```
 1 *  THIS IS A COPYRIGHTED PROGRAM, COPYRIGHT 1972 BY VARIAN DATA MACHINES00 00001
 2 *                                                                     00 00002
 3 *     V.D.M.  PART  NO.        92L0107-0030                           00 00003
 4 *                                                                     00 00004
 5 *                                             RELEASED    04-06-72    00 00005
 6 *                                                                     00 00006
 7 *              INSTRUCTION TEST   (PART 2)                            00 00007
 8 *                                                                     00 00008
 9 *                                                                     00 00009
10 *              620 INSTRUCTIONS TEST PROGRAM                         00 00010
11 *                                                                     00 00011
12 *                                                                     00 00012
13 *                          ***   ***    **                           00 00013
14 *                         *   *   *  *  *                             00 00014
15 *                            *      *   *  *                          00 00015
16 *                         ****  ***     *                             00 00016
17 *                         *   * *  *     *                            00 00017
18 *                         *   *   *      *                            00 00018
19 *                          *** *****    **                            00 00019
20 *                                                                     00 00020
21 *                                                                     00 00021
22 *    ***   *   *  ***  ***** ****   *   *  ***  ***** ***  ***** *  *00 00022
23 *     *   **  * *   *    *   *    *  *   *  *   * *      *  *  * **  *00 00023
24 *     *   * * * *       *   *   *   *   *  *   *  *      *  * * * *00 00024
25 *     *   *  ** * **  *  *   ****  *   *   *   * *      *  *  * **00 00025
26 *     *   *   * *   *    *   *  *   *   *  *   *  *      *  *  * *00 00026
27 *     *   *   * *   *    *   *  *   *  *   *   *  *      *  *  * *00 00027
28 *    ***  *   *  ***     *   *   *  *  *   ***  *      *** ***** *  *00 00028
29 *                                                                     00 00029
30 *                                                                     00 00030
31 *    ***** ***** ***  *****     ****   *   **** *****       ***    00 00031
32 *      *     *  *   *    *      *    *  *  *   *   *        *   *   00 00032
33 *      *     *  *       *       *    *  **  *   *           *     00 00033
34 *      *   ***   *       *      **** ****  *  **** *       ***    00 00034
35 *      *   *     *       *      *    ***** * *    *       *       00 00035
36 *      *   *     *       *      *    *   * * *    *       *       00 00036
37 *      *  *****  ***     *      *    *   * *  *   *       *****   00 00037
38 *                                                                     00 00038
39 *                                                                     00 00039
40 *          THIS TEST PROGRAM IS A PART OF THE MAINTAIN II           00 00040
41 *                    TEST PROGRAM SYSTEM                            00 00041
42 *                                                                     00 00042
```

```
43 *                                                                      00 00043
44 *                                                                      00 00044
45 *        THE INSTRUCTION TEST CONSIST OF TWO PARTS, EACH PART IS FREE  00 00045
46 *        STANDING AND NOT FUNCTIONALLY DEPENDENT UPON THE OTHER,       00 00046
47 *        THIS IS PART 2, NORMALLY PART 1 IS EXECUTED FIRST,            00 00047
48 *        PART 2   TESTS THE EXTENDED ADDRESSING INSTRUCTIONS, I/O      00 00048
49 *        INSTRUCTIONS AND THE OPTIONAL INSTRUCTIONS.                   00 00049
50 *                                                                      00 00050
51 *                                                                      00 00051
52 *                                                                      00 00052
53 *                                                                      00 00053
54 *                                                                      00 00054
55 *                                                                      00 00055
56 *                                                                      00 00056
57 *                                                                      00 00057
58 *                                                                      00 00058
59 *                                                                      00 00059
60 *                                                                      00 00060
61 *        ********************************                              00 00061
62 *        *                              *                              00 00062
63 *        * AREAS RESERVED BY EXECUTIVE *                              00 00063
64 *        ********************************                              00 00064
65 *        ORG      0                                                    00 00065
66 *        JMP      EXECUTIVE                                            00 00066
67 *        ORG      040                                                  00 00067
68 *        JMPM     POWER DOWN ROUTINE                                   00 00068
69 *        JMP      POWER UP   ROUTINE                                   00 00069
70 *        NOTE:    THE TEST EXECUTIVE ALSO RESERVES LOCATIONS 0400 TO 0477  00 00070
71 *                 FOR A POINTER TABLE TO STANDARD ROUTINES,AND AS AN AREA  00 00071
72 *                 FOR EXECUTIVE DATA, ALL TEST PROGRAMS WORKING WITH THE   00 00072
73 *                 EXECUTIVE MUST PRESERVE THIS BLOCK.                 00 00073
74 *                 STANDARD ROUTINES WILL BE CALLED INDIRECTLY THRU    00 00074
75 *                 THIS TABLE                                          00 00075
76 *                                                                      00 00076
77 *                                                                      00 00077
78 *                                                                      00 00078
79 *                                                                      00 00079
80 *                                                                      00 00080
81 *                                                                      00 00081
000400  82           ORG      0400                                        00 00082
000400  83 OUTA      BSS      1              OUTPUT ONE CHAR ROUTINE       00 00083
000401  84 OUTB      BSS      1              OUTPUT TWO CHAR ROUTINE       00 00084
```

```
000402            85 OUTC   BSS     1               OUTPUT CR/LF     ROUTINE            00 000085
000403            86 OUTD   BSS     1               OUTPUT MESSAGE   ROUTINE            00 000086
000404            87 OUTE   BSS     1               OUTPUT OCTAL WORD ROUTINE           00 000087
000405            88 OUTF   BSS     1               OUTPUT OCTAL ADDR ROUTINE           00 000088
000406            89 OUTG   BSS     1               OUTPUT ERROR MSG  ROUTINE           00 000089
000407            90 OUTH   BSS     1               OUTPUT CONTROL CHAR TO TTY ROUTINE  00 000090
000410            91 INPA   BSS     1               INPUT   ONE CHAR           ROUTINE  00 000091
000411            92 INPB   BSS     1               INPUT   AND PRINT ONE CHAR ROUTINE  00 000092
000412            93 INPC   BSS     1               INPUT   ONE CHAR EDITED    ROUTINE  00 000093
000413            94 INPD   BSS     1               INPUT   ONE ALPHA CHAR     ROUTINE  00 000094
000414            95 INPE   BSS     1               INPUT   TWO ALPHA CHAR     ROUTINE  00 000095
000415            96 INPF   BSS     1               INPUT   COMMA/PERIOD TERMINATION ROUTINE  00 000096
000416            97 INPG   BSS     1               INPUT   OCTAL NUMBER ROUTINE        00 000097
000417            98 TOUT   BSS     1               TIME-OUT             ROUTINE        00 000098
000420            99 TDLY   BSS     1               TIME DELAY           ROUTINE        00 000099
000421           100 SSWT   BSS     1               STANDARD SENSE SWITCH ROUTINE       00 000100
000422           101 SLWE   BSS     1               LOWEST WORD USED BY EXEC            00 000101
000423           102 ESZC   BSS     1               MEMORY SIZE DETERMINATION ROUTINE   00 000102
000424           103 SMSM   BSS     1               MEMORY SIZE MESSAGE                 00 000103
000425           104 INPH   BSS     1               SENSE TTY BUFFER READY              00 000104
000426           105 INPI   BSS     1               INIT TTY(INPUT CHAR W/O SENSE BUF READY)  00 000105
                 106 *                                                                 00 000106
                 107 *                                                                 00 000107
000440           108        ORG     0440                                               00 000108
                 109 *                                                                 00 000109
                 110 *      EXECUTIVE DATA TABLE                                        00 000110
                 111 *                                                                 00 000111
000440           112 SFLG   BSS     1               LOOP ON ERROR FLAG, 0=DON'T LOOP 1=LOOP  00 000112
000441           113 SMEM   BSS     1               MEMORY SIZE (HIGHEST AVAIL CORE)    00 000113
000442           114 SCON   BSS     1               0=CONSOLE MODE 1=TTY MODE           00 000114
000443           115        BSS     22                                                 00 000115
000471           116 SDCT   BSS     1               DIGIT COUNTER FOR INPG              00 000116
                 117 *                                                                 00 000117
                 118 ********************************************************************00 000118
                 119 *                                                                *00 000119
                 120 ********************************************************************00 000120
                 121 *                                                                 00 000121
                 122 *                                                                 00 000122
                 123 *                                                                 00 000123
007370 A         124 STTY   SET     07370           STTY IS SET BY THE TEST EXECUTVIE AND  00 000124
                 125 *                              CONTAINS THE TTY DEVICE ADDRESS     00 000125
                 126 *                                                                 00 000126
```

```
                          127 *                                                         00  00127
                          128 *                                                         00  00128
                          129 *                                                         00  00129
                          130 *****************************************************************00  00130
                          131 *                                                        *00  00131
000600                    132         ORG      0600            STARTING ADDRESS OF INSTRUCTION TEST   00  00132
                          133 *                                                        *00  00133
                          134 *****************************************************************00  00134
                          135 *                                                         00  00135
000600 010442 A           136 IBGN    LDA      SCON            TTY/CONSOLE MODE FLAG         00  00136
000601 001010 A           137         JAZ      IBG4            CONSOLE MODE ?,YES            00  00137
000602 000722 A
000603 006030 A           138         LDXI     MSG1            THIS IS THE 620 INSTRUCTION TEST   00  00138
000604 001102 A
000605 002000 A           139         CALL*    OUTD                                          00  00139
000606 100403 A
000607 006030 A           140 IBG1    LDXI     MSG2            'CPU TYPE='                   00  00140
000610 001132 A
000611 002000 A           141         CALL*    OUTD                                          00  00141
000612 100403 A
000613 002000 A           142         CALL*    INPG            IPUT CPU TYPE (1-6).          00  00142
000614 100416 A
000615 001000 A           143         JMP      IBGN                         SS3 EXIT         00  00143
000616 000600 A
000617 001000 A           144         JMP      IBG1            BACK SLASH EXIT              00  00144
000620 000607 A
000621 001000 A           145         JMP      *+2                          , EXIT          00  00145
000622 000623 A
000623 051161 A           146         STA      STYP                                          00  00146
000624 006030 A           147 IBG2    LDXI     MSG3            'CYCLES = '                   00  00147
000625 001142 A
000626 002000 A           148         CALL*    OUTD                                          00  00148
000627 100403 A
000630 005301 A           149         DECR     01              INPUT #CYCLES (SCYC),AND TERMINATING   00  00149
000631 051162 A           150         STA      SECY                     CHARACTER (SECY),SECY PRESET TO ,   00  00150
000632 002000 A           151         CALL*    INPG                                          00  00151
000633 100416 A
000634 001000 A           152         JMP      IBGN                         SS3 EXIT         00  00152
000635 000600 A
000636 001000 A           153         JMP      IBG2            BACK SLASH EXIT              00  00153
000637 000624 A
000640 001000 A           154         JMP      *+4                          , EXIT          00  00154
```

```
000641 000644 A
                        155 *        PERIOD RETURN FROM INPG                                             00 00155
000642 005002 A         156         TZB                                                                 00 00156
000643 061162 A         157         STB       $ECY                                                      00 00157
000644 051163 A         158         STA       $CYC                                                      00 00158
000645 011161 A         159 IBG3    LDA       $TYP          GET CPU TYPE                                00 00159
000646 006140 A         160         SUBI      3                                                         00 00160
000647 000003 A
000650 051161 A         161         STA       $TYP          SET CPU TYPE FOR INTERNAL USE: -2=620/I;    00 00161
000651 006140 A         162         SUBI      2             -1=620/I WITH OPTION INST.; 0=622/F ;       00 00162
000652 000002 A
                        163 *                                +1=622/F WITH OPTION INSTRUCTIONS          00 00163
000653 001010 A         164         JAZ       IBGH                                                      00 00164
000654 000667 A
000655 001002 A         165         JAP       IBGD                                                      00 00165
000656 000703 A
000657 006130 A         166         ERAI      0100000                                                   00 00166
000660 100000 A
000661 001002 A         167         JAP       *+4                                                       00 00167
000662 000665 A
000663 001000 A         168         JMP       IBG1          RETURN FOR CORRECT CPU TYPE INPUT           00 00168
000664 000607 A
000665 001000 A         169         JMP       IBGF                                                      00 00169
000666 000716 A
000667 005311 A         170 IBGH    DAR                     SET $TYP=-3 FOR INTERNAL USE. -3 REPRESENTS 00 00170
000670 006140 A         171         SUBI      2             622/I WITHOUT OPTION INSTRUCTIONS           00 00171
000671 000002 A
000672 051161 A         172         STA       $TYP                                                      00 00172
000673 006130 A         173         ERAI      0100000                                                   00 00173
000674 100000 A
000675 001004 A         174         JAN       *+4                                                       00 00174
000676 000701 A
000677 001000 A         175         JMP       IBG1          RETURN FOR CORRECT CPU TYPE INPUT           00 00175
000700 000607 A
000701 001000 A         176         JMP       IBGF                                                      00 00176
000702 000716 A
                        177 *                                                                           00 00177
000703 006140 A         178 IBGD    SUBI      5             SET $TYP=-4 FOR 622/I W/O                    00 00178
000704 000005 A
000705 051161 A         179         STA       $TYP                                                      00 00179
000706 006130 A         180         ERAI      0100000                                                   00 00180
000707 100000 A
```

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000710 001004 A   181         JAN     *+4                                                      00  00181
000711 000714 A
000712 001000 A   182         JMP     IBG1        RETURN FOR CORRECT CPU TYPE INPUT            00  00182
000713 000607 A
000714 002000 A   183 IBGE    JMPM    IBGG        PROGRAM OVERLAY FOR 18-BIT 622/I TESTING     00  00183
000715 000730 A
000716 011163 A   184 IBGF    LDA     SCYC                                                     00  00184
000717 051164 A   185         STA     CCTR        SET INTERNAL CYCLE COUNTER                   00  00185
000720 001000 A   186         JMP     IBGA                                                     00  00186
000721 000771 A
000722 005003 A   187 IBG4    ZERO    03          PRESET A&B FOR CPU TYPE= 620F AND            00  00187
000723 000000 A   188         HLT                 CYCLES= TO CONTINUOUS                         00  00188
000724 051161 A   189         STA     STYP                                                     00  00189
000725 061163 A   190         STB     SCYC                                                     00  00190
000726 001000 A   191         JMP     IBG3                                                     00  00191
000727 000645 A
                  192 *                                                                        00  00192
                  193 *                                                                        00  00193
                  194 *                                                                        00  00194
                  195 *         THIS ROUTINE OVERLAYS DATA PARAMETERS TO ADAPT THE PROGRAM      00  00195
                  196 *         FOR TESTING THE 18-BIT 622/I CPU.                               00  00196
                  197 *                                                                        00  00197
                  198 *                                                                        00  00198
000730 000000 A   199 IBGG    ENTR    0                                                        00  00199
000731 005002 A   200         TZB                                                              00  00200
000732 005001 A   201         TZA                                                              00  00201
000733 005311 A   202         DAR                 A=-1                                         00  00202
000734 052360 A   203         STA     KMON                                                     00  00203
000735 052015 A   204         STA     K402+2                                                   00  00204
000736 052017 A   205         STA     K402+4                                                   00  00205
000737 052040 A   206         STA     K434+2                                                   00  00206
000740 052042 A   207         STA     K434+4                                                   00  00207
000741 053034 A   208         STA     EXNG        =1                                           00  00208
000742 006140 A   209         SUBI    4                                                        00  00209
000743 000004 A
000744 052353 A   210         STA     KMFV        =-5                                          00  00210
000745 006010 A   211         LDAI    0100000                                                  00  00211
000746 100000 A
000747 004442 A   212         LLRL    2           A=400000                                     00  00212
000750 052352 A   213         STA     KMXN        MAX NEGATIVE NUMBER                          00  00213
000751 053035 A   214         STA     EMXN        MAX NEG                                      00  00214
000752 005211 A   215         CPA                 A=377777                                     00  00215
```

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000753 052351 A   216          STA     KMXP         MAX POSITIVE NUMBER                         00 000216
000754 006130 A   217          ERAI    0777         A=377000                                   00 000217
000755 000777 A
000756 052666 A   218          STA     EX76+1                                                  00 000218
000757 006010 A   219          LDAI    052525                                                  00 000219
000760 052525 A
000761 004443 A   220          LLRL    3                                                       00 000220
000762 006130 A   221          ERAI    ?                                                       00 000221
000763 000002 A
000764 053024 A   222          STA     EXK          =525252                                    00 000222
000765 005211 A   223          CPA                                                             00 000223
000766 053030 A   224          STA     EXK2         =252525                                    00 000224
000767 001000 A   225          JMP*    IBGG         RETURN                                     00 000225
000770 100730 A
                  226 *                                                                        00 000226
                  227 *******************************************************************      00 000227
                  228 *                                                                        00 000228
                  229 * SEQUENCE OF INSTRUCTIONS TESTS                                 02230000 00229
                  230 *                                                                        00 000230
                  231 *******************************************************************      00 000231
                  232 *                                                                        00 000232
000771 011161 A   233 IBGA  LDA     STYP         620/F ?                                       00 000233
000772 001002 A   234       JAP     IBGC         YES                                           00 000234
000773 001040 A
000774 005211 A   235       CPA                                                               00 000235
000775 001010 A   236       JAZ     IBGB         620 WITH OPTION INSTRUCTIONS                  00 000236
000776 001005 A
000777 006130 A   237       ERAI    3                                                         00 000237
001000 000003 A
001001 001010 A   238       JAZ     IBGB         622 WITH OPTION INSTRUCTIONS                  00 000238
001002 001005 A
001003 001000 A   239       JMP     IOTEST+2     620/622 WITHOUT OPTIONS                       *******
001004 001031 A
001005 002000 A   240 IBGB  JMPM    EXEN         EXTENDED ADDRESSING TEST                      00 000240
001006 002370 A
001007 002000 A   241       JMPM    KENT         OPTIONAL INSTRUCTIONS TEST                    00 000241
001010 001244 A
001011 002000 A   242       CALL    IBGX         CHECK FOR PRINTING 'END INST #2' MESSAGE      00 000242
001012 001065 A
001013 001400 A   243 IBG7  JSS3    IOTEST                                                    00 000243
001014 001027 A
001015 011163 A   244       LDA     $CYC         CONTINUOUS RUN ?                             00 000244
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001016 001010 A    245          JAZ    IBGB       YES--EXECUTE ANOTHER CYCLE                          00 00245
001017 001005 A
001020 011164 A    246          LDA    CCTR       INTERNAL CYCLE COUNTER                              00 00246
001021 005311 A    247          DAR                                                                   00 00247
001022 001010 A    248          JAZ    IOTEST     RUN I/O TEST IF NOT IN CONSOLE MODE                 00 00248
001023 001027 A
001024 051164 A    249          STA    CCTR                                                           00 00249
001025 001000 A    250          JMP    IBGB       EXECUTE ANOTHER CYCLE                               00 00250
001026 001005 A
001027 001400 A    251 IOTEST   JSS3   *          RESET SS3 TO CONTINUE                               00 00251
001030 001027 A
001031 010442 A    252          LDA    SCON       CONSOLE MODE ?                                      00 00252
001032 001010 A    253          JAZ    IBG4       YES--RETURN TO CONSOLE MODE STARTING POINT 00 00253
001033 000722 A
001034 002000 A    254          JMPM   IONT       I/O TEST                                            00 00254
001035 003042 A
001036 001000 A    255          JMP    IBG1       RETURN TO TTY MODE STARTING POINT                   00 00255
001037 000607 A
                   256 *                                                                              00 00256
001040 002000 A    257 IBGC     JMPM   EXEN       EXTENDED ADDRESSING TEST                            00 00257
001041 002370 A
001042 011161 A    258          LDA    STYP       620/F WITHOUT OPTION INSTRUCTIONS ?                 00 00258
001043 001010 A    259          JAZ    *+4        YES                                                 00 00259
001044 001047 A
001045 002000 A    260          JMPM   KENT       OPTIONAL INSTRUCTIONS TEST                          00 00260
001046 001244 A
001047 002000 A    261          CALL   IBGX       CHECK FOR PRINTING 'END INST #2' MESSAGE            00 00261
001050 001065 A
001051 001400 A    262          JSS3   IOTEST                                                         00 00262
001052 001027 A
001053 011163 A    263          LDA    SCYC       CONTINUOUS RUN ?                                    00 00263
001054 001010 A    264          JAZ    IBGC       YES                                                 00 00264
001055 001040 A
001056 011164 A    265          LDA    CCTR       INTERNAL CYCLE COUNTER                              00 00265
001057 005311 A    266          DAR                                                                   00 00266
001060 001010 A    267          JAZ    IOTEST     RUN I/O TEST IF NOT IN CONSOLE MODE                 00 00267
001061 001027 A
001062 051164 A    268          STA    CCTR                                                           00 00268
001063 001000 A    269          JMP    IBGC                                                           00 00269
001064 001040 A
                   270 *                                                                              00 00270
001065 000000 A    271 IBGX     ENTR   0                                                              00 00271
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001066 010442 A    272          LDA      $CON       CONSOLE MODE ?              00 00272
001067 001010 A    273          JAZ*     IBGX       YES                         00 00273
001070 101066 A
001071 011162 A    274          LDA      $ECY       PRINT 'END INST #2'         00 00274
001072 001010 A    275          JAZ*     IBGX       NO                          00 00275
001073 101065 A
001074 006030 A    276          LDXI     MSG4       MESSAGE: END INST #2        00 00276
001075 001151 A
001076 002000 A    277          CALL*    OUTD       PRINT MESSAGE               00 00277
001077 100403 A
001100 001000 A    278          RETU*    IBGX                                   00 00278
001101 101065 A
                   279 *                                                        00 00279
                   280 *                                                        00 00280
001102 106612 A    281 MSG1     DATA     0106612,0106612,'THIS IS THE 620 INSTRUCTION TEST, '   00 00281
001103 106612 A
001104 152310 A
001105 144723 A
001106 120311 A
001107 151640 A
001110 152310 A
001111 142640 A
001112 133262 A
001113 130240 A
001114 144716 A
001115 151724 A
001116 151325 A
001117 141724 A
001120 144717 A
001121 147240 A
001122 152305 A
001123 151724 A
001124 126240 A
001125 150301 A    282          DATA     'PART 2',0106612,0                     00 00282
001126 151324 A
001127 120262 A
001130 106612 A
001131 000000 A
                   283 *                                                        00 00283
001132 106612 A    284 MSG2     DATA     0106612,'CPU TYPE = ',0                00 00284
001133 141720 A
001134 152640 A
```

```
001135 152331 A
001136 150305 A
001137 120275 A
001140 120240 A
001141 000000 A
001142 106612 A   285 MSG3    DATA    0106612,'CYCLES = ',0                                           00 00285
001143 141731 A
001144 141714 A
001145 142723 A
001146 120275 A
001147 120240 A
001150 000000 A
001151 106612 A   286 MSG4    DATA    0106612,'END INST #2',0                                         00 00286
001152 142716 A
001153 142240 A
001154 144716 A
001155 151724 A
001156 120243 A
001157 131240 A
001160 000000 A
                  287 *                                                                               00 00287
                  288 *                                                                               00 00288
001161 000000 A   289 STYP    DATA    0                 CPU TYPE: 620I,620I W/0,620F,OR 620F W/0.     00 00289
001162            290 SECY    BSS     1                 0=SUPPRESS END INST PRINT,=1=ALLOW PRINT       00 00290
001163            291 SCYC    BSS     1                 NUMBER OF TEST CYCLES, O=CONTINUES             00 00291
001164            292 CCTR    BSS     1                 INTERNAL CYCLE COUNTER                         00 00292
                  293 *                                                                               00 00293
                  294 *                                                                               00 00294
                  295 *                                                                               00 00295
                  296 *                                                                               00 00296
                  297 *    ENTRIES FOR LOOPING/TROUBLESHOOTING                                         00 00297
001165 006140 A   298 ITRS    SUBI    3                                                               00 00298
001166 000003 A
001167 051161 A   299         STA     STYP              ESTABLISH CPU TYPE                            00 00299
001170 006140 A   300         SUBI    2                                                               00 00300
001171 000002 A
001172 001010 A   301         JAZ     INS1                                                            00 00301
001173 001205 A
001174 001002 A   302         JAP     *+4                                                             00 00302
001175 001200 A
001176 001000 A   303         JMP     INS3                                                            00 00303
001177 001213 A
```

```
001200 006140 A   304            SUBI    5                                               00 000304
001201 000005 A
001202 051161 A   305            STA     STYP        *-4 FOR 622/I WITH OPTION INSTRUCTIONS    00 000305
001203 001000 A   306            JMP     INS2                                            00 000306
001204 001211 A
001205 006311 A   307 INS1       DAR                                                     00 000307
001206 006140 A   308            SUBI    2                                               00 000308
001207 000002 A
001210 051161 A   309            STA     STYP        *-3 FOR 622/I WITHOUT OPTION INST   00 000309
001211 002000 A   310 INS2       CALL    IBGG        ALTER PROGRAM FOR 622/I TESTING     00 000310
001212 000730 A
001213 000000 A   311 INS3       HLT                                                     00 000311
001214 000000 A   312            HLT                 SELECT DESIRED TEST                 00 000312
001215 002000 A   313 IEXA       JMPM    EXEN            TEST EXTENDED ADDR INSTR        00 000313
001216 002370 A
001217 001200 A   314            JSS2    IEXA                                            00 000314
001220 001215 A
001221 000000 A   315            HLT                                                     00 000315
001222 002000 A   316 IARO       JMPM    KENT            TEST OPTIONAL ARITHMETIC INSTR 01359000 00316
001223 001244 A
001224 001200 A   317            JSS2    IARO                                       01360000 00317
001225 001222 A
001226 000000 A   318            HLT                                             01361000 000318
001227 002000 A   319 IOTS       JMPM    IONT        I/O INSTRUCTION TEST                00 000319
001230 003042 A
001231 001200 A   320            JSS2    IOTS                                            00 000320
001232 001227 A
001233 000000 A   321            HLT                                                     00 000321
001234 002000 A   322 INST       JMPM    EXEN        EXTENDED ADDRESSING TEST            00 000322
001235 002370 A
001236 002000 A   323            JMPM    KENT        OPTIONAL INSTRUCTIONS TEST          00 000323
001237 001244 A
001240 001200 A   324            JSS2    INST                                            00 000324
001241 001234 A
001242 000000 A   325            HLT                                                     00 000325
001243 000000 A   326            HLT                                                     00 000326
                  327 *                                                                  00 000327
                  328 *                                                                  00 000328
                  329 *                                                                  00 000329
                  330 *                                                                  00 000330
                  331 *                                                                  00 000331
                  332 *************************************************************************00 00332
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                    333 *                                                        00  00333
                    334 *         OPTIONAL INSTRUCTIONS TEST                      00  00334
                    335 *                                                        00  00335
                    336 *         620/622I & 620/F: MUL,DIV,MULI,DIVI,MULE,DIVE.  00  00336
                    337 *         620/F ONLY: HT & SRE                            00  00337
                    338 *                                                        00  00338
                    339 *                         *** NOTE ***                   00  00339
                    340 *                                                        00  00340
                    341 *         THE FOLLOWING CONSTANTS AND PARAMETERS ARE ALTERED AT START-UP  00  00341
                    342 *         IF 622/I TESTING IS SPECIFIED: KMON,K400+2,K400+4,K434+2,K434+4, 00  00342
                    343 *         KMFV,KMXN AND KMXP. EACH OCTAL IS SET TO THE 18-BIT EQUIV.        00  00343
                    344 *                                                        00  00344
                    345 *                                                        00  00345
                    346 *                                                        00  00346
                    347 *******************************************************************************00  00347
                    348 *                                                        00  00348
001244 000000 A     349 KENT    ENTR                          TEST ENTRY         00  00349
                    350 *                                                        00  00350
                    351 *                                                        00  00351
                    352 * TEST -MUL- BY ZERO                                     00  00352
                    353 *                                                        00  00353
001245 005001 A     354 K200    TZA                           A=0                00  00354
001246 005302 A     355         DECR    002                   B=-1               00  00355
001247 142356 A     356         MUL     KZRO                  EXECUTE            00  00356
001250 001010 A     357         JAZ     K201                  A SHUD=0           00  00357
001251 001254 A
001252 002000 A     358         JMPM    K09                   ERROR              00  00358
001253 002346 A
001254 001020 A     359 K201    JBZ     K210                  B SHUD=0           00  00359
001255 001260 A
001256 002000 A     360         JMPM    K09                   ERROR              00  00360
001257 002346 A
001260 005101 A     361 K210    INCR    001                   A=+1               00  00361
001261 005302 A     362         DECR    002                   B=-1               00  00362
001262 142356 A     363         MUL     KZRO                  EXECUTE            00  00363
001263 001010 A     364         JAZ     K211                  A SHUD=0           00  00364
001264 001267 A
001265 002000 A     365         JMPM    K09                   ERROR              00  00365
001266 002346 A
001267 005322 A     366 K211    DBR                           B=B-1              00  00366
001270 001020 A     367         JBZ     K220                  B SHUD=+1          00  00367
001271 001274 A
```

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001272 002000 A  368           JMPM     K09          ERROR                      00 00368
001273 002346 A
001274 005303 A  369 K220      DECR     003          A=B=-1                     00 00369
001275 162356 A  370           MUL      KZRO         EXECUTE                    00 00370
001276 005111 A  371           IAR                   A=A+1                      00 00371
001277 001010 A  372           JAZ      K221         A SHUD=-1                  00 00372
001300 001303 A
001301 002000 A  373           JMPM     K09          ERROR                      00 00373
001302 002346 A
001303 007400 A  374 K221      ROF                   INIT OFLO                  00 00374
001304 005122 A  375           IBR                   B=B+1                      00 00375
001305 001001 A  376           JOF      K230         SHUD OFLO                  00 00376
001306 001311 A
001307 002000 A  377           JMPM     K09          ERROR                      00 00377
001310 002346 A
                 378 *                                                          00 00378
                 379 * TEST =MUL= BY PLUS ONE                                   00 00379
                 380 *                                                          00 00380
001311 005001 A  381 K230      TZA                   A=0                        00 00381
001312 005302 A  382           DECR     002          B=-1                       00 00382
001313 162357 A  383           MUL      KONE         EXECUTE                    00 00383
001314 005111 A  384           IAR                   A=A+1                      00 00384
001315 001010 A  385           JAZ      K231         A SHUD=-1                  00 00385
001316 001321 A
001317 002000 A  386           JMPM     K09          ERROR                      00 00386
001320 002346 A
001321 007400 A  387 K231      ROF                   INIT OFLO                  00 00387
001322 005122 A  388           IBR                   B=B+1                      00 00388
001323 001001 A  389           JOF      K240         SHUD OFLO                  00 00389
001324 001327 A
001325 002000 A  390           JMPM     K09          ERROR                      00 00390
001326 002346 A
001327 005301 A  391 K240      DECR     001          A=-1                       00 00391
001330 005002 A  392           TZB                   B=0                        00 00392
001331 162357 A  393           MUL      KONE         EXECUTE                    00 00393
001332 005111 A  394           IAR                   A=A+1                      00 00394
001333 001010 A  395           JAZ      K241         A SHUD=-1                  00 00395
001334 001337 A
001335 002000 A  396           JMPM     K09          ERROR                      00 00396
001336 002346 A
001337 007400 A  397 K241      ROF                   INIT OFLO                  00 00397
001340 005122 A  398           IBR                   B=B+1                      00 00398
```

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001341 001001 A   399          JOF     K250        SHUD OFLO                        00 00399
001342 001345 A
001343 002000 A   400          JMPM    K09         ERROR                            00 00400
001344 002346 A
                  401 *                                                             00 00401
                  402 * TEST *MUL* BY MINUS ONE                                     00 00402
                  403 *                                                             00 00403
001345 005001 A   404 K250     TZA                 A=0                              00 00404
001346 005102 A   405          INCR    002         B=+1                             00 00405
001347 162360 A   406          MUL     KMON        EXECUTE                          00 00406
001350 005111 A   407          IAR                 A=A+1                            00 00407
001351 001010 A   408          JAZ     K251        A SHUD=-1                        00 00408
001352 001355 A
001353 002000 A   409          JMPM    K09         ERROR                            00 00409
001354 002346 A
001355 007400 A   410 K251     ROF                 INIT OFLO                        00 00410
001356 005122 A   411          IBR                 B=B+1                            00 00411
001357 001001 A   412          JOF     K260        SHUD OFLO                        00 00412
001360 001363 A
001361 002000 A   413          JMPM    K09         ERROR                            00 00413
001362 002346 A
001363 005303 A   414 K260     DECR    003         A=B=-1                           00 00414
001364 162360 A   415          MUL     KMON        EXECUTE                          00 00415
001365 001010 A   416          JAZ     K261        A SHUD=0                         00 00416
001366 001371 A
001367 002000 A   417          JMPM    K09         ERROR                            00 00417
001370 002346 A
001371 001020 A   418 K261     JBZ     K270        B SHUD=0                         00 00418
001372 001375 A
001373 002000 A   419          JMPM    K09         ERROR                            00 00419
001374 002346 A
                  420 *                                                             00 00420
                  421 * TEST *MUL* BY MAX POSITIVE                                  00 00421
                  422 *                                                             00 00422
001375 005001 A   423 K270     TZA                 A=0                              00 00423
001376 022351 A   424          LDB     KMXP        B=MAX POS                        00 00424
001377 162351 A   425          MUL     KMXP        EXECUTE                          00 00425
001400 007400 A   426          ROF                 INIT OFLO                        00 00426
001401 005111 A   427          IAR                                                  00 00427
001402 005111 A   428          IAR                 A=A+2                            00 00428
001403 001001 A   429          JOF     K271        SHUD OFLO                        00 00429
001404 001407 A
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001405 002000 A   430           JMPM    K09            ERROR                  00 00430
001406 002346 A
001407 005322 A   431 K271      DBR                    B=B-1                  00 00431
001410 001020 A   432           JBZ     K280           B SHUD=+1              00 00432
001411 001414 A
001412 002000 A   433           JMPM    K09            ERROR                  00 00433
001413 002346 A
001414 012351 A   434 K280      LDA     KMXP                                  00 00434
001415 005012 A   435           TAB                    A=B=MAX POS           00 00435
001416 162351 A   436           MUL     KMXP           EXECUTE               00 00436
001417 007400 A   437           ROF                    INIT OFLO             00 00437
001420 005111 A   438           IAR                    A=A+1                  00 00438
001421 001001 A   439           JOF     K281           SHUD OFLO             00 00439
001422 001425 A
001423 002000 A   440           JMPM    K09            ERROR                  00 00440
001424 002346 A
001425 001020 A   441 K281      JBZ     K290           B SHUD=0              00 00441
001426 001431 A
001427 002000 A   442           JMPM    K09            ERROR                  00 00442
001430 002346 A
                  443 *                                                       00 00443
                  444 * TEST =MUL= BY MAX NEGATIVE                            00 00444
                  445 *                                                       00 00445
001431 005001 A   446 K290      TZA                    A=0                    00 00446
001432 005302 A   447           DECR    002            B=-1                   00 00447
001433 162352 A   448           MUL     KMXN           EXECUTE               00 00448
001434 005311 A   449           DAR                    A=A-1                  00 00449
001435 001010 A   450           JAZ     K291           A SHUD=+1             00 00450
001436 001441 A
001437 002000 A   451           JMPM    K09            ERROR                  00 00451
001440 002346 A
001441 001020 A   452 K291      JBZ     K292           B SHUD = 0           00 00452
001442 001445 A
001443 002000 A   453           JMPM    K09            ERROR                  00 00453
001444 002346 A
001445 005001 A   454 K292      TZA                    A=0                    00 00454
001446 005102 A   455           INCR    002            B=+1                   00 00455
001447 162352 A   456           MUL     KMXN           EXECUTE               00 00456
001450 005111 A   457           IAR                    A=A+1                  00 00457
001451 001010 A   458           JAZ     K293           A SHUD=-1            00 00458
001452 001455 A
001453 002000 A   459           JMPM    K09            ERROR                  00 00459
```

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001454 002346 A
001455 001020 A     460 K293    JBZ     K294          B  S+UD=0                      00 00460
001456 001461 A
001457 002000 A     461         JMPM    K09           ERROR                          00 00461
001460 002346 A
001461 005301 A     462 K294    DECR    001           A=-1                           00 00462
001462 022352 A     463         LDB     KMXN          B=MAX NEG                      00 00463
001463 162352 A     464         MUL     KMXN          EXECUTE                        00 00464
001464 007400 A     465         ROF                   INIT OFLO                      00 00465
001465 005111 A     466         IAR                   A=A+1                          00 00466
001466 001001 A     467         JOF     K295          SHUD OFLO                      00 00467
001467 001472 A
001470 002000 A     468         JMPM    K09           ERROR                          00 00468
001471 002346 A
001472 005122 A     469 K295    IBR                   B=B+1                          00 00469
001473 001001 A     470         JOF     K300          SHUD OFLO                      00 00470
001474 001477 A
001475 002000 A     471         JMPM    K09           ERROR                          00 00471
001476 002346 A
                    472 *                                                            00 00472
                    473 *   TEST  =DIV=  FOR OFLO DETECTION                          00 00473
001477 007400 A     474 K300    ROF                   INIT OFLO                      00 00474
001500 005103 A     475         INCR    003           A=B=1                          00 00475
001501 172356 A     476         DIV     KZRO          EXECUTE                        00 00476
001502 001001 A     477         JOF     K302          OK                             00 00477
001503 001506 A
001504 002000 A     478         JMPM    K09           ERROR                          00 00478
001505 002346 A
001506 005101 A     479 K302    INCR    001           A=1                            00 00479
001507 005002 A     480         TZB                                                  00 00480
001510 172357 A     481         DIV     KONE          =+1                            00 00481
001511 001001 A     482         JOF     K403          CONTINUE                       00 00482
001512 001515 A
001513 002000 A     483         JMPM    K09           ERROR                          00 00483
001514 002346 A
                    484 *                                                            00 00484
                    485 *   TEST  =DIV=  BY MAX POSITIVE                             00 00485
                    486 *                                                            00 00486
001515 012351 A     487 K403    LDA     KMXP                                         00 00487
001516 005311 A     488         DAR                                                  00 00488
001517 005002 A     489         TZB                                                  00 00489
001520 172351 A     490         DIV     KMXP                                         00 00490
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001521 005111 A   491          IAR                                         00 000491
001522 007400 A   492          ROF                                         00 000492
001523 005111 A   493          IAR                                         00 000493
001524 001001 A   494          JOF        K404                             00 000494
001525 001530 A
001526 002000 A   495          JMPM       K09                              00 000495
001527 002346 A
001530 005122 A   496 K404     IBR                                         00 000496
001531 007400 A   497          ROF                                         00 000497
001532 005122 A   498          IBR                                         00 000498
001533 001001 A   499          JOF        K405                             00 000499
001534 001537 A
001535 002000 A   500          JMPM       K09                              00 000500
001536 002346 A
001537 012351 A   501 K405     LDA        KMXP                             00 000501
001540 005311 A   502          DAR                                         00 000502
001541 005211 A   503          CPA                                         00 000503
001542 005111 A   504          IAR                                         00 000504
001543 005002 A   505          TZB                                         00 000505
001544 172351 A   506          DIV        KMXP                             00 000506
001545 007400 A   507          RBF                                         00 000507
001546 005311 A   508          DAR                                         00 000508
001547 005311 A   509          DAR                                         00 000509
001550 005311 A   510          DAR                                         00 000510
001551 001001 A   511          JOF        K406                             00 000511
001552 001555 A
001553 002000 A   512          JMPM       K09                              00 000512
001554 002346 A
001555 005322 A   513 K406     DBR                                         00 000513
001556 005322 A   514          DBR                                         00 000514
001557 005322 A   515          DBR                                         00 000515
001560 001001 A   516          JOF        K407                             00 000516
001561 001564 A
001562 002000 A   517          JMPM       K09                              00 000517
001563 002346 A
                  518 *                                                    00 000518
                  519 *   TEST  =DIV=   +16,=15 BY =5                       00 000519
                  520 *                                                    00 000520
001564 005001 A   521 K407     TZA                                         00 000521
001565 022354 A   522          LDB        KSTN                             00 000522
001566 172353 A   523          DIV        KMFV                             00 000523
001567 005311 A   524          DAR                                         00 000524
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001570 001010 A   525          JAZ     K408                                      00 00525
001571 001574 A
001572 002000 A   526          JMPM    K09                                       00 00526
001573 002346 A
001574 005122 A   527 K408     IBR                                               00 00527
001575 005122 A   528          IBR                                               00 00528
001576 005122 A   529          IBR                                               00 00529
001577 001020 A   530          JBZ     K411                                      00 00530
001600 001603 A
001601 002000 A   531          JMPM    K09                                       00 00531
001602 002346 A
001603 011161 A   532 K411     LDA     STYP          620F ?                      00 00532
001604 001002 A   533          JAP     K412          YES                         00 00533
001605 001635 A
                  534 *                                                          00 00534
                  535 *        620/I ONLY                                        00 00535
001606 005301 A   536 K409     DECR    001                                       00 00536
001607 022354 A   537          LDB     KSTN                                      00 00537
001610 005222 A   538          CPB                                               00 00538
001611 005122 A   539          IBR                                               00 00539
001612 005122 A   540          IBR                                               00 00540
001613 172353 A   541          DIV     KMFV                                      00 00541
001614 005111 A   542          IAR                                               00 00542
001615 005111 A   543          IAR                                               00 00543
001616 005111 A   544          IAR                                               00 00544
001617 005111 A   545          IAR                                               00 00545
001620 005111 A   546          IAR                                               00 00546
001621 001010 A   547          JAZ     K410                                      00 00547
001622 001625 A
001623 002000 A   548          JMPM    K09                                       00 00548
001624 002346 A
001625 005322 A   549 K410     DBR                                               00 00549
001626 005322 A   550          DBR                                               00 00550
001627 001020 A   551          JBZ     K310                                      00 00551
001630 001654 A
001631 002000 A   552          JMPM    K09                                       00 00552
001632 002346 A
001633 001000 A   553          JMP     K310          CONTINUE                    00 00553
001634 001654 A
                  554 *                                                          00 00554
                  555 *        620/F ONLY                                        00 00555
001635 005301 A   556 K412     DECR    001           A=-1                        00 00556
```

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001636 006020 A   557            LDBI     0177761         B=-15                           00 000557
001637 177761 A
001640 172353 A   558            DIV      KMFV            =-5                             00 000558
001641 001010 A   559            JAZ      K414            OK                              00 000559
001642 001645 A
001643 002000 A   560            JMPM     K09             ERROR                           00 000560
001644 002346 A
001645 005322 A   561 K414       DBR                                                      00 000561
001646 005322 A   562            DBR                                                      00 000562
001647 005322 A   563            DBR                                                      00 000563
001650 001020 A   564            JBZ      K310            OK                              00 000564
001651 001654 A   .
001652 002000 A   565            JMPM     K09             ERROR                           00 000565
001653 002346 A
                  566 *                                                                   00 000566
                  567 *   TEST  =DIV=  BY ONE                                             00 000567
                  568 *                                                                   00 000568
001654 005001 A   569 K310       TZA                      A=0                             00 000569
001655 005102 A   570            INCR     002             B=1                             00 000570
001656 172357 A   571            DIV      KONE            EXECUTE                         00 000571
001657 001010 A   572            JAZ      K311            A SHUD=0                        00 000572
001660 001663 A
001661 002000 A   573            JMPM     K09             ERROR                           00 000573
001662 002346 A
001663 005322 A   574 K311       DBR                      B=B-1                           00 000574
001664 001020 A   575            JBZ      K315            CONTINUE                        00 000575
001665 001670 A
001666 002000 A   576            JMPM     K09             ERROR                           00 000576
001667 002346 A
001670 011161 A   577 K315       LDA      STYP            620F ?                          00 000577
001671 001002 A   578            JAP      K324            YES                             00 000578
001672 001710 A
                  579 *                                                                   00 000579
                  580 *   620/I ONLY                                                      00 000580
001673 005303 A   581 K320       DECR     003             A=B=-1                          00 000581
001674 172357 A   582            DIV      KONE            EXECUTE                         00 000582
001675 005111 A   583            IAR                      A=A+1                           00 000583
001676 001010 A   584            JAZ      K321            A SHUD=-1                       00 000584
001677 001702 A
001700 002000 A   585            JMPM     K09             ERROR                           00 000585
001701 002346 A
001702 001020 A   586 K321       JBZ      K330            B SHUD=0                        00 000586
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001703 001723 A
001704 002000 A    587        JMPM     K09          ERROR              00 00587
001705 002346 A
001706 001000 A    588        JMP      K330         CONTINUE           00 00588
001707 001723 A
                   589 *                                               00 00589
                   590 *     620/F ONLY                                00 00590
001710 005303 A    591 K324   DECR     003          A=B=-1             00 00591
001711 172357 A    592        DIV      KONE         -1                 00 00592
001712 005122 A    593        IBR                                      00 00593
001713 001020 A    594        JBZ      *+4          OK                 00 00594
001714 001717 A
001715 002000 A    595        JMPM     K09          ERROR              00 00595
001716 002346 A
001717 001010 A    596        JAZ      K330         OK                 00 00596
001720 001723 A
001721 002000 A    597        JMPM     K09          ERROR              00 00597
001722 002346 A
                   598 *                                               00 00598
                   599 *   TEST  -DIV-  BY MINUS ONE                   00 00599
                   600 *                                               00 00600
001723 005001 A    601 K330   TZA                   A=0                00 00601
001724 005102 A    602        INCR     002          B=+1               00 00602
001725 172360 A    603        DIV      KMON         EXECUTE            00 00603
001726 001010 A    604        JAZ      K331         A SHUD=0           00 00604
001727 001732 A
001730 002000 A    605        JMPM     K09          ERROR              00 00605
001731 002346 A
001732 005122 A    606 K331   IBR                   B=B+1              00 00606
001733 001020 A    607        JBZ      K345         CONTINUE           00 00607
001734 001737 A
001735 002000 A    608        JMPM     K09          ERROR              00 00608
001736 002346 A
001737 011161 A    609 K345   LDA      STYP         620F ?             00 00609
001740 001002 A    610        JAP      K430         YES                00 00610
001741 001757 A
                   611 *                                               00 00611
                   612 *     620/I ONLY                                00 00612
001742 005303 A    613 K340   DECR     003          A=B=-1             00 00613
001743 172360 A    614        DIV      KMON         EXECUTE            00 00614
001744 005111 A    615        IAR                   A=A+1              00 00615
001745 001010 A    616        JAZ      K341         A SHUD=-1          00 00616
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001746 001751 A
001747 002000 A    617            JMPM     K09         ERROR                       00 00617
001750 002346 A
001751 001020 A    618 K341       JBZ      K400        B SHUD=0                    00 00618
001752 001772 A
001753 002000 A    619            JMPM     K09         ERROR                       00 00619
001754 002346 A
001755 001000 A    620            JMP      K400        CONTINUE                    00 00620
001756 001772 A
                   621 *                                                           00 00621
                   622 *     620/F ONLY---TEST DIV BY MINUS ONE                     00 00622
                   623 *                                                           00 00623
001757 005303 A    624 K430       DECR     003         A=B=-1                      00 00624
001760 172360 A    625            DIV      KMON        -1                          00 00625
001761 005322 A    626            DBR                                              00 00626
001762 001020 A    627            JBZ      *+4         OK                          00 00627
001763 001766 A
001764 002000 A    628            JMPM     K09         ERROR                       00 00628
001765 002346 A
001766 001010 A    629            JAZ      K400        CONTINUE                    00 00629
001767 001772 A
001770 002000 A    630            JMPM     K09         ERROR                       00 00630
001771 002346 A
                   631 *                                                           00 00631
                   632 *     DIVIDE -7 BY +4 : B=-1,A=-3                            00 00632
                   633 *                                                           00 00633
001772 005301 A    634 K400       DECR     001                                     00 00634
001773 006020 A    635            LDBI     6                                       00 00635
001774 000006 A
001775 005222 A    636            CPB                  B=-7                        00 00636
001776 172367 A    637            DIV      KFOR        =+4                         00 00637
001777 005122 A    638            IBR                                              00 00638
002000 001020 A    639            JBZ      *+4         OK                          00 00639
002001 002004 A
002002 002000 A    640            JMPM     K09         ERROR                       00 00640
002003 002346 A
002004 005111 A    641            IAR                                              00 00641
002005 005111 A    642            IAR                                              00 00642
002006 005111 A    643            IAR                                              00 00643
002007 001010 A    644            JAZ      K402        CONTINUE                    00 00644
002010 002013 A
002011 002000 A    645            JMPM     K09         ERROR                       00 00645
```

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002012 002346 A
                    646 *                                                         00 00646
                    647 *                                                         00 00647
                    648 *      TEST DIVI AND MULI IN SEQUENCE (620/I AND 620/F)   00 00648
                    649 *                                                         00 00649
                    650 *                                                         00 00650
002013 005303 A     651 K402  DECR      003            A=B=-1                      00 00651
002014 006170 A     652       DIVI      =1             DIV BY -1                   00 00652
002015 177777 A
002016 006160 A     653       MULI      =1             MUL BY -1                   00 00653
002017 177777 A
002020 005111 A     654       IAR                      A=A+1                       00 00654
002021 001010 A     655       JAZ       K401           A SHUD=-1                   00 00655
002022 002025 A
002023 002000 A     656       JMPM      K09            ERROR                       00 00656
002024 002346 A
002025 007400 A     657 K401  ROF                      INIT OFLO                   00 00657
002026 005122 A     658       IBR                      B=B+1                       00 00658
002027 001001 A     659       JOF       K432           CONTINUE                    00 00659
002030 002033 A
002031 002000 A     660       JMPM      K09            ERROR                       00 00660
002032 002346 A
                    661 *                                                         00 00661
002033 011161 A     662 K432  LDA       STYP           620/F ?                     00 00662
002034 001004 A     663       JAN       K450           NO                          00 00663
002035 002056 A
                    664 *      620/F ONLY!  DIVI/MULI                              00 00664
002036 005303 A     665 K434  DECR      003            A=B=-1                      00 00665
002037 006170 A     666       DIVI      =1             A=0;B=+1                    00 00666
002040 177777 A
002041 006160 A     667       MULI      =1             A=-1;B=0                    00 00667
002042 177777 A
002043 005111 A     668       IAR                                                  00 00668
002044 001010 A     669       JAZ       *+4                                        00 00669
002045 002050 A
002046 002000 A     670       JMPM      K09            ERROR                       00 00670
002047 002346 A
002050 005021 A     671       TBA                                                  00 00671
002051 132351 A     672       ERA       KMXP           =077777                     00 00672
002052 001010 A     673       JAZ       K450           CONTINUE                    00 00673
002053 002056 A
002054 002000 A     674       JMPM      K09                                        00 00674
```

```
002055 002346 A
                   675 *                                                        00 00675
                   676 *     TEST MULE AND DIVE (EXTENDED ADDRESSING)           00 00676
                   677 *                                                        00 00677
                   678 *                                                        00 00678
002056 005001 A    679 K450  TZA                                               00 00679
002057 006020 A    680       LDBI    3                                         00 00680
002060 000003 A
002061 006167 A    681       MULE    KTEN           3X10=30                     00 00681
002062 002366 A
002063 006177 A    682       DIVE    KMFV           030 DIV BY =5= =4,R=4       00 00682
002064 002353 A
002065 006130 A    683       ERAI    4                                         00 00683
002066 000004 A
002067 001010 A    684       JAZ     *+4                                       00 00684
002070 002073 A
002071 002000 A    685       JMPM    K09            ERROR                       00 00685
002072 002346 A
002073 005021 A    686       TBA                                               00 00686
002074 005311 A    687       DAR                                               00 00687
002075 142353 A    688       SUB     KMFV           =5                          00 00688
002076 001010 A    689       JAZ     K452                                       00 00689
002077 002102 A
002100 002000 A    690       JMPM    K09            ERROR                       00 00690
002101 002346 A
002102 005102 A    691 K452  INCR    002            B=1                         00 00691
002103 006166 A    692       MULE    KEXK-1,2       INDEXED BY B                00 00692
002104 002363 A
002105 001010 A    693       JAZ     *+4                                       00 00693
002106 002111 A
002107 002000 A    694       JMPM    K09                                        00 00694
002110 002346 A
002111 005021 A    695       TBA                                               00 00695
002112 132364 A    696       ERA     KEXK                                       00 00696
002113 001010 A    697       JAZ     K454                                       00 00697
002114 002117 A
002115 002000 A    698       JMPM    K09            ERROR                       00 00698
002116 002346 A
002117 005001 A    699 K454  TZA                                               00 00699
002120 022364 A    700       LDB     KEXK           B=025252                    00 00700
002121 006177 A    701       DIVE*   KEXK+1                                     00 00701
002122 102365 A
```

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002123 001010 A  702          JAZ      *+4                                                  00 00702
002124 002127 A
002125 002000 A  703          JMPM     K09          ERROR                                   00 00703
002126 002346 A
002127 005322 A  704          OBR                                                           00 00704
002130 001020 A  705          JBZ      K677         CONTINUE                                00 00705
002131 002134 A
002132 002000 A  706          JMPM     K09                                                  00 00706
002133 002346 A
002134 011161 A  707 K677     LDA      STYP         620/F?                                  00 00707
002135 001002 A  708          JAP      *+4                                                  00 00708
002136 002141 A
002137 001000 A  709          JMP*     KENT         EXIT OPTIONS TEST IF 620/I              00 00709
002140 101244 A
002141 001010 A  710          JAZ*     KENT         EXIT OPTIONS TEST IF 620/F WITHOUT OPTIONS 00 00710
002142 101244 A
002143 001000 A  711          JMP      K700         EXECUTE 620/F OPTIONS: BT & SRE         00 00711
002144 002145 A
                 712 *                                                                      00 00712
                 713 *                                                                      00 00713
                 714 *                                                                      00 00714
                 715 *    620/F TEST: BT INSTRUCTION                                        00 00715
                 716 *                                                                      00 00716
002145 012362 A  717 K700     LDA      KD01                                                 00 00717
002146 006440 A  718          BT       040,K702     TEST BIT 0 OF A FOR 0                   00 00718
002147 002152 A
002150 001000 A  719          JMP      K726         ERROR JUMP                              00 00719
002151 002231 A
002152 006401 A  720 K702     BT       01,K704      TEST BIT 1 OF A FOR 1                   00 00720
002153 002156 A
002154 001000 A  721          JMP      K726         ERROR JUMP                              00 00721
002155 002231 A
002156 006446 A  722 K704     BT       046,K706     TEST BIT 6 OF A FOR 0                   00 00722
002157 002162 A
002160 001000 A  723          JMP      K726         ERROR JUMP                              00 00723
002161 002231 A
002162 006407 A  724 K706     BT       07,K708      TEST BIT 7 OF A FOR 1                   00 00724
002163 002166 A
002164 001000 A  725          JMP      K726         ERROR JUMP                              00 00725
002165 002231 A
002166 006456 A  726 K70F     BT       056,K710     TEST BIT 14 OF A FOR 0                  00 00726
002167 002172 A
```

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002170 001000 A   727            JMP     K726         ERROR JUMP                                   00 000727
002171 002231 A
002172 006417 A   728 K710       BT      017,K712     TEST BIT 15 OF A FOR 1                       00 000728
002173 002176 A
002174 001000 A   729            JMP     K726         ERROR JUMP                                   00 000729
002175 002231 A
002176 006442 A   730 K712       BT*     042,KIND     TEST BIT 2 OF A FOR 0, JUMP INDIRECT         00 000730
002177 102361 A
002200 001000 A   731            JMP     K726         ERROR JUMP                                   00 000731
002201 002231 A
002202 022363 A   732 K714       LDB     KD02                                                      00 000732
002203 006420 A   733            BT      020,K716     TEST BIT / OF B FOR 1                         00 000733
002204 002207 A
002205 001000 A   734            JMP     K726         ERROR JUMP                                   00 000734
002206 002231 A
002207 006421 A   735 K716       BT      021,K718     TEST BIT 1 OF B FOR 1                        00 000735
002210 002213 A
002211 001000 A   736            JMP     K726         ERROR JUMP                                   00 000736
002212 002231 A
002213 006466 A   737 K718       BT      066,K720     TEST BIT 6 OF B FOR 0                        00 000737
002214 002217 A
002215 001000 A   738            JMP     K726         ERROR JUMP                                   00 000738
002216 002231 A
002217 006467 A   739 K720       BT      067,K722     TEST BIT 7 OF B FOR 0                        00 000739
002220 002223 A
002221 001000 A   740            JMP     K726         ERROR JUMP                                   00 000740
002222 002231 A
002223 006435 A   741 K722       BT      035,K724     TEST BIT 13 OF B FOR 1                       00 000741
002224 002227 A
002225 001000 A   742            JMP     K726         ERROR JUMP                                   00 000742
002226 002231 A
002227 006476 A   743 K724       BT      076,K730     TEST BIT 14 OF B FOR 0                       00 000743
002230 002240 A
002231 001100 A   744 K726       J881    *+6                                                       00 000744
002232 002237 A
002233 002000 A   745            JMPM    IQ80         PRINT ERROR DATA                             00 000745
002234 003716 A
002235 001000 A   746            JMP     K730         CONTINUE                                     00 000746
002236 002240 A
002237 000000 A   747            HLT                  ERROR--BT                                    00 000747
                  748 *                                                                            00 000748
                  749 *                                                                            00 000749
```

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                                750 *                                                              00 00750
                                751 *    620/F TEST: SRE INSTRUCTION                                00 00751
                                752 *                                                              00 00752
002240 012362 A   753 K730    LDA      KD01                                                        00 00753
002241 006613 A   754         DATA     006613        CODE FOR SRE,COMPARE A,DIRECT,NO SKIP         00 00754
002242 002362 A   755         DATA     KD01                                                        00 00755
002243 001000 A   756         JMP      K746          ERROR JUMP                                    00 00756
002244 002316 A
002245 006613 A   757         DATA     006613        CODE FOR SRE,COMPARE WITH A,DIRECT,DKIP OK    00 00757
002246 002363 A   758         DATA     KD02           ADDRESS FOR CONDTANT KD02                    00 00758
002247 001000 A   759         JMP      K732                                                        00 00759
002250 002253 A
002251 001000 A   760         JMP      K746          ERROR JUMP                                    00 00760
002252 002316 A
002253 022360 A   761 K732    LDB      KMON                                                        00 00761
002254 006030 A   762         LDXI     100                                                         00 00762
002255 000144 A
002256 006625 A   763         SRE      KMON-100,1,020    COMPARE WITH B,INDEXED BY X,SKIP OK        00 00763
002257 002214 A
002260 001000 A   764         JMP      K746          ERROR JUMP                                    00 00764
002261 002316 A
002262 005000 A   765         NOP                                                                  00 00765
002263 005004 A   766         TZX                                                                  00 00766
002264 006020 A   767 K734    LDBI     200                                                         00 00767
002265 000310 A
002266 006646 A   768         SRE      KZPO-200,2,040    COMPARE WITH X, INDEXED BY B, SKIP OK      00 00768
002267 002046 A
002270 001000 A   769         JMP      K746          ERROR JUMP                                    00 00769
002271 002316 A
002272 005000 A   770         NOP                                                                  00 00770
002273 022357 A   771 K742    LDB      KONE                                                        00 00771
002274 006627 A   772         DATA     006627        CODE FOR SRE,COMPARE WITH B,INDIRECT,SKIP     00 00772
002275 102330 A   773         MZE      K752           INDIRECT ADDRESS                             00 00773
002276 001000 A   774         JMP      K746          ERROR JUMP                                    00 00774
002277 002316 A
002300 006627 A   775 K738    DATA     006627        SRE--COMPARE WITH B,INDIRECT,NO SKIP          00 00775
002301 102327 A   776         MZE      K750                                                        00 00776
002302 001000 A   777         JMP      K748                                                        00 00777
002303 002306 A
002304 001000 A   778         JMP      K746          ERROR JUMP                                    00 00778
002305 002316 A
002306 012362 A   779 K748    LDA      KD01           *125252                                      00 00779
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002307 006614 A   780        DATA    006614        SRE-COMPARE WITH A,RELATIVE,SKIP    00 000780
002310 000005 A   781        DATA    5             RELATIVE ADDRESS                    00 000781
002311 001000 A   782        JMP     K746          ERROR JUMP                          00 000782
002312 002316 A
002313 001000 A   783        JMP*    KENT          EXIT                                00 000783
002314 101244 A
002315 125252 A   784        DATA    0125252                                           00 000784
002316 001100 A   785 K746   J8S1    *+6                                               00 000785
002317 002324 A
002320 002000 A   786        JMPM    IQ80          PRINT ERROR DATA                    00 000786
002321 003716 A
002322 001000 A   787        JMP*    KENT          EXIT                                00 000787
002323 101244 A
002324 000000 A   788        HLT                   ERROR--SRE                          00 000788
002325 001000 A   789        JMP*    KENT          EXIT                                00 000789
002326 101244 A
                  790 *                                                                00 000790
002327 002363 A   791 K750   DATA    KD02          INDIRECT ADDRESS FOR K738           00 000791
002330 002357 A   792 K752   DATA    KONE          INDIRECT ADDRESS FOR K742           00 000792
                  793 *                                                                00 000793
                  794 *                                                                00 000794
                  795 *                                                                00 000795
                  796 *    KENT--ERROR CONTORL ROUTINE.                                 00 000796
                  797 *    MAINTAINS CONTENTS OF A AND B AND PLACES                     00 000797
                  798 *    ERROR ENTRANCE ADDRESS IN X. ORIGINAL                        00 000798
                  799 *    CONTENTS OF X SAVED AT KSVX.                                 00 000799
                  800 *    CONTINUE CHECKING AFTER ERROR HALT/PRINTOUT.                 00 000800
                  801 *                                                                00 000801
002331 072355 A   802 K10    STX     KSVX          SAVE X REG                          00 000802
002332 032346 A   803        LDX     K09           ERROR ADDR                          00 000803
002333 005344 A   804        DXR                                                       00 000804
002334 005344 A   805        DXR                                                       00 000805
002335 001100 A   806        J8S1    K23                                               00 000806
002336 002343 A
002337 002000 A   807        JMPM    IQ80          PRINT ERROR DATA                    00 000807
002340 003716 A
002341 001000 A   808        JMP     K33           RETURN                              00 000808
002342 002344 A
002343 000300 A   809 K23    HLT     0300                                              00 000809
002344 032355 A   810 K33    LDX     KSVX          RESTOR X REG                        00 000810
002345 001000 A   811        JMP     K09           RETURN                              00 000811
002346 002346 A
```

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002346              812 K09    BES    0                                                                    00 000812
002347 001000 A     813        JMP    K10                                                                  00 000813
002350 002331 A
                    814 *                                                                                  00 000814
                    815 *                                                                                  00 000815
002351 077777 A     816 KMX.   DATA   077777            MAX POS, *ALTERED TO 377777 FOR 622/I TEST 00 000816
002352 100000 A     817 KMXN   DATA   0100000           MAX NEG, *ALTERED TO 400000 FOR 622/I TEST 00 000817
002353 177773 A     818 KMFV   DATA   -5                                                                   00 000818
002354 000020 A     819 KSTV   DATA   16                                                                   00 000819
002355 000000 A     820 KSVX   DATA   0                 X REG STOR                                          00 000820
002356 000000 A     821 KZRO   DATA   0                                                                    00 000821
002357 000001 A     822 KONE   DATA   1                                                                    00 000822
002360 177777 A     823 KMON   DATA   -1                                                                   00 000823
002361 002202 A     824 KIND   DATA   K714              INDIRECT ADDRESS FOR K712                          00 000824
002362 125252 A     825 KD01   DATA   0125252                                                              00 000825
002363 031463 A     826 KD02   DATA   031463                                                               00 000826
002364 025252 A     827 KEXK   DATA   025252,(KEXK)                                                        00 000827
002365 002364 A
002366 000010 A     828 KTEN   DATA   010                                                                  00 000828
002367 000004 A     829 KFOR   DATA   4                                                                    00 000829
                    830 *                                                                                  00 000830
                    831 *                                                                                  00 000831
                    832 *                                                                                  00 000832
                    833 *                                                                                  00 000833
                    834 *                                                                                  00 000834
                    835 *                                                                                  00 000835
                    836 ********************************************************************00 000836
                    837 *                                                                                  00 000837
                    838 *              EXTENDED ADDRESSING INSTRUCTIONS TEST                  00 000838
                    839 *                                                                                  00 000839
                    840 *                       *** NOTE ***                                               00 000840
                    841 *                                                                                  00 000841
                    842 *       THE FOLLOWING CONSTANTS AND PARAMETERS ARE ALTERED AT START-UP  00 000842
                    843 *       IF 622/I TESTING IS SPECIFIED: EXNG,EMXN AND EX76+1,            00 000843
                    844 *       EACH OCTAL IS SET TO THE 18-BIT EQUIV.                          00 000844
                    845 *                                                                                  00 000845
                    846 *                                                                                  00 000846
                    847 *                                                                                  00 000847
                    848 ********************************************************************00 000848
                    849 *                                                                                  00 000849
002370 000000 A     850 EXEN   ENTR   0                                                                    00 000850
002371 006017 A     851        LDAE   EXK              -125252   (DIRECT)                                  00 000851
```

```
002372 003024 A
002373 133024 A     852          ERA      EXK                                                    00 000852
002374 001010 A     853          JAZ      *+4               CONTINUE                              00 000853
002375 002400 A
002376 001000 A     854          JMP      EX01              ERROR JUMP                            00 000854
002377 002415 A
002400 006027 A     855          LDBE     EXPO              =0                                    00 000855
002401 003036 A
002402 005021 A     856          TBA                                                              00 000856
002403 001010 A     857          JAZ      *+4               CONTINUE                              00 000857
002404 002407 A
002405 001000 A     858          JMP      EX01              ERROR JUMP                            00 000858
002406 002415 A
002407 006037 A     859          LDXE     EXK                                                     00 000859
002410 003024 A
002411 005041 A     860          TXA                                                              00 000860
002412 133024 A     861          ERA      EXK                                                     00 000861
002413 001010 A     862          JAZ      EX02              CONTINUE                              00 000862
002414 002424 A
002415 001100 A     863 EX01     JSS1     *+6                                                     00 000863
002416 002423 A
002417 002000 A     864          JMPM     IQ80              PRINT ERROR DATA                      00 000864
002420 003716 A
002421 001000 A     865          JMP      EX02                                                    00 000865
002422 002424 A
002423 000000 A     866          HLT                        ERROR--LDAE/LDBE/LDXE (DIRECT ADDRESSING)  00 000866
                    867 *                                                                         00 000867
002424 013030 A     868 EX02     LDA      EXK2              =052525                               00 000868
002425 006057 A     869          STAE     EXK3              DIRECT                                00 000869
002426 003031 A
002427 013031 A     870          LDA      EXK3                                                    00 000870
002430 133030 A     871          ERA      EXK2                                                    00 000871
002431 001010 A     872          JAZ      *+4               CONTINUE                              00 000872
002432 002435 A
002433 001000 A     873          JMP      EX03              ERROR JUMP                            00 000873
002434 002451 A
002435 006030 A     874          LDXI     100                                                     00 000874
002436 000144 A
002437 023024 A     875          LDB      EXK                                                     00 000875
002440 006065 A     876          STBE     EXK3-100,1        INDEXED WITH X                        00 000876
002441 002665 A
002442 005021 A     877          TBA                                                              00 000877
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002443 006055 A   878          STAE    EXK3-99,1     INDEXED WITH X, STORE AT EXK3+1          00 000878
002444 002666 A
002445 013031 A   879          LDA     EXK3                                                   00 000879
002446 143032 A   880          SUB     EXK3+1                                                 00 000880
002447 001010 A   881          JAZ     EX04          CONTINUE                                 00 000881
102450 002460 A
102451 001100 A   882 EX03     J881    *+6                                                    00 000882
102452 002457 A
102453 002000 A   883          JMPM    IQ80          PRINT ERROR DATA                         00 000883
002454 003716 A
002455 001000 A   884          JMP     EX04                                                   00 000884
002456 002460 A
002457 000000 A   885          HLT                   ERROR--STAE/STBE/STXE   (DIRECT,X-INDEXED) 00 000885
                  886 *                                                                       00 000886
002460 006020 A   887 EX04     LDBI    EXNG                                                   00 000887
002461 003034 A
002462 006016 A   888          LDAE    0,2           INDEXED BY B                             00 000888
002463 000000 A
002464 001002 A   889          JAP     EX05          ERROR JUMP                               00 000889
002465 002503 A
002466 006147 A   890          SUBE    EXNG          DIRECT                                   00 000890
002467 003034 A
002470 001010 A   891          JAZ     *+4                                                    00 000891
002471 002474 A
002472 001000 A   892          JMP     EX05          ERROR JUMP                               00 000892
002473 002503 A
002474 005002 A   893          TZB                                                            00 000893
002475 006126 A   894          ADDE    EXK,2         INDEXED BY B                             00 000894
002476 003024 A
002477 006146 A   895          SUBE    EXK,2         INDEXED BY B                             00 000895
002500 003024 A
002501 001010 A   896          JAZ     EX06          CONTINUE                                 00 000896
002502 002512 A
002503 001100 A   897 EX05     J881    *+6                                                    00 000897
002504 002511 A
002505 002000 A   898          JMPM    IQ80          PRINT ERROR DATA                         00 000898
002506 003716 A
002507 001000 A   899          JMP     EX06                                                   00 000899
002510 002512 A
002511 000000 A   900          HLT                   ERROR--LDAE/ADDE/SUBE (DIRECT/INDEXED B) 00 000900
                  901 *                                                                       00 000901
002512 006017 A   902 EX06     LDAE*   EXK+1         INDIRECT                                 00 000902
```

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002513 103025 A
002514 006147 A   903          SUBE*    EXK+1          INDIRECT                                  00 000903
002515 103025 A
002516 001010 A   904          JAZ      *+4            CONTINUE                                  00 000904
002517 002522 A
002520 001000 A   905          JMP      EX07           ERROR JUMP                                00 000905
002521 002540 A
002522 006126 A   906          ADDE*    EXK+1,2        INDIRECT/PRETNDEXING                      00 000906
002523 103025 A
002524 006137 A   907          ERAE     EXK            DIRECT                                    00 000907
002525 003024 A
002526 001010 A   908          JAZ      *+4            CONTINUE                                  00 000908
002527 002532 A
002530 001000 A   909          JMP      EX07           ERROR JUMP                                00 000909
002531 002540 A
002532 006037 A   910          LDXE*    EXKA+2         DOUBLE INDIRECT                           00 000910
002533 103041 A
002534 005041 A   911          TXA                                                               00 000911
002535 133037 A   912          ERA      EXKA           EXKA=123456                               00 000912
002536 001010 A   913          JAZ      EX10           CONTINUE                                  00 000913
002537 002547 A
002540 001100 A   914 EX07     JSS1     *+6                                                      00 000914
002541 002546 A
002542 002000 A   915          JMPM     IO80           PRINT ERROR DATA                          00 000915
002543 003716 A
002544 001000 A   916          JMP      EX10                                                     00 000916
002545 002547 A
002546 000000 A   917          HLT                     ERROR--LDAE/ADDE/SUBE/LDXE   (INDIRECT)   00 000917
                  918 *                                                                          00 000918
002547 013034 A   919 EX10     LDA      EXNG           A=+1                                      00 000919
002550 006117 A   920          ORAE     EXNG           A=-1                                      00 000920
002551 003034 A
002552 006157 A   921          ANAE     EXNG           A=-1                                      00 000921
002553 003034 A
002554 006137 A   922          ERAE     EXNG           A=0                                       00 000922
002555 003034 A
002556 001010 A   923          JAZ      *+4            CONTINUE                                  00 000923
002557 002562 A
002560 001000 A   924          JMP      EX11           ERROR JUMP                                00 000924
002561 002575 A
002562 006117 A   925          ORAE*    EXK+1          =125252                                   00 000925
002563 103025 A
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002564 006117 A   926           ORAE    EXK          =125252                                      00 000926
002565 003024 A
002566 006137 A   927           ERAE    EXK2         =177777                                      00 000927
002567 003030 A
002570 006157 A   928           ANAE    EXNG         =177777                                      00 000928
002571 003034 A
002572 133034 A   929           ERA     EXNG         EXNG=-1                                       00 000929
002573 001010 A   930           JAZ     EX12                                                       00 000930
002574 002604 A
002575 001100 A   931 EX11      JBI     *+6                                                        00 000931
002576 002603 A
002577 002000 A   932           JMPM    IQ80         PRINT ERROR DATA                             00 000932
002600 003716 A
002601 001000 A   933           JMP     EX12                                                       00 000933
002602 002604 A
002603 000000 A   934           HLT                  ERROR--ERAE/ORAE/ANAE   (DIRECT/INDIRECT)    00 000934
                  935 *                                                                            00 000935
002604 006014 A   936 EX12      DATA    0006014      CODE FOR LDAE--RELATIVE ADDRESSING           00 000936
002605 000007 A   937           DATA    07           RELATIVE ADDRESS FOR LDAE                     00 000937
002606 006130 A   938           ERAI    0177777                                                    00 000938
002607 177777 A
002610 001010 A   939           JAZ     *+5          CONTINUE                                      00 000939
002611 002615 A
002612 001000 A   940           JMP     EX13         ERROR JUMP                                    00 000940
002613 002624 A
002614 177777 A   941           DATA    0177777      USED WITH RELATIVE LDAE ABOVE                00 000941
002615 006022 A   942           DATA    006022       CODE FOR LDBI,SPECIAL TEST OF X-FIELD        00 000942
002616 003024 A   943           DATA    EXK                                                        00 000943
002617 005021 A   944           TBA                                                                00 000944
002620 006130 A   945           ERAI    EXK                                                        00 000945
002621 003024 A
002622 001010 A   946           JAZ     EX14         CONTINUE                                      00 000946
002623 002633 A
002624 001100 A   947 EX13      JBI     *+6                                                        00 000947
002625 002632 A
002626 002000 A   948           JMPM    IQ80         PRINT ERROR DATA                             00 000948
002627 003716 A
002630 001000 A   949           JMP     EX14         CONTINUE                                      00 000949
002631 002633 A
002632 000000 A   950           HLT                  ERROR--LDAE/LDBI (RELATIVE/IMMEDIATE)        00 000950
                  951 *                                                                            00 000951
002633 013034 A   952 EX14      LDA     EXNG         A=-1                                          00 000952
```

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002634 053031 A   953          STA     EXK3                                          00 000953
002635 006047 A   954          INRE    EXK3         CHECK INRE FOR -1 TO +1          00 000954
002636 003031 A
002637 013031 A   955          LDA     EXK3                                          00 000955
002640 001010 A   956          JAZ     **+4         CONTINUE                         00 000956
002641 002644 A
002642 001000 A   957          JMP     EX73         ERROR JUMP                       00 000957
002643 002727 A
002644 005004 A   958          TZX                                                   00 000958
002645 006020 A   959          LDBI    01000                                         00 000959
002646 001000 A
002647 006047 A   960 EX70     INRE    EXK3         CHECK INCREMENT FROM 0 TO 01000  00 000960
002650 003031 A
002651 005322 A   961          DBR                                                   00 000961
002652 005144 A   962          IXR                                                   00 000962
002653 001020 A   963          JBZ     **+4                                          00 000963
002654 002657 A
002655 001000 A   964          JMP     EX70         INCREMENT AGAIN                  00 000964
002656 002647 A
002657 005041 A   965          TXA                                                   00 000965
002660 143031 A   966          SUB     EXK3                                          00 000966
002661 001010 A   967          JAZ     **+4         CONTINUE                         00 000967
002662 002665 A
002663 001000 A   968          JMP     EX73         ERROR JUMP                       00 000968
002664 002727 A
002665 006010 A   969 EX76     LDAI    077000       ALTERED TO 377000 FOR 622/I TESTING   00 000969
002666 077000 A
002667 053031 A   970          STA     EXK3                                          00 000970
002670 005004 A   971          TZX                                                   00 000971
002671 006020 A   972          LDBI    01000                                         00 000972
002672 001000 A
002673 007400 A   973          ROF                                                   00 000973
002674 006047 A   974 EX71     INRE    EXK3         INCR FROM 077000/377000(622I) TO OVFL   00 000974
002675 003031 A
002676 005322 A   975          DBR                                                   00 000975
002677 005144 A   976          IXR                                                   00 000976
002700 001020 A   977          JBZ     **+4                                          00 000977
002701 002704 A
002702 001000 A   978          JMP     EX71         INCREMENT AGAIN                  00 000978
002703 002674 A
002704 001001 A   979          JOF     **+4                                          00 000979
002705 002710 A
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002706 001000 A   980           JMP    EX73        ERROR JUMP                                  00 00980
002707 002727 A
002710 001001 A   981           JOF    EX73        ERROR JUMP                                  00 00981
002711 002727 A
002712 013031 A   982           LDA    EXK3                                                    00 00982
002713 133035 A   983 EX72      ERA    EMXN        MAX NEG                                     00 00983
002714 001010 A   984           JAZ    *+4                                                     00 00984
002715 002720 A
002716 001000 A   985           JMP    EX73        ERROR JUMP                                  00 00985
002717 002727 A
002720 013034 A   986 EX77      LDA    EXNG        -1                                          00 00986
002721 053031 A   987           STA    EXK3     ,                                              00 00987
002722 006047 A   988           INRE   EXK3                                                    00 00988
002723 003031 A
002724 013031 A   989           LDA    EXK3                                                    00 00989
002725 001010 A   990           JAZ    EX75        CHECK IF POSTINDEXING TO BE TESTED          00 00990
002726 002736 A
002727 001100 A   991 EX73      JSS1   *+6                                                     00 00991
002730 002735 A
002731 002000 A   992           JMPM   IQ80        PRINT ERROR DATA                            00 00992
002732 003716 A
002733 001000 A   993           JMP    EX75        CHECK IF POSTINDEXING TO BE TESTED          00 00993
002734 002736 A
002735 000800 A   994           HLT                ERROR--INRE                                 00 00994
                  995 *                                                                        00 00995
002736 011161 A   996 EX75      LDA    STYP        620F ?                                      00 00996
002737 001002 A   997           JAP    EX15        YES                                         00 00997
002740 002743 A
002741 001000 A   998           JMP*   EXEN        RETURN                                      00 00998
002742 102370 A
                  999 *                                                                        00 00999
                 1000 *                                                                        00 01000
                 1001 *    620/F TEST: POSTINDEX EXTENDED ADDRESSING                           00 01001
                 1002 *                                                                        00 01002
002743 005004 A  1003 EX15      TZX                                                            00 01003
002744 006215 A  1004           LDAE   EXK,1,0200  POSTINDEXING WITH X REG                     00 01004
002745 003024 A
002746 133024 A  1005           ERA    EXK                                                     00 01005
002747 001010 A  1006           JAZ    EX16        CONTINUE                                    00 01006
002750 002753 A
002751 001000 A  1007           JMP    EX20        ERROR                                       00 01007
002752 002771 A
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002753 006020 A 1008 EX16   LDBI     100                                        00 01008
002754 000144 A
002755 006216 A 1009        LDAE     EXK=100,2,0200   POSTINDEXING WITH B REG    00 01009
002756 002660 A
002757 133024 A 1010        ERA      EXK                                        00 01010
002760 001010 A 1011        JAZ      EX17             CONTINUE                   00 01011
002761 002764 A
002762 001000 A 1012        JMP      EX20             ERROR                      00 01012
002763 002771 A
002764 006215 A 1013 EX17   LDAE*    EXK+1,1,0200     INDIRECT/POSTINDEXING      00 01013
002765 103025 A
002766 133024 A 1014        ERA      EXK                                        00 01014
002767 001010 A 1015        JAZ      EX30             CONTINUE                   00 01015
002770 003000 A
002771 001100 A 1016 EX20   JSS1     *+6                                        00 01016
002772 002777 A
002773 002000 A 1017        JMPM     IQ80             PRINT ERROR                00 01017
002774 003716 A
002775 001000 A 1018        JMP      EX30             CONTINUE                   00 01018
002776 003000 A
002777 000000 A 1019        HLT                       ERROR--LDAE/POSTINDEXING   00 01019
               1020 *                                                           00 01020
003000 013024 A 1021 EX30   LDA      EXK                                        00 01021
003001 006257 A 1022        DATA     006257           CODE FOR STAE, INDIRECT    00 01022
003002 103027 A 1023        MZE      EXK1+1           INDIRECT ADDRESS           00 01023
003003 013026 A 1024        LDA      EXK1                                       00 01024
003004 133024 A 1025        ERA      EXK                                        00 01025
003005 006326 A 1026        ADDE     EXK=100,2,0200      POSTINDEXING WITH B     00 01026
003006 002660 A
003007 003347 A 1027        DATA     006347           CODE FOR SUBE,DIRECT       00 01027
003010 003024 A 1028        DATA     EXK              ADDRESS FOR SUBE           00 01028
003011 001010 A 1029        JAZ      EX32             CONTINUE                   00 01029
003012 003022 A
003013 001100 A 1030        JSS1     *+6                                        00 01030
003014 003021 A
003015 002000 A 1031        JMPM     IQ80                                       00 01031
003016 003716 A
003017 001000 A 1032        JMP      EX32                                       00 01032
003020 003022 A
003021 000000 A 1033        HLT                                                 00 01033
               1034 *                                                           00 01034
003022 001000 A 1035 EX32   JMP*     EXEN             RETURN                     00 01035
```

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003023 102370 A
                1036 *                                                       00 01036
                1037 *                                                       00 01037
003024 125252 A 1038 EXK      DATA    0125252,(EXK)                          00 01038
003025 003024 A
003026 000000 A 1039 EXK1     DATA    0,(EXK1)                               00 01039
003027 003026 A
003030 052525 A 1040 EXK2     DATA    052525                                 00 01040
003031          1041 EXK3     BSS     3                 STORAGE CELLS        00 01041
003034 177777 A 1042 EXNG     DATA    =1                   ALTERED TO 777777 FOR 622/I TESTING  00 01042
003035 100000 A 1043 EMXN     DATA    0100000           MAX NEG, ALTERED TO 0400000 FOR 622/I   00 01043
003036 000000 A 1044 EXRO     DATA    0                                      00 01044
003037 123456 A 1045 EXKA     DATA    0123456,(EXKA),(EXKA+1)*               00 01045
003040 003037 A
003041 103040 A
                1046 ***************************************************      00 01046
                1047 *                                              *        00 01047
                1048 *                    I/O TEST                   *        00 01048
                1049 *                                              *        00 01049
                1050 ***************************************************      00 01050
003042 000000 A 1051 IONT     ENTR    0                 I/O TEST ENTRY AND EXIT   00 01051
003043 006020 A 1052          LDBI    $TTY                                   00 01052
003044 007370 A
003045 006030 A 1053          LDXI    IO1               UPDATE I/O INSTRUCTIONS TO CURRENT   00 01053
003046 003514 A
003047 015000 A 1054          LDA     0,1               *         DEVICE ADDR ($TTY)   00 01054
003050 001010 A 1055          JAZ     ION1              *     JMP IF DONE    00 01055
003051 003061 A
003052 004346 A 1056          LSRA    6                 *                    00 01056
003053 004246 A 1057          LRLA    6                 *                    00 01057
003054 116000 A 1058          ORA     0,2                                    00 01058
003055 055000 A 1059          STA     0,1               *                    00 01059
003056 005144 A 1060          IXR                       *                    00 01060
003057 001000 A 1061          JMP     IONT+5            ******               00 01061
003060 003047 A
003061 006030 A 1062 ION1     LDXI    MSG5              OUTPUT 'THIS IS INST TEST'VIA OBR   00 01062
003062 003537 A
003063 005301 A 1063          DECR    01                * (A)=-1 FOR POSSIBLE INTERFERENCE   00 01063
003064 025000 A 1064          LDB     0,1               *         WITH (B)   00 01064
003065 001020 A 1065          JBZ     ION2              * DONE?,YES      *** EXIT ***   00 01065
003066 003100 A
003067 004150 A 1066          LSRB    8                 * HIGH ORDER 8 BITS  00 01066
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003070 002000 A 1067           CALL    IONA       *          OUTPUT                       00 01067
003071 003406 A
003072 025000 A 1068           LDB     0,1        *    LOW ORDER 8 BITS                    00 01068
003073 002000 A 1069           CALL    IONA       *          OUTPUT                       00 01069
003074 003406 A
003075 005144 A 1070           IXR                *                                       00 01070
003076 001000 A 1071           JMP     ION1+3     *****                                   00 01071
003077 003064 A
003100 006030 A 1072 ION2      LDXI    MSG6       OUTPUT 'PLEASE TYPE IN ' VIA DAR        00 01072
003101 003561 A
003102 005302 A 1073           DECR    02         *    (B) = -1 FOR POSSIBLE INTERFERENCE 00 01073
003103 002000 A 1074           CALL    (OUTD)*    *****          WITH (A)                  00 01074
003104 100403 A
003105 013520 A 1075           LDA     IO5        OUTPUT 'A LOWER CASE CHAR' VIA OME       00 01075
003106 053123 A 1076           STA     ION3       *   UPDATE I/O INSTRUCTION              00 01076
003107 006010 A 1077           LDAI    MSG7-1     *   *                                   00 01077
003110 003572 A
003111 053124 A 1078           STA     ION3+1     *   *                                   00 01078
003112 006030 A 1079           LDXI    24+1       *    SET OUTPUT CTR (24 CHAR)           00 01079
003113 000031 A
003114 005303 A 1080           DECR    03         *   (A)=(B)=-1 FOR POSSIBLE INTERFERENCE 00 01080
003115 043124 A 1081           INR     ION3+1     *                                       00 01081
003116 005344 A 1082           DXR                *   DONE ?                              00 01082
003117 001040 A 1083           JXZ     ION4       *    YES      *** EXIT ***              00 01083
003120 003127 A
003121 002000 A 1084           CALL    IONB       *   NO,SEN BFR RDY                      00 01084
003122 003420 A
003123 103000 A 1085 ION3      OME     0          *       YES,OUTPUT,CONTINUE             00 01085
003124 000000 A
003125 001000 A 1086           JMP     *-8        *****                                   00 01086
003126 003115 A
003127 013521 A 1087 ION4      LDA     IO6        EXECUTE INIT FUNCTION                   00 01087
003130 053131 A 1088           STA     *+1        *   CLEAR RDR BFR                       00 01088
003131 102500 A 1089           CIA                *   *                                   00 01089
003132 002000 A 1090           CALL    IONC       *   SEN BFR RDY                         00 01090
003133 003442 A
003134 013514 A 1091           LDA     IO1        *   EXC INIT INSTRUCTION                00 01091
003135 053136 A 1092           STA     *+1        *   *                                   00 01092
003136 100000 A 1093           EXC     0          *   *                                   00 01093
003137 013531 A 1094           LDA     IO14       *   BFR STILL RDY?                      00 01094
003140 053141 A 1095           STA     *+1        *   *                                   00 01095
003141 101000 A 1096           SEN     0,*+4      *    *  YES - ERROR                     00 01096
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003142 003145 A
003143 001000 A 1097         JMP      *+6          *    *   NO                              00 01097
003144 003151 A
003145 006030 A 1098         LDXI     MSG8         *    'EXC 04XX,01004XX,DOES NOT WORK'   00 01098
003146 003632 A
003147 001000 A 1099         JMP      *+4          *                                       00 01099
003150 003153 A
003151 006030 A 1100         LDXI     MSG9         *    'THANKYOU'                         00 01100
003152 003624 A
003153 002000 A 1101         CALL     (OUTD)*      ******   WRITE MSG (X),EXIT ******      00 01101
003154 100403 A
003155 003000 A 1102         XEC      I01          INITIALIZE TTY                          00 01102
003156 003514 A
003157 006020 A 1103         LDBI     0200         OUTPUT 'NOW TYPE ASDF' VIA OAB          00 01103
003160 000200 A
003161 006030 A 1104         LDXI     MSG0         *    (B)=0200 , 'A)=CHAR 'X)=0200       00 01104
003162 003651 A
003163 013516 A 1105         LDA      I03          *    UPDATE OAB INSTRUCTION             00 01105
003164 053174 A 1106         STA      *+8          *    *                                  00 01106
003165 015000 A 1107         LDA      0,1          *    'A)=()(X)                          00 01107
003166 001010 A 1108         JAZ      ION5-5       *    DONE?,YES  *** EXIT ***            00 01108
003167 003200 A
003170 006130 A 1109         ERAI     0200         *    REMOVE BIT 0200                    00 01109
003171 000200 A
003172 002000 A 1110         CALL     ION8         *      SEN BFR RDY                      00 01110
003173 003420 A
003174 103300 A 1111         OAB                   *    OUTPUT                             00 01111
003175 005144 A 1112         IXR                   *                                       00 01112
003176 001000 A 1113         JMP      *-9          *****                                   00 01113
003177 003165 A
003200 006010 A 1114         LDAI     IOWA         INPUT                                   00 01114
003201 003352 A
003202 053536 A 1115         STA      IO21         *    'AS' VIA CIA                       00 01115
003203 006030 A 1116         LDXI     IO6          *    'DF' VIA CIAB                      00 01116
003204 003521 A
003205 005041 A 1117 ION5    TXA                   *    'AS' VIA INA                       00 01117
003206 006140 A 1118         SUBI     IO10         *    'DF' VIA INAB                      00 01118
003207 003525 A
003210 001010 A 1119         JAZ      ION6         *                                       00 01119
003211 003223 A
003212 002000 A 1120         CALL     IOND,(OUTA)* *                                       00 01120
003213 003503 A
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003214 100400 A
003215 002000 A 1121          CALL     IOND,(OUTA)*   *                          00 01121
003216 003503 A
003217 100400 A
003220 005144 A 1122          IXR                     *****                      00 01122
003221 001000 A 1123          JMP      ION5            *****                     00 01123
003222 003205 A
003223 002000 A 1124 ION6     CALL     IOND,IONE      INPUT                      00 01124
003224 003503 A
003225 003506 A
003226 002000 A 1125          CALL     IOND,IONE      *    'AS' VIA CIB          00 01125
003227 003503 A
003230 003506 A
003231 005144 A 1126          IXR                     *    'DF' VIA INB          00 01126
003232 002000 A 1127          CALL     IOND,IONE      *                          00 01127
003233 003503 A
003234 003506 A
003235 002000 A 1128          CALL     IOND,IONE      ******                     00 01128
003236 003503 A
003237 003506 A
003240 002000 A 1129          CALL     IONC           INPUT         SEN BFR RDY  00 01129
003241 003442 A
003242 033536 A 1130          LDX      IO21           *    'AS' VIA IME          00 01130
003243 005301 A 1131          DECR     01             *    (X) PTS TO INPUT AREA 00 01131
003244 055000 A 1132          STA      0,1            *    INPUT SET TO -1       00 01132
003245 073251 A 1133          STX      ION7+1         *    GET UPDATE INSTRUCTION 00 01133
003246 013527 A 1134          LDA      IO12           *    *                     00 01134
003247 053250 A 1135          STA      ION7           *    *                     00 01135
003250 102000 A 1136 ION7     IME      0              *    INPUT                 00 01136
003251 000000 A
003252 015000 A 1137          LDA      0,1            *    PRINT CHARACTER       00 01137
003253 002000 A 1138          CALL     (OUTA)*        *    *                     00 01138
003254 100400 A
003255 005144 A 1139          IXR                     *    INC PTR               00 01139
003256 005301 A 1140          DECR     01             *    INPUT SET TO -1       00 01140
003257 055000 A 1141          STA      0,1            *    *                     00 01141
003260 013527 A 1142          LDA      IO12           *    GET UPDATED INSTRUCTION 00 01142
003261 053265 A 1143          STA      ION8           *    *                     00 01143
003262 073266 A 1144          STX      ION8+1         *    *                     00 01144
003263 002000 A 1145          CALL     IONC           *    SEN BFR RDY           00 01145
003264 003442 A
003265 102000 A 1146 ION8     IME      0              *    INPUT                 00 01146
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003266 000000 A
003267 015000 A 1147          LDA    0,1           *   PRINT CHARACTER              00 01147
003270 002000 A 1148          CALL   (OUTA)*       ******                           00 01148
003271 100400 A
003272 006030 A 1149          LDXI   IOWE-1        COMPARE ACTUAL INPUT TO EXPECTFD 00 01149
003273 003317 A
003274 005145 A 1150 ION9     INCR   045           *   END OF TBL ?                 00 01150
003275 006140 A 1151          SUBI   IOWE+26       *   *                            00 01151
003276 003352 A
003277 001010 A 1152          JAZ    (IONT)*       *   *   YES       **** EXIT ****  00 01152
003300 103042 A
003301 015000 A 1153          LDA    0,1           *   ERROR ?                      00 01153
003302 135032 A 1154          ERA    26,1          *   *                            00 01154
003303 001010 A 1155          JAZ    ION9          *   * NO                         00 01155
003304 003274 A
003305 015000 A 1156          LDA    0,1           *   * YES                        00 01156
003306 025032 A 1157          LDB    26,1          *   (A)*ACTUAL (B)*EXP           00 01157
003307 001100 A 1158          JS31   *+6           *   PRINT?,NO                    00 01158
003310 003315 A
003311 002000 A 1159          CALL   IQ80          *   * YES                        00 01159
003312 003716 A
003313 001000 A 1160          JMP    ION9          *   *                            00 01160
003314 003274 A
003315 000200 A 1161          HLT    0200                                           00 01161
003316 001000 A 1162          JMP    ION9          ******                           00 01162
003317 003274 A
                     1163 *                        I/O INPUT EXPECTED DATA          00 01163
                     1164 *                        ENTRIES *(A),(B) AFTER INPUT,BEFORE INPUT (A)*(B)*077600 00 01164
       077600 A 1165 IP       SET    077600        IP*INTERFERENCE FATTERN         00 01165
003320 000301 A 1166 IOWF     DATA   0301,IP       CIA  A                           00 01166
003321 077600 A
003322 000323 A 1167          DATA   0323,IP       CIA  S                           00 01167
003323 077600 A
003324 000304 A 1168          DATA   0304,0304     CIAB D                           00 01168
003325 000304 A
003326 000306 A 1169          DATA   0306,0306     CIAB F                           00 01169
003327 000306 A
003330 077701 A 1170          DATA   077701,IP     INA  A                           00 01170
003331 077600 A
003332 077723 A 1171          DATA   077723,IP     INA  S                           00 01171
003333 077600 A
003334 077704 A 1172          DATA   077704,077704 INAB D                           00 01172
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003335 077704 A
003336 077706 A 1173          DATA     077706,077706 INAB F                              00 01173
003337 077706 A
003340 077600 A 1174          DATA     IP,0301       CIB  A                              00 01174
003341 000301 A
003342 077600 A 1175          DATA     IP,0323       CIB  S                              00 01175
003343 000323 A
003344 077600 A 1176          DATA     IP,077704     INB  D                              00 01176
003345 077704 A
003346 077600 A 1177          DATA     IP,077706     INB  F                              00 01177
003347 077706 A
003350 000301 A 1178          DATA     0301          IME  A                              00 01178
003351 000323 A 1179          DATA     0323          IME  S                              00 01179
003352          1180 IONA     BSS      28            TABLE OF ACTUAL INPUTS              00 01180
                1181 *                 OUTPUT B REG                                      00 01181
003406 000000 A 1182 IONA     ENTR     0             OUT (B) ENTRY AND EXIT              00 01182
003407 002000 A 1183          CALL     IONB          *    SEN WRITE BFR RDY              00 01183
003410 003420 A
003411 053535 A 1184          STA      IO20          *    GET UPDATE INSTRUCTION         00 01184
003412 013517 A 1185          LDA      IO4           *    *                              00 01185
003413 053415 A 1186          STA      *+2           *    *                              00 01186
003414 013535 A 1187          LDA      IO20          *    *                              00 01187
003415 103200 A 1188          OBR                    *    OUTPUT (B)                     00 01188
003416 001000 A 1189          JMP      (IONA)*       ******                             00 01189
003417 103406 A
                1190 *                 SENSE WRITE BFR RDY                               00 01190
003420 000000 A 1191 IONB     ENTR     0             SEN WRITE BFR RDY ENTRY AND EXIT    00 01191
003421 073535 A 1192          STX      IO29          *    SAVE (X)                       00 01192
003422 033530 A 1193          LDX      IO13          *    GET UPDATE INSTRUCTION         00 01193
003423 073425 A 1194          STX      *+2           *    *                              00 01194
003424 033533 A 1195          LDX      IO15          *    (X) = TIME OUT CONSTANT 077777 00 01195
003425 101000 A 1196          SEN      0,IONC-3      *    BFR RDY?                       00 01196
003426 003437 A
003427 002000 A 1197          CALL     (TOUT)*       *    NO,TOO MUCH TIME?              00 01197
003430 100417 A
003431 005304 A 1198          DECR     04            *      YES HALT                     00 01198
003432 000000 A 1199          HLT                    *      *                            00 01199
003433 001400 A 1200          JSS3     (IONT)*       **** SS3 EXIT ****                  00 01200
003434 103042 A
003435 001000 A 1201          JMP      *-8           *      *                            00 01201
003436 003425 A
003437 033535 A 1202          LDX      IO20          *    RESTORE (X)                    00 01202
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003440 001000 A 1203          JMP      (IONB)*         ******              00 01203
003441 103420 A
               1204 *                   SENSE READ BFR RDY,NO TIME OUT      00 01204
003442 000000 A 1205 IONC     ENTR     0               SEN READ BFR RDY ENTRY AND EXIT   00 01205
003443 073535 A 1206          STX      IO20         *    SAVE (X)          00 01206
003444 033531 A 1207          LDX      IO14         *    GET UPDATED INSTRUCTION   00 01207
003445 073447 A 1208          STX      *+2          *    *                 00 01208
003446 033535 A 1209          LDX      IO20         *    RESTORE (X)       00 01209
003447 101000 A 1210          SEN      0,(IONC)*    *    BFR RDY? YES-RETURN   00 01210
003450 103442 A
003451 001400 A 1211          JSS3     (IONT)*         **** SS3 EXIT ****   00 01211
003452 103042 A
003453 001000 A 1212          JMP      *-4             ******              00 01212
003454 003447 A
               1213 *                   INPUT VIA INST(X),AND PRINT VIA ROUTINE IN PARAMETER 1   00 01213
003455 002000 A 1214 IO1D     CALL     IONC            INPUT, SEN READ BFR RDY   00 01214
003456 003442 A
003457 015000 A 1215          LDA      0,1          *    GET UPDATED INSTRUCTION   00 01215
003460 053463 A 1216          STA      *+3          *    *                 00 01216
003461 013534 A 1217          LDA      IO16         *    (A)=(B)=INTERFERENCE PATTERN   00 01217
003462 005012 A 1218          TAB                   *    *                 00 01218
003463 102500 A 1219          CIA                   *    INPUT VIA INST(X)   00 01219
003464 073535 A 1220          STX      IO20         *    SAVE (X)          00 01220
003465 033536 A 1221          LDX      IO21         *    (X) PTS TO IOWA   00 01221
003466 055000 A 1222          STA      0,1          *    PUT (A),(B) INTO ACTUAL TBL   00 01222
003467 005144 A 1223          IXR                   *    *                 00 01223
003470 065000 A 1224          STB      0,1          *    *                 00 01224
003471 005144 A 1225          IXR                   *    *                 00 01225
003472 073536 A 1226          STX      IO21         *    *                 00 01226
003473 033503 A 1227          LDX      IOND         *    CALL OUTPUT ROUTINE (PARAMETER 1)   00 01227
003474 035000 A 1228          LDX      0,1          *    *                 00 01228
003475 073500 A 1229          STX      *+3          *    *                 00 01229
003476 033535 A 1230          LDX      IO20         *    *                 00 01230
003477 002000 A 1231          CALL     0            *    *                 00 01231
003500 000000 A
003501 043503 A 1232          INR      IOND         *    SET RETURN        00 01232
003502 001000 A 1233          JMP      0            *    *** EXIT ***      00 01233
003503 000000 A
003503        1234 IOND        BES      0               INPUT VIA INSTR()(X)    ENTRY AND EXIT   00 01234
003504 001000 A 1235          JMP      IO1D                                00 01235
003505 003455 A
               1236 *                                   OUTPUT (B)          00 01236
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003506 000000 A 1237 IONE   ENTR    0                  OUTPUT (B) ENTRY AND EXIT        00 001237
003507 005021 A 1238         TBA                        *     (A) = (B)                  00 001238
003510 002000 A 1239         CALL    (OUTA)*            *     OUTPUT (A)                 00 001239
003511 100400 A
003512 001000 A 1240         JMP     (IONE)*            ******                           00 001240
003513 103506 A
              1241 *                  DATA FOR IONT                                      00 001241
003514 100400 A 1242 IO1    DATA    0100400            EXC     INIT TTY                 00 001242
003515 103100 A 1243 IO2    DATA    0103100            OAR                              00 001243
003516 103300 A 1244 IO3    DATA    0103300            OAB                              00 001244
003517 103200 A 1245 IO4    DATA    0103200            OBR                              00 001245
003520 103000 A 1246 IO5    DATA    0103000            OME                              00 001246
003521 102500 A 1247 IO6    DATA    0102500            CIA                              00 001247
003522 102700 A 1248 IO7    DATA    0102700            CIAB                             00 001248
003523 102100 A 1249 IO8    DATA    0102100            INA                              00 001249
003524 102300 A 1250 IO9    DATA    0102300            INAB                             00 001250
003525 102600 A 1251 IO10   DATA    0102600            CIB                              00 001251
003526 102200 A 1252 IO11   DATA    0102200            INB                              00 001252
003527 102000 A 1253 IO12   DATA    0102000            IME                              00 001253
003530 101100 A 1254 IO13   DATA    0101100            SEN     WRITE BFR RDY            00 001254
003531 101200 A 1255 IO14   DATA    0101200            SEN     READ  BFR RDY            00 001255
003532 000000 A 1256         DATA    0                  END OF IO INSTR TABLE ******    00 001256
003533 077777 A 1257 IO15   DATA    077777             TIME OUT CONSTANT               00 001257
003534 077600 A 1258 IO16   DATA    077600             INTERFERENCE PATTERN            00 001258
003535         1259 IO20   BSS     1                  TEMP                             00 001259
003536         1260 IO21   BSS     1                  TEMP                             00 001260
              1261 *                  MESSAGES                                          00 001261
003537 106612 A 1262 MSG5   DATA    0106612,'THIS IS THE I/O INSTRUCTION TEST',0       00 001262
003540 152310 A
003541 144723 A
003542 120311 A
003543 151640 A
003544 152310 A
003545 142640 A
003546 144657 A
003547 147640 A
003550 144716 A
003551 151724 A
003552 151325 A
003553 141724 A
003554 144717 A
003555 147240 A
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003556 152305 A
003557 151724 A
003560 000000 A
003561 106612 A 1263 MSG6    DATA     0106612,'PLEASE TYPE IN ',0                          00 01263
003562 150314 A
003563 142701 A
003564 151705 A
003565 120324 A
003566 154720 A
003567 142640 A
003570 144716 A
003571 120240 A
003572 000000 A
003573 120301 A 1264 MSG7    DATA     'A LOWER CASE CHARACTER',0215,0212 00 01264
003574 120240 A
003575 120314 A
003576 120317 A
003577 120327 A
003600 120305 A
003601 120322 A
003602 120240 A
003603 120303 A
003604 120301 A
003605 120323 A
003606 120305 A
003607 120240 A
003610 120303 A
003611 120610 A
003612 120301 A
003613 120322 A
003614 120301 A
003615 120303 A
003616 120324 A
003617 120305 A
003620 120322 A
003621 000215 A
003622 000212 A
003623 000000 A 1265         DATA     0                                                    00 01265
003624 152310 A 1266 MSG9    DATA     'THANK YOU',0                                         00 01266
003625 140715 A
003626 145640 A
003627 154717 A
```

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003630 152640 A
003631 000000 A
003632 142730 A 1267 MSG8    DATA     'EXEC (1004XX) DOES NOT WORK',0                    00 01267
003633 142703 A
003634 120250 A
003635 130660 A
003636 130264 A
003637 154330 A
003640 124640 A
003641 142317 A
003642 142723 A
003643 120316 A
003644 147724 A
003645 120327 A
003646 147722 A
003647 145640 A
003650 000000 A
003651 000215 A 1268 MSG0    DATA     0215,0212,' N O W    T Y P E    A S D F A S D F A S D F'  00 01268
003652 000212 A
003653 120316 A
003654 120317 A
003655 120327 A
003656 120240 A
003657 120324 A
003660 120331 A
003661 120320 A
003662 120305 A
003663 120240 A
003664 120301 A
003665 120323 A
003666 120304 A
003667 120306 A
003670 120301 A
003671 120323 A
003672 120304 A
003673 120306 A
003674 120301 A
003675 120323 A
003676 120304 A
003677 120306 A
003700 120301 A 1269         DATA     ' A S',0215,0212,0240,0240,0240,0240,0240,0240,0240   00 01269
003701 120323 A
```

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003702 000215 A
003703 000212 A
003704 000240 A
003705 000240 A
003706 000240 A
003707 000240 A
003710 000240 A
003711 000240 A
003712 000240 A
003713 000240 A 1270           DATA    0240,0240,0                                              00 01270
003714 000240 A
003715 000000 A
               1271 *                                                                           00 01271
               1272 *                                                                           00 01272
               1273 *                                                                           00 01273
               1274 *    ERROR PRINT ROUTINE                                                    00 01274
003716 000000 A 1275 IQ80  ENTR    0                                                            00 01275
003717 053752 A 1276        STA     ITMP+1                                                01999000 01276
003720 063753 A 1277        STB     ITMP+2                                                02000000 01277
003721 073754 A 1278        STX     ITMP+3                                                02001000 01278
003722 002000 A 1279        CALL*   OUTC      DO CARRIAGE RETURN AND LINE FEED                  00 01279
003723 100402 A
003724 006020 A 1280        LDBI    (IQ80)                                                02006000 01280
003725 003716 A
003726 016000 A 1281        LDA     0,2                                                         00 01281
003727 005311 A 1282        DAR                                                                 00 01282
003730 005311 A 1283        DAR                                                                 00 01283
003731 002000 A 1284        CALL*   OUTF      PRINT ERROR REFERENCE ADDRESS                     00 01284
003732 100408 A
003733 013752 A 1285        LDA     ITMP+1                                                      00 01285
003734 002000 A 1286        CALL*   OUTE      PRINT A REG CONTENTS                               00 01286
003735 100404 A
003736 013753 A 1287        LDA     ITMP+2                                                      00 01287
003737 002000 A 1288        CALL*   OUTE      PRINT B REG CONTENTS                               00 01288
003740 100404 A
003741 013754 A 1289        LDA     ITMP+3                                                      00 01289
003742 002000 A 1290        CALL*   OUTE      PRINT X REG CONTENTS                               00 01290
003743 100404 A
003744 013752 A 1291        LDA     ITMP+1          RESTORE STATUS                              00 01291
003745 023753 A 1292        LDB     ITMP+2                                                      00 01292
003746 033754 A 1293        LDX     ITMP+3                                                      00 01293
003747 001000 A 1294        JMP*    IQ80                                                  02016000 01294
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003750 103716 A
                           1295 *   00 01295
003751   1296 ITMP   BSS   4   02065000 01296
                           1297 *   00 01297
           000600 A 1298   END   IBGN   00 01298
ENTRY NAMES
EXTERNAL NAMES
SYMBOLS
000442 A SCON   001163 A SCYC   000471 A SDCT   001162 A SECY
000440 A SFLG   000422 A SLWE   000441 A SMEM   000424 A SMSM
007370 A STTY   001161 A STYP   001164 A CCTR   003035 A EMXN
000423 A ESZC   002415 A EX01   002424 A EX02   002451 A EX03
002460 A EX04   002503 A EX05   002512 A EX06   002540 A EX07
002547 A EX10   002575 A EX11   002604 A EX12   002624 A EX13
002633 A EX14   002743 A EX15   002753 A EX16   002764 A EX17
002771 A EX20   003000 A EX30   003022 A EX32   002647 A EX70
002674 A EX71   002713 A EX72   002727 A EX73   002736 A EX75
002665 A EX76   002720 A EX77   002370 A EXEN   003024 A EXK
003026 A EXK1   003030 A EXK2   003031 A EXK3   003037 A EXKA
003034 A EXNG   003036 A EXRO   001222 A IARD   000607 A IBG1
000624 A IBG2   000645 A IBG3   000722 A IBG4   001013 A IBG7
000771 A IBGA   001005 A IBGB   001040 A IBGC   000703 A IBGD
000714 A IBGE   000716 A IBGF   000730 A IBGG   000667 A IBGH
000600 A IBGN   001065 A IBGX   001215 A IEXA   000410 A INPA
000411 A INPB   000412 A INPC   000413 A INPD   000414 A INPE
000415 A INPF   000416 A INPG   000425 A INPH   000426 A INPI
001205 A INS1   001211 A INS2   001213 A INS3   001234 A INST
003514 A IO1   003525 A IO10   003526 A IO11   003527 A IO12
003530 A IO13   003531 A IO14   003533 A IO15   003534 A IO16
003455 A IO1D   003515 A IO2   003535 A IO20   003536 A IO21
003516 A IO3   003517 A IO4   003520 A IO5   003521 A IO6
003522 A IO7   003523 A IO8   003524 A IO9   003061 A ION1
003100 A ION2   003123 A ION3   003127 A ION4   003205 A ION5
003223 A ION6   003250 A ION7   003265 A ION8   003274 A ION9
003406 A IONA   003420 A IONB   003442 A IONC   003503 A IOND
003506 A IONE   003042 A IONT   001027 A IOTEST   001227 A IOTS
003352 A IOWA   003320 A IOWE   077600 A IP   003716 A IQ80
003751 A ITMP   001165 A ITRS   002346 A K09   002331 A K10
001245 A K200   001254 A K201   001260 A K210   001267 A K211
001274 A K220   001303 A K221   002343 A K23   001311 A K230
001321 A K231   001327 A K240   001337 A K241   001345 A K250
001355 A K251   001363 A K260   001371 A K261   001375 A K270

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001407 A K271   001414 A K280   001425 A K281   001431 A K290
001441 A K291   001445 A K292   001455 A K293   001461 A K294
001472 A K295   001477 A K300   001506 A K302   001654 A K310
001663 A K311   001670 A K315   001673 A K320   001702 A K321
001710 A K324   002344 A K33    001723 A K330   001732 A K331
001742 A K340   001751 A K341   001737 A K345   001772 A K400
002025 A K401   002013 A K402   001515 A K403   001530 A K404
001537 A K405   001555 A K406   001564 A K407   001574 A K408
001606 A K409   001625 A K410   001603 A K411   001635 A K412
001645 A K414   001757 A K430   002033 A K432   002036 A K434
002056 A K450   002102 A K452   002117 A K454   002134 A K677
002145 A K700   002152 A K702   002156 A K704   002162 A K706
002166 A K708   002172 A K710   002176 A K712   002202 A K714
002207 A K716   002213 A K718   002217 A K720   002223 A K722
002227 A K724   002231 A K726   002240 A K730   002253 A K732
002264 A K734   002300 A K738   002273 A K742   002316 A K746
002306 A K748   002327 A K750   002330 A K752   002362 A KD01
002363 A KD02   001244 A KENT   002364 A KEXK   002367 A KFOR
002361 A KIND   002353 A KHFV   002360 A KMON   002352 A KMXN
002351 A KMXP   002357 A KONE   002354 A KSTN   002355 A KSVX
002366 A KTEN   002356 A KZRO   003651 A MSG0   001102 A MSG1
001132 A MSG2   001142 A MSG3   001151 A MSG4   003537 A MSG5
003561 A MSG6   003573 A MSG7   003632 A MSG8   003624 A MSG9
000400 A OUTA   000401 A OUTB   000402 A OUTC   000403 A OUTD
000404 A OUTE   000405 A OUTF   000406 A OUTG   000407 A OUTH
000421 A SSWT   000420 A TOLY   000417 A TOUT
     0 ERRORS ASSEMBLY COMPLETE
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