```
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 BSS   )8J003,G                                          5  0201  B 257 G     GEN      1   257
147             NOP     TO PATCH IN TRAPS FOR DEBUGGING                    1  0206  N           GEN      1
148         )0J003 EQU   *&1                                                0207                GEN
149             LCA   )9J003,)6J003                                        7  0207  L 281 110   GEN      1   281     110
150             BCE   )1J003,)6K003,1    Q: LOADING FROM CARDS?           8  0214  B 250 700 1 GEN      1   250     700
151             BCE   )1J003,)6L003&4,0  Q: LOADING FROM AUTOCODER TAPE?   8  0222  B 250 708 0 GEN      1   250     708
152             RTW   1,LOADAD           READ THE BLOCK                   8  0230  L %U1 838 R GEN      1   %U1     838
153             BER   )6M003             Q: TAPE ERROR?                   5  0238  B 728 L     GEN      2   728
154             CS    LOADNX,)9R003      ENTER THE BLOCK                  7  0243  / 700 287   GEN      2   700     287
155         )1J003 CS    )6K003,)9R003      LOAD CARDS OR AUTOCODER TAPE     7  0250  / 700 287   GEN      2   700     287
156         )8J003 SW    )9R003                                          4  0257  , 287       GEN      2   287
157             MU    %T0,)8K003,W                                       8  0261  M %T0 273 W GEN      2   %T0     273
158             H     )0J003                                             4  0269  . 207       GEN      2   207
159         )8K003 EQU   *&1                                                0273                GEN
160         )9J003 DCW   @ARITH ONE@          PHASE ID                   9  0281                GEN      3
161             DCW   #1                                                 1  0282                GEN      3
162             DC    @33.1@          PHASE NUMBER                       4  0286                GEN      3
163         )9R003 DCW   @}@                                              1  0287                GEN      3
164             XFR   PHAS33                                                   B 201               3   201
165         *
166             ORG   BEGIN3                                                   0838
167         LOADAD EQU   *&1                                                0838
168     838 BEGN33 SBR   SX3,2&X3                                          7  0838  H M34 0?2           4  2434     002+3
169     845        SW    GM                                               4  0845  , J41               4  2141
170     849        MCW   0&X1,CODSEQ                                      7  0849  M 0|0 M28           4   000+1  2428
171     856        BCE   LOOP1,CODSEQ-3,R                                 8  0856  B 890 M25 R         4   890    2425
172     864        BCE   LOOP1,CODSEQ-3,E                                 8  0864  B 890 M25 E         4   890    2425
173     872        MCW   DOT,X2                                           7  0872  M M24 094           5  2424     094
174     879        B     DONE                                             4  0879  B 920               5   920
175     883 LOOP   MCW   0&X1,CODSEQ                                      7  0883  M 0|0 M28           5   000+1  2428
176     890 LOOP1  SBR   SX3B,0&X3                                        7  0890  H M31 0?0           5  2431     000+3
177     897        BCE   EXPR,CODSEQ-3,R                                  8  0897  B 924 M25 R         5   924    2425
178     905        BCE   EXPR,CODSEQ-3,E                                  8  0905  B 924 M25 E         6   924    2425
179     913        MCW   SX3,X2                                           7  0913  M M34 094           6  2434     094
180     920 DONE   B     LOADNX                                           4  0920  B 700               6   700
181         *
182         * EITHER ASSIGNMENT OR ARITHMETIC IF
183         *
184     943 EXPR   LCA   0&X1,0&X3  MOVE PREFIX UP                        7  0924  L 0|0 0?0           6   000+1   000+3
185     950        SAR   X1                                               4  0931  Q 089               6   089
186     954        C     0&X3                                             4  0935  C 0?0               6   000+3
187     958        SAR   X3                                               4  0939  Q 099               6   099
188     962        BWZ   *&5,CODSEQ,2                                     8  0943  V 955 M28 2         7   955    2428
189     970        B     *&9                                              4  0951  B 963               7   963
190     974        BWZ   EXPR2,CODSEQ-2,2                                 8  0955  V 979 M26 2         7   979    2426
191     982        MCW   CODSEQ,X2                                        7  0963  M M28 094           7  2428     094
192     989        MN    0&X2,CODSEQ                                      7  0970  D 0!0 M28           7   000+2  2428
193     996        MN                                                     1  0977  D                   7
194     997        MN                                                     1  0978  D                   7
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SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

195    998  EXPR2  C     0&X1                                        4  0979  C 0|0                8   000+1
196  1 002         SAR   SX1                                       4  0983  Q M37                8  2437
197  1 006         BCE   ASG,CODSEQ-3,R                            8  0987  B |66 M25 R          8  1066    2425
198         *
199         * STATEMENT IS ARITHMETIC IF
200         *
201  1 014         C     0&X1,KB10  MOVE X1 DOWN                   7  0995  C 0|0 M47            8   000+1  2447
202  1 021         SAR   X1           BY TEN                       4  1002  Q 089                8   089
203  1 025         SW    1&X1                                      4  1006  , 0|1                8   001+1
204  1 029         LCA   10&X1,0&X3  MOVE UP LABELS                7  1010  L 0/0 0?0            8   010+1   000+3
205  1 036         SAR   X1                                        4  1017  Q 089                9   089
206  1 040         C     0&X3                                      4  1021  C 0?0                9   000+3
207  1 044         SAR   X3                                        4  1025  Q 099                9   099
208  1 048         CW    1&X1,1&X3                                 7  1029  ) 0|1 0?1            9   001+1   001+3
209  1 055         LCA   GM                                        4  1036  L J41                9  2141
210  1 059         LCA   KIFBOT                                    4  1040  L M51                9  2451
211  1 063         SBR   X3                                        4  1044  H 099                9   099
212  1 067         CW    1&X3,5&X3                                 7  1048  ) 0?1 0?5           10   001+3   005+3
213  1 074         SBR   SX1B,0&X1                                 7  1055  H M54 0|0           10  2454     000+1
214  1 081         B     EXPR3                                     4  1062  B /24               10  1124
215         *
216         * STATEMENT IS ASSIGNMENT
217         *
218  1 085  ASG    SBR   X2,1&X1                                   7  1066  H 094 0|1           10   094     001+1
219  1 092         BCE   MSG23,0&X1,#  EQUAL SIGN IS FIRST         8  1073  B Z82 0|0 #         10  1982     000+1
220  1 100         SBR   SX1B,0&X1                                 7  1081  H M54 0|0           11  2454     000+1
221  1 107  GETEQ  BCE   GOTEQ,0&X1,#                              8  1088  B /12 0|0 #         11  1112     000+1
222  1 115         BCE   MSG23,0&X1,}  NO EQUAL SIGN AT ALL       8  1096  B Z82 0|0 } GMARK   11  1982     000+1
223  1 123         SBR   X1                                        4  1104  H 089               11   089
224  1 127         B     GETEQ                                     4  1108  B |88               11  1088
225  1 131  GOTEQ  B     SUBCHK                                    4  1112  B !34               11  2034
226  1 135  ASGL   MN    0&X1                                      4  1116  D 0|0               11   000+1
227  1 139         SAR   X1                                        4  1120  Q 089               12   089
228  1 143  EXPR3  SBR   X2,1&X1                                   7  1124  H 094 0|1           12   094     001+1
229  1 150         SBR   SX1C                                      4  1131  H M57               12  2457
230  1 154  OPCHKL MN    0&X1,OPCHK&7                              7  1135  D 0|0 /60           12   000+1  1160
231  1 161         MZ    0&X1,OPCHK&7                              7  1142  Y 0|0 /60           12   000+1  1160
232  1 168         SAR   X1                                        4  1149  Q 089               12   089
233  1 172  OPCHK  BCE   GOTOP,OPRATR,0  &-@*#%) OR GM            8  1153  B /72 M65 0         13  1172    2465
234  1 180         CHAIN 7                                                                 MACRO
235                BCE                                             1  1161  B                GEN     13
236                BCE                                             1  1162  B                GEN     13
237                BCE                                             1  1163  B                GEN     13
238                BCE                                             1  1164  B                GEN     13
239                BCE                                             1  1165  B                GEN     13
240                BCE                                             1  1166  B                GEN     13
241                BCE                                             1  1167  B                GEN     14
242  1 187         B     OPCHKL                                    4  1168  B /35               14  1135
243  1 191  GOTOP  SBR   X1,1&X1                                   7  1172  H 089 0|1           14   089     001+1
244  1 198         BCE   MINUS,0&X1,-                              8  1179  B V79 0|0 -         14  1579     000+1
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

245  1 206          BCE   LPAREN,0&X1,%                                    8  1187  B W22 0|0 %         14  1622     000+1
246  1 214          BCE   STAR,0&X1,*                                      8  1195  B U12 0|0 *         14  1412     000+1
247  1 222          BCE   PLUS,0&X1,&                                      8  1203  B V25 0|0 &         15  1525     000+1
248  1 230          BCE   CHK27,0&X1,@  WAS ORIGINALLY SLASH               8  1211  B U27 0|0 @         15  1427     000+1
249  1 238          BCE   ASGL,0&X1,#                                      8  1219  B /16 0|0 #         15  1116     000+1
250  1 246          BCE   RPAREN,0&X1,)                                    8  1227  B T20 0|0 )         15  1320     000+1
251  1 254          MN    1&X1,OPCHK2&7                                    7  1235  D 0|1 S56           15   001+1  1256
252  1 261          MZ    1&X1,OPCHK2&7                                    7  1242  Y 0|1 S56           16   001+1  1256
253  1 268  OPCHK2  BCE   MSG27,OPRAT2,0  &-*@.#,                         8  1249  B J03 M72 0         16  2103    2472
254  1 276          CHAIN 6                                                                 MACRO
255                 BCE                                                    1  1257  B           GEN     16
256                 BCE                                                    1  1258  B           GEN     16
257                 BCE                                                    1  1259  B           GEN     16
258                 BCE                                                    1  1260  B           GEN     16
259                 BCE                                                    1  1261  B           GEN     16
260                 BCE                                                    1  1262  B           GEN     17
261  1 282          BCE   RESTR2,1&X1,                                     8  1263  B S91 0|1           17  1291     001+1
262  1 290          BCE   RESTR2,1&X1,%                                    8  1271  B S91 0|1 %         17  1291     001+1
263  1 298          BCE   RESTR2,1&X1,)                                    8  1279  B S91 0|1 )         17  1291     001+1
264  1 306          B     SUBCHK                                           4  1287  B !34               17  2034
265  1 310  RESTR2  MCW   SX1B,X2                                          7  1291  M M54 094           17  2454     094
266  1 317          LCA   0&X2,0&X3                                       7  1298  L 0!0 0?0           18   000+2   000+3
267  1 324          SBR   X3                                               4  1305  H 099               18   099
268  1 328          MCW   SX1,X1                                          7  1309  M M37 089           18  2437     089
269  1 335          B     LOOP                                             4  1316  B 883               18   883
270         *
271  1 339  RPAREN  MCW   0&X1,RPARSV                                      7  1320  M 0|0 M74           18   000+1  2474
272  1 346          MCW   RPARSV-1,*&8  CHAR AFTER RIGHT PARENTHESIS       7  1327  M M73 T41           18  2473    1341
273  1 353          BCE   RPAR2,OPRAT3,0  &*@-})  INCLUDES GM             8  1334  B T59 M80 0         19  1359    2480
274  1 361          CHAIN 5                                                                 MACRO
275                 BCE                                                    1  1342  B           GEN     19
276                 BCE                                                    1  1343  B           GEN     19
277                 BCE                                                    1  1344  B           GEN     19
278                 BCE                                                    1  1345  B           GEN     19
279                 BCE                                                    1  1346  B           GEN     19
280  1 366          BCE   RPAR2,RPARSV-1,#                                 8  1347  B T59 M73 #         19  1359    2473
281  1 374          B     MSG27                                            4  1355  B J03               20  2103
282  1 378  RPAR2   MN    1&X1,OPCHK4&7                                    7  1359  D 0|1 T80           20   001+1  1380
283  1 385          MZ    1&X1,OPCHK4&7                                    7  1366  Y 0|1 T80           20   001+1  1380
284  1 392  OPCHK4  BCE   MSG27,OPRAT4,0  &-*.@ %,                         8  1373  B J03 M88 0         20  2103    2488
285  1 400          CHAIN 7                                                                 MACRO
286                 BCE                                                    1  1381  B           GEN     20
287                 BCE                                                    1  1382  B           GEN     20
288                 BCE                                                    1  1383  B           GEN     20
289                 BCE                                                    1  1384  B           GEN     21
290                 BCE                                                    1  1385  B           GEN     21
291                 BCE                                                    1  1386  B           GEN     21
292                 BCE                                                    1  1387  B           GEN     21
293  1 407          BCE   ASGL,1&X1,#                                      8  1388  B /16 0|1 #         21  1116     001+1
294  1 415          BCE   ASGL,1&X1,)                                      8  1396  B /16 0|1 )         21  1116     001+1
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

295  1 423          B     SUBCHK                                        4  1404  B !34              21  2034
296  1 427          B     ASGL                                          4  1408  B /16              22  1116
297          *
298          * ASTERISK
299          *
300  1 431  STAR    MCW   0&X1,STAR2                                   7  1412  M 0|0 M90          22   000+1  2490
301  1 438          BCE   EXPON,STAR2-1,*                             8  1419  B U94 M89 *        22  1494    2489
302          * SLASH ORIGINALLY, NOW @
303  1 446  CHK27   BCE   MSG27,1&X1,#                                8  1427  B J03 0|1 #        22  2103     001+1
304  1 454          BCE   MSG27,1&X1,%                                8  1435  B J03 0|1 %        22  2103     001+1
305  1 462          BCE   MSG27,1&X1,                                 8  1443  B J03 0|1          23  2103     001+1
306  1 470  CHK31   MN    1&X1,OPCHK5&7                               7  1451  D 0|1 U72          23   001+1  1472
307  1 477          MZ    1&X1,OPCHK5&7                               7  1458  Y 0|1 U72          23   001+1  1472
308  1 484  OPCHK5  BCE   MSG31,OPRAT5,0  &-@*.,                     8  1465  B J42 M96 0        23  2142    2496
309  1 492          CHAIN 5                                                                 MACRO
310                 BCE                                               1  1473  B                  GEN     23
311                 BCE                                               1  1474  B                  GEN     23
312                 BCE                                               1  1475  B                  GEN     23
313                 BCE                                               1  1476  B                  GEN     24
314                 BCE                                               1  1477  B                  GEN     24
315  1 497          BCE   ASGL,1&X1,)                                 8  1478  B /16 0|1 )        24  1116     001+1
316  1 505          B     SUBCHK                                        4  1486  B !34              24  2034
317  1 509          B     ASGL                                          4  1490  B /16              24  1116
318          *
319          * TWO ASTERISKS IN A ROW
320          *
321  1 513  EXPON   MN    0&X1                                          4  1494  D 0|0              24   000+1
322  1 517          MN                                                1  1498  D                  24
323  1 518          SAR   X1                                          4  1499  Q 089              25   089
324  1 522          MCW   DOT,2&X1  REPLACE ** BY DOT                 7  1503  M M24 0|2          25  2424     002+1
325  1 529          LCA   0&X1                                        4  1510  L 0|0              25   000+1
326  1 533          SBR   X1,2&X1                                     7  1514  H 089 0|2          25   089     002+1
327  1 540          B     CHK27                                       4  1521  B U27              25  1427
328          *
329          * PLUS SIGN
330          *
331  1 544  PLUS    BCE   IGNORE,1&X1,#  IS PLUS                     8  1525  B V53 0|1 #        25  1553     001+1
332  1 552          BCE   IGNORE,1&X1,%    SIGN                      8  1533  B V53 0|1 %        26  1553     001+1
333  1 560          BCE   IGNORE,1&X1,       UNARY?                 8  1541  B V53 0|1          26  1553     001+1
334  1 568          B     CHK31                                       4  1549  B U51              26  1451
335  1 572  IGNORE  MN    0&X1                                        4  1553  D 0|0              26   000+1
336  1 576          SAR   X1                                          4  1557  Q 089              26   089
337  1 580          LCA   0&X1,1&X1  MOVE UP, CLOBBERING PLUS SIGN    7  1561  L 0|0 0|1          26   000+1   001+1
338  1 587          SBR   X1,1&X1                                     7  1568  H 089 0|1          27   089     001+1
339  1 594          B     EXPR3                                       4  1575  B /24              27  1124
340          *
341          * MINUS SIGN
342          *
343  1 598  MINUS   BCE   NEGATE,1&X1,#                               8  1579  B W07 0|1 #        27  1607     001+1
344  1 606          BCE   NEGATE,1&X1,%                               8  1587  B W07 0|1 %        27  1607     001+1
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

345  1 614          BCE   NEGATE,1&X1,                                8  1595  B W07 0|1           27  1607     001+1
346  1 622          B     CHK31                                       4  1603  B U51               27  1451
347          *
348  1 626  NEGATE  MCW   COMMA,0&X1                                  7  1607  M M97 0|0           28  2497     000+1
349  1 633          CW    SAWNEG                                      4  1614  ) 123               28   123
350  1 637          B     ASGL                                        4  1618  B /16               28  1116
351          *
352          * LEFT PARENTHESIS
353          *
354  1 641  LPAREN  BCE   FUNC,1&X1,F  MAYBE A FUNCTION               8  1622  B W64 0|1 F         28  1664     001+1
355  1 649          MN    1&X1,LPARC&7                                7  1630  D 0|1 W51           28   001+1  1651
356  1 656          MZ    1&X1,LPARC&7                                7  1637  Y 0|1 W51           28   001+1  1651
357  1 663  LPARC   BCE   ASGL,OPRAT6,0  &-*@ #%,.                   8  1644  B /16 N06 0         29  1116    2506
358  1 671          CHAIN 8                                                                 MACRO
359                 BCE                                               1  1652  B                GEN     29
360                 BCE                                               1  1653  B                GEN     29
361                 BCE                                               1  1654  B                GEN     29
362                 BCE                                               1  1655  B                GEN     29
363                 BCE                                               1  1656  B                GEN     29
364                 BCE                                               1  1657  B                GEN     29
365                 BCE                                               1  1658  B                GEN     30
366                 BCE                                               1  1659  B                GEN     30
367  1 679          B     MSG27                                       4  1660  B J03               30  2103
368          *
369          * LEFT PARENTHESIS FOLLOWS F, MAYBE A FUNCTION
370          *
371  1 683  FUNC    MCW   X2,SX2                                      7  1664  M 094 N09           30   094    2509
372  1 690          MCW   SX1C,X2                                     7  1671  M M57 094           30  2457     094
373  1 697          MN    0&X2                                        4  1678  D 0!0               30   000+2
374  1 701          SAR   X2                                        4  1682  Q 094               30   094
375  1 705          SW    0&X1                                        4  1686  , 0|0               31   000+1
376  1 709          SBR   SX1C,2&X1                                  7  1690  H M57 0|2           31  2457     002+1
377  1 716          C     SX1C,X2                                     7  1697  C M57 094           31  2457     094
378  1 723          BE    MSG27                                       5  1704  B J03 S             31  2103
379  1 728          SBR   SX1C,3&X1                                  7  1709  H M57 0|3           31  2457     003+1
380  1 735          C     SX1C,X2                                     7  1716  C M57 094           31  2457     094
381  1 742          BE    MSG27                                       5  1723  B J03 S             32  2103
382  1 747          MCW   X3,SX3C                                    7  1728  M 099 N12           32   099    2512
383  1 754          MCW   X1,SX1D                                    7  1735  M 089 N15           32   089    2515
384  1 761          SBR   X1,SINCOS                                  7  1742  H 089 118           32   089     118
385  1 768          SBR   X3,FNCLST                                  7  1749  H 099 M22           32   099    2422
386  1 775  FUNCL   BCE   NOTFNC,0&X3,*  SEARCH FUNCTION NAME TABLE  8  1756  B X99 0?0 *         33  1799     000+3
387  1 783          SBR   X3                                        4  1764  H 099               33   099
388  1 787          C     0&X3,0&X2                                   7  1768  C 0?0 0!0           33   000+3   000+2
389  1 794          BE    GOTFNC                                      5  1775  B Y64 S             33  1864
390  1 799          C     0&X3                                        4  1780  C 0?0               33   000+3
391  1 803          SAR   X3                                        4  1784  Q 099               33   099
392  1 807          SBR   X1,1&X1                                   7  1788  H 089 0|1           33   089     001+1
393  1 814          B     FUNCL                                       4  1795  B X56               34  1756
394          *
```

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

395         * NAME ENDING IN F AND FOLLOWED BY LEFT PARENTHESIS
396         * IS NOT IN THE FUNCTION TABLE
397         *
398  1 818  NOTFNC CS    332                                                4  1799  / 332              34   332
399  1 822         CS                                                       1  1803  /                  34
400  1 823         SW    GLOBER                                             4  1804  , 184              34   184
401  1 827         MN    CODSEQ,249                                         7  1808  D M28 249          34  2428     249
402  1 834         MN                                                       1  1815  D                  34
403  1 835         MN                                                       1  1816  D                  34
404  1 836         MCW   ERR29                                             4  1817  M N61              35  2561
405  1 840         W                                                        1  1821  2                  35
406  1 841         BCV   *&5                                               5  1822  B Y31 @            35  1831
407  1 846         B     *&3                                                4  1827  B Y33              35  1833
408  1 850         CC    1                                                  2  1831  F 1                35
409  1 852         B     RESTRT                                             4  1833  B !16              35  2016
410         *
411         * NEED SERIES FOR UNDEFINED FUNCTION, SIN, COS, LOG, EXP, ATAN
412         *
413  1 856  GETSER CW    SERIES                                             4  1837  ) 117              35   117
414  1 860         B     FNC2                                               4  1841  B Z07              36  1907
415         *
416         * SIN AND COS ARE THE SAME
417         *
418  1 864  COSF   CW    SINCOS                                             4  1845  ) 118              36   118
419  1 868         B     GETSER                                             4  1849  B Y37              36  1837
420         *
421         * NEED NEGATE FOR ABS
422         *
423  1 872  ABSF   CW    SAWABS,SAWNEG  ABSF NEEDS NEGATION                 7  1853  ) 122 123          36   122     123
424  1 879         B     FNC2                                               4  1860  B Z07              36  1907
425         *
426  1 883  GOTFNC SW    1&X3                                               4  1864  , 0?1              36   001+3
427  1 887         BCE   COSF,1&X3,C  COSF                                  8  1868  B Y45 0?1 C        36  1845     001+3
428  1 895         BCE   ABSF,1&X3,A  ABSF                                  8  1876  B Y53 0?1 A        37  1853     001+3
429  1 903         CW    0&X1                                               4  1884  ) 0|0              37   000+1
430  1 907         MCW   1&X3,*&8                                           7  1888  M 0?1 Z02          37   001+3  1902
431  1 914         BCE   GETSER,SGECT,0  SIN LOG EXP COS ATAN              8  1895  B Y37 N66 0        37  1837    2566
432  1 922         CHAIN 4                                                                  MACRO
433               BCE                                                      1  1903  B                  GEN  37
434               BCE                                                      1  1904  B                  GEN  37
435               BCE                                                      1  1905  B                  GEN  37
436               BCE                                                      1  1906  B                  GEN  38
437  1 926  FNC2   BCE   INTFNC,0&X2,X  INTEGER FUNCTION RESULT?            8  1907  B Z70 0!0 X        38  1970     000+2
438  1 934  FNC3   MCW   1&X3,0&X2  MOVE FUNCTION CODE                       7  1915  M 0?1 0!0          38   001+3   000+2
439  1 941         MCW   KB1          AND A BLANK                           4  1922  M N67              38  2567
440  1 945         SBR   X2                                                 4  1926  H 094              38   094
441  1 949         MCW   SX3C,X3                                            7  1930  M N12 099          38  2512     099
442  1 956         MCW   SX1D,X1                                            7  1937  M N15 089          38  2515     089
443  1 963         CW    0&X1                                               4  1944  ) 0|0              39   000+1
444  1 967         SAR   X1                                                 4  1948  Q 089              39   089
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SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

445  1 971         LCA   0&X1,0&X2                                          7  1952  L 0|0 0!0          39   000+1   000+2
446  1 978         SBR   X1,0&X2                                           7  1959  H 089 0!0          39   089     000+2
447  1 985         B     EXPR3                                              4  1966  B /24              39  1124
448  1 989  INTFNC MN    0&X2                                               4  1970  D 0!0              39   000+2
449  1 993         SAR   X2                                                 4  1974  Q 094              39   094
450  1 997         B     FNC3                                               4  1978  B Z15              40  1915
451         *
452         * TAPE BLOCK IS TOO BIG FOR CHM TAU EMULATOR
453         *
454         END1   DCW   @}@                                                1  1982             GMARK   40
455                XFR   LOADNX        LOAD THIS                                    B 700              40   700
456         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
457         )6K004 EQU   700  LOAD NEXT PHASE                                 0700               GEN
458         )6L004 EQU   704  TAPE READ INSTRUCTION                           0704               GEN
459         )6M004 EQU   728  TAPE ERROR HANDLER                              0728               GEN
            *                                                                                       GEN
460                ORG   201                                                        0201
461         PART2  BSS   )8J004,G                                              5  0201  B 250 G      GEN     41   250
462                NOP     TO PATCH IN TRAPS FOR DEBUGGING                    1  0206  N            GEN     41
463         )0J004 EQU   *&1                                                   0207               GEN
464                BCE   )1J004,)6K004,1    Q: LOADING FROM CARDS?            8  0207  B 243 700 1  GEN     41   243     700
465                BCE   )1J004,)6L004&4,0  Q: LOADING FROM AUTOCODER TAPE?    8  0215  B 243 708 0  GEN     41   243     708
466                RTW   1,MSG23           READ THE BLOCK                     8  0223  L %U1 Z82 R  GEN     41   %U1    1982
467                BER   )6M004             Q: TAPE ERROR?                    5  0231  B 728 L      GEN     41   728
468                CS    BEGN33,)9R004      ENTER THE BLOCK                   7  0236  / 838 271    GEN     42   838     271
469         )1J004 CS    )6K004,)9R004      LOAD CARDS OR AUTOCODER TAPE      7  0243  / 700 271    GEN     42   700     271
470         )8J004 SW    )9R004                                             4  0250  , 271        GEN     42   271
471                MU    %T0,)8K004,W                                       8  0254  M %T0 266 W  GEN     42   %T0     266
472                H     )0J004                                             4  0262  . 207        GEN     42   207
473         )8K004 EQU   *&1                                                   0266               GEN
474                DCW   #1                                                 1  0266               GEN     42
475                DC    @33.2@          PHASE NUMBER                       4  0270               GEN     42
476         )9R004 DCW   @}@                                                1  0271               GEN     42
477                XFR   PART2                                                    B 201              42   201
478                ORG   END1                                                      1982
479         *
480         * EMIT CODING IS UNINTELLIGIBLE MESSAGE
481         *
482  2 001  MSG23  CS    332                                                4  1982  / 332              43   332
483  2 005         CS                                                       1  1986  /                  43
484  2 006         SW    GLOBER                                             4  1987  , 184              43   184
485  2 010         MN    CODSEQ,247                                         7  1991  D M28 247          43  2428     247
486  2 017         MN                                                       1  1998  D                  43
487  2 018         MN                                                       1  1999  D                  43
488  2 019         MCW   ERR23  UNINTELLIGIBLE                              4  2000  M O11              43  2611
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SEQ PG LIN  LABEL  OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

489  2 023         W                                               1  2004  2                    44
490  2 024         BCV   *&5                                       5  2005  B !14 @              44  2014
491  2 029         B     *&3                                       4  2010  B !16                44  2016
492  2 033         CC    1                                         2  2014  F 1                  44
493  2 035  RESTRT MCW   SX3B,X3                                  7  2016  M M31 099            44  2431     099
494  2 042         MCW   SX1,X1                                    7  2023  M M37 089            44  2437     089
495  2 049         B     LOOP                                      4  2030  B 883                44   883
496         *
497         * CHECK FOR SUBSCRIPT?
498         *
499  2 053  SUBCHK SBR   SUBCHX&3                                  4  2034  H !63                45  2063
500  2 057         BCE   SUBCH2,1&X1,$                           8  2038  B J80 0|1 $          45  2180     001+1
501  2 065         SBR   SX1E,4&X1                               7  2046  H O14 0|4            45  2614     004+1
502  2 072  SUBCH3 C     SX1E,X2                                   7  2053  C O14 094            45  2614     094
503  2 079  SUBCHX BE    0                                         5  2060  B 000 S              45   000
504         *
505         * LEFT SIDE IS INVALID
506         *
507  2 084  MSG25  CS    332                                       4  2065  / 332                45   332
508  2 088         CS                                              1  2069  /                    45
509  2 089         SW    GLOBER                                    4  2070  , 184                46   184
510  2 093         MN    CODSEQ,243                                7  2074  D M28 243            46  2428     243
511  2 100         MN                                              1  2081  D                    46
512  2 101         MN                                              1  2082  D                    46
513  2 102         MCW   ERR25                                     4  2083  M O54                46  2654
514  2 106         W                                               1  2087  2                    46
515  2 107         BCV   *&5                                       5  2088  B !97 @              46  2097
516  2 112         B     *&3                                       4  2093  B !99                47  2099
517  2 116         CC    1                                         2  2097  F 1                  47
518  2 118         B     RESTRT                                    4  2099  B !16                47  2016
519         *
520         * ARITHMETIC SYNTAX ERROR
521         *
522  2 122  MSG27  CS    332                                       4  2103  / 332                47   332
523  2 126         CS                                              1  2107  /                    47
524  2 127         SW    GLOBER                                    4  2108  , 184                47   184
525  2 131         MN    CODSEQ,249                                7  2112  D M28 249            47  2428     249
526  2 138         MN                                              1  2119  D                    48
527  2 139         MN                                              1  2120  D                    48
528  2 140         MCW   ERR27                                     4  2121  M P00                48  2700
529  2 144         W                                               1  2125  2                    48
530  2 145         BCV   *&5                                       5  2126  B J35 @              48  2135
531  2 150         B     *&3                                       4  2131  B J37                48  2137
532  2 154         CC    1                                         2  2135  F 1                  48
533  2 156         B     RESTRT                                    4  2137  B !16                49  2016
534         *
535  2 160  GM     DC    @}@                                       1  2141              GMARK   49
536         *
537         * DOUBLE OPERATORS
538         *
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

539  2 161  MSG31   CS    332                                               4  2142  / 332               49   332
540  2 165          CS                                                      1  2146  /                   49
541  2 166          SW    GLOBER                                            4  2147  , 184               49   184
542  2 170          MN    CODSEQ,242                                        7  2151  D M28 242           49  2428     242
543  2 177          MN                                                      1  2158  D                   49
544  2 178          MN                                                      1  2159  D                   49
545  2 179          MCW   ERR31                                            4  2160  M P39               50  2739
546  2 183          W                                                       1  2164  2                   50
547  2 184          BCV   *&5                                              5  2165  B J74 @             50  2174
548  2 189          B     *&3                                               4  2170  B J76               50  2176
549  2 193          CC    1                                                 2  2174  F 1                 50
550  2 195          B     RESTRT                                            4  2176  B !16               50  2016
551          *
552  2 199  SUBCH2 SBR   SX1E,12&X1                                        7  2180  H O14 0/2           50  2614     012+1
553  2 206          BCE   SUBCH3,11&X1,$                                   8  2187  B !53 0/1 $         51  2053     011+1
554  2 214          SBR   SX1E,18&X1                                       7  2195  H O14 0/8           51  2614     018+1
555  2 221          B     SUBCH3                                            4  2202  B !53               51  2053
556          *
557          * DATA
558          *
559  2 225          DCW   @*@                    WM CLEARED IF NEEDED      1  2206                      51
560  2 234          DCW   @   %FSOCC@  COSF      118 AND 117               9  2215                      51
561  2 243          DCW   @  %FSBAXA@  XABSF     122 AND 123               9  2224                      51
562  2 252          DCW   @ %FKNILXI@  XLINKF    139                       9  2233                      52
563  2 261          DCW   @        H@            138                       9  2242                      52
564  2 270          DCW   @        D@            137                       9  2251                      52
565  2 279          DCW   @        M@            136                       9  2260                      52
566  2 288          DCW   @        L@            135                       9  2269                      53
567  2 297          DCW   @        K@            134                       9  2278                      53
568  2 306          DCW   @        J@            133                       9  2287                      53
569  2 315          DCW   @        Z@            132                       9  2296                      53
570  2 324          DCW   @        Y@            131                       9  2305                      54
571  2 333          DCW   @        W@            130                       9  2314                      54
572  2 342          DCW   @        P@            129                       9  2323                      54
573  2 351          DCW   @        U@            128                       9  2332                      54
574  2 360          DCW   @        R@            127                       9  2341                      55
575  2 369          DCW   @  %FTRQSQ@  SQRTF     126                       9  2350                      55
576  2 378          DCW   @ %FTAOLFF@  FLOATF    125                       9  2359                      55
577  2 387          DCW   @  %FXIFXX@  XFIXF     124                       9  2368                      55
578  2 396          DCW   #9           NEGATION  123                       9  2377                      56
579  2 405          DCW   @   %FSBAA@  ABSF      122                       9  2386                      56
580  2 414          DCW   @  %FNATAT@  ATANF     121 AND 117               9  2395                      56
581  2 423          DCW   @   %FPXEE@  EXPF      129 AND 117               9  2404                      56
582  2 432          DCW   @   %FGOLG@  LOGF      119 AND 117               9  2413                      57
583  2 441  FNCLST  DCW   @   %FNISS@  SINF      118 AND 117               9  2422                      57
584  2 442          DCW   #1                                                1  2423                      57
585  2 443  DOT     DCW   @.@                                               1  2424                      57
586  2 447  CODSEQ  DCW   #4  STATEMENT CODE AND SEQUENCE NUMBER            4  2428                      57
587  2 450  SX3B    DCW   #3                                                3  2431                      57
588  2 453  SX3     DCW   #3                                                3  2434                      57
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

589  2 465  SX1     DCW   #3                                                  3  2437                      58
590  2 475  KB10    DCW   #10                                                10  2447                      58
591  2 479  KIFBOT  DCW   @#<99@                                             4  2451                      58
592  2 482  SX1B    DCW   #3                                                  3  2454                      58
593  2 485  SX1C    DCW   #3                                                  3  2457                      58
594  2 493  OPRATR  DCW   @&-@*#%)}@                                         8  2465                      58
595  2 500  OPRAT2  DCW   @&-*@.#,@                                          7  2472                      58
596  2 502  RPARSV  DCW   #2  RIGHT PARENTHESIS AND NEXT CHARACTER           2  2474                      59
597  2 508  OPRAT3  DCW   @&*@-})@                                           6  2480                      59
598  2 516  OPRAT4  DCW   @&-*.@ %,@                                         8  2488                      59
599  2 518  STAR2   DCW   #2  ASTERISK AND NEXT CHARACTER                    2  2490                      59
600  2 524  OPRAT5  DCW   @&-@*.,@                                           6  2496                      59
601  2 525  COMMA   DCW   @,@                                                1  2497                      59
602  2 534  OPRAT6  DCW   @&-*@ #%,.@                                        9  2506                      59
603  2 537  SX2     DCW   #3                                                  3  2509                      60
604  2 540  SX3C    DCW   #3                                                  3  2512                      60
605  2 543  SX1D    DCW   #3                                                  3  2515                      60
606  2 589  ERR29   DCW   @ERROR 29 - UNDEFINED FUNCTION NAME, STATEMENT @  46  2561                      62
607  2 594  SGECT   DCW   @SGECT@                                            5  2566                      62
608  2 595  KB1     DCW   #1                                                  1  2567                      62
609  2 639  ERR23   DCW   @ERROR 23 - CODING UNINTELLIGIBLE, STATEMENT @    44  2611                      64
610  2 642  SX1E    DCW   #3                                                  3  2614                      64
611  2 682  ERR25   DCW   @ERROR 25 - LEFT SIDE INVALID, STATEMENT @        40  2654                      66
612  2 728  ERR27   DCW   @ERROR 27 - ARITHMETIC SYNTAX ERROR, STATEMENT @  46  2700                      68
613  2 767  ERR31   DCW   @ERROR 31 - DOUBLE OPERATORS, STATEMENT @         39  2739                      69
614  2 768  GMWM    DCW   @}@                                                1  2740          GMARK       70
615                 XFR   BEGN33                                                     B 838                 70   838
616          CLRME  CLRA  BEGN33,GMWM,C                                                                   MACRO
             *      CLRA  CLRBOT,CLRTOP[,SS,HERE,GWMAD]                                                   GEN
             *                                                                                            GEN
             * CLEAR CORE AFTER A PHASE USING THE CLRTOP ADDRESS                                          GEN
             *                                                                                            GEN
617                 ORG   201                                                                 0201
             *                                                                                            GEN
             * CLEAR DOWN TO CLRBOT & X00 THE EASY WAY                                                    GEN
             *                                                                                            GEN
618          CLRME  EQU   *&1                                                        0201                  GEN
619                 BSS   SNAPSH,C                                                   5  0201  B 333 C      GEN     71   333
620          )0J005 CS    GMWM         CLEAR FROM CLRTOP                           4  0206  / P40        GEN     71  2740
621                 SBR   )0J005&3                                                  4  0210  H 209        GEN     71   209
622                 SBR   )0L005&6                                                  4  0214  H 255        GEN     71   255
623                 C     )0J005&3,)0M005   DOWN TO CLRBOT & X00?                  7  0218  C 209 266    GEN     71   209     266
624                 BU    )0J005                                                    5  0225  B 206 /      GEN     71   206
             *                                                                                            GEN
             * NOW CLEAR DOWN TO CLRBOT THE HARD WAY                                                      GEN
             *                                                                                            GEN
625          )0K005 C     )0L005&6,)0N005                                           7  0230  C 255 269    GEN     71   255     269
626                 BU    )0L005                                                    5  0237  B 249 /      GEN     72   249
627                 CS    LOADNX,)0Q005  LOAD THE NEXT BLOCK AT 1                   7  0242  / 700 276    GEN     72   700     276
628          )0L005 LCA   )0P005,0-0     CLEAR WITH BLANK AND WORD MARK            7  0249  L 270 000    GEN     72   270     000
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

629                 SBR   )0L005&6                                          4  0256  H 255       GEN     72   255
630                 B     )0K005                                            4  0260  B 230       GEN     72   230
631         )0M005  DSA   )0R005         CLRBOT & X00 - 1                  3  0266  899         GEN     72   899
632         )0N005  DSA   BEGN33         CLRBOT                            3  0269  838         GEN     72   838
633         )0P005  DCW   #1                                              1  0270              GEN     73
634                 DC    @CLRA @     IDENTIFY IN A DECK, TAPE, OR DUMP     5  0275              GEN     73
635         )0Q005  DCW   @}@                                             1  0276              GEN     73
636                 ORG   BEGN33&X00                                                 0900
637         )0R005  EQU   *           CLRBOT & X00 - 1                        0899              GEN
638                 XFR   CLRME                                                     B 201               73   201
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
)0J003	0207: 0	)0J004	0207: 0	)0J005	0206: 0	)0K005	0230: 0	)0L005	0249: 0	)0M005	0266: 0
)0N005	0269: 0	)0P005	0270: 0	)0Q005	0276: 0	)0R005	0899: 0	)1J003	0250: 0	)1J004	0243: 0
)6J003	0110: 0	)6K003	0700: 0	)6K004	0700: 0	)6L003	0704: 0	)6L004	0704: 0	)6M003	0728: 0
)6M004	0728: 0	)8J003	0257: 0	)8J004	0250: 0	)8K003	0273: 0	)8K004	0266: 0	)9J003	0281: 0
)9R003	0287: 0	)9R004	0271: 0	ABSF	1853: 0	ASG	1066: 0	ASGL	1116: 0	BEGIN3	0838: 0
BEGN33	0838: 0	CDOVLY	0700: 0	CHK27	1427: 0	CHK31	1451: 0	CLRME	0201: 0	CODSEQ	2428: 0
COMMA	2497: 0	COSF	1845: 0	DONE	0920: 0	DOT	2424: 0	END1	1982: 0	ERR23	2611: 0
ERR25	2654: 0	ERR27	2700: 0	ERR29	2561: 0	ERR31	2739: 0	EXPON	1494: 0	EXPR	0924: 0
EXPR2	0979: 0	EXPR3	1124: 0	FNC2	1907: 0	FNC3	1915: 0	FNCLST	2422: 0	FUNC	1664: 0
FUNCL	1756: 0	GETEQ	1088: 0	GETSER	1837: 0	GLOBER	0184: 0	GM	2141: 0	GMWM	2740: 0
GOTEQ	1112: 0	GOTFNC	1864: 0	GOTOP	1172: 0	IGNORE	1553: 0	INTFNC	1970: 0	KB1	2567: 0
KB10	2447: 0	KIFBOT	2451: 0	LOADAD	0838: 0	LOADNX	0700: 0	LOOP	0883: 0	LOOP1	0890: 0
LPARC	1644: 0	LPAREN	1622: 0	MINUS	1579: 0	MSG23	1982: 0	MSG25	2065: 0	MSG27	2103: 0
MSG31	2142: 0	NEGATE	1607: 0	NOTFNC	1799: 0	OPCHK	1153: 0	OPCHK2	1249: 0	OPCHK4	1373: 0
OPCHK5	1465: 0	OPCHKL	1135: 0	OPRAT2	2472: 0	OPRAT3	2480: 0	OPRAT4	2488: 0	OPRAT5	2496: 0
OPRAT6	2506: 0	OPRATR	2465: 0	PART2	0201: 0	PHAS33	0201: 0	PHASLD	0381: 0	PLUS	1525: 0
RESTR2	1291: 0	RESTRT	2016: 0	RPAR2	1359: 0	RPAREN	1320: 0	RPARSV	2474: 0	SAWABS	0122: 0
SAWNEG	0123: 0	SERIES	0117: 0	SGECT	2566: 0	SINCOS	0118: 0	SNAPEX	0564: 0	SNAPSH	0333: 0
STAR	1412: 0	STAR2	2490: 0	SUBCH2	2180: 0	SUBCH3	2053: 0	SUBCHK	2034: 0	SUBCHX	2060: 0
SX1	2437: 0	SX1B	2454: 0	SX1C	2457: 0	SX1D	2515: 0	SX1E	2614: 0	SX2	2509: 0
SX3	2434: 0	SX3B	2431: 0	SX3C	2512: 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