```
CLEAR STORAGE 1     ,008015,022026,030037,044,049,053053N000000N00001026                                         1
CLEAR STORAGE 2     L068116,105106,110117B101/I9I#071029C029056B026/B001/0991,001/001117I0?                      2
BOOTSTRAP           ,008015,022029,036040,047054,061068,072/061039              ,0010011040                      3

                          FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63                            PAGE    1

 SEQ PG LIN  LABEL  OP    OPERANDS                                           SFX CT  LOCN  INSTRUCTION TYPE  CARD

 101                JOB   FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63
 102                CTL   6611
 103         *
 104         * THIS PHASE IS COMPRISED OF THE ARITHMETIC ROUTINE WHICH IS
 105         * LOADED BY GEAUX PHASE 2.
 106         *
 107                ORG   87                                                                0087
 108      89 X1     DCW   000                                                     3  0089                        4
 109      91        DC    00                                                      2  0091                        4
 110      94 X2     DCW   000                                                     3  0094                        4
 111      96        DC    00                                                      2  0096                        4
 112      99 X3     DCW   000                                                     3  0099                        4
 113     100        DC    0                                                       1  0100                        4
 114         *
 115         * ARITHMETIC INTERPRETER
 116         *
 117         * GENERAL FORM OF INTERPRETED STRING IS
 118         * OPERAND [ OPERATOR OPERAND ... ],
 119         * HOWEVER, IF OPERAND HAS A WORD MARK, IT'S AN OPERATOR,
 120         * USUALLY A FUNCTION CALL.  OPERANDS ARE MACHINE ADDRESSES,
 121         * WITH A TAG IN THE TENS DIGIT TO INDICATE TYPE: A- OR B-
 122         * ZONE ALONE INDICATES INTEGER.  OPERATORS ARE ONE CHARACTER.
 123         * SUBSCRIPT CALCULATIONS ARE SURROUNDED BY $...$.
 124         *
 125         * TWO ACCUMULATORS IN THE PRINT AREA ARE USED.  THE LOW-ORDER
 126         * DIGIT OF AN OPERAND IS LOADED INTO ACCUMULATOR 1 AT 250; IT
 127         * EXTENDS LEFTWARD  BY THE LENGTH OF THE OPERAND, AND RIGHTWARD
 128         * FROM THE LEFT END BY THE MANTISSA WIDTH.  ACCUMULATOR 2 HAS ITS
 129         * HIGH-ORDER DIGIT AT ACCHI&1; IT EXTENDS RIGHTWARD BY THE MANTISSA
 130         * WIDTH.
 131         *
 132         * IN THE FORTRAN MANUAL C24-1455, THE HIGH-ORDER DIGIT OF
 133         * ACCUM 2 IS LABELED ACCHI&1.
 134         *
 135         ACCHI  EQU   279                                                        0279
 136         *
 137         * MOSTLY, INDEX REGISTER USAGE IS
 138         * X1 = OPERAND ADDRESS
 139         * X2 = INTERPRETER'S COUNTER, LOW-ORDER DIGIT OF ACCUM 1
 140         * X3 = OPERAND WIDTH
 141         *
 142         * ADDRESS IN PHASE 62
 143         *
 144         LDRET  EQU   227  RETURN HERE AFTER LOADING                             0227
 145         *
 146                ORG   700                                                               0700
 147     700 ARITF  SBR   X2                                                      4  0700  H 094                 5
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SEQ PG LIN  LABEL  OP    OPERANDS                                           SFX CT  LOCN  INSTRUCTION TYPE  CARD

148    704         SBR   X1-3        INTERPRETER ADDRESS FOR DUMPS                4  0704  H 086                5
149    708         SBR   ERMSI&6     INTERPRETER ADDRESS FOR ERR MSGS             4  0708  H V06                5
150    712  NXTOP  MCW   2&X2,X1     X1 = OPERAND (RESULT) ADDRESS                7  0712  M 0!2 089            5
151    719         SAR   SX2A&6      SAVE X2-1                                    4  0719  Q 765                5
152    723  NXTOP0 SBR   SX2B&6        TWICE                                      4  0723  H S27                5
153    727         BCE   DOSUB,0&X2,$  SUBSCRIPT?                                 8  0727  B S06 0!0 $          5
154    735         SBR   RES&6,0&X1  SAVE X1 (RESULT ADDRESS)                     7  0735  H T75 0|0            6
155    742         CS    303         CLEAR ACCUMUMULATORS                         4  0742  / 303                6
156    746         CS                                                             1  0746  /                    6
157    747         CS                                                             1  0747  /                    6
158    748         LCA   KZ1,ACCHI&1     SET HIGH-ORDER ZERO IN ACCUM 2           7  0748  L W85 280            6
159    755  NXTOP1 S     X1&2        CLEAR X1                                     4  0755  S 091                6
160    759  SX2A   SBR   X2,0-0      RECOVER X2 = ADDR(OPERAND) - 1               7  0759  H 094 000            6
161    766         C     4&X2,ASGOP  COMPARE OP TO ASSIGNMENT OP                  7  0766  C 0!4 W86            7
162    773         MCW   4&X2,SAVOP  SAVE WHATEVER OPERATOR IT IS                 7  0773  M 0!4 924            7
163    780         SW    201                                                      4  0780  , 201                7
164    784         BL    FUNC        FUNC IF ASSIGNMENT OP .LT. OPERATOR          5  0784  B T05 T              7
165         *
166         * ASSIGNMENT OP GREATER OR EQUAL TO OPERATOR, I.E., OPERATOR IS
167         * BLANK, ., ) LOZENGE, } GROUP MARK, &, $, *, -, /, COMMA, %, #
168         *
169    789         SBR   NXTOP2&6,4&X2  SAVE ADDR OF OPERATOR                     7  0789  H 874 0!4            7
170    796         BCE   DOSUB5,5&X2,$  SUBSCRIPT?                                8  0796  B /99 0!5 $          7
171    804         MCW   7&X2,X1     SECOND OPERAND ADDRESS TO X1                 7  0804  M 0!7 089            8
172    811         SAR   SX2A&6      SAVE 4&X2                                    4  0811  Q 765                8
173    815  TSTZON BWZ   ARITI,X1-1,K  OPERAND 2 TAG IS B ZONE (INTEGER)?         8  0815  V V30 088 K          8
174    823         BWZ   ARITI,X1-1,S  OPERAND 2 TAG IS A ZONE (INTEGER)?         8  0823  V V30 088 S          8
175    831         SBR   X3,0        LOADER PLUGS MANTISSA WIDTH INTO B           7  0831  H 099 000            8
176    838         CW    IFLAG       INDICATE FLOATING POINT                      4  0838  ) W87                8
177    842         MCW   0&X1,EXP1-1   SAVE EXPONENT 1                            7  0842  M 0|0 W82            9
178    849         SAR   X1          SAVE MANTISSA 1 ADDRESS                      4  0849  Q 089                9
179    853         MCW   0&X1,250    MANTISSA 1 TO ACCUMULATOR 1                  7  0853  M 0|0 250            9
180         * FROM HERE, X2 INDEXES ACCUM 1, FIRST HIGH, THEN LOW DIGIT
181    860         SBR   X2          SET X2 TO ACCUM 1 ADDRESS - OP WIDTH         4  0860  H 094                9
182    864         LCA   KZ1         APPEND A HIGH-ORDER ZERO TO ACCUM 1          4  0864  L W85                9
183    868  NXTOP2 BW    NOSIGN,0-0  WM UNDER OPERATOR?                           8  0868  V 883 000 1          9
184    876         MZ    250,ZAS     SIGN OF OPERAND 1 DETERMINES ZA OR ZS        7  0876  Y 250 |87           10
185    883  NOSIGN S     KZ1,252&X3  ADD ZEROS BELOW MANTISSA                     7  0883  S W85 2E2           10
186    890         C     1&X2,KZ1    COMPARE OPERAND HIGH-ORDER DIGIT TO 0        7  0890  C 0!1 W85           10
187    897         A     X3,X2       X2 NOW AT LOW-ORDER DIGIT OF ACCUM 1         7  0897  A 099 094           10
188    904         BCE   FDIV,SAVOP,/  DIVIDE?                                    8  0904  B S33 924 /         10
189    912         BCE   FMPY,SAVOP,*  MULTIPLY?                                  8  0912  B S62 924 *         11
190    920         S     SAVOP         TURN IT BACK TO ZA                         4  0920  S 924               11
191    924  SAVOP  ZA    ZAS           COPY THIS OP CODE                          4  0924  ? |87               11
192    928         BCE   NMLZ1,ACCHI&1,0   HIGH-ORDER DIGIT OF ACCUM 2 ZERO?      8  0928  B |17 280 0         11
193    936         BE    CLRWK         ACCUM 1 HIGH-ORDER DIGIT IS ZERO           5  0936  B /34 S             11
194    941         S     EXP1-1,EXP2-1  EXP2 IS NOW EXP2 - EXP1                   7  0941  S W82 W79           11
195    948         ZA    EXP2,X1&1     MOVE ABS(EXP2-EXP1) TO X1                  7  0948  ? W80 090           12
196    955         C     X3,X1  COMPARE MANTISSA WIDTH AND ABS(EXP2-EXP1)         7  0955  C 099 089           12
197    962         BM    E1GTE2,EXP2-1  EXP1 .GT. EXP2                            8  0962  V /65 W79 K         12
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                          FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63                              PAGE    3

 SEQ PG LIN  LABEL  OP    OPERANDS                                              SFX CT  LOCN  INSTRUCTION TYPE  CARD

 198    970         BH    EXDGMW        ABS(EXP2-EXP1) .GT. MANTISSA WIDTH         5  0970  B /88 U              12
 199    975         A     EXP2-1,EXP1-1  ADD EXP2-EXP1 TO EXP1                     7  0975  A W79 W82            12
 200    982         ZA    250,250&X1    SHIFT MANTISSA RIGHT BY EXP2-EXP1          7  0982  ? 250 2V0            13
 201    989         ZA    X3&1,X1&1     X1 AND X3 NOW BOTH MANTISSA WIDTH          7  0989  ? 100 090            13
 202    996  ADDSUB MZ    ZAS,0&X2      SIGN OF ACCUM 1 DEPENDS ON OP              7  0996  Y |87 0!0            13
 203  1 003         A     ACCHI&X1,0&X2   ADD (SUBTRACT) MANTISSAS                 7  1003  A 2X9 0!0            13
 204         *
 205         * RELOCATABLE FUNCTIONS RETURN HERE TOO
 206         *
 207  1 010  FRET   MZ    0&X2,ZAS                                                 7  1010  Y 0!0 |87            13
 208         *
 209         * NORMALIZE FLOATING-POINT RESULT OF A SINGLE ARITHMETIC
 210         * OPERATION; PLACE THE NORMALIZED RESULT IN THE WORKING
 211         * ACCUMULATOR.  IF EXPONENT OVERFLOW IS DETECTED, GO TO ERMSG TO
 212         * PRINT MESSAGE (NOF); THEN GO TO STR99.  IF EXPONENT UNDERFLOW
 213         * IS DETECTED, GO TO STRZE.  HERE, THE LOW-ORDER DIGIT OF THE
 214         * RESULT IS INDEXED BY X2.
 215         *
 216         * THE NORMALIZED RESULT IS LEFT IN ACCUM 2.
 217         *
 218  1 017  NMLZ1  ZA    EXP1-1,EXP2-1                                            7  1017  ? W82 W79            14
 219  1 024  NMLZ2  MCW   RM,1&X2    INSERT RM AFTER LOW-ORDER DIGIT               7  1024  M W75 0!1            14
 220  1 031         MZ               CHAIN                                         1  1031  Y                    14
 221  1 032         MZ                 TWO ZEROS                                   1  1032  Y                    14
 222  1 033         A                AND ADD ANOTHER ONE                           1  1033  A                    14
 223  1 034         MN               DECR A AND B (COPIES JUNK TO UNUSED)          1  1034  D                    14
 224  1 035         SBR   X1         X1 IS NOW TWO BELOW ACCUM 1 HIGH-ORDER        4  1035  H 089                14
 225  1 039         S     ACCHI&2&X3    CLEAR ACCUM 2                              4  1039  S 2H1                15
 226  1 043  NMLZL  BCE   STRZE,2&X1,|  RECORD MARK INDICATES ZERO RESULT          8  1043  B /42 0|2 |          15
 227  1 051         SBR   X1            BUMP X1                                  4  1051  H 089                15
 228  1 055         BCE   NMLZL,1&X1,0  ZERO MEANS MORE NORMALIZATION NEEDED       8  1055  B |43 0|1 0          15
 229  1 063         MCM   1&X1,ACCHI&1      NORMALIZE                              7  1063  P 0|1 280            15
 230  1 070         S     X3,X2                                                    7  1070  S 099 094            15
 231  1 077         CW                  DECREASE AS AND BS TO                      1  1077  )                    15
 232  1 078         CW                    REFER TO X2 AND X1                       1  1078  )                    16
 233  1 079         S                   S    X2,X1                                 1  1079  S                    16
 234  1 080         S     X1,EXP2-1     STORE NORMALIZED EXPONENT                  7  1080  S 089 W79            16
 235  1 087  ZAS    ZA    ACCHI&X3        ZS IF ACCUM 1 NEGATIVE                   4  1087  ? 2G9                16
 236  1 091         SW                                                             1  1091  ,                    16
 237  1 092         BCE   CLRWK,EXP2-3,0                                           8  1092  B /34 W77 0          16
 238  1 100         BM    STRZE,EXP2-1  EXPONENT UNDERFLOW                         8  1100  V /42 W79 K          16
 239  1 108         B     ERMSG         EXPONENT OVERFLOW                          4  1108  B U71                17
 240  1 114         DCW   @NOF@                                                    3  1114                       17
 241         *
 242         * EXPONENT OVERFLOW; SET RESULT MAGNITUDE EQUAL TO LARGEST
 243         * VALUE POSSIBLE IN FLOATING-POINT NOTATION; SET RESULT SIGN
 244         * AS APPROPRIATE.
 245         *
 246  1 115  STR99  ZA    KP99,EXP2-1   -99 TO EXP2                                7  1115  ? W89 W79            17
 247  1 122         MN    KP99,ACCHI&X3   ALL 9'S                                  7  1122  D W89 2G9            17
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD

248  1 129         MCW                    TO MANTISSA                              1  1129  M                   17
249  1 130         MCW   ACCHI-1&X3            IN ACCUM2                           4  1130  M 2G8               17
250         *
251         * CLEAR ACCUM 1 AFTER AN INDIVIDUAL ARITHMETIC OPERATION
252         *
253  1 134  CLRWK  CS    ACCHI-1                                                   4  1134  / 278               17
254  1 138         B     NXTOP1                                                    4  1138  B 755               18
255         *
256         * EXPONENT UNDERFLOW, OR RESULT IS ZERO.  SET FLOATING-POINT
257         * RESULT TO ZERO
258         *
259  1 142  STRZE  S     EXP2-1  EXP2 = 0                                          4  1142  S W79               18
260  1 146         S     ACCHI&X3  ACCUM 2 MANTISSA = 0                            4  1146  S 2G9               18
261  1 150         B     CLRWK                                                     4  1150  B /34               18
262         *
263         * DIVISION BY ZERO
264         *
265  1 154  DVERR  B     ERMSG                                                     4  1154  B U71               18
266  1 160         DCW   @DZE@  DIVIDE BY ZERO MESSAGE                             3  1160                      18
267  1 161         B     STR99  INSERT OVERFLOW EXPONENT                           4  1161  B /15               18
268         *
269         * EXP1 IS GREATER THAN EXP2
270         *
271  1 165  E1GTE2 BH    NMLZ1  ABS(EXP2-EXP1) .GT. MANTISSA WIDTH                 5  1165  B |17 U             19
272  1 170         S     X3&1,X1&1  SUBTR MAN. WIDTH FROM ABS(EXP2-EXP1)           7  1170  S 100 090           19
273  1 177         MZ    ACCHI&X3,ACCHI&X1  MOVE ZONE OVER TO NEW WIDTH            7  1177  Y 2G9 2X9           19
274  1 184         B     ADDSUB  GO ADD (OR SUBTRACT) MANTISSAS                    4  1184  B 996               19
275         *
276         * ABS(EXP2-EXP1) .GT. MANTISSA WIDTH
277         *
278  1 188  EXDGMW A     EXP1-1,EXP2-1  RESTORE EXP2                               7  1188  A W82 W79           19
279  1 195         B     CLRWK                                                     4  1195  B /34               19
280         *
281         * CALCULATE SUBSCRIPTED ADDRESS USING A RELOCATABLE ROUTINE THAT
282         * IS ONLY LOADED IF NEEDED.
283         *
284  1 199  DOSUB5 SBR   X2,5&X2  BUMP X2 TO BEGINNING OF SUBSCRIPT INFO           7  1199  H 094 0!5           20
285  1 206  DOSUB  B     0-0  LOADER PLUGS SUBSCRIPT ROUTINE ADDRESS HERE          4  1206  B 000               20
286         *
287  1 210         MN    0&X2  SUBTRACT 4 FROM X2                                  4  1210  D 0!0               20
288  1 214         MN                                                              1  1214  D                   20
289  1 215         MN                                                              1  1215  D                   20
290  1 216         MN                                                              1  1216  D                   20
291  1 217         SAR   SX2A&6                                                    4  1217  Q 765               20
292  1 221  SX2B   BCE   NXTOP0,0-0,$                                              8  1221  B 723 000 $         21
293  1 229         B     TSTZON                                                    4  1229  B 815               21
294         *
295         * FLOATING-POINT DIVIDE
296         *
297  1 233  FDIV   BE    DVERR     DIVIDE BY ZERO (COMPARE WAS AT NOSIGN)          5  1233  B /54 S             21
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                              FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63                              PAGE    5

 SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD

 298  1 238         MN    ACCHI&X3,1&X2                                           7  1238  D 2G9 0!1           21
 299  1 245         MCW                                                           1  1245  M                   21
 300  1 246         MN                                                            1  1246  D                   21
 301  1 247         D     0&X1,251  DIVIDE MANTISSAS.                             7  1247  % 0|0 251           21
 302  1 254         ZS    EXP1-1    NEGATE EXPONENT                               4  1254  ! W82               22
 303  1 258         B     EXPS      GO ADD EXPONENTS, NORMALIZE, ETC.             4  1258  B S83               22
 304         *
 305         * FLOATING-POINT MULTIPLY
 306         *
 307  1 262  FMPY   M     ACCHI&X3,251&X3  MULTIPLY MANTISSAS                     7  1262  @ 2G9 2E1           22
 308  1 269         SBR   X2,3&X2                                                 7  1269  H 094 0!3           22
 309  1 276         S     KP2,EXP2-1                                              7  1276  S W90 W79           22
 310  1 283  EXPS   A     EXP1-1,EXP2-1  ADD EXPONENTS                            7  1283  A W82 W79           22
 311  1 290         MZ    ACCHI&X3,*&1  PREPARE TO                                7  1290  Y 2G9 S97           23
 312  1 297         ZA    ZAS            SET SIGN OF RESULT                       4  1297  ? |87               23
 313  1 301         B     NMLZ2       NORMALIZE                                   4  1301  B |24               23
 314         *
 315         * ASSIGNMENT OPERATOR IS LESS THAN CURRENT OPERATOR, I.E.,
 316         * CURRENT OPERATOR IS ONE OF @, ?, A-I, !, J-R, |, S-Z, 0-9.
 317         * IF NOT RECORD MARK, IT'S THE FIRST CHARACTER OF WHAT WOULD
 318         * OTHERWISE BE AN OPERAND, SO BUMP THE OPERAND ADDRESS.
 319         *
 320  1 305  FUNC   BCE   DONE,4&X2,|  DONE (RECORD MARK)?                        8  1305  B T31 0!4 |         23
 321  1 313         SBR   SX2A&6,1&X2  BUMP OPERAND ADDR                          7  1313  H 765 0!1           23
 322  1 320         C     ACCHI&1,KZ1      HIGH-ORDER ACCUM 2 MANTISSA DIGIT      7  1320  C 280 W85           23
 323         * THE LOADER PLUGS THE RELOCATABLE FUNCTION SELECTOR ADDRESS HERE
 324  1 327  QFUNCT B     0            GO TO FUNCTION SELECTOR                    4  1327  B 000               24
 325  1 331  DONE   BCE   RES,ACCHI&1,0    FLOATING-POINT RESULT ZERO?            8  1331  B T69 280 0         24
 326  1 339         BW    RES,IFLAG    INTEGER RESULT?                            8  1339  V T69 W87 1         24
 327  1 347         BW    FPRES,4&X2   WM UNDER OPERATOR?                         8  1347  V T92 0!4 1         24
 328  1 355         SBR   X3,2&X3                                                 7  1355  H 099 0?2           24
 329  1 362  SEXP2  MCM   EXP2-2,ACCHI-1&X3  MOVE EXP2 TO ACCUM 2                 7  1362  P W78 2G8           25
 330  1 369  RES    LCA   ACCHI&X3,0     STORE ACCUMULATOR TO SAVED B             7  1369  L 2G9 000           25
 331  1 376         BW    5&X2,4&X2    RETURN IF DONE (WORD MARK)                 8  1376  V 0!5 0!4 1         25
 332  1 384         SAR   X2           BUMP X2 TO NEXT OPERAND                    4  1384  Q 094               25
 333  1 388         B     NXTOP                                                   4  1388  B 712               25
 334         *
 335         * ROUND NONZERO FLOATING-POINT RESULT
 336         *
 337  1 392  FPRES  A     KP5,ACCHI-1&X3   ROUND MANTISSA                         7  1392  A W91 2G8           25
 338  1 399         BWZ   CARRY,ACCHI&1,S  CARRY IN ACC2 SHOWN BY A-ZONE?         8  1399  V U18 280 S         26
 339  1 407  CPZONE MZ    ACCHI&X3,ACCHI-2&X3  MOVE ZONE FROM EXP TO MAN          7  1407  Y 2G9 2G7           26
 340  1 414         B     SEXP2                                                   4  1414  B T62               26
 341  1 418  CARRY  A     KP1,EXP2-1   BUMP EXPONENT                              7  1418  A W92 W79           26
 342  1 425         BCE   FOVFL,EXP2-3,1  OVERFLOW?                               8  1425  B U48 W77 1         26
 343  1 433         S     ACCHI&X3       CLEAR MANTISSA                           4  1433  S 2G9               26
 344  1 437         LCA   K1B-1,ACCHI&1  AND PUT 1 IN ITS HIGH-ORDER DIGIT        7  1437  L W93 280           27
 345  1 444         B     CPZONE                                                  4  1444  B U07               27
 346         *
 347         * FLOATING-POINT OVERFLOW -- HIGH-ORDER DIGIT OF EXP2 IS 1
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                         FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63                          PAGE    6

 SEQ PG LIN  LABEL  OP    OPERANDS                                         SFX CT  LOCN  INSTRUCTION TYPE  CARD

 348         *
 349  1 448  FOVFL  MN    KP99,ACCHI&X3  99 TO                                  7  1448  D W89 2G9          27
 350  1 455         MCW                  EXPONENT                               1  1455  M                  27
 351  1 456         MCW   ACCHI-1&X3     ALL 9S TO MANTISSA                     4  1456  M 2G8              27
 352  1 460         S     KP1,EXP2-1                                            7  1460  S W92 W79          27
 353  1 467         B     CPZONE                                                4  1467  B U07              27
 354         *
 355         * PRINT APPROPRIATE ERROR MESSAGES, WHICH INCLUDES A MNEMONIC
 356         * THREE-CHARACTER CODE AND THE DISPLAY ADDRESS IN THE GENERATED
 357         * PROCEDURE OF THE SOURCE PROGRAM STATEMENT BEING EXECUTED.  THIS
 358         * SUBROUTINE IS USED TO RECORD CIRCUMSTANCES, OCCURRING DURING
 359         * ARITHMETIC OPERATIONS, WHICH MAY AFFECT THE CALCULATION
 360         * ADVERSELY.
 361         *
 362  1 471  ERMSG  SBR   ERSVX&6    SAVE RETURN ADDRESS                        4  1471  H U92              28
 363  1 475         CS    202&X3                                                4  1475  / 2?2              28
 364  1 479         SBR   ERSX3&6,0&X3  SAVE X3                                 7  1479  H V25 0?0          28
 365  1 486  ERSVX  SBR   X3,0       RETURN ADDRESS TO X3                       7  1486  H 099 000          28
 366  1 493         MCW   2&X3,212   MNEMONIC TO PRINT AREA                     7  1493  M 0?2 212          28
 367  1 500  ERMSI  SBR   217,0      INTERPRETER ADDRESS TO PRINT AREA          7  1500  H 217 000          28
 368  1 507         W                                                           1  1507  2                  28
 369  1 508         SW    201                                                   4  1508  , 201              29
 370  1 512         SBR   ERMSGX&3,3&X3  RETURN ADDRESS TO EXIT                 7  1512  H V29 0?3          29
 371  1 519  ERSX3  SBR   X3,0       RESTORE X3                                 7  1519  H 099 000          29
 372  1 526  ERMSGX B     0                                                     4  1526  B 000              29
 373         *
 374         * OPERAND TENS DIGIT HAS A OR B BUT NOT AB ZONE (INTEGER ARITH.)
 375         *
 376  1 530  ARITI  SBR   X3,0          LOADER PUTS INTEGER SIZE IN B           7  1530  H 099 000          29
 377  1 537         SW    IFLAG         INDICATE INTEGER                        4  1537  , W87              29
 378  1 541         MCS   0&X1,250      OPERAND TO ACCUMULATOR 1                7  1541  Z 0|0 250          30
 379  1 548         BCE   XDIV,SAVOP,/  DIVIDE?                                 8  1548  B W23 924 /        30
 380  1 556         BCE   XMPY,SAVOP,*  MULTIPLY?                               8  1556  B V98 924 *        30
 381  1 564         BM    XSUB,SAVOP    SUBTRACT?                               8  1564  V V87 924 K        30
 382  1 572         A     0&X1,ACCHI&X3   ADD OPERAND TO ACCUMULATOR 2          7  1572  A 0|0 2G9          30
 383  1 579  XSIGN  ZA    ACCHI&X3        PUT A SIGN ON THE ACCUMULATOR         4  1579  ? 2G9              31
 384  1 583         B     CLRWK                                                 4  1583  B /34              31
 385  1 587  XSUB   S     0&X1,ACCHI&X3   SUBTRACT OPERAND FROM ACCUMULATOR 2   7  1587  S 0|0 2G9          31
 386  1 594         B     XSIGN                                                 4  1594  B V79              31
 387  1 598  XMPY   LCA   0&X1,250      MOVE OPERAND TO ACCUMULATOR 1           7  1598  L 0|0 250          31
 388  1 605         M     ACCHI&X3,251&X3                                       7  1605  @ 2G9 2E1          31
 389  1 612         MCW   251&X3,ACCHI&X3                                       7  1612  M 2E1 2G9          32
 390  1 619         B     CLRWK                                                 4  1619  B /34              32
 391  1 623  XDIV   BCE   DVERR,250,    DIVIDE BY ZERO?                         8  1623  B /54 250          32
 392  1 631         MCW   0&X1,250&X3                                           7  1631  M 0|0 2E0          32
 393  1 638         MN                                                          1  1638  D                  32
 394  1 639         SBR   MOVEQ&3       STORE ADDR TO MOVE TO ACCUM 2           4  1639  H W64              32
 395  1 643         LCA   ACCHI&X3                                              4  1643  L 2G9              32
 396  1 647         ZA    ACCHI&X3,250&X3                                       7  1647  ? 2G9 2E0          33
 397  1 654         D     0&X1,251                                              7  1654  % 0|0 251          33
```

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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD

398  1 661  MOVEQ  MCW   249,ACCHI&X3                                              7  1661  M 249 2G9            33
399  1 668         B     CLRWK                                                     4  1668  B /34                33
400         *
401         * DATA
402         *
403  1 674         DCW   000     CHAINED TO RM                                     3  1674                       33
404  1 675  RM     DCW   @|@                                                       1  1675                       33
405  1 676         DCW   0                                                         1  1676                       33
406  1 680  EXP2   DCW   @000|@  EXPONENT OF ACCUM 2, AND ZERO AND RM              4  1680                       34
407  1 683  EXP1   DCW   000     EXPONENT OF ACCUM 1, AND ZERO                     3  1683                       34
408  1 684  K8     DCW   8                                                         1  1684                       34
409  1 685  KZ1    DCW   0                                                         1  1685                       34
410  1 686  ASGOP  DCW   @#@     ASSIGNMENT OPERATOR                               1  1686                       34
411  1 687  IFLAG  DCW   #1      WORD MARK INDICATES INTEGER                       1  1687                       34
412  1 689  KP99   DCW   &99     USED FOR OVERFLOW                                 2  1689                       34
413  1 690  KP2    DCW   &2                                                        1  1690                       35
414  1 691  KP5    DCW   &5                                                        1  1691                       35
415  1 692  KP1    DCW   &1                                                        1  1692                       35
416  1 694  K1B    DCW   @1 @                                                      2  1694                       35
417  1 695         DCW   0                                                         1  1695                       35
418  1 696  GMWM   DCW   @}@                                                       1  1696            GMARK      35
419                EX    LDRET                                                              B 227                36
420                END                                                                      / 000 080
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
ACCHI	279	ADDSUB	996	ARITF	700	ARITI	1530	ASGOP	1686	CARRY	1418	CLRWK	1134
CPZONE	1407	DONE	1331	DOSUB	1206	DOSUB5	1199	DVERR	1154	E1GTE2	1165	ERMSG	1471
ERMSGX	1526	ERMSI	1500	ERSVX	1486	ERSX3	1519	EXDGMW	1188	EXP1	1683	EXP2	1680
EXPS	1283	FDIV	1233	FMPY	1262	FOVFL	1448	FPRES	1392	FRET	1010	FUNC	1305
GMWM	1696	IFLAG	1687	K1B	1694	K8	1684	KP1	1692	KP2	1690	KP5	1691
KP99	1689	KZ1	1685	LDRET	227	MOVEQ	1661	NMLZ1	1017	NMLZ2	1024	NMLZL	1043
NOSIGN	883	NXTOP	712	NXTOP0	723	NXTOP1	755	NXTOP2	868	QFUNCT	1327	RES	1369
RM	1675	SAVOP	924	SEXP2	1362	STR99	1115	STRZE	1142	SX2A	759	SX2B	1221
TSTZON	815	X1	89	X2	94	X3	99	XDIV	1623	XMPY	1598	XSIGN	1579
XSUB	1587	ZAS	1087										