```
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
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                         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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FORTRAN COMPILER -- ARITHMETIC PACKAGE -- PHASE 63   PAGE   2

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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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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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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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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
```

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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										