524A	CON1	002713A
CON2	002714A	CON3	002715A	CON4	002716A	CON5	002717A
CON6	002720A	CON7	002721A	CON8	002722A	CON9	003222A
D20K	000324A	D20L	000257A	DC01	000230A	DC02	000231A
DC03	000237A	DC04	000240A	DCCR	000467A	DHLT	005165A
DHSC	000460A	DIV	005417A	DIV1	005255A	DIV2	005262A
DIVA	005450A	DIVB	005455A	DIVC	005462A	DIVH	005517A
DIVN	005467A	DIVS	005475A	DIVT	005241A	DIVU	005515A
DIVX	005451A	DIVY	005506A	DIVZ	005453A	DLAY	000773A
DLY	007510A	DLY1	007517A	DMSG	000445A	DPFM	003757A
EAC1	000300A	EFL1	000424A	EFL2	000425A	EOPI	000335A
ERAA	002464A	FIVE	000442A	FOUR	000441A	GENO	001016A
HADD	006227A	HALT	005106A	HERE	000521A	HERR	001574A
HERS	001660A	HERT	001661A	HISC	000464A	HSCD	000447A
HSCT	000465A	HSE1	005533A	HSEC	005527A	HWDT	002624A
IABA	002362A	IABP	002373A	IABV	002416A	IABW	002417A
IABX	002415A	IENL	005163A	IMAA	002323A	IN00	000145A
IN01	000155A	IN02	000171A	IN03	000211A	IN04	000213A
IN05	000304A	IN06	000320A	IN07	000301A	IN08	000177A
IN09	000206A	IN10	000270A	INC1	000372A	INC2	000375A

INDA	002230A	INDR	004570A	INDX	003142A	IRP1	005016A
IRSA	002442A	IRSB	002446A	IRSD	002432A	IRSG	002455A
IRSX	002421A	IRUP	005010A	ITMP	005164A	IXC1	004574A
IXD1	000765A	JPTB	004455A	KEY1	003174A	KEY2	003221A
KEYS	003160A	LADD	006230A	LD10	000452A	LDIR	000767A
LDM7	000451A	LGLA	003346A	LGLB	003354A	LGLD	003360A
LGLG	003411A	LGLS	003410A	LGRA	003414A	LGRB	003422A
LGRD	003426A	LGRG	003464A	LGRS	003466A	LLLA	004070A
LLLB	004124A	LLLC	004130A	LLLG	004164A	LLLS	004166A
LLPA	004253A	LLRB	004261A	LLRC	004265A	LLRG	004317A
LLPS	004321A	LLSA	004013A	LLSB	004021A	LLSC	004025A
LLSG	004064A	LLSS	004066A	LM24	000457A	LOCT	001544A
LRLA	004170A	LRLB	004176A	LRLC	004202A	LRLG	004247A
LRLS	004251A	LRRA	004323A	LRRB	004331A	LRRC	004335A
LRRG	004367A	LRRS	004371A	LRSA	003627A	LRSB	003635A
LRSG	003722A	LRSH	003657A	LRSS	003724A	MDCT	005237A
MES1	005605A	MES2	002742A	MES3	002723A	MES4	002751A
MES5	004752A	MESS	005562A	MLNN	005375A	MMSZ	004741A
MOOV	000456A	MOVE	004715A	MPY	005303A	MPY1	005203A
MPY2	005205A	MPY3	005213A	MPYA	005314A	MPYB	005317A
MPYC	005324A	MPYN	005371A	MPYS	005340A	MPYT	005167A
MV01	000226A	MVEA	000310A	MVEB	000330A	N1	006243A
N2	006342A	N3	006351A	N4	006363A	N5	006405A
N6	006435A	NDTS	004573A	NSRT	000120A	NXMV	000215A
ONE	000436A	OTK1	007300A	OTKU	007205A	OTNT	000454A
PATX	005561A	PCRT	000435A	PFIB	003744A	PFIC	003751A
PFID	003752A	PFIS	003726A	PNT1	000430A	PNT2	000431A
PNTP	006223A	PRCH	000411A	PTRN	002462A	RECY	000262A
PRST	004567A	S47R	005733A	SASO	005101A	SB47	000453A
SEVN	000444A	SFFX	004572A	SFFY	004571A	SFQQ	004410A
SFRR	004411A	SFT	003605A	SFTA	004416A	SFTB	004566A
SFTT	004374A	SFTX	003622A	SFTY	003623A	SFTZ	003624A
SFXX	004412A	SFXY	003625A	SFYY	004413A	SFZZ	004414A
SHFQ	003620A	SHFR	003621A	SHFT	003603A	SHXT	004372A
SIX	000443A	SKNA	000551A	SKNB	000571A	SKNC	000611A
SKND	000631A	SKNE	000651A	SKNG	004614A	SKNH	004634A
SKNJ	004654A	SKNK	004674A	SKNL	004714A	SR10	001606A

SR20	001621A	SR30	001634A	SR40	001647A	SS10	001601A
SS1A	001612A	SS20	001614A	SS2A	001625A	SS30	001627A
SS3A	001640A	SS40	001642A	SS4A	001653A	ST5	000347A
STIR	000766A	STR2	000162A	STTA	004456A	STTB	004463A
STTC	004470A	STTD	004475A	STTE	004502A	STTF	004517A
STTG	004534A	STTH	004536A	STTJ	004437A	STTK	004545A
STTL	004432A	SUB7	000450A	SWCH	001546A	SXTX	004407A
T1AA	002336A	T1AG	002356A	T1AX	002357A	T1AZ	002360A
T2AB	002474A	T2AW	002514A	T2AX	002515A	T2AY	002516A
T2XZ	002517A	TAAB	001701A	TAAC	001713A	TAAE	001730A
TAAV	001735A	TAAY	001734A	TAAZ	001733A	TABB	002030A
TABY	002047A	TABZ	002050A	TACB	002125A	TACC	002140A
TACI	002150A	TACJ	002160A	TACK	002167A	TACL	002170A
TACM	002171A	TACN	002172A	TACP	002173A	TBAB	002203A
TBAX	002225A	TBAY	002226A	TBBD	002551A	TBBS	002557A
TBBT	002560A	TBBY	002561A	TBNE	002543A	TEMP	001543A
TEWL	001655A	THAB	002246A	THAT	002320A	THAV	002311A
THAZ	002321A	THRI	000440A	TMP1	000461A	TPYA	002461A
TSO1	001004A	TSO2	002000A	TSO3	003000A	TSO4	004000A
TSO5	005000A	TSO6	006000A	TSO7	007000A	TS2	000432A
TS3	000433A	TSST	001670A	TST1	003026A	TST2	003042A
TST4	003113A	TSTA	003725A	TSTB	000672A	TSTC	000713A
TSTD	000734A	TSTE	000755A	TSTR	000735A	TSTU	000714A
TSTV	000673A	TSTX	000652A	TWO	000437A	TXBA	002051A
TXBB	002052A	TXBC	002053A	TXBD	002066A	TXBE	002054A
TXBF	002055A	TXBG	002056A	TXBJ	002067A	TXBK	002071A
TXBP	002057A	TYPE	000402A	TYPW	001663A	WAIT	007432A
WOFK	000770A	X001	005233A	X002	005234A	X133	005655A
X134	005703A	X135	005705A	X13A	006062A	X13B	006107A
X13C	006206A	X13D	006231A	X13I	006460A	X13J	006475A
X13K	006511A	X13L	006524A	X13M	006617A	X13R	005615A
X13S	000446A	X13T	006006A	X601	006221A	X602	006222A
X603	006361A	X604	006403A	X605	006423A	X6AA	006300A
X797	007345A	X798	007366A	X799	007441A	X7IT	007006A
XR01	003057A	XR02	003074A	XREG	003017A	XRG0	003322A
Y001	005235A	Y002	005236A				

0000 WARNING OR ERROR FLAGS
DAP-16 MOD 2 REV. D 06-28-71