```
SEQ PG LIN  LABEL  OP    OPERANDS                                                SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

101               JOB   FORTRAN COMPILER -- CONSTANTS PHASE ONE -- 18
102               CTL   6611
103         *
104         * CONSTANTS IN THE SOURCE PROGRAM ARE NOTED AND NORMALIZED
105         * AND/OR TRUNCATED.  THE ONLY WORD MARKS IN THE STATEMENT ARE
106         * UNDER THE GROUP MARKS THAT SEPARATE PREFIX FROM BODY AND
107         * ONE STATEMENT FROM ANOTHER.
108         *
109         X1     EQU   89                                                        0089
110         X2     EQU   94                                                        0094
111         X3     EQU   99                                                        0099
112         *
113         * ON ENTRY, X1 IS THE TOP OF CODE.
114         *
115         * ON EXIT, CODE IS MOVED UP TO THE TOP, 83 IS THE TOP OF
116         * CODE, AND X2 IS ONE BELOW THE BOTTOM OF CODE.
117         *
118         * STUFF IN THE RESIDENT AREA
119         *
120         GLOBER EQU   184  GLOBAL ERROR FLAG -- WM MEANS ERROR                 0184
121         TOPCOR EQU   688  TOP CORE ADDRESS FROM PARAM CARD                    0688
122         IMOD   EQU   690  INTEGER MODULUS -- NUMBER OF DIGITS                 0690
123         MANTIS EQU   692  FLOATING POINT MANTISSA DIGITS                      0692
124         *
125               EXT00   SNAPSH, LOADNX, CDOVLY                                                MACRO
126         SNAPSH EQU   333                                                      0333             GEN
127         PHASLD EQU   381                                                      0381             GEN
128         SNAPEX EQU   564                                                      0564             GEN
129         LOADNX EQU   700   CARD OVERLAY UNLESS NOP                           0700             GEN
130         CDOVLY EQU   700   1 IF LOADING FROM CARDS, N IF FROM TAPE           0700             GEN
131         TPREAD EQU   704   LOAD OVERLAY FROM TAPE                            0704             GEN
132         TPERR  EQU   728                                                      0728             GEN
133         *
134               EXT03   START, TOP OF PHASE 3                                                  MACRO
135         BEGIN3 EQU   838                                                      0838             GEN
136         TOP3   EQU   2600                                                     2600             GEN
137         *
138         110    DCW   @CONST ONE@                                          9  0110                       1
139         094    DCW   000                                                  3  0094                       2
140         096    DC    00                                                   2  0096                       2
141         099    DCW   000                                                  3  0099                       2
142         100    DC    0                                                    1  0100                       2
143         *
144         * LOAD THIS BLOCK AND PART 2
145         *
146         PHAS18 LDPH  CONST ONE,LOADAD,LOADNX,,,18.1                                          MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]               GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                                    GEN
            *                                                                               GEN
            * LOAD A BLOCK                                                                  GEN
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                         SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

            *                                                                                   GEN
147         )6J003 EQU   110  PHASE ID                                            0110          GEN
148         )6K003 EQU   700  LOAD NEXT PHASE                                     0700          GEN
149         )6L003 EQU   704  TAPE READ INSTRUCTION                               0704          GEN
150         )6M003 EQU   728  TAPE ERROR HANDLER                                  0728          GEN
            *                                                                                   GEN
151                ORG   201                                                          0201
152         PHAS18 EQU   *&1                                                      0201          GEN
153                LCA   )9J003,)6J003                                         7  0201  L 252 110   GEN     3   252     110
154                BCE   )6K003,)6K003,1      Q: LOADING FROM CARDS?           8  0208  B 700 700 1 GEN     3   700     700
155                BCE   )6K003,)6L003&4,0    Q: LOADING FROM AUTOCODER TAPE?  8  0216  B 700 708 0 GEN     3   700     708
156                RTW   1,LOADAD             READ THE BLOCK                   8  0224  L %U1 838 R GEN     3   %U1     838
157                BER   )6M003               Q: TAPE ERROR?                   5  0232  B 728 L     GEN     3   728
158                CS    LOADNX,)9R003        ENTER THE BLOCK                  7  0237  / 700 258   GEN     4   700     258
159         )9J003 DCW   @CONST ONE@          PHASE ID                         9  0252              GEN     4
160                DC    #1                                                    1  0253              GEN     4
161                DC    @18.1@          PHASE NUMBER                          4  0257              GEN     4
162         )9R003 DCW   @}@                                                   1  0258              GEN     4
163                XFR   PHAS18                                                       B 201                 5   201
164         *
165                ORG   BEGIN3                                                       0838
166         LOADAD EQU   *&1          LOAD ADDRESS                                0838
167    838  BEGN18 CS    299                                                   4  0838  / 299                 6   299
168    842         SW    GM                                                    4  0842  , L28                 6  2328
169    846         SW    200                                                   4  0846  , 200                 6   200
170    850         MCW   TOPCOR,X2                                             7  0850  M 688 094             6   688     094
171    857         MN    0&X2                                                  4  0857  D 0!0                 6   000+2
172    861         MN                                                          1  0861  D                     6
173    862         SAR   X2          TOPCOR-2                                  4  0862  Q 094                 6   094
174    866         SBR   83          TOPCOR-2                                  4  0866  H 083                 7   083
175    870         LCA   GM,1&X2     GMWM TO TOPCOR-1                          7  0870  L L28 0!1             7  2328     001+2
176    877  LOOP   BCE   DONE,0&X1,  BOTTOM OF STATEMENTS IF BLANK             8  0877  B J53 0|0             7  2153     000+1
177    885         MCW   0&X1,SEQCOD                                           7  0885  M 0|0 L32             7   000+1  2332
178    892         LCA   0&X1,PREFIX                                           7  0892  L 0|0 L42             7   000+1  2342
179    899         SAR   X1                                                    4  0899  Q 089                 7   089
180    903         SBR   SX1                                                   4  0903  H L45                 8  2345
181    907         SBR   SX2,0&X2                                              7  0907  H L48 0!0             8  2348     000+2
182    914         LCA   PREFIX,0&X2  MOVE PREFIX UP                           7  0914  L L42 0!0             8  2342     000+2
183    921         SBR   X2                                                    4  0921  H 094                 8   094
184    925         MCW   SEQCOD-3,*&8                                          7  0925  M L29 939             8  2329     939
185    932         BCE   IO,CODES,0  INTERESTING STATEMENT?                    8  0932  B 972 L58 0           8   972    2358
186    940         CHAIN 9                                                                          MACRO
187                BCE                                                         1  0940  B           GEN     8
188                BCE                                                         1  0941  B           GEN     9
189                BCE                                                         1  0942  B           GEN     9
190                BCE                                                         1  0943  B           GEN     9
191                BCE                                                         1  0944  B           GEN     9
192                BCE                                                         1  0945  B           GEN     9
193                BCE                                                         1  0946  B           GEN     9
194                BCE                                                         1  0947  B           GEN     9
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

195             BCE                                                        1  0948  B          GEN     10
196    949      LCA   0&X1,0&X2   MOVE STATEMENT BODY UP                   7  0949  L 0|0 0!0          10   000+1   000+2
197    956      SAR   X1                                                   4  0956  Q 089              10   089
198    960      C     0&X2                                                 4  0960  C 0!0              10   000+2
199    964      SAR   X2                                                   4  0964  Q 094              10   094
200    968      B     LOOP                                                 4  0968  B 877              10   877
201         *
202         * I/O, IF, DO, ARITHEMTIC STATEMENT
203         *
204    972  IO  SBR   X3,CODTAB-4                                          7  0972  H 099 K86          10   099    2286
205    979      MCW   SEQCOD-3,*&8                                         7  0979  M L29 993          11  2329     993
206    986  SEARCH BCE FOUND,4&X3,0                                        8  0986  B |02 0?4 0        11  1002     004+3
207    994      SBR   X3                                                   4  0994  H 099              11   099
208    998      B     SEARCH                                               4  0998  B 986              11   986
209         *
210         * FOUND THE STATEMENT CODE IN CODTAB.  COPY THE INTERESTING
211         * PUNCTUATION AND THE COUNT TO PUNCNT.  THE PUNCTUATION
212         * MARK IS WHAT IS SOUGHT IN THE STATEMENT.  THE COUNT
213         * PART IS 2 MINUS THE NUMBER OF TIMES THE PUNCTUATION
214         * MARK MUST BE FOUND.  IT STARTS AT 0, 1 OR 2, AND IS
215         * INCREMENTED UNTIL IT IS 2.
216         *
217  1 002  FOUND  MCW   6&X3,PUNCNT                                        7  1002  M 0?6 L60          11   006+3  2360
218  1 009      MCW   PUNCNT-1,SCHPUN&7                                    7  1009  M L59 |38          11  2359    1038
219  1 016  SCHCNT BCE FOUND2,PUNCNT,2  FOUND IT ENOUGH TIMES?            8  1016  B |67 L60 2        12  1067    2360
220  1 024      A     K1,PUNCNT                                            7  1024  A L61 L60          12  2361    2360
221  1 031  SCHPUN BCE GOTPUN,0&X1,0  FOUND THE DESIRED PUNCTUATION?      8  1031  B |55 0|0 0       12  1055     000+1
222  1 039      BCE   FOUND2,0&X1,}  FOUND GM?                            8  1039  B |67 0|0 } GMARK  12  1067     000+1
223  1 047      SBR   X1                                                   4  1047  H 089              12   089
224  1 051      B     SCHPUN  GO SEARCH FOR MORE PUNCTUATION               4  1051  B |31              12  1031
225  1 055  GOTPUN MN    0&X1                                             4  1055  D 0|0              13   000+1
226  1 059      SAR   X1                                                   4  1059  Q 089              13   089
227  1 063      B     SCHCNT  GO TEST HAVE WE SEEN IT ENOUGH TIMES?       4  1063  B |16              13  1016
228  1 067  FOUND2 BWZ NOZONE,0&X1,3  DIGIT OR GMWM?                      8  1067  V |91 0|0 3        13  1091     000+1
229  1 075      SBR   X1                                                   4  1075  H 089              13   089
230  1 079      BCE   SWITCH,1&X1,$  SUBSCRIPT?                           8  1079  B /76 0|1 $        13  1176     001+1
231  1 087      B     FOUND2                                               4  1087  B |67              13  1067
232  1 091  NOZONE BCE ENDSTM,0&X1,}  GM MEANS END OF STATEMENT           8  1091  B J74 0|0 } GMARK  14  2174     000+1
233  1 099      SBR   X1                                                   4  1099  H 089              14   089
234  1 103      BCE   FOUND2,1&X1,#  ASSIGNMENT OPERATOR IS NOT A NUMBER  8  1103  B |67 0|1 #        14  1067     001+1
235  1 111      BCE   FOUND2,1&X1,@  ATSIGN IS NOT A NUMBER              8  1111  B |67 0|1 @        14  1067     001+1
236  1 119      MCW   2&X1,BEFORE                                         7  1119  M 0|2 L27          14   002+1  2327
237  1 126      MCW        AT                                            1  1126  M                  14
238  1 127      MCW        AFTER                                         1  1127  M                  14
239  1 128      SAR   X1                                                   4  1128  Q 089              15   089
240  1 132      MCW   BEFORE,*&8                                         7  1132  M L27 /46          15  2327    1146
241  1 139      BCE   FOUND3,OPPUN,0  CHAR BEFORE IS OPERATOR OR PUNCT?  8  1139  B S16 L72 0        15  1216    2372
242  1 147      CHAIN 10                                                                 MACRO
243             BCE                                                        1  1147  B          GEN     15
244             BCE                                                        1  1148  B          GEN     15
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

245               BCE                                                      1  1149  B           GEN     15
246               BCE                                                      1  1150  B           GEN     15
247               BCE                                                      1  1151  B           GEN     16
248               BCE                                                      1  1152  B           GEN     16
249               BCE                                                      1  1153  B           GEN     16
250               BCE                                                      1  1154  B           GEN     16
251               BCE                                                      1  1155  B           GEN     16
252               BCE                                                      1  1156  B           GEN     16
253  1 157        BCE   ENDSTM,1&X1,}                                      8  1157  B J74 0|1 } GMARK   16  2174     001+1
254  1 165  BACKSP SBR   X1,1&X1                                           7  1165  H 089 0|1           17   089     001+1
255  1 172        B     FOUND2                                             4  1172  B |67               17  1067
256       *
257       * SUBSCRIPT BEGIN
258       *
259  1 176  SWITCH NOP   UNSW                                             4  1176  N /98               17  1198
260  1 180        MCW   BRANCH,SWITCH                                      7  1180  M L73 /76           17  2373    1176
261  1 187        MCW   KB1,SWICH3&4  SET TO UNCONDITIONAL BRANCH         7  1187  M M83 !42           17  2483    2042
262  1 194        B     FOUND2                                             4  1194  B |67               17  1067
263       *
264       * SUBSCRIPT END
265       *
266  1 198  UNSW   MCW   NOP,SWITCH                                        7  1198  M L74 /76           18  2374    1176
267  1 205        MCW   UNEQ,SWICH3&4  SET TO BRANCH UNEQUAL              7  1205  M L75 !42           18  2375    2042
268  1 212        B     FOUND2                                             4  1212  B |67               18  1067
269       *
270       * FOUND A DIGIT PRECEDED BY AN OPERATOR OR PUNCTUATION IN OPPUN
271       *
272  1 216  FOUND3 BCE   DECMAL,3&X1,.  3&X1 = BEFORE                      8  1216  B K11 0|3 .         18  2211     003+1
273  1 224        MCW   AFTER,*&8                                          7  1224  M L25 S38           18  2325    1238
274  1 231        BCE   BACKSP,ATHRUR,0  ?A-I!J-R ?                       8  1231  B /65 L95 0         19  1165    2395
275  1 239        CHAIN 19                                                                 MACRO
276               BCE                                                      1  1239  B           GEN     19
277               BCE                                                      1  1240  B           GEN     19
278               BCE                                                      1  1241  B           GEN     19
279               BCE                                                      1  1242  B           GEN     19
280               BCE                                                      1  1243  B           GEN     19
281               BCE                                                      1  1244  B           GEN     19
282               BCE                                                      1  1245  B           GEN     20
283               BCE                                                      1  1246  B           GEN     20
284               BCE                                                      1  1247  B           GEN     20
285               BCE                                                      1  1248  B           GEN     20
286               BCE                                                      1  1249  B           GEN     20
287               BCE                                                      1  1250  B           GEN     20
288               BCE                                                      1  1251  B           GEN     20
289               BCE                                                      1  1252  B           GEN     21
290               BCE                                                      1  1253  B           GEN     21
291               BCE                                                      1  1254  B           GEN     21
292               BCE                                                      1  1255  B           GEN     21
293               BCE                                                      1  1256  B           GEN     21
294               BCE                                                      1  1257  B           GEN     21
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

295  1 258          BCE   TESTIF,3&X1,)                                       8  1258  B J62 0|3 )         21  2162     003+1
296  1 266  MARK    SW    3&X1  WM ABOVE FIELD                                 4  1266  , 0|3               22   003+1
297  1 270          MCW   SX1,X3                                              7  1270  M L45 099           22  2345     099
298  1 277          LCA   0&X3,0&X2  MOVE UP STUFF ABOVE FIELD                7  1277  L 0?0 0!0           22   000+3   000+2
299  1 284          SBR   X2                                                  4  1284  H 094               22   094
300  1 288          MCW   KLESS,3&X1                                         7  1288  M L96 0|3           22  2396     003+1
301  1 295          SBR   TLESS&6,3&X1                                      7  1295  H J17 0|3           22  2117     003+1
302  1 302          CW    1&X2                                              4  1302  ) 0!1               23   001+2
303  1 306          LCA   KUNDER,0&X2  MARK TOP OF CONSTANT                  7  1306  L L97 0!0           23  2397     000+2
304  1 313          SBR   X2                                                4  1313  H 094               23   094
305  1 317          CW    1&X2                                              4  1317  ) 0!1               23   001+2
306  1 321          CW    FLAG                                              4  1321  ) N23               23  2523
307  1 325          S     EXP                                               4  1325  S L99               23  2399
308  1 329          S     SIGWID                                            4  1329  S M02               23  2402
309  1 333          S     NLZ                                               4  1333  S M07               24  2407
310  1 337          MCW   SW,SWNOP                                          7  1337  M M03 K43           24  2403    2243
311  1 344          MCW   NOP,ASN2                                          7  1344  M L74 T90           24  2374    1390
312  1 351          MCW   BRANCH,SWICH2                                     7  1351  M L73 U04           24  2373    1404
313  1 358          SBR   MAN&3,ADD                                         7  1358  H K54 L20           24  2254    2320
314  1 365          SBR   MSN&3,SUB                                         7  1365  H K25 L21           24  2225    2321
315  1 372          SBR   X1,2&X1                                           7  1372  H 089 0|2           25   089     002+1
316  1 379  ZSCAN   MCW   0&X1,AT                                           7  1379  M 0|0 L26           25   000+1  2326
317  1 386          SAR   X1                                                4  1386  Q 089               25   089
318  1 390  ASN2    NOP   KP1,EXP  ADD, SUB OR NOP                          7  1390  N M04 L99           25  2404    2399
319  1 397          A     KP1,NLZ                                           7  1397  A M04 M07           25  2404    2407
320  1 404  SWICH2  BCE   ZSCAN,AT,0                                        8  1404  B T79 L26 0         26  1379    2326
321  1 412          BCE   MSN,AT,.                                          8  1412  B K22 L26 .         26  2222    2326
322  1 420          BCE   MAN,SWICH2,B                                      8  1420  B K51 U04 B         26  2251    1404
323  1 428          A     KP1,SIGWID                                        7  1428  A M04 M02           26  2404    2402
324  1 435  TSTASG  BCE   KLEFT,AT,#  CONSTANT ON LEFT SIDE OF EQUAL SIGN    8  1435  B X20 L26 #         26  1720    2326
325  1 443          BCE   *&9,AT,@    ORIGINALLY SLASH IN INPUT?            8  1443  B U59 L26 @         27  1459    2326
326  1 451          BWZ   ZSCAN,AT,2                                         8  1451  V T79 L26 2         27  1379    2326
327  1 459          C     MAN&3,ANOP                                        7  1459  C K54 L24           27  2254    2324
328  1 466          BU    GOTIK                                             5  1466  B Z31 /             27  1931
329  1 471          BWZ   *&8,EXP,B                                         8  1471  V U86 L99 B         27  1486    2399
330  1 479          A     KP1,EXP                                           7  1479  A M04 L99           28  2404    2399
331  1 486          SW    2&X1                                              4  1486  , 0|2               28   002+1
332  1 490          BCE   DEC2,2&X1,.                                       8  1490  B Y22 0|2 .         28  1822     002+1
333  1 498  DECBAK  BCE   GOTEXP,AT,E                                       8  1498  B Y37 L26 E         28  1837    2326
334  1 506  EXPBAK  C     NLZ,KP01                                          7  1506  C M07 M09           28  2407    2409
335  1 513          NOP   SYNTAX                                            4  1513  N X84               28  1784
336  1 517          NOP                                                     1  1517  N                   28
337  1 518          C     SIGWID,KPZ3                                       7  1518  C M02 M12           29  2402    2412
338  1 525          BU    GOTFPK                                            5  1525  B V49 /             29  1549
339  1 530  SYNBAK  LCA   K15K,0&X2                                         7  1530  L M15 0!0           29  2415     000+2
340  1 537          SBR   X2                                                4  1537  H 094               29   094
341  1 541          CW    1&X2                                              4  1541  ) 0!1               29   001+2
342  1 545          B     TLESSX                                            4  1545  B J00               29  2100
343          *
344          * FOUND A FLOATING-POINT CONSTANT
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

345         *
346  1 549  GOTFPK MCW   X1,SX1A                                            7  1549  M 089 M18           29   089    2418
347  1 556         BW    *&8,FLAG                                          8  1556  V V71 N23 1         30  1571    2523
348  1 564         LCA   0&X3,1&X3                                         7  1564  L 0?0 0?1           30   000+3   001+3
349  1 571         MCW   SX1B,X1                                           7  1571  M M21 089           30  2421     089
350  1 578         MCW   MANTIS,WIDTH                                      7  1578  M 692 M23           30   692    2423
351  1 585         A     KP2,WIDTH                                         7  1585  A M24 M23           30  2424    2423
352  1 592         SBR   X3,198                                            7  1592  H 099 198           31   099     198
353  1 599         SW    200                                               4  1599  , 200               31   200
354  1 603  FLOOP  MCW   0&X1,AT  USE THE                                  7  1603  M 0|0 L26           31   000+1  2326
355  1 610         SAR   X1          PRINT AREA                            4  1610  Q 089               31   089
356  1 614         MCW   AT,2&X3       TO REVERSE                        7  1614  M L26 0?2           31  2326     002+3
357  1 621         SBR   X3              THE CONSTANT                      4  1621  H 099               31   099
358  1 625         BW    FINFK,1&X1        TO CORRECT                      8  1625  V W52 0|1 1         32  1652     001+1
359  1 633         S     KP1,WIDTH           ORDER                         7  1633  S M04 M23           32  2404    2423
360  1 640         C     WIDTH,KP00                                        7  1640  C M23 M26           32  2423    2426
361  1 647         BU    FLOOP                                             5  1647  B W03 /             32  1603
362  1 652  FINFK  SBR   X3,1&X3  FINISHED WITH FLOATING POINT CONSTANT     7  1652  H 099 0?1           32   099     001+3
363  1 659  SKIP0  BCE   *&5,0&X3,0                                        8  1659  B W71 0?0 0         33  1671     000+3
364  1 667         B     NOT0                                              4  1667  B W83               33  1683
365  1 671         MN    0&X3                                              4  1671  D 0?0               33   000+3
366  1 675         SAR   X3                                                4  1675  Q 099               33   099
367  1 679         B     SKIP0                                             4  1679  B W59               33  1659
368  1 683  NOT0   MN    0&X3                                              4  1683  D 0?0               33   000+3
369  1 687         SAR   X3                                                4  1687  Q 099               33   099
370  1 691         MCW   EXP,3&X3   MOVE EXPONENT                         7  1691  M L99 0?3           34  2399     003+3
371  1 698         MZ    ADD2,1&X3  ZONE FOR MANTISSA                      7  1698  Y M27 0?1           34  2427     001+3
372  1 705         LCA   3&X3,0&X2                                         7  1705  L 0?3 0!0           34   003+3   000+2
373  1 712         SBR   X2                                                4  1712  H 094               34   094
374  1 716         B     KFIN                                              4  1716  B !89               34  2089
375         *
376         * CONSTANT ON LEFT SIDE OF EQUAL SIGN
377         *
378  1 720  KLEFT  CS    332                                               4  1720  / 332               34   332
379  1 724         CS                                                      1  1724  /                   34
380  1 725         SW    GLOBER                                            4  1725  , 184               35   184
381  1 729         MN    SEQCOD,256                                        7  1729  D L32 256           35  2332     256
382  1 736         MN                                                      1  1736  D                   35
383  1 737         MN                                                      1  1737  D                   35
384  1 738         MCW   KLM1                                              4  1738  M M49               35  2449
385  1 742         MCW   KLM2                                              4  1742  M M82               35  2482
386  1 746         W                                                       1  1746  2                   35
387  1 747         BCV   *&5                                              5  1747  B X56 @             36  1756
388  1 752         B     *&3                                               4  1752  B X58               36  1758
389  1 756         CC    1                                                 2  1756  F 1                 36
390  1 758         MCW   SX2,X2                                            7  1758  M L48 094           36  2348     094
391  1 765         MCW   KB1,0&X2                                          7  1765  M M83 0!0           36  2483     000+2
392  1 772         C     0&X1                                              4  1772  C 0|0               36   000+1
393  1 776         SAR   X1                                                4  1776  Q 089               36   089
394  1 780         B     LOOP                                              4  1780  B 877               37   877
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

395         *
396         * SYNTAX ERROR FOR CONSTANT
397         *
398  1 784  SYNTAX CS    332                                         4  1784  / 332              37   332
399  1 788         CS                                               1  1788  /                  37
400  1 789         SW    GLOBER                                     4  1789  , 184              37   184
401  1 793         MN    SEQCOD,241                                 7  1793  D L32 241          37  2332     241
402  1 800         MN                                               1  1800  D                  37
403  1 801         MN                                               1  1801  D                  37
404  1 802         MCW   ERR44                                      4  1802  M N21              38  2521
405  1 806         W                                                1  1806  2                  38
406  1 807         BCV   *&5                                        5  1807  B Y16 @            38  1816
407  1 812         B     *&3                                        4  1812  B Y18              38  1818
408  1 816         CC    1                                          2  1816  F 1                38
409  1 818         B     SYNBAK                                     4  1818  B V30              38  1530
410         *
411  1 822  DEC2   MCW   K0,2&X1                                    7  1822  M N22 0|2          38  2522     002+1
412  1 829         SW    FLAG                                       4  1829  , N23              39  2523
413  1 833         B     DECBAK                                     4  1833  B U98              39  1498
414         *
415         * FLOATING-POINT EXPONENT
416         *
417  1 837  GOTEXP ZA    PZE,THEEXP                                 7  1837  ? N24 N26          39  2524    2526
418  1 844         BWZ   EXPNS,0&X1,2                               8  1844  V Y63 0|0 2        39  1863     000+1
419  1 852         MZ    0&X1,THEEXP  EXPONENT IS SIGNED            7  1852  Y 0|0 N26          39   000+1  2526
420  1 859         SAR   X1                                         4  1859  Q 089              39   089
421  1 863  EXPNS  MN    0&X1                                       4  1863  D 0|0              39   000+1
422  1 867         SAR   X1                                         4  1867  Q 089              40   089
423  1 871         C     0&X1,Z                                     7  1871  C 0|0 N27          40   000+1  2527
424  1 878         BL    EXP2                                       5  1878  B Y94 T            40  1894
425  1 883         MN    1&X1,THEEXP                                7  1883  D 0|1 N26          40   001+1  2526
426  1 890         B     EXP3                                       4  1890  B Z12              40  1912
427  1 894  EXP2   MN    1&X1,THEEXP-1                              7  1894  D 0|1 N25          40   001+1  2525
428  1 901         MN    0&X1,THEEXP                                7  1901  D 0|0 N26          41   000+1  2526
429  1 908         SAR   X1                                         4  1908  Q 089              41   089
430  1 912  EXP3   A     THEEXP,EXP                                 7  1912  A N26 L99          41  2526    2399
431  1 919         MN    0&X1                                       4  1919  D 0|0              41   000+1
432  1 923         SAR   X1                                         4  1923  Q 089              41   089
433  1 927         B     EXPBAK                                     4  1927  B V06              41  1506
434         *
435         * FOUND INTEGER CONSTANT
436         *
437  1 931  GOTIK  C     SIGWID,KPZ3                                7  1931  C M02 M12          41  2402    2412
438  1 938         BU    I2                                         5  1938  B Z62 /            42  1962
439  1 943         LCA   KB0,0&X2  ZERO CONSTANT                    7  1943  L N29 0!0          42  2529     000+2
440  1 950         SBR   X2                                         4  1950  H 094              42   094
441  1 954         CW    1&X2                                       4  1954  ) 0!1              42   001+2
442  1 958         B     TLESSX                                     4  1958  B J00              42  2100
443  1 962  I2     MCW   X1,SX1A                                    7  1962  M 089 M18          42   089    2418
444  1 969         MCW   SX1B,X3                                    7  1969  M M21 099          42  2421     099
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

445  1 976         SW    0&X3                                                4  1976  , 0?0               43   000+3
446  1 980         SBR   X3,299                                             7  1980  H 099 299           43   099     299
447  1 987         MCW   IMOD,WIDTH                                         7  1987  M 690 M23           43   690    2423
448  1 994  ILOOP  MCW   2&X1,AT  MOVE UP                                   7  1994  M 0|2 L26           43   002+1  2326
449  2 001         SAR   X1         CONSTANT,                               4  2001  Q 089               43   089
450  2 005         MCW   AT,0&X3      REVERSING DIGITS                      7  2005  M L26 0?0           43  2326     000+3
451  2 012         SBR   X3             TO CORRECT                          4  2012  H 099               44   099
452  2 016         BW    FINIK,1&X1       ORDER                             8  2016  V !43 0|1 1         44  2043     001+1
453  2 024         S     KP1,WIDTH                                          7  2024  S M04 M23           44  2404    2423
454  2 031         C     WIDTH,KP00                                         7  2031  C M23 M26           44  2423    2426
455  2 038  SWICH3 BU    ILOOP                                              5  2038  B Z94 /             44  1994
456  2 043  FINIK  SW    1&X3  FINISHED WITH INTEGER CONSTANT               4  2043  , 0?1               44   001+3
457  2 047         LCA   299,0&X2                                          7  2047  L 299 0!0           45   299     000+2
458  2 054         SBR   X2                                                4  2054  H 094               45   094
459  2 058         CW    1&X3                                               4  2058  ) 0?1               45   001+3
460  2 062         C     SIGWID,KP001                                       7  2062  C M02 N32           45  2402    2532
461  2 069         BU    KFIN                                               5  2069  B !89 /             45  2089
462  2 074         CW    1&X2                                               4  2074  ) 0!1               45   001+2
463  2 078         LCA   KB1A,0&X2                                          7  2078  L N33 0!0           45  2533     000+2
464  2 085         SBR   X2                                                4  2085  H 094               46   094
465  2 089  KFIN   CW    1&X2  FINISHED WITH INTEGER OR FP CONSTANT          4  2089  ) 0!1               46   001+2
466  2 093         MCW   SX1A,X1                                            7  2093  M M18 089           46  2418     089
467  2 100  TLESSX SBR   X1,1&X1                                           7  2100  H 089 0|1           46   089     001+1
468  2 107         SBR   SX1                                               4  2107  H L45               46  2345
469  2 111  TLESS  BCE   FOUND2,0-0,<                                      8  2111  B |67 000 <         46  1067     000
470         *
471         * PROGRAM IS TOO BIG
472         *
473  2 119         CS    332                                                4  2119  / 332               46   332
474  2 123         CS                                                       1  2123  /                   47
475  2 124         CC    1                                                  2  2124  F 1                 47
476  2 126         MCW   ERROR2,270                                         7  2126  M N69 270           47  2569     270
477  2 133         W                                                        1  2133  2                   47
478  2 134         CC    1                                                  2  2134  F 1                 47
479  2 136         BCE   HALT,CDOVLY,1                                     8  2136  B J49 700 1         47  2149     700
480  2 144         RWD   1                                                  5  2144  U %U1 R             47   %U1
481  2 149  HALT   H     HALT                                               4  2149  . J49               48  2149
482         *
483         * TAPE BLOCK IS TOO BIG FOR CHM TAU EMULATOR
484         *
485         END1   DCW   @}@                                                1  2153                GMARK  48
486                XFR   LOADNX        LOAD THIS                                    B 700                  49   700
487         PART2  LDPH  ,DONE,BEGN18,,,18.2  LOAD PART2 AND START IN PART 1                              MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]                           GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                                              GEN
            *                                                                                          GEN
            * LOAD A BLOCK                                                                             GEN
            *                                                                                          GEN
488         )6K004 EQU   700  LOAD NEXT PHASE                                 0700                    GEN
489         )6L004 EQU   704  TAPE READ INSTRUCTION                           0704                    GEN
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

490         )6M004  EQU   728  TAPE ERROR HANDLER                                 0728             GEN
            *                                                                                      GEN
491                 ORG   201                                                             0201
492         PART2   EQU   *&1                                                       0201             GEN
493                 BCE   )6K004,)6K004,1      Q: LOADING FROM CARDS?            8  0201  B 700 700 1 GEN     50   700     700
494                 BCE   )6K004,)6L004&4,0    Q: LOADING FROM AUTOCODER TAPE?   8  0209  B 700 708 0 GEN     50   700     708
495                 RTW   1,DONE             READ THE BLOCK                    8  0217  L %U1 J53 R GEN     50   %U1    2153
496                 BER   )6M004               Q: TAPE ERROR?                  5  0225  B 728 L     GEN     50   728
497                 CS    BEGN18,)9R004        ENTER THE BLOCK                 7  0230  / 838 242   GEN     50   838     242
498                 DC    #1                                                   1  0237              GEN     50
499                 DC    @18.2@          PHASE NUMBER                         4  0241              GEN     51
500         )9R004  DCW   @}@                                                  1  0242              GEN     51
501                 XFR   PART2                                                       B 201             52   201
502                 ORG   END1                                                         2153
503         *
504         * DONE
505         *
506  2 153  DONE    BSS   SNAPSH,C                                            5  2153  B 333 C           53   333
507  2 179          B     LOADNX                                             4  2158  B 700             53   700
508         *
509         * CHECK FOR IF STATEMENT
510         *
511  2 183  TESTIF  BCE   ENDSTM,SEQCOD-3,E  IF STATEMENT?                    8  2162  B J74 L29 E       53  2174    2329
512  2 191          B     MARK                                               4  2170  B S66             53  1266
513         *
514         * END OF STATEMENT.  MOVE IT UP
515         *
516  2 195  ENDSTM  MCW   SX1,X3                                             7  2174  M L45 099         53  2345     099
517  2 202          LCA   0&X3,0&X2                                          7  2181  L 0?0 0!0         53   000+3   000+2
518  2 209          SAR   X3                                                 4  2188  Q 099             53   099
519  2 213          C     0&X2                                               4  2192  C 0!0             54   000+2
520  2 217          SAR   X2                                                 4  2196  Q 094             54   094
521  2 221          MCW   X3,X1                                              7  2200  M 099 089         54   099     089
522  2 228          B     LOOP                                               4  2207  B 877             54   877
523         *
524         * FP CONSTANT BEGN18ING WITH A DECIMAL POINT
525         *
526  2 232  DECMAL  SBR   X1,1&X1                                            7  2211  H 089 0|1         54   089     001+1
527  2 239          B     MARK                                               4  2218  B S66             54  1266
528         *
529         * DECIMAL POINT
530         *
531  2 243  MSN     MCW   SUB2,ASN2  MOVE SUB OR NOP                         7  2222  M N70 T90         54  2570    1390
532  2 250          MCW   ANOP,MAN&3                                         7  2229  M L24 K54         55  2324    2254
533  2 257          MCW   X1,X3                                              7  2236  M 089 099         55   089     099
534  2 264  SWNOP   SW    FLAG  EITHER SW OR NOP                             4  2243  , N23             55  2523
535  2 268          B     ZSCAN                                              4  2247  B T79             55  1379
536         *
537  2 272  MAN     MCW   ADD2,ASN2  MOVE ADD OR NOP                         7  2251  M M27 T90         55  2427    1390
538  2 279          MCW   ANOP,MSN&3                                         7  2258  M L24 K25         55  2324    2225
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                    SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
539  2 286          MCW   NOP,SWICH2                                    7  2265  M L74 U04           56  2374    1404
540  2 293          SBR   SX1B,1&X1                                     7  2272  H M21 0|1           56  2421     001+1
541  2 300          MCW   NOP,SWNOP                                     7  2279  M L74 K43           56  2374    2243
542  2 307          B     TSTASG                                        4  2286  B U35               56  1435
543          *
544          * DATA
545          *
546          CODTAB EQU   *&1                                              2290                      
547  2 340          DCW   @R 2E 2D#1L,15,0U,1P,16,01,13,1@             30  2319                      57
548  2 341  ADD     A                                                   1  2320  A                   57
549  2 342  SUB     S                                                   1  2321  S                   57
550  2 345  ANOP    DSA   NOP                                           3  2324  L74                 57  2374
551  2 346  AFTER   DCW   #1    CHAR AFTER DIGIT                        1  2325                      57
552  2 347  AT      DCW   #1    DIGIT                                   1  2326                      57
553  2 348  BEFORE  DCW   #1    CHAR BEFORE DIGIT                       1  2327                      57
554  2 349  GM      DC    @}@   GM                                      1  2328              GMARK   57
555  2 353  SEQCOD  DCW   #4    STATEMENT CODE, SEQUENCE NUMBER         4  2332                      58
556  2 363  PREFIX  DCW   #10   ENTIRE STATEMENT PREFIX                10  2342                      58
557  2 366  SX1     DCW   #3                                            3  2345                      58
558  2 369  SX2     DCW   #3                                            3  2348                      58
559  2 379  CODES   DCW   @UPL3165DER@  I/O, DO, IF, ARITH CODES       10  2358                      58
560  2 381  PUNCNT  DCW   #2                                            2  2360                      58
561  2 382  K1      DCW   1                                             1  2361                      58
562  2 393  OPPUN   DCW   @)}@.#%$,*-&@  OPERATORS AND PUNCTUATION     11  2372                      59
563  2 394  BRANCH  B                                                   1  2373  B                   59
564  2 395  NOP     NOP                                                 1  2374  N                   59
565  2 396  UNEQ    DCW   @/@  D-MODIFIER FOR UNEQUAL BRANCH           1  2375                      59
566  2 416  ATHRUR  DCW   @?ABCDEFGHI!JKLMNOPQR@                      20  2395                      59
567  2 417  KLESS   DCW   @<@                                           1  2396                      59
568  2 418  KUNDER  DCW   @_@                                           1  2397                      59
569  2 420  EXP     DCW   #2                                            2  2399                      60
570  2 423  SIGWID  DCW   #3  SIGNIFICANT WIDTH OF CONSTANT            3  2402                      60
571  2 424  SW      SW                                                  1  2403  ,                   60
572  2 425  KP1     DCW   &1                                            1  2404                      60
573  2 428  NLZ     DCW   #3  NUMBER OF LEADING ZEROS                   3  2407                      60
574  2 430  KP01    DCW   &01                                           2  2409                      60
575  2 433  KPZ3    DCW   &000                                          3  2412                      60
576  2 436  K15K    DSA   15000                                         3  2415  ?0?                 61 15000
577  2 439  SX1A    DCW   #3                                            3  2418                      61
578  2 442  SX1B    DCW   #3                                            3  2421                      61
579  2 444  WIDTH   DCW   #2  MANTIS OR IMOD                           2  2423                      61
580  2 445  KP2     DCW   &2                                            1  2424                      61
581  2 447  KP00    DCW   &00                                           2  2426                      61
582  2 448  ADD2    A                                                   1  2427  A                   61
583  2 470  KLM1    DCW   @EQUAL SIGN, STATEMENT @                     22  2449                      62
584  2 503  KLM2    DCW   @ERROR 41 - CONSTANT LEFT SIDE OF @          33  2482                      63
585  2 504  KB1     DCW   #1                                            1  2483                      63
586  2 542  ERR44   DCW   @ERROR 44 - CONSTANT SYNTAX, STATEMENT @     38  2521                      64
587  2 543  K0      DCW   0                                             1  2522                      64
588  2 544  FLAG    DCW   #1                                            1  2523                      65
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

589  2 545  PZE     DCW   &0                                                1  2524                    65
590  2 547  THEEXP  DCW   #2                                                2  2526                    65
591  2 548  Z       DCW   @Z@                                               1  2527                    65
592  2 550  KB0     DCW   @ 0@                                              2  2529                    65
593  2 553  KP001   DCW   &001                                             3  2532                    65
594  2 554  KB1A    DCW   #1                                                1  2533                    65
595  2 590  ERROR2  DCW   @MESSAGE 2 - OBJECT PROGRAM TOO LARGE@           36  2569                    66
596  2 600  SUB2    S                                                       1  2570  S                 66
597  2 601  GMWM    DCW   @}@                                               1  2571            GMARK   66
598                 ORG   *&X00  MOKOTOFF V3M4.LST LINE 4022                    2600
599 *        FREBOT EQU   *                                                    2599
600                 XFR   BEGN18                                                  B 838               67   838
601          CLRME  CLRA  BEGN18,GMWM                                                        MACRO
             *      CLRA  CLRBOT,CLRTOP[,ORG,GMWMAD]                                         GEN
             *                                                                               GEN
             * CLEAR CORE AFTER A PHASE USING THE CLRTOP ADDRESS                             GEN
             *                                                                               GEN
602                 ORG   201                                                      0201
             *                                                                               GEN
             * CLEAR DOWN TO CLRBOT & X00 THE EASY WAY                                       GEN
             *                                                                               GEN
603          CLRME  EQU   *&1                                                  0201          GEN
604          )0J005 CS    GMWM         CLEAR FROM CLRTOP                   4  0201  / N71       GEN      68  2571
605                 SBR   )0J005&3                                          4  0205  H 204       GEN      68   204
606                 SBR   )0L005&6                                          4  0209  H 250       GEN      68   250
607                 C     )0J005&3,)0M005   DOWN TO CLRBOT & X00?           7  0213  C 204 261   GEN      68   204     261
608                 BU    )0J005                                            5  0220  B 201 /     GEN      68   201
             *                                                                               GEN
             * NOW CLEAR DOWN TO CLRBOT THE HARD WAY                                         GEN
             *                                                                               GEN
609          )0K005 C     )0L005&6,)0N005                                   7  0225  C 250 264   GEN      68   250     264
610                 BU    )0L005                                            5  0232  B 244 /     GEN      68   244
611                 CS    LOADNX,)0Q005  LOAD THE NEXT BLOCK AT 1           7  0237  / 700 271   GEN      69   700     271
612          )0L005 LCA   )0P005,0-0     CLEAR WITH BLANK AND WORD MARK    7  0244  L 265 000   GEN      69   265     000
613                 SBR   )0L005&6                                          4  0251  H 250       GEN      69   250
614                 B     )0K005                                            4  0255  B 225       GEN      69   225
615          )0M005 DSA   )0R005         CLRBOT & X00 - 1                  3  0261  899         GEN      69   899
616          )0N005 DSA   BEGN18         CLRBOT                            3  0264  838         GEN      69   838
617          )0P005 DCW   #1                                                1  0265              GEN      69
618                 DC    @CLRA @     IDENTIFY IN A DECK, TAPE, OR DUMP     5  0270              GEN      69
619          )0Q005 DCW   @}@                                               1  0271              GEN      70
620                 ORG   BEGN18&X00                                              0900
621          )0R005 EQU   *           CLRBOT & X00 - 1                         0899              GEN
622                 XFR   CLRME                                                   B 201                71   201
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
)0J005	0201: 0	)0K005	0225: 0	)0L005	0244: 0	)0M005	0261: 0	)0N005	0264: 0	)0P005	0265: 0
)0Q005	0271: 0	)0R005	0899: 0	)6J003	0110: 0	)6K003	0700: 0	)6K004	0700: 0	)6L003	0704: 0
)6L004	0704: 0	)6M003	0728: 0	)6M004	0728: 0	)9J003	0252: 0	)9R003	0258: 0	)9R004	0242: 0
ADD	2320: 0	ADD2	2427: 0	AFTER	2325: 0	ANOP	2324: 0	ASN2	1390: 0	AT	2326: 0
ATHRUR	2395: 0	BACKSP	1165: 0	BEFORE	2327: 0	BEGIN3	0838: 0	BEGN18	0838: 0	BRANCH	2373: 0
CDOVLY	0700: 0	CLRME	0201: 0	CODES	2358: 0	CODTAB	2290: 0	DEC2	1822: 0	DECBAK	1498: 0
DECMAL	2211: 0	DONE	2153: 0	END1	2153: 0	ENDSTM	2174: 0	ERR44	2521: 0	ERROR2	2569: 0
EXP	2399: 0	EXP2	1894: 0	EXP3	1912: 0	EXPBAK	1506: 0	EXPNS	1863: 0	FINFK	1652: 0
FINIK	2043: 0	FLAG	2523: 0	FLOOP	1603: 0	FOUND	1002: 0	FOUND2	1067: 0	FOUND3	1216: 0
FREBOT	2599: 0	GLOBER	0184: 0	GM	2328: 0	GMWM	2571: 0	GOTEXP	1837: 0	GOTFPK	1549: 0
GOTIK	1931: 0	GOTPUN	1055: 0	HALT	2149: 0	I2	1962: 0	ILOOP	1994: 0	IMOD	0690: 0
IO	0972: 0	K0	2522: 0	K1	2361: 0	K15K	2415: 0	KB0	2529: 0	KB1	2483: 0
KB1A	2533: 0	KFIN	2089: 0	KLEFT	1720: 0	KLESS	2396: 0	KLM1	2449: 0	KLM2	2482: 0
KP00	2426: 0	KP001	2532: 0	KP01	2409: 0	KP1	2404: 0	KP2	2424: 0	KPZ3	2412: 0
KUNDER	2397: 0	LOADAD	0838: 0	LOADNX	0700: 0	LOOP	0877: 0	MAN	2251: 0	MANTIS	0692: 0
MARK	1266: 0	MSN	2222: 0	NLZ	2407: 0	NOP	2374: 0	NOT0	1683: 0	NOZONE	1091: 0
OPPUN	2372: 0	PART2	0201: 0	PHAS18	0201: 0	PHASLD	0381: 0	PREFIX	2342: 0	PUNCNT	2360: 0
PZE	2524: 0	SCHCNT	1016: 0	SCHPUN	1031: 0	SEARCH	0986: 0	SEQCOD	2332: 0	SIGWID	2402: 0
SKIP0	1659: 0	SNAPEX	0564: 0	SNAPSH	0333: 0	SUB	2321: 0	SUB2	2570: 0	SW	2403: 0
SWICH2	1404: 0	SWICH3	2038: 0	SWITCH	1176: 0	SWNOP	2243: 0	SX1	2345: 0	SX1A	2418: 0
SX1B	2421: 0	SX2	2348: 0	SYNBAK	1530: 0	SYNTAX	1784: 0	TESTIF	2162: 0	THEEXP	2526: 0
TLESS	2111: 0	TLESSX	2100: 0	TOP3	2600: 0	TOPCOR	0688: 0	TPERR	0728: 0	TPREAD	0704: 0
TSTASG	1435: 0	UNEQ	2375: 0	UNSW	1198: 0	WIDTH	2423: 0	X1	0089: 0	X2	0094: 0
X3	0099: 0	Z	2527: 0	ZSCAN	1379: 0						

UNREFERENCED SYMBOLS

FREBOT PHASLD SNAPEX TOP3 TPERR TPREAD