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

101               JOB   FORTRAN COMPILER -- ARITH PHASE ONE -- PHASE 33
102               CTL   6611
103         *
104         * THIS IS A HOUSEKEEPING PHASE.  THE UNARY MINUS (NEGATE) AND
105         * EXPONENTIATION OPERATORS ARE CHANGED TO UNIQUE ONE-CHARACTER
106         * SYMBOLS (NEGATE BECOMES COMMA, EXPONENTIATE BECOMES DOT).
107         * ERROR CHECKING ALSO TAKES PLACE.
108         *
109         * ON ENTRY, X1 IS THE TOP OF THE PREFIX OF CODE IN LOW CORE,
110         * X2 IS X1&1, AND X3 IS TWO BELOW THE GM BELOW THE I/O STRINGS,
111         * FORMATS AND CONSTANTS IN HIGH CORE.
112         *
113         X1     EQU   89                                                      0089
114         X2     EQU   94                                                      0094
115         X3     EQU   99                                                      0099
116         *
117         * STUFF IN THE RESIDENT AREA
118         *
119         SERIES EQU   117  NEED SERIES ROUTINE IF NO WM                       0117
120         SINCOS EQU   118  SAW SINF OR COSF IF NO WM                          0118
121         SAWABS EQU   122  SAW ABSF IF NO WM                                  0122
122         SAWNEG EQU   123  SAW NEGATION OPERATOR (UNARY MINUS) IF NO WM       0123
123         GLOBER EQU   184  GLOBAL ERROR FLAG -- WM MEANS ERROR                0184
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         * LOAD THIS BLOCK AND THE NEXT ONE
139         *
140         PHAS33 LDPH  ARITH ONE,LOADAD,LOADNX,,,33.1                                            MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]                     GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                                         GEN
            *                                                                                     GEN
            * LOAD A BLOCK                                                                       GEN
            *                                                                                     GEN
141         )6J003 EQU   110  PHASE ID                                           0110             GEN
142         )6K003 EQU   700  LOAD NEXT PHASE                                    0700             GEN
143         )6L003 EQU   704  TAPE READ INSTRUCTION                              0704             GEN
144         )6M003 EQU   728  TAPE ERROR HANDLER                                 0728             GEN
            *                                                                                     GEN
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

145             ORG   201                                                    0201
146         PHAS33 EQU   *&1                                                0201          GEN
147             LCA   )9J003,)6J003                                     7   0201  L 252 110   GEN      1   252     110
148             BCE   )6K003,)6K003,1      Q: LOADING FROM CARDS?       8   0208  B 700 700 1 GEN      1   700     700
149             BCE   )6K003,)6L003&4,0    Q: LOADING FROM AUTOCODER TAPE? 8   0216  B 700 708 0 GEN      1   700     708
150             RTW   1,LOADAD             READ THE BLOCK               8   0224  L %U1 838 R GEN      1   %U1     838
151             BER   )6M003               Q: TAPE ERROR?               5   0232  B 728 L     GEN      1   728
152             CS    LOADNX,)9R003        ENTER THE BLOCK              7   0237  / 700 258   GEN      2   700     258
153         )9J003 DCW   @ARITH ONE@         PHASE ID                     9   0252          GEN      2
154             DC    #1                                                1   0253          GEN      2
155             DC    @33.1@          PHASE NUMBER                      4   0257          GEN      2
156         )9R003 DCW   @}@                                            1   0258          GEN      2
157             XFR   PHAS33                                                  B 201                2   201
158         *
159             ORG   BEGIN3                                                  0838
160         LOADAD EQU   *&1                                                0838
161    838  BEGN33 SBR   SX3,2&X3                                       7   0838  H M39 0?2           3  2439     002+3
162    845         SW    GM                                            4   0845  , J46               3  2146
163    849         MCW   0&X1,CODSEQ                                   7   0849  M 0|0 M33           3   000+1  2433
164    856         BCE   LOOP1,CODSEQ-3,R                             8   0856  B 890 M30 R         3   890    2430
165    864         BCE   LOOP1,CODSEQ-3,E                             8   0864  B 890 M30 E         3   890    2430
166    872         MCW   DOT,X2                                       7   0872  M M29 094           4  2429     094
167    879         B     DONE                                          4   0879  B 920               4   920
168    883  LOOP   MCW   0&X1,CODSEQ                                   7   0883  M 0|0 M33           4   000+1  2433
169    890  LOOP1  SBR   SX3B,0&X3                                     7   0890  H M36 0?0           4  2436     000+3
170    897         BCE   EXPR,CODSEQ-3,R                             8   0897  B 929 M30 R         4   929    2430
171    905         BCE   EXPR,CODSEQ-3,E                             8   0905  B 929 M30 E         5   929    2430
172    913         MCW   SX3,X2                                       7   0913  M M39 094           5  2439     094
173    920  DONE   BSS   SNAPSH,C                                     5   0920  B 333 C             5   333
174    939         B     LOADNX                                        4   0925  B 700               5   700
175         *
176         * EITHER ASSIGNMENT OR ARITHMETIC IF
177         *
178    943  EXPR   LCA   0&X1,0&X3  MOVE PREFIX UP                     7   0929  L 0|0 0?0           5   000+1   000+3
179    950         SAR   X1                                            4   0936  Q 089               5   089
180    954         C     0&X3                                          4   0940  C 0?0               5   000+3
181    958         SAR   X3                                            4   0944  Q 099               6   099
182    962         BWZ   *&5,CODSEQ,2                                  8   0948  V 960 M33 2         6   960    2433
183    970         B     *&9                                           4   0956  B 968               6   968
184    974         BWZ   EXPR2,CODSEQ-2,2                            8   0960  V 984 M31 2         6   984    2431
185    982         MCW   CODSEQ,X2                                    7   0968  M M33 094           6  2433     094
186    989         MN    0&X2,CODSEQ                                   7   0975  D 0!0 M33           6   000+2  2433
187    996         MN                                                  1   0982  D                   6
188    997         MN                                                  1   0983  D                   7
189    998  EXPR2  C     0&X1                                          4   0984  C 0|0               7   000+1
190  1 002         SAR   SX1                                           4   0988  Q M42               7  2442
191  1 006         BCE   ASG,CODSEQ-3,R                                8   0992  B |71 M30 R         7  1071    2430
192         *
193         * STATEMENT IS ARITHMETIC IF
194         *
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SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

195  1 014         C     0&X1,KB10  MOVE X1 DOWN                      7  1000  C 0|0 M52           7   000+1  2452
196  1 021         SAR   X1           BY TEN                          4  1007  Q 089               7   089
197  1 025         SW    1&X1                                         4  1011  , 0|1               7   001+1
198  1 029         LCA   10&X1,0&X3  MOVE UP LABELS                   7  1015  L 0/0 0?0           8   010+1   000+3
199  1 036         SAR   X1                                           4  1022  Q 089               8   089
200  1 040         C     0&X3                                         4  1026  C 0?0               8   000+3
201  1 044         SAR   X3                                           4  1030  Q 099               8   099
202  1 048         CW    1&X1,1&X3                                    7  1034  ) 0|1 0?1           8   001+1   001+3
203  1 055         LCA   GM                                           4  1041  L J46               8  2146
204  1 059         LCA   KIFBOT                                       4  1045  L M56               8  2456
205  1 063         SBR   X3                                           4  1049  H 099               9   099
206  1 067         CW    1&X3,5&X3                                    7  1053  ) 0?1 0?5           9   001+3   005+3
207  1 074         SBR   SX1B,0&X1                                    7  1060  H M59 0|0           9  2459     000+1
208  1 081         B     EXPR3                                        4  1067  B /29               9  1129
209          *
210          * STATEMENT IS ASSIGNMENT
211          *
212  1 085  ASG    SBR   X2,1&X1                                      7  1071  H 094 0|1           9   094     001+1
213  1 092         BCE   MSG23,0&X1,#  EQUAL SIGN IS FIRST            8  1078  B Z87 0|0 #         9  1987     000+1
214  1 100         SBR   SX1B,0&X1                                    7  1086  H M59 0|0          10  2459     000+1
215  1 107  GETEQ  BCE   GOTEQ,0&X1,#                                 8  1093  B /17 0|0 #        10  1117     000+1
216  1 115         BCE   MSG23,0&X1,}  NO EQUAL SIGN AT ALL          8  1101  B Z87 0|0 } GMARK  10  1987     000+1
217  1 123         SBR   X1                                           4  1109  H 089              10   089
218  1 127         B     GETEQ                                        4  1113  B |93              10  1093
219  1 131  GOTEQ  B     SUBCHK                                       4  1117  B !39              10  2039
220  1 135  ASGL   MN    0&X1                                         4  1121  D 0|0              10   000+1
221  1 139         SAR   X1                                           4  1125  Q 089              11   089
222  1 143  EXPR3  SBR   X2,1&X1                                      7  1129  H 094 0|1          11   094     001+1
223  1 150         SBR   SX1C                                         4  1136  H M62              11  2462
224  1 154  OPCHKL MN    0&X1,OPCHK&7                                 7  1140  D 0|0 /65          11   000+1  1165
225  1 161         MZ    0&X1,OPCHK&7                                 7  1147  Y 0|0 /65          11   000+1  1165
226  1 168         SAR   X1                                           4  1154  Q 089              11   089
227  1 172  OPCHK  BCE   GOTOP,OPRATR,0  &-@*#%) OR GM               8  1158  B /77 M70 0        12  1177    2470
228  1 180         CHAIN 7                                                                MACRO
229                BCE                                              1  1166  B                  GEN     12
230                BCE                                              1  1167  B                  GEN     12
231                BCE                                              1  1168  B                  GEN     12
232                BCE                                              1  1169  B                  GEN     12
233                BCE                                              1  1170  B                  GEN     12
234                BCE                                              1  1171  B                  GEN     12
235                BCE                                              1  1172  B                  GEN     13
236  1 187         B     OPCHKL                                       4  1173  B /40              13  1140
237  1 191  GOTOP  SBR   X1,1&X1                                      7  1177  H 089 0|1          13   089     001+1
238  1 198         BCE   MINUS,0&X1,-                                 8  1184  B V84 0|0 -        13  1584     000+1
239  1 206         BCE   LPAREN,0&X1,%                                8  1192  B W27 0|0 %        13  1627     000+1
240  1 214         BCE   STAR,0&X1,*                                  8  1200  B U17 0|0 *        13  1417     000+1
241  1 222         BCE   PLUS,0&X1,&                                  8  1208  B V30 0|0 &        14  1530     000+1
242  1 230         BCE   CHK27,0&X1,@  WAS ORIGINALLY SLASH          8  1216  B U32 0|0 @        14  1432     000+1
243  1 238         BCE   ASGL,0&X1,#                                  8  1224  B /21 0|0 #        14  1121     000+1
244  1 246         BCE   RPAREN,0&X1,)                                8  1232  B T25 0|0 )        14  1325     000+1
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
245  1 254          MN    1&X1,OPCHK2&7                                     7  1240  D 0|1 S61          14   001+1  1261
246  1 261          MZ    1&X1,OPCHK2&7                                     7  1247  Y 0|1 S61          15   001+1  1261
247  1 268  OPCHK2  BCE   MSG27,OPRAT2,0  &-*@.#,                          8  1254  B J08 M77 0        15  2108    2477
248  1 276          CHAIN 6                                                          MACRO
249                 BCE                                                   1  1262  B          GEN     15
250                 BCE                                                   1  1263  B          GEN     15
251                 BCE                                                   1  1264  B          GEN     15
252                 BCE                                                   1  1265  B          GEN     15
253                 BCE                                                   1  1266  B          GEN     15
254                 BCE                                                   1  1267  B          GEN     16
255  1 282          BCE   RESTR2,1&X1,                                     8  1268  B S96 0|1          16  1296     001+1
256  1 290          BCE   RESTR2,1&X1,%                                    8  1276  B S96 0|1 %        16  1296     001+1
257  1 298          BCE   RESTR2,1&X1,)                                    8  1284  B S96 0|1 )        16  1296     001+1
258  1 306          B     SUBCHK                                            4  1292  B !39              16  2039
259  1 310  RESTR2  MCW   SX1B,X2                                          7  1296  M M59 094          16  2459     094
260  1 317          LCA   0&X2,0&X3                                       7  1303  L 0!0 0?0          17   000+2   000+3
261  1 324          SBR   X3                                              4  1310  H 099              17   099
262  1 328          MCW   SX1,X1                                          7  1314  M M42 089          17  2442     089
263  1 335          B     LOOP                                            4  1321  B 883              17   883
264         *
265  1 339  RPAREN MCW   0&X1,RPARSV                                      7  1325  M 0|0 M79          17   000+1  2479
266  1 346          MCW   RPARSV-1,*&8  CHAR AFTER RIGHT PARENTHESIS       7  1332  M M78 T46          17  2478    1346
267  1 353          BCE   RPAR2,OPRAT3,0  &*@-})  INCLUDES GM             8  1339  B T64 M85 0        18  1364    2485
268  1 361          CHAIN 5                                                          MACRO
269                 BCE                                                   1  1347  B          GEN     18
270                 BCE                                                   1  1348  B          GEN     18
271                 BCE                                                   1  1349  B          GEN     18
272                 BCE                                                   1  1350  B          GEN     18
273                 BCE                                                   1  1351  B          GEN     18
274  1 366          BCE   RPAR2,RPARSV-1,#                                8  1352  B T64 M78 #        18  1364    2478
275  1 374          B     MSG27                                           4  1360  B J08              19  2108
276  1 378  RPAR2   MN    1&X1,OPCHK4&7                                   7  1364  D 0|1 T85          19   001+1  1385
277  1 385          MZ    1&X1,OPCHK4&7                                   7  1371  Y 0|1 T85          19   001+1  1385
278  1 392  OPCHK4 BCE   MSG27,OPRAT4,0  &-*.@ %,                         8  1378  B J08 M93 0        19  2108    2493
279  1 400          CHAIN 7                                                          MACRO
280                 BCE                                                   1  1386  B          GEN     19
281                 BCE                                                   1  1387  B          GEN     19
282                 BCE                                                   1  1388  B          GEN     19
283                 BCE                                                   1  1389  B          GEN     20
284                 BCE                                                   1  1390  B          GEN     20
285                 BCE                                                   1  1391  B          GEN     20
286                 BCE                                                   1  1392  B          GEN     20
287  1 407          BCE   ASGL,1&X1,#                                     8  1393  B /21 0|1 #        20  1121     001+1
288  1 415          BCE   ASGL,1&X1,)                                     8  1401  B /21 0|1 )        20  1121     001+1
289  1 423          B     SUBCHK                                          4  1409  B !39              20  2039
290  1 427          B     ASGL                                            4  1413  B /21              21  1121
291         *
292         * ASTERISK
293         *
294  1 431  STAR   MCW   0&X1,STAR2                                       7  1417  M 0|0 M95          21   000+1  2495
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
295  1 438          BCE   EXPON,STAR2-1,*                             8  1424  B U99 M94 *         21  1499    2494
296          * SLASH ORIGINALLY, NOW @
297  1 446  CHK27   BCE   MSG27,1&X1,#                                 8  1432  B J08 0|1 #         21  2108     001+1
298  1 454          BCE   MSG27,1&X1,%                                 8  1440  B J08 0|1 %         21  2108     001+1
299  1 462          BCE   MSG27,1&X1,                                  8  1448  B J08 0|1           22  2108     001+1
300  1 470  CHK31   MN    1&X1,OPCHK5&7                               7  1456  D 0|1 U77           22   001+1  1477
301  1 477          MZ    1&X1,OPCHK5&7                               7  1463  Y 0|1 U77           22   001+1  1477
302  1 484  OPCHK5  BCE   MSG31,OPRAT5,0  &-@*.,                     8  1470  B J47 N01 0         22  2147    2501
303  1 492          CHAIN 5                                                                 MACRO
304                 BCE                                               1  1478  B                GEN     22
305                 BCE                                               1  1479  B                GEN     22
306                 BCE                                               1  1480  B                GEN     22
307                 BCE                                               1  1481  B                GEN     23
308                 BCE                                               1  1482  B                GEN     23
309  1 497          BCE   ASGL,1&X1,)                                 8  1483  B /21 0|1 )         23  1121     001+1
310  1 505          B     SUBCHK                                      4  1491  B !39               23  2039
311  1 509          B     ASGL                                        4  1495  B /21               23  1121
312          *
313          * TWO ASTERISKS IN A ROW
314          *
315  1 513  EXPON   MN    0&X1                                        4  1499  D 0|0               23   000+1
316  1 517          MN                                                1  1503  D                   23
317  1 518          SAR   X1                                          4  1504  Q 089               24   089
318  1 522          MCW   DOT,2&X1  REPLACE ** BY DOT                 7  1508  M M29 0|2           24  2429     002+1
319  1 529          LCA   0&X1                                        4  1515  L 0|0               24   000+1
320  1 533          SBR   X1,2&X1                                     7  1519  H 089 0|2           24   089     002+1
321  1 540          B     CHK27                                       4  1526  B U32               24  1432
322          *
323          * PLUS SIGN
324          *
325  1 544  PLUS    BCE   IGNORE,1&X1,#  IS PLUS                     8  1530  B V58 0|1 #         24  1558     001+1
326  1 552          BCE   IGNORE,1&X1,%    SIGN                      8  1538  B V58 0|1 %         25  1558     001+1
327  1 560          BCE   IGNORE,1&X1,       UNARY?                 8  1546  B V58 0|1           25  1558     001+1
328  1 568          B     CHK31                                       4  1554  B U56               25  1456
329  1 572  IGNORE  MN    0&X1                                        4  1558  D 0|0               25   000+1
330  1 576          SAR   X1                                          4  1562  Q 089               25   089
331  1 580          LCA   0&X1,1&X1  MOVE UP, CLOBBERING PLUS SIGN    7  1566  L 0|0 0|1           25   000+1   001+1
332  1 587          SBR   X1,1&X1                                     7  1573  H 089 0|1           26   089     001+1
333  1 594          B     EXPR3                                       4  1580  B /29               26  1129
334          *
335          * MINUS SIGN
336          *
337  1 598  MINUS   BCE   NEGATE,1&X1,#                               8  1584  B W12 0|1 #         26  1612     001+1
338  1 606          BCE   NEGATE,1&X1,%                               8  1592  B W12 0|1 %         26  1612     001+1
339  1 614          BCE   NEGATE,1&X1,                                8  1600  B W12 0|1           26  1612     001+1
340  1 622          B     CHK31                                       4  1608  B U56               26  1456
341          *
342  1 626  NEGATE  MCW   COMMA,0&X1                                  7  1612  M N02 0|0           27  2502     000+1
343  1 633          CW    SAWNEG                                      4  1619  ) 123               27   123
344  1 637          B     ASGL                                        4  1623  B /21               27  1121
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SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

345         *
346         * LEFT PARENTHESIS
347         *
348  1 641  LPAREN BCE   FUNC,1&X1,F  MAYBE A FUNCTION               8  1627  B W69 0|1 F         27  1669     001+1
349  1 649         MN    1&X1,LPARC&7                               7  1635  D 0|1 W56           27   001+1  1656
350  1 656         MZ    1&X1,LPARC&7                               7  1642  Y 0|1 W56           27   001+1  1656
351  1 663  LPARC  BCE   ASGL,OPRAT6,0  &-*@ #%,.                  8  1649  B /21 N11 0         28  1121    2511
352  1 671         CHAIN 8                                                                 MACRO
353                BCE                                             1  1657  B           GEN     28
354                BCE                                             1  1658  B           GEN     28
355                BCE                                             1  1659  B           GEN     28
356                BCE                                             1  1660  B           GEN     28
357                BCE                                             1  1661  B           GEN     28
358                BCE                                             1  1662  B           GEN     28
359                BCE                                             1  1663  B           GEN     29
360                BCE                                             1  1664  B           GEN     29
361  1 679         B     MSG27                                     4  1665  B J08               29  2108
362         *
363         * LEFT PARENTHESIS FOLLOWS F, MAYBE A FUNCTION
364         *
365  1 683  FUNC   MCW   X2,SX2                                     7  1669  M 094 N14           29   094    2514
366  1 690         MCW   SX1C,X2                                    7  1676  M M62 094           29  2462     094
367  1 697         MN    0&X2                                       4  1683  D 0!0               29   000+2
368  1 701         SAR   X2                                        4  1687  Q 094               29   094
369  1 705         SW    0&X1                                       4  1691  , 0|0               30   000+1
370  1 709         SBR   SX1C,2&X1                                 7  1695  H M62 0|2           30  2462     002+1
371  1 716         C     SX1C,X2                                    7  1702  C M62 094           30  2462     094
372  1 723         BE    MSG27                                      5  1709  B J08 S             30  2108
373  1 728         SBR   SX1C,3&X1                                 7  1714  H M62 0|3           30  2462     003+1
374  1 735         C     SX1C,X2                                    7  1721  C M62 094           30  2462     094
375  1 742         BE    MSG27                                      5  1728  B J08 S             31  2108
376  1 747         MCW   X3,SX3C                                   7  1733  M 099 N17           31   099    2517
377  1 754         MCW   X1,SX1D                                   7  1740  M 089 N20           31   089    2520
378  1 761         SBR   X1,SINCOS                                 7  1747  H 089 118           31   089     118
379  1 768         SBR   X3,FNCLST                                 7  1754  H 099 M27           31   099    2427
380  1 775  FUNCL  BCE   NOTFNC,0&X3,*  SEARCH FUNCTION NAME TABLE 8  1761  B Y04 0?0 *         32  1804     000+3
381  1 783         SBR   X3                                        4  1769  H 099               32   099
382  1 787         C     0&X3,0&X2                                  7  1773  C 0?0 0!0           32   000+3   000+2
383  1 794         BE    GOTFNC                                     5  1780  B Y69 S             32  1869
384  1 799         C     0&X3                                       4  1785  C 0?0               32   000+3
385  1 803         SAR   X3                                        4  1789  Q 099               32   099
386  1 807         SBR   X1,1&X1                                   7  1793  H 089 0|1           32   089     001+1
387  1 814         B     FUNCL                                      4  1800  B X61               33  1761
388         *
389         * NAME ENDING IN F AND FOLLOWED BY LEFT PARENTHESIS
390         * IS NOT IN THE FUNCTION TABLE
391         *
392  1 818  NOTFNC CS    332                                        4  1804  / 332               33   332
393  1 822         CS                                              1  1808  /                   33
394  1 823         SW    GLOBER                                     4  1809  , 184               33   184
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
395  1 827          MN    CODSEQ,249                                           7  1813  D M33 249           33  2433     249
396  1 834          MN                                                         1  1820  D                   33
397  1 835          MN                                                         1  1821  D                   33
398  1 836          MCW   ERR29                                              4  1822  M N66               34  2566
399  1 840          W                                                        1  1826  2                   34
400  1 841          BCV   *&5                                                5  1827  B Y36 @             34  1836
401  1 846          B     *&3                                                4  1832  B Y38               34  1838
402  1 850          CC    1                                                  2  1836  F 1                 34
403  1 852          B     RESTRT                                             4  1838  B !21               34  2021
404           *
405           * NEED SERIES FOR UNDEFINED FUNCTION, SIN, COS, LOG, EXP, ATAN
406           *
407  1 856  GETSER CW    SERIES                                             4  1842  ) 117               34   117
408  1 860          B     FNC2                                               4  1846  B Z12               35  1912
409           *
410           * SIN AND COS ARE THE SAME
411           *
412  1 864  COSF   CW    SINCOS                                             4  1850  ) 118               35   118
413  1 868          B     GETSER                                             4  1854  B Y42               35  1842
414           *
415           * NEED NEGATE FOR ABS
416           *
417  1 872  ABSF   CW    SAWABS,SAWNEG  ABSF NEEDS NEGATION                 7  1858  ) 122 123           35   122     123
418  1 879          B     FNC2                                               4  1865  B Z12               35  1912
419           *
420  1 883  GOTFNC SW    1&X3                                               4  1869  , 0?1               35   001+3
421  1 887          BCE   COSF,1&X3,C  COSF                                 8  1873  B Y50 0?1 C         35  1850     001+3
422  1 895          BCE   ABSF,1&X3,A  ABSF                                 8  1881  B Y58 0?1 A         36  1858     001+3
423  1 903          CW    0&X1                                               4  1889  ) 0|0               36   000+1
424  1 907          MCW   1&X3,*&8                                           7  1893  M 0?1 Z07           36   001+3  1907
425  1 914          BCE   GETSER,SGECT,0  SIN LOG EXP COS ATAN              8  1900  B Y42 N71 0         36  1842    2571
426  1 922          CHAIN 4                                                                  MACRO
427                BCE                                                      1  1908  B           GEN     36
428                BCE                                                      1  1909  B           GEN     36
429                BCE                                                      1  1910  B           GEN     36
430                BCE                                                      1  1911  B           GEN     37
431  1 926  FNC2   BCE   INTFNC,0&X2,X  INTEGER FUNCTION RESULT?            8  1912  B Z75 0!0 X         37  1975     000+2
432  1 934  FNC3   MCW   1&X3,0&X2  MOVE FUNCTION CODE                       7  1920  M 0?1 0!0           37   001+3   000+2
433  1 941          MCW   KB1          AND A BLANK                          4  1927  M N72               37  2572
434  1 945          SBR   X2                                                 4  1931  H 094               37   094
435  1 949          MCW   SX3C,X3                                            7  1935  M N17 099           37  2517     099
436  1 956          MCW   SX1D,X1                                            7  1942  M N20 089           37  2520     089
437  1 963          CW    0&X1                                               4  1949  ) 0|0               38   000+1
438  1 967          SAR   X1                                                 4  1953  Q 089               38   089
439  1 971          LCA   0&X1,0&X2                                         7  1957  L 0|0 0!0           38   000+1   000+2
440  1 978          SBR   X1,0&X2                                           7  1964  H 089 0!0           38   089     000+2
441  1 985          B     EXPR3                                              4  1971  B /29               38  1129
442  1 989  INTFNC MN    0&X2                                               4  1975  D 0!0               38   000+2
443  1 993          SAR   X2                                                 4  1979  Q 094               38   094
444  1 997          B     FNC3                                               4  1983  B Z20               39  1920
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

445         *
446         * TAPE BLOCK IS TOO BIG FOR CHM TAU EMULATOR
447         *
448         END1    DCW   @}@                                                1  1987            GMARK   39
449                 XFR   LOADNX        LOAD THIS                                  B 700             39   700
450         PART2   LDPH  ,MSG23,BEGN33,,,33.2  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
451         )6K004 EQU   700  LOAD NEXT PHASE                                 0700              GEN
452         )6L004 EQU   704  TAPE READ INSTRUCTION                           0704              GEN
453         )6M004 EQU   728  TAPE ERROR HANDLER                              0728              GEN
            *                                                                                     GEN
454                 ORG   201                                                        0201
455         PART2   EQU   *&1                                                 0201              GEN
456                 BCE   )6K004,)6K004,1      Q: LOADING FROM CARDS?         8  0201  B 700 700 1 GEN     40   700     700
457                 BCE   )6K004,)6L004&4,0    Q: LOADING FROM AUTOCODER TAPE? 8  0209  B 700 708 0 GEN     40   700     708
458                 RTW   1,MSG23             READ THE BLOCK                 8  0217  L %U1 Z87 R GEN     40   %U1    1987
459                 BER   )6M004               Q: TAPE ERROR?                5  0225  B 728 L     GEN     40   728
460                 CS    BEGN33,)9R004        ENTER THE BLOCK               7  0230  / 838 242   GEN     40   838     242
461                 DC    #1                                                 1  0237              GEN     40
462                 DC    @33.2@          PHASE NUMBER                       4  0241              GEN     41
463         )9R004  DCW   @}@                                                1  0242              GEN     41
464                 XFR   PART2                                                    B 201             41   201
465                 ORG   END1                                                     1987
466         *
467         * EMIT CODING IS UNINTELLIGIBLE MESSAGE
468         *
469  2 001  MSG23   CS    332                                                4  1987  / 332             42   332
470  2 005          CS                                                       1  1991  /                 42
471  2 006          SW    GLOBER                                             4  1992  , 184             42   184
472  2 010          MN    CODSEQ,247                                         7  1996  D M33 247         42  2433     247
473  2 017          MN                                                       1  2003  D                 42
474  2 018          MN                                                       1  2004  D                 42
475  2 019          MCW   ERR23  UNINTELLIGIBLE                             4  2005  M O16             42  2616
476  2 023          W                                                        1  2009  2                 43
477  2 024          BCV   *&5                                                5  2010  B !19 @           43  2019
478  2 029          B     *&3                                                4  2015  B !21             43  2021
479  2 033          CC    1                                                  2  2019  F 1               43
480  2 035  RESTRT  MCW   SX3B,X3                                            7  2021  M M36 099         43  2436     099
481  2 042          MCW   SX1,X1                                             7  2028  M M42 089         43  2442     089
482  2 049          B     LOOP                                               4  2035  B 883             43   883
483         *
484         * CHECK FOR SUBSCRIPT?
485         *
486  2 053  SUBCHK SBR   SUBCHX&3                                            4  2039  H !68             44  2068
487  2 057          BCE   SUBCH2,1&X1,$                                      8  2043  B J85 0|1 $       44  2185     001+1
488  2 065          SBR   SX1E,4&X1                                          7  2051  H O19 0|4         44  2619     004+1
```

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

489  2 072  SUBCH3 C     SX1E,X2                                    7  2058  C O19 094           44  2619     094
490  2 079  SUBCHX BE    0                                          5  2065  B 000 S             44   000
491         *
492         * LEFT SIDE IS INVALID
493         *
494  2 084  MSG25  CS    332                                        4  2070  / 332               44   332
495  2 088         CS                                              1  2074  /                   44
496  2 089         SW    GLOBER                                     4  2075  , 184               45   184
497  2 093         MN    CODSEQ,243                                 7  2079  D M33 243           45  2433     243
498  2 100         MN                                              1  2086  D                   45
499  2 101         MN                                              1  2087  D                   45
500  2 102         MCW   ERR25                                     4  2088  M O59               45  2659
501  2 106         W                                               1  2092  2                   45
502  2 107         BCV   *&5                                       5  2093  B J02 @             45  2102
503  2 112         B     *&3                                       4  2098  B J04               46  2104
504  2 116         CC    1                                         2  2102  F 1                 46
505  2 118         B     RESTRT                                    4  2104  B !21               46  2021
506         *
507         * ARITHMETIC SYNTAX ERROR
508         *
509  2 122  MSG27  CS    332                                        4  2108  / 332               46   332
510  2 126         CS                                              1  2112  /                   46
511  2 127         SW    GLOBER                                     4  2113  , 184               46   184
512  2 131         MN    CODSEQ,249                                 7  2117  D M33 249           46  2433     249
513  2 138         MN                                              1  2124  D                   47
514  2 139         MN                                              1  2125  D                   47
515  2 140         MCW   ERR27                                     4  2126  M P05               47  2705
516  2 144         W                                               1  2130  2                   47
517  2 145         BCV   *&5                                       5  2131  B J40 @             47  2140
518  2 150         B     *&3                                       4  2136  B J42               47  2142
519  2 154         CC    1                                         2  2140  F 1                 47
520  2 156         B     RESTRT                                    4  2142  B !21               48  2021
521         *
522  2 160  GM     DC    @}@                                       1  2146              GMARK   48
523         *
524         * DOUBLE OPERATORS
525         *
526  2 161  MSG31  CS    332                                        4  2147  / 332               48   332
527  2 165         CS                                              1  2151  /                   48
528  2 166         SW    GLOBER                                     4  2152  , 184               48   184
529  2 170         MN    CODSEQ,242                                 7  2156  D M33 242           48  2433     242
530  2 177         MN                                              1  2163  D                   48
531  2 178         MN                                              1  2164  D                   48
532  2 179         MCW   ERR31                                     4  2165  M P44               49  2744
533  2 183         W                                               1  2169  2                   49
534  2 184         BCV   *&5                                       5  2170  B J79 @             49  2179
535  2 189         B     *&3                                       4  2175  B J81               49  2181
536  2 193         CC    1                                         2  2179  F 1                 49
537  2 195         B     RESTRT                                    4  2181  B !21               49  2021
538         *
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
539  2 199  SUBCH2  SBR   SX1E,12&X1                                        7  2185  H O19 0/2           49  2619     012+1
540  2 206          BCE   SUBCH3,11&X1,$                                   8  2192  B !58 0/1 $         50  2058     011+1
541  2 214          SBR   SX1E,18&X1                                       7  2200  H O19 0/8           50  2619     018+1
542  2 221          B     SUBCH3                                           4  2207  B !58               50  2058
543          *
544          * DATA
545          *
546  2 225          DCW   @*@                    WM CLEARED IF NEEDED      1  2211                      50
547  2 234          DCW   @   %FSOCC@  COSF      118 AND 117               9  2220                      50
548  2 243          DCW   @  %FSBAXA@  XABSF     122 AND 123               9  2229                      50
549  2 252          DCW   @ %FKNILXI@  XLINKF    139                       9  2238                      51
550  2 261          DCW   @        H@            138                       9  2247                      51
551  2 270          DCW   @        D@            137                       9  2256                      51
552  2 279          DCW   @        M@            136                       9  2265                      51
553  2 288          DCW   @        L@            135                       9  2274                      52
554  2 297          DCW   @        K@            134                       9  2283                      52
555  2 306          DCW   @        J@            133                       9  2292                      52
556  2 315          DCW   @        Z@            132                       9  2301                      52
557  2 324          DCW   @        Y@            131                       9  2310                      53
558  2 333          DCW   @        W@            130                       9  2319                      53
559  2 342          DCW   @        P@            129                       9  2328                      53
560  2 351          DCW   @        U@            128                       9  2337                      53
561  2 360          DCW   @        R@            127                       9  2346                      54
562  2 369          DCW   @  %FTRQSQ@  SQRTF     126                       9  2355                      54
563  2 378          DCW   @ %FTAOLFF@  FLOATF    125                       9  2364                      54
564  2 387          DCW   @  %FXIFXX@  XFIXF     124                       9  2373                      54
565  2 396          DCW   #9           NEGATION  123                       9  2382                      55
566  2 405          DCW   @   %FSBAA@  ABSF      122                       9  2391                      55
567  2 414          DCW   @  %FNATAT@  ATANF     121 AND 117               9  2400                      55
568  2 423          DCW   @   %FPXEE@  EXPF      129 AND 117               9  2409                      55
569  2 432          DCW   @   %FGOLG@  LOGF      119 AND 117               9  2418                      56
570  2 441  FNCLST  DCW   @   %FNISS@  SINF      118 AND 117               9  2427                      56
571  2 442          DCW   #1                                                1  2428                      56
572  2 443  DOT     DCW   @.@                                               1  2429                      56
573  2 447  CODSEQ  DCW   #4  STATEMENT CODE AND SEQUENCE NUMBER            4  2433                      56
574  2 450  SX3B    DCW   #3                                                3  2436                      56
575  2 453  SX3     DCW   #3                                                3  2439                      56
576  2 465  SX1     DCW   #3                                                3  2442                      57
577  2 475  KB10    DCW   #10                                              10  2452                      57
578  2 479  KIFBOT  DCW   @#<99@                                           4  2456                      57
579  2 482  SX1B    DCW   #3                                                3  2459                      57
580  2 485  SX1C    DCW   #3                                                3  2462                      57
581  2 493  OPRATR  DCW   @&-@*#%)}@                                       8  2470                      57
582  2 500  OPRAT2  DCW   @&-*@.#,@                                        7  2477                      57
583  2 502  RPARSV  DCW   #2  RIGHT PARENTHESIS AND NEXT CHARACTER         2  2479                      58
584  2 508  OPRAT3  DCW   @&*@-})@                                         6  2485                      58
585  2 516  OPRAT4  DCW   @&-*.@ %,@                                       8  2493                      58
586  2 518  STAR2   DCW   #2  ASTERISK AND NEXT CHARACTER                  2  2495                      58
587  2 524  OPRAT5  DCW   @&-@*.,@                                         6  2501                      58
588  2 525  COMMA   DCW   @,@                                              1  2502                      58
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SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

589  2 534  OPRAT6 DCW   @&-*@ #%,.@                                         9  2511                      58
590  2 537  SX2    DCW   #3                                                  3  2514                      59
591  2 540  SX3C   DCW   #3                                                  3  2517                      59
592  2 543  SX1D   DCW   #3                                                  3  2520                      59
593  2 589  ERR29  DCW   @ERROR 29 - UNDEFINED FUNCTION NAME, STATEMENT @   46  2566                      61
594  2 594  SGECT  DCW   @SGECT@                                            5  2571                      61
595  2 595  KB1    DCW   #1                                                  1  2572                      61
596  2 639  ERR23  DCW   @ERROR 23 - CODING UNINTELLIGIBLE, STATEMENT @     44  2616                      63
597  2 642  SX1E   DCW   #3                                                  3  2619                      63
598  2 682  ERR25  DCW   @ERROR 25 - LEFT SIDE INVALID, STATEMENT @         40  2659                      65
599  2 728  ERR27  DCW   @ERROR 27 - ARITHMETIC SYNTAX ERROR, STATEMENT @   46  2705                      67
600  2 767  ERR31  DCW   @ERROR 31 - DOUBLE OPERATORS, STATEMENT @         39  2744                      68
601  2 768  GMWM   DCW   @}@                                                 1  2745          GMARK       69
602                XFR   BEGN33                                                      B 838                 69   838
603         CLRME  CLRA  BEGN33,GMWM                                                                MACRO
            *      CLRA  CLRBOT,CLRTOP[,ORG,GMWMAD]                                                 GEN
            *                                                                                       GEN
            * CLEAR CORE AFTER A PHASE USING THE CLRTOP ADDRESS                                     GEN
            *                                                                                       GEN
604                ORG   201                                                          0201
            *                                                                                       GEN
            * CLEAR DOWN TO CLRBOT & X00 THE EASY WAY                                               GEN
            *                                                                                       GEN
605         CLRME  EQU   *&1                                                    0201                GEN
606         )0J005 CS    GMWM         CLEAR FROM CLRTOP                        4  0201  / P45       GEN      70  2745
607                SBR   )0J005&3                                               4  0205  H 204       GEN      70   204
608                SBR   )0L005&6                                               4  0209  H 250       GEN      70   250
609                C     )0J005&3,)0M005   DOWN TO CLRBOT & X00?                7  0213  C 204 261   GEN      70   204     261
610                BU    )0J005                                                 5  0220  B 201 /     GEN      70   201
            *                                                                                       GEN
            * NOW CLEAR DOWN TO CLRBOT THE HARD WAY                                                 GEN
            *                                                                                       GEN
611         )0K005 C     )0L005&6,)0N005                                        7  0225  C 250 264   GEN      70   250     264
612                BU    )0L005                                                 5  0232  B 244 /     GEN      70   244
613                CS    LOADNX,)0Q005  LOAD THE NEXT BLOCK AT 1                7  0237  / 700 271   GEN      71   700     271
614         )0L005 LCA   )0P005,0-0     CLEAR WITH BLANK AND WORD MARK         7  0244  L 265 000   GEN      71   265     000
615                SBR   )0L005&6                                               4  0251  H 250       GEN      71   250
616                B     )0K005                                                 4  0255  B 225       GEN      71   225
617         )0M005 DSA   )0R005         CLRBOT & X00 - 1                       3  0261  899         GEN      71   899
618         )0N005 DSA   BEGN33         CLRBOT                                 3  0264  838         GEN      71   838
619         )0P005 DCW   #1                                                    1  0265              GEN      71
620                DC    @CLRA @     IDENTIFY IN A DECK, TAPE, OR DUMP        5  0270              GEN      71
621         )0Q005 DCW   @}@                                                   1  0271              GEN      72
622                ORG   BEGN33&X00                                                   0900
623         )0R005 EQU   *           CLRBOT & X00 - 1                             0899              GEN
624                XFR   CLRME                                                       B 201                 72   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
ABSF	1858: 0	ASG	1071: 0	ASGL	1121: 0	BEGIN3	0838: 0	BEGN33	0838: 0	CDOVLY	0700: 0
CHK27	1432: 0	CHK31	1456: 0	CLRME	0201: 0	CODSEQ	2433: 0	COMMA	2502: 0	COSF	1850: 0
DONE	0920: 0	DOT	2429: 0	END1	1987: 0	ERR23	2616: 0	ERR25	2659: 0	ERR27	2705: 0
ERR29	2566: 0	ERR31	2744: 0	EXPON	1499: 0	EXPR	0929: 0	EXPR2	0984: 0	EXPR3	1129: 0
FNC2	1912: 0	FNC3	1920: 0	FNCLST	2427: 0	FUNC	1669: 0	FUNCL	1761: 0	GETEQ	1093: 0
GETSER	1842: 0	GLOBER	0184: 0	GM	2146: 0	GMWM	2745: 0	GOTEQ	1117: 0	GOTFNC	1869: 0
GOTOP	1177: 0	IGNORE	1558: 0	INTFNC	1975: 0	KB1	2572: 0	KB10	2452: 0	KIFBOT	2456: 0
LOADAD	0838: 0	LOADNX	0700: 0	LOOP	0883: 0	LOOP1	0890: 0	LPARC	1649: 0	LPAREN	1627: 0
MINUS	1584: 0	MSG23	1987: 0	MSG25	2070: 0	MSG27	2108: 0	MSG31	2147: 0	NEGATE	1612: 0
NOTFNC	1804: 0	OPCHK	1158: 0	OPCHK2	1254: 0	OPCHK4	1378: 0	OPCHK5	1470: 0	OPCHKL	1140: 0
OPRAT2	2477: 0	OPRAT3	2485: 0	OPRAT4	2493: 0	OPRAT5	2501: 0	OPRAT6	2511: 0	OPRATR	2470: 0
PART2	0201: 0	PHAS33	0201: 0	PHASLD	0381: 0	PLUS	1530: 0	RESTR2	1296: 0	RESTRT	2021: 0
RPAR2	1364: 0	RPAREN	1325: 0	RPARSV	2479: 0	SAWABS	0122: 0	SAWNEG	0123: 0	SERIES	0117: 0
SGECT	2571: 0	SINCOS	0118: 0	SNAPEX	0564: 0	SNAPSH	0333: 0	STAR	1417: 0	STAR2	2495: 0
SUBCH2	2185: 0	SUBCH3	2058: 0	SUBCHK	2039: 0	SUBCHX	2065: 0	SX1	2442: 0	SX1B	2459: 0
SX1C	2462: 0	SX1D	2520: 0	SX1E	2619: 0	SX2	2514: 0	SX3	2439: 0	SX3B	2436: 0
SX3C	2517: 0	TOP3	2600: 0	TPERR	0728: 0	TPREAD	0704: 0	X1	0089: 0	X2	0094: 0
X3	0099: 0										

UNREFERENCED SYMBOLS

CDOVLY MSG25 PHASLD SNAPEX TOP3 TPERR TPREAD