```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
101                JOB   FORTRAN COMPILER -- LOADER PHASE -- PHASE 52B
102                CTL   6611
103         *
104         * RELOCATABLE FUNCTION ROUTINES AND SUBROUTINES ARE LOADED.
105         * A TABLE OF THE STARTING ADDRESSES OF THESE ROUTINES IS
106         * CREATED.
107         *
108         * RELOCATION OF RELOCATABLE FUNCTIONS IN THE 1401 FORTRAN
109         * COMPILER IS ACCOMPLISHED BY TAGGING THE LOAD INSTRUCTION IN
110         * LOCATION 40, AND THE SUBSEQUENT SET WORD MARK INSTRUCTIONS, TO
111         * INDICATE WHAT FIELDS ARE TO BE RELOCATED.  IT IS ASSUMED THAT
112         * THEY ARE RELOCATED BY THE LOAD ADDRESS LESS 2000, SINCE THEY
113         * ARE ASSEMBLED TO BE LOADED AT 2000.  THE UTILITY THAT CONVERTS
114         * AUTOCODER DECKS TO RELOCATABLE FORM ASSUMES ADDRESSES ABOVE
115         * 2000 ARE TO BE RELOCATED.
116         *
117         * IF THE INDEX TAG OF THE A FIELD OF THE LOAD INSTRUCTION HAS A
118         * AND B ZONES, IT MEANS THE B ADDRESS OF THE LOAD INSTRUCTION AND
119         * BOTH ADDRESSES OF THE SET WORD MARK INSTRUCTIONS, EXCEPT THOSE
120         * THAT ARE 040, ARE TO BE RELOCATED.  OTHERWISE THEY ARE NOT TO
121         * BE RELOCATED.  IF THE INDEX TAG OF THE B ADDRESS OF THE LOAD
122         * INSTRUCTION HAS AN A ZONE IT INDICATES THAT ONLY THE B ADDRESS
123         * (WORD MARK + 4--6) OF THE FIRST FIELD IS TO BE RELOCATED,  IF
124         * IT HAS A B ZONE IT INDICATES THAT ONLY THE A ADDRESS (WORD
125         * MARK + 1--3) IS TO BE RELOCATED.  IF IT HAS BOTH A AND B ZONES
126         * IT INDICATES THAT BOTH ADDRESSES ARE TO BE RELOCATED.
127         *
128         * IF THE INDEX TAG OF EITHER ADDRESS IN A SET WORD MARK
129         * INSTRUCTION HAS AN A ZONE IT INDICATES THAT ONLY THE B ADDRESS
130         * (WORD MARK + 4-6) OF THE TAGGED FIELD IS TO BE RELOCATED,  IF
131         * IT HAS A B ZONE IT INDICATES THAT ONLY THE A ADDRESS (WORD
132         * MARK + 1-3) IS TO BE RELOCATED.  IF IT HAS BOTH A AND B ZONES
133         * IT INDICATES THAT BOTH ADDRESSES ARE TO BE RELOCATED.
134         *
135         * THE BEGNNING OF THE SERIES ROUTINE USED BY THE TRANSCENDENTAL
136         * FUNCTIONS IS MARKED BY UNDERSCORE CHARACTERS (11-7-8) IN
137         * COLUMNS 1-5 OF THE FIRST LOAD CARD.  THE BASE ADDRESS IS SAVED
138         * AT THIS POINT IN SERBAS.  THEN, ADDRESSES ABOVE 4K, WHICH ARE
139         * ABOVE 14K, ARE CONVERTED TO ADDRESSES ABOVE 2K, AND RELOCATED
140         * BY SERBAS.  THIS IS DONE SO THAT THE TRANSCENDENTAL FUNCTION
141         * ROUTINES CAN ACCESS ADDRESSES WITHIN THE SERIES FUNCTION.
142         *
143         110    DCW   @FUNLOAD B@                                       9  0110                      1
144         X1     EQU   89                                                  0089
145         X2     EQU   94                                                  0094
146         X3     EQU   99                                                  0099
147         *
148         * STUFF IN THE RESIDENT AREA
149         *
150         FUNC1  EQU   111  SWITCH TO SELECT FIRST RELOCATABLE FUNC         0111
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SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

151         SINCOS EQU   118  SAW SINF OR COSF IF NO WM                          0118
152         FUNCN  EQU   139  SWITCH TO SELECT LAST RELOCATABLE FUNC             0139
153         GOTXL  EQU   185  XLINKF WAS LOADED                                  0185
154         RELTAB EQU   188  TOP OF RELOCATABLE FUNCTIONS & 1                   0188
155         ARYTOP EQU   194  TOP OF ARRAYS IN OBJECT CODE                       0194
156         TOPCOR EQU   688  TOP CORE ADDRESS FROM PARAM CARD     *             0688
157         *
158                EXT00   SNAPSH, LOADNX, CDOVLY, TPERR                                 MACRO
159         SNAPSH EQU   333                                                     0333      GEN
160         PHASLD EQU   381                                                     0381      GEN
161         SNAPEX EQU   564                                                     0564      GEN
162         LOADNX EQU   700   CARD OVERLAY UNLESS NOP                          0700      GEN
163         CDOVLY EQU   700   1 IF LOADING FROM CARDS, N IF FROM TAPE          0700      GEN
164         TPREAD EQU   704   LOAD OVERLAY FROM TAPE                           0704      GEN
165         TPERR  EQU   728                                                     0728      GEN
166         *
167                XT52A   ADDRESSES IN PHASE 52A -- LOAD 52B&C                          MACRO
168         EXLINK EQU   840   139 I XLINKF ENTRY ADDRESS                       0840      GEN
169         USER1  EQU   876   127 R USER FUNCTION 01 ENTRY ADDRESS             0876      GEN
170         SUBSC  EQU   909   116 SUBSCRIPT                                   0909      GEN
171         OBLIST EQU   912   115 I/O LIST AND NOT LIMITED FORMAT             0912      GEN
172         SX2    EQU   927                                                     0927      GEN
173         CONBOT EQU   930   BOTTOM OF CONSTANTS - 1  FIXWD                  0930      GEN
174         ARYBOT EQU   933   BOTTOM OF ARRAYS - 1     FLTWD                  0933      GEN
175         BEG52A EQU   934   V3M4                                            0934      GEN
176                XT54C   ADDRESS IN NORMAL FORMAT ROUTINE                             MACRO
177         FMTBAS EQU   1697                                                    1697      GEN
178         RELENT EQU   2132  ENTER HERE FROM RELOCATABLE FUNCTION TABLE       2132      GEN
179         NOOVFL EQU   3138                                                    3138      GEN
180         NGM    EQU   4279                                                    4279      GEN
181         AFMT1  EQU   4280                                                    4280      GEN
182         AGM    EQU   4616                                                    4616      GEN
183         *
184                EXT03   START, TOP OF PHASE 3                                  MACRO
185         BEGIN3 EQU   838                                                     0838      GEN
186         TOP3   EQU   2600                                                    2600      GEN
187         *
188         * THIS PHASE IS SPLIT INTO TWO NONCONTIGUOUS PIECES.  THE FIRST,
189         * WHICH LOADS THE RELOCATABLE FUNCTIONS, REPLACES THE SNAPSHOT
190         * DUMP. THEN A GAP MUST BE LEFT TO AVOID CLOBBERING THE PHASE
191         * LOADER. THE FIRST INTERPHASE LOADS THE FIRST HALF, AND THEN
192         * RUNS THE LOADER AGAIN. PHASE 52B (FUNLOAD B) IS HERE INSTEAD
193         * OF IN HIGHER CORE BECAUSE THERE MIGHT ALREADY BE OBJECT CODE
194         * GENERATED.
195         *
196         PHS52B LDPH  FUNLOAD B,LOADD1,LOADNX,,,53B                                 MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]       GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                          GEN
            *                                                                       GEN
            * LOAD A BLOCK                                                         GEN
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

            *                                                                         GEN
197         )6J005  EQU   110  PHASE ID                                      0110     GEN
198         )6K005  EQU   700  LOAD NEXT PHASE                              0700     GEN
199         )6L005  EQU   704  TAPE READ INSTRUCTION                        0704     GEN
200         )6M005  EQU   728  TAPE ERROR HANDLER                           0728     GEN
            *                                                                         GEN
201                 ORG   201                                                  0201
202         PHS52B  EQU   *&1                                                0201     GEN
203                 LCA   )9J005,)6J005                                 7    0201  L 252 110   GEN      2   252     110
204                 BCE   )6K005,)6K005,1      Q: LOADING FROM CARDS?   8    0208  B 700 700 1 GEN      2   700     700
205                 BCE   )6K005,)6L005&4,0    Q: LOADING FROM AUTOCODER TAPE?  8  0216  B 700 708 0 GEN  2   700     708
206                 RTW   1,LOADD1             READ THE BLOCK           8    0224  L %U1 333 R GEN      2   %U1     333
207                 BER   )6M005               Q: TAPE ERROR?           5    0232  B 728 L     GEN      2   728
208                 CS    LOADNX,)9R005        ENTER THE BLOCK          7    0237  / 700 257   GEN      3   700     257
209         )9J005  DCW   @FUNLOAD B@          PHASE ID                 9    0252              GEN      3
210                 DC    #1                                           1    0253              GEN      3
211                 DC    @53B@          PHASE NUMBER                  3    0256              GEN      3
212         )9R005  DCW   @}@                                          1    0257              GEN      3
213                 XFR   PHS52B                                                 B 201               4   201
214         *
215                 ORG   SNAPSH                                              0333
216         LOADD1  EQU   *&1          LOAD ADDRESS                      0333
217    333          H     333                                          4    0333  . 333               5   333
218    337  BEG52B  CS    80                                           4    0337  / 080               5   080
219    341          MCW   X3,SX3                                       7    0341  M 099 V74           5   099    1574
220    348          SBR   X3,1&X3                                      7    0348  H 099 0?1           5   099     001+3
221    355          SW    1,40           SET WORD                      7    0355  , 001 040           5   001     040
222    362          SW    47,54            MARKS TO                    7    0362  , 047 054           5   047     054
223    369          SW    61,68              READ RELOCATABLE          7    0369  , 061 068           6   061     068
224    376          SW    72                   SUBPROGRAMS             4    0376  , 072               6   072
225    380          MCW   CDOVLY,RDCARD  CARDS IF 1, TAPE IF NOP        7    0380  M 700 /60          6   700    1160
226    387          B     RDREC          SKIP BOUNDARY -- FIVE BRACKETS 4    0387  B /49              6  1149
227    391          MCW   83,X2                                         7    0391  M 083 094           6   083     094
228    398          MN    0&X2                                         4    0398  D 0!0               6   000+2
229    402          MN                                                 1    0402  D                   6
230    403          SBR   TSTUND&6                                     4    0403  H |95               7  1095
231    407          MCW   KUND1       TOO BIG IF THIS GETS CLOBBERED   4    0407  M V04              7  1504
232    411          NOP                                                1    0411  N                   7
233    412  OUTER   MCW   X3,ADD14K&3                                   7    0412  M 099 436           7   099     436
234    419          MZ    BRANCH,ADD14K&2  X3 ZONE                     7    0419  Y V05 435           7  1505     435
235    426          MCW   K14K,X3                                      7    0426  M U99 099           7  1499     099
236         * WHY NOT SBR  X3,0-0 ???
237    433  ADD14K  NOP   0-0          SUBTRACT 2000 FROM X3 BECAUSE    4    0433  N 000               7   000
238    437          SAR   X3             RELOCTABLES ORG AT 2000       4    0437  Q 099               8   099
239    441  GETUND  B     RDREC                                          4    0441  B /49               8  1149
240    445  CHKUND  C     5,KUND4      DOES RECORD BEGIN WITH UNDERLINES 7    0445  C 005 V09           8   005    1509
241    452          BU    NOTUND       NO                               5    0452  B 468 /             8   468
242    457          MCW   X3,SERBAS    SAVE BASE ADDRESS FOR SERIES FUNCTION 7 0457  M 099 V12           8   099    1512
243    464          B     GETUND       YES, GET ANOTHER RECORD          4    0464  B 441               8   441
244    468  NOTUND  MCW   AFUNC1,X1    NEXT LOAD SWITCH                 7    0468  M V02 089           8  1502     089
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
245    475  SBRNOP  SBR   AFUNC1,1&X1   NOP FOR SECOND PASS SIN FLAG          7  0475  H V02 0|1           9  1502     001+1
246    482          C     X1,AFUNCN    END OF LOAD FLAGS?                    7  0482  C 089 V15           9   089    1515
247    489          BE    SWITCH       YES                                   5  0489  B T30 S             9  1330
248    494          MCW   SBR,SBRNOP                                        7  0494  M V16 475           9  1516     475
249    501          C     SX2,AUSER1                                         7  0501  C 927 V19           9   927    1519
250    508  SWICH1  BE    GOTUSR       USER FUNCTIONS?                       5  0508  B T94 S             9  1394
251    513  RETUSR  MCW   SX2,X2       DECREMENT                             7  0513  M 927 094          10   927     094
252    520          C     0&X2           FUNCTION TABLE                      4  0520  C 0!0              10   000+2
253    524          SAR   SX2              POINTER                           4  0524  Q 927              10   927
254    528          BW    SKIP,0&X1    DON'T NEED DECK IF WM IN LOAD FLAG    8  0528  V T06 0|0 1        10  1306     000+1
255    536  MCWNOP  MCW   NOP,SWICH2   ALLOW STORING LOAD ADDRESS UNLESS NOP  7  0536  M V20 583          10  1520     583
256    543  TSTREL  BWZ   NOREL,42,2   NO RELOCATION                         8  0543  V /31 042 2        10  1131     042
257    551          MN    46,LOAD&6    LOAD FROM WHERE                       7  0551  D 046 578          11   046     578
258    558          CHAIN 5                                                                MACRO
259                 MN                                                      1  0558  D          GEN     11
260                 MN                                                      1  0559  D          GEN     11
261                 MN                                                      1  0560  D          GEN     11
262                 MN                                                      1  0561  D          GEN     11
263                 MN                                                      1  0562  D          GEN     11
264    563          MZ    46,LOAD&6    LOAD TO WHERE                         7  0563  Y 046 578          11   046     578
265    570          MN                 DONT CLOBBER X3 ZONE TAG              1  0570  D                  12
266    571          MZ                                                      1  0571  Y                  12
267    572  LOAD    LCA   0,0&X3       LOAD THE FIELD FROM THE RECORD        7  0572  L 000 0?0          12   000     000+3
268    579          SBR   X2                                                4  0579  H 094              12   094
269    583  SWICH2  NOP   MZ45         SKIP STORING LOAD ADDRESS IF BRANCH   4  0583  N 608              12   608
270    587          MCW   SX2,X1                                           7  0587  M 927 089          12   927     089
271    594          SBR   3&X1,1&X2    STORE FUNCTION LOAD ADDRESS           7  0594  H 0|3 0!1          12   003+1   001+2
272    601          MCW   BRANCH,SWICH2  SKIP OVER STORING LOAD ADDRESS     7  0601  M V05 583          13  1505     583
273    608  MZ45    MZ    45,SAVZON    RELOCATION TAG FOR FIRST FIELD        7  0608  Y 045 V21          13   045    1521
274    615          B     RELOC                                             4  0615  B /88              13  1188
275    619          S     X1&1                                              4  0619  S 090              13   090
276    623  LOOP    C     50&X1,A40    WHY NOT BCE NORELX,50&X1,0 ???        7  0623  C 0V0 V24          13   050+1  1524
277    630          BE    NORELX       AT WM ADDRESS 040 OR AT 1040 INSTR    5  0630  B |11 S            13  1011
278    635          MCW   50&X1,SWCW&3                                      7  0635  M 0V0 667          14   050+1   667
279    642          MZ    BRANCH,SWCW&2  X3 TAG                           7  0642  Y V05 666          14  1505     666
280    649          BCE   SWCW,SWCW,)                                       8  0649  B 664 664 )        14   664     664
281    657          MCW   SW,SWCW      IN CASE WE ARE DOING THE B FIELD     7  0657  M V25 664          14  1525     664
282    664  SWCW    SW    0&X3  SET OR CLEAR RELOCATED WORD MARK            4  0664  , 0?0              14   000+3
283    668          SAR   X2                                                4  0668  Q 094              14   094
284    672          B     BEG52C  BRANCH AROUND PHASE LOADER                4  0672  B 934              15   934
285    676          NOP   0                                                 4  0676  N 000              15   000
286    680          DCW   @}@                                               1  0680           GMARK   15
287                 XFR   LOADNX    LOAD THE INTERPHASE LOADER FOR PART C                B 700              16   700
288         *
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

289            JOB   FORTRAN COMPILER -- LOADER PHASE -- PHASE 52C
290         *
291         PHS52C LDPH  FUNLOAD C,LOADAD,BEG52B,,,52C                                                  MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]                           GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                                               GEN
            *                                                                                           GEN
            * LOAD A BLOCK                                                                              GEN
            *                                                                                           GEN
292         )6J006 EQU   110  PHASE ID                                          0110                   GEN
293         )6K006 EQU   700  LOAD NEXT PHASE                                   0700                   GEN
294         )6L006 EQU   704  TAPE READ INSTRUCTION                             0704                   GEN
295         )6M006 EQU   728  TAPE ERROR HANDLER                                0728                   GEN
            *                                                                                           GEN
296            ORG   201                                                              0201
297         PHS52C EQU   *&1                                                    0201                   GEN
298            LCA   )9J006,)6J006                                           7  0201  L 252 110        GEN     17   252     110
299            BCE   )6K006,)6K006,1      Q: LOADING FROM CARDS?             8  0208  B 700 700 1      GEN     17   700     700
300            BCE   )6K006,)6L006&4,0    Q: LOADING FROM AUTOCODER TAPE?    8  0216  B 700 708 0      GEN     17   700     708
301            RTW   1,LOADAD             READ THE BLOCK                     8  0224  L %U1 934 R      GEN     17   %U1     934
302            BER   )6M006               Q: TAPE ERROR?                     5  0232  B 728 L          GEN     17   728
303            CS    BEG52B,)9R006        ENTER THE BLOCK                    7  0237  / 337 257        GEN     18   337     257
304         )9J006 DCW   @FUNLOAD C@          PHASE ID                      9  0252                   GEN     18
305            DC    #1                                                     1  0253                   GEN     18
306            DC    @52C@          PHASE NUMBER                           3  0256                   GEN     18
307         )9R006 DCW   @}@                                                 1  0257                   GEN     18
308            XFR   PHS52C                                                          B 201                  19   201
309         *
310         110    DCW   @FUNLOAD C@                                        9  0110                          20
311            ORG   BEG52A                                                           0934
312         LOADAD EQU   *&1                                                    0934
313         *
314 *  934  BEG52C MZ    49&X1,SAVZON  RELOCATION TAG FROM SW INSTRUCTION    7  0934  Y 0U9 V21        21   049+1  1521
315    941         B     RELOC                                               4  0941  B /88            21  1188
316         * ADD EITHER 3 OR 4 TO X1 TO GET TO NEXT SW ADDRESS
317         * THIS WOULD BE SIMPLER IF SBR/NOP X1,1&X1 THEN SBR X1,3&X1 ???
318    945  NOPADD NOP   K4,X1  SOMETIMES ADD, SOMETIMES NOP                   7  0945  N V26 089        21  1526     089
319    952  ADDNOP A     K3,X1  SOMETIMES ADD, SOMETIMES NOP                   7  0952  A V27 089        21  1527     089
320    959         BCE   EXCH43,NOPADD,A                                      8  0959  B 993 945 A      21   993     945
321    967         MCW   ADD,NOPADD                                           7  0967  M V28 945        22  1528     945
322    974         MCW   NOP,ADDNOP                                           7  0974  M V20 952        22  1520     952
323    981         BCE   NOPADD,SWCW,)  ???                                   8  0981  B 945 664 )      22   945     664
324    989         B     LOOP                                                4  0989  B 623            22   623
325    993  EXCH43 MCW   NOP,NOPADD                                           7  0993  M V20 945        22  1520     945
326  1 000         MCW   ADD,ADDNOP                                           7  1000  M V28 952        23  1528     952
327  1 007         B     LOOP                                                4  1007  B 623            23   623
328         *
329         * DONE WITH RELOCATION OF ONE DECK
330         *
331  1 011  NORELX MCW   46,WHERE    TOP ADDRESS LOADED?                     7  1011  M 046 V31        23   046    1531
332  1 018         MCW   NOP,NOPADD  RESET ADD 3/4                           7  1018  M V20 945        23  1520     945
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SEQ PG LIN  LABEL   OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

333  1 025          MCW   ADD,ADDNOP    TOGGLE                              7  1025  M V28 952           23  1528     952
334  1 032          B     RDREC                                             4  1032  B /49               23  1149
335  1 036          BCE   EXEND,68,B  EX CARD?                            8  1036  B |56 068 B         24  1056     068
336  1 044          BCE   EXEND,40,/  END CARD?                           8  1044  B |56 040 /         24  1056     040
337  1 052          B     TSTREL                                            4  1052  B 543               24   543
338  1 056  EXEND   MCW   WHERE,*&11  CAN WE USE LOAD&6 HERE ???           7  1056  M V31 |73           24  1531    1073
339  1 063          MZ    BRANCH,*&3  X3 TAG                              7  1063  Y V05 |72           24  1505    1072
340  1 070          NOP   0&X3                                            4  1070  N 0?0               24   000+3
341  1 074          SAR   X3                                              4  1074  Q 099               25   099
342  1 078          SBR   SX3                                             4  1078  H V74               25  1574
343  1 082          SBR   X3,1&X3     NEXT FUNCTION LOAD ADDRESS           7  1082  H 099 0?1           25   099     001+3
344  1 089  TSTUND  BCE   OUTER,0,_   NOT TOO BIG IF STILL UNDERLINE       8  1089  B 412 000 _         25   412     000
345  1 097          CS    332                                             4  1097  / 332               25   332
346  1 101          CS                                                    1  1101  /                   25
347  1 102          CC    1                                               2  1102  F 1                 25
348  1 104          MCW   ERROR2,270                                      7  1104  M V67 270           26  1567     270
349  1 111          W                                                     1  1111  2                   26
350  1 112          CC    1                                               2  1112  F 1                 26
351  1 114          BCE   HALT,CDOVLY,1                                  8  1114  B /27 700 1         26  1127     700
352  1 122          RWD   1                                               5  1122  U %U1 R             26   %U1
353  1 127  HALT    H     HALT                                            4  1127  . /27               26  1127
354          *
355          * NO RELOCATION, SIMPLY EXECUTE THE LOAD CODE
356          *
357  1 131  NOREL   SBR   71,NORELX                                       7  1131  H 071 |11           26   071    1011
358  1 138          MCW   BRANCH,68                                       7  1138  M V05 068           27  1505     068
359  1 145          B     40                                              4  1145  B 040               27   040
360          *
361          * READ A RECORD OF THE RELOCATABLE LIBRARY EITHER
362          * FROM CARD OR TAPE
363          *
364  1 149  RDREC   SBR   RDRECX&3                                        4  1149  H /87               27  1187
365  1 153          MCW   KB1,1   IN CASE IT WAS A GM IN THE PREV RECORD  7  1153  M V68 001           27  1568     001
366  1 160  RDCARD R     RDRECX  NOP IF LOADED FROM TAPE                 4  1160  1 /84               27  1184
367  1 164  REREAD MCW   KP9,ERRCNT                                      7  1164  M V69 V70           27  1569    1570
368  1 171  RDTAPE RT    1,1                                             8  1171  M %U1 001 R         28   %U1     001
369  1 179          BER   TPERR  BACKS UP ITS RETURN TO REREAD            5  1179  B 728 L             28   728
370  1 184  RDRECX B     0                                               4  1184  B 000               28   000
371          *
372          * RELOCATE FIELDS OF LOADED INSTRUCTIONS
373          *
374  1 217  RELOC   SBR   RELOCX&3                                        4  1188  H T05               28  1305
375  1 221          BWZ   RELOCX,SAVZON,2  NO RELOCATION                  8  1192  V T02 V21 2         28  1302    1521
376  1 229          BWZ   RELX1,SAVZON,S   B FIELD RELOCATION ONLY        8  1200  V S59 V21 S         28  1259    1521
377  1 237          MCW   X3,SX3                                          7  1208  M 099 V74           29   099    1574
378  1 244          BWZ   RELNZ1,4&X2,2    IS RELOCATED FIELD BELOW 4K    8  1215  V S37 0!4 2         29  1237     004+2
379  1 252          MCW   SERBAS,X3        NO, MUST BE ABOVE 14K = 16K-2K  7  1223  M V12 099           29  1512     099
380  1 259          MZ    *-4,4&X2         THOUSANDS TAG SET TO 2          7  1230  Y S32 0!4           29  1232     004+2
381  1 266  RELNZ1  MA    X3,4&X2          RELOCATE A FIELD                7  1237  # 099 0!4           29   099     004+2
382  1 273          MCW   SX3,X3                                          7  1244  M V74 099           30  1574     099
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SEQ PG LIN  LABEL  OP    OPERANDS                                    SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

383  1 280         BM    RELOCX,SAVZON    A FIELD RELOCATION ONLY        8  1251  V T02 V21 K        30  1302    1521
384  1 288  RELX1  MCW   X3,SX3                                         7  1259  M 099 V74          30   099    1574
385  1 295         BWZ   RELNZ2,7&X2,2    IS RELOCATED FIELD BELOW 4K    8  1266  V S88 0!7 2        30  1288     007+2
386  1 303         MCW   SERBAS,X3        NO, MUST BE ABOVE 14K = 16K-2K 7  1274  M V12 099          30  1512     099
387  1 310         MZ    *-4,7&X2         THOUSANDS TAG SET TO 2         7  1281  Y S83 0!7          31  1283     007+2
388  1 317  RELNZ2 MA    X3,7&X2          RELOCATE B FIELD               7  1288  # 099 0!7          31   099     007+2
389  1 324         MCW   SX3,X3                                         7  1295  M V74 099          31  1574     099
390  1 331  RELOCX B     0                                             4  1302  B 000              31   000
391         *
392         * DON'T NEED THE FUNCTION
393         * SKIP UNTIL END OR XFR RECORD
394         *
395  1 335  SKIP   B     RDREC                                         4  1306  B /49              31  1149
396  1 339         BCE   GETUND,40,/                                   8  1310  B 441 040 /        31   441     040
397  1 347         BCE   GETUND,68,B                                   8  1318  B 441 068 B        32   441     068
398  1 355         B     SKIP                                          4  1326  B T06              32  1306
399         *
400         * GOT TO END OF LOAD FLAGS
401         * START OVER AT SINCOS TO STORE THE ENTRY TABLE
402         *
403  1 359  SWITCH NOP   DONE           SECOND TIME IT IS A BRANCH     4  1330  N U12              32  1412
404  1 363         MCW   BRANCH,SWITCH  ONLY DO THIS ONCE              7  1334  M V05 T30          32  1505    1330
405  1 370         SBR   AFUNC1,SINCOS  START OVER AT SINCOS           7  1341  H V02 118          32  1502     118
406  1 377         MCW   SX3,X2                                        7  1348  M V74 094          32  1574     094
407  1 384         SBR   RELTAB,1&X2    RELOCATABLE ENTRY TABLE ADDRESS 7  1355  H 188 0!1          33   188     001+2
408  1 391         MCW   NOP,SBRNOP                                   7  1362  M V20 475          33  1520     475
409  1 398         MCW   NOP,MCWNOP                                   7  1369  M V20 536          33  1520     536
410  1 405         MCW   BRANCH,SWICH2  SKIP STORING LOAD ADDRESS      7  1376  M V05 583          33  1505     583
411  1 412         MCW   SX3,SX3D                                      7  1383  M V74 V77          33  1574    1577
412  1 419         B     CHKUND                                        4  1390  B 445              33   445
413         *
414         * DOWN TO USER FUNCTIONS IN THE ADDRESS TABLE
415         *
416  1 423  GOTUSR MCW   SX3,SX3C  SAVE FIRST USER FUNCTION ADDRESS    7  1394  M V74 V80          34  1574    1580
417  1 430         MCW   NOP,SWICH1                                    7  1401  M V20 508          34  1520     508
418  1 437         B     RETUSR                                        4  1408  B 513              34   513
419         *
420  1 441  DONE   MCW   SX3,X3         TOP OF FUNCTION ENTRY TABLE    7  1412  M V74 099          34  1574     099
421  1 448         MCW   TOPCOR,X2                                     7  1419  M 688 094          34   688     094
422  1 455         C     0&X2                                          4  1426  C 0!0              34   000+2
423  1 459         SAR   X2                                          4  1430  Q 094              35   094
424  1 463         SBR   ARYBOT          BOTTOM OF ARRAYS - 1           4  1434  H 933              35   933
425  1 467         C     0&X2                                          4  1438  C 0!0              35   000+2
426  1 471         SAR   CONBOT          BOTTOM OF CONSTANTS - 1        4  1442  Q 930              35   930
427  1 475         BCE   BLANK,EXLINK,   IS XLINKF LOADED               8  1446  B U79 840          35  1479     840
428  1 483         MCW   EXLINK,X1       YES                            7  1454  M 840 089          35   840     089
429  1 490         MA    A13,X1          WHY NOT MCW  ARYTOP,13&X1 ???  7  1461  # V83 089          35  1583     089
430  1 497         MCW   ARYTOP,0&X1     STORE WITHIN XLINKF            7  1468  M 194 0|0          36   194     000+1
431  1 504         CW    GOTXL                                         4  1475  ) 185              36   185
432  1 508  BLANK  MCW   SX3C,X1  FIRST USER FUNCTION ADDRESS          7  1479  M V80 089          36  1580     089
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

433  1 515          MCW   SX3D,X2  LAST FUNCTION LOAD ADDRESS & 1             7  1486  M V77 094          36  1577     094
434  1 554          B     LOADNX                                             4  1493  B 700              36   700
435          *
436          * DATA
437          *
438  1 560  K14K    DSA   14000    14000 IS 16000-2000                       3  1499  !0?                36 14000
439  1 563  AFUNC1  DCW   FUNC1    ADDRESS OF FIRST FUNCTION SWITCH          3  1502  111                36   111
440  1 564          DC    #1                                                 1  1503                     36
441  1 565  KUND1   DCW   @_@      ONE UNDERLINE CHARACTER                   1  1504                     37
442  1 566  BRANCH  B                                                        1  1505  B                  37
443  1 570  KUND4   DCW   @____@   FOUR UNDERLINE CHARACTERS (11-7-8)        4  1509                     37
444  1 573  SERBAS  DCW   #3       BASE ADDRESS FOR SERIES FUNCTION          3  1512                     37
445  1 576  AFUNCN  DSA   FUNCN&1  ADDRESS OF LAST FUNCTION SWITCH           3  1515  140                37   140
446  1 577  SBR     SBR                                                      1  1516  H                  37
447  1 580  AUSER1  DSA   USER1    FIRST USER FUNCTION ENTRY                 3  1519  876                37   876
448  1 581  NOP     NOP                                                      1  1520  N                  38
449  1 582  SAVZON  DCW   #1                                                 1  1521                     38
450  1 585  A40     DSA   40                                                 3  1524  040                38   040
451  1 586  SW      SW                                                       1  1525  ,                  38
452  1 587  K4      DCW   4                                                  1  1526                     38
453  1 588  K3      DCW   3                                                  1  1527                     38
454  1 589  ADD     A                                                        1  1528  A                  38
455  1 592  WHERE   DCW   #3                                                 3  1531                     39
456  1 628  ERROR2  DCW   @MESSAGE 2 - OBJECT PROGRAM TOO LARGE@            36  1567                     39
457  1 629  KB1     DCW   #1                                                 1  1568                     40
458  1 630  KP9     DCW   &9                                                 1  1569                     40
459  1 631  ERRCNT  DCW   #1  TAPE ERROR COUNTER                            1  1570                     40
460  1 632  KP1     DCW   &1                                                 1  1571                     40
461  1 635  SX3     DCW   #3                                                 3  1574                     40
462  1 638  SX3D    DCW   #3                                                 3  1577                     40
463  1 641  SX3C    DCW   #3                                                 3  1580                     40
464  1 644  A13     DSA   13                                                 3  1583  013                41   013
465  1 654  GMWM    DCW   @}@                                               1  1584        GMARK    41
466          CLRTOP  EQU   1696  MOKOTOFF V3M0.LST LINE 105771                1696
467 *        CLR52C  EQU   CLRTOP                                             1696
468                  XFR   BEG52B                                                   B 337              42   337
469          * CAN'T CLEAR HERE BECAUSE THE RELOCATABLE LIBRARY APPEARS NEXT
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
)6J005	0110: 0	)6J006	0110: 0	)6K005	0700: 0	)6K006	0700: 0	)6L005	0704: 0	)6L006	0704: 0
)6M005	0728: 0	)6M006	0728: 0	)9J005	0252: 0	)9J006	0252: 0	)9R005	0257: 0	)9R006	0257: 0
A13	1583: 0	A40	1524: 0	ADD	1528: 0	ADD14K	0433: 0	ADDNOP	0952: 0	AFMT1	4280: 0
AFUNC1	1502: 0	AFUNCN	1515: 0	AGM	4616: 0	ARYBOT	0933: 0	ARYTOP	0194: 0	AUSER1	1519: 0
BEG52A	0934: 0	BEG52B	0337: 0	BEG52C	0934: 0	BEGIN3	0838: 0	BLANK	1479: 0	BRANCH	1505: 0
CDOVLY	0700: 0	CHKUND	0445: 0	CLR52C	1696: 0	CLRTOP	1696: 0	CONBOT	0930: 0	DONE	1412: 0
ERRCNT	1570: 0	ERROR2	1567: 0	EXCH43	0993: 0	EXEND	1056: 0	EXLINK	0840: 0	FMTBAS	1697: 0
FUNC1	0111: 0	FUNCN	0139: 0	GETUND	0441: 0	GMWM	1584: 0	GOTUSR	1394: 0	GOTXL	0185: 0
HALT	1127: 0	K14K	1499: 0	K3	1527: 0	K4	1526: 0	KB1	1568: 0	KP1	1571: 0
KP9	1569: 0	KUND1	1504: 0	KUND4	1509: 0	LOAD	0572: 0	LOADAD	0934: 0	LOADD1	0333: 0
LOADNX	0700: 0	LOOP	0623: 0	MCWNOP	0536: 0	MZ45	0608: 0	NGM	4279: 0	NOOVFL	3138: 0
NOP	1520: 0	NOPADD	0945: 0	NOREL	1131: 0	NORELX	1011: 0	NOTUND	0468: 0	OBLIST	0912: 0
OUTER	0412: 0	PHASLD	0381: 0	PHS52B	0201: 0	PHS52C	0201: 0	RDCARD	1160: 0	RDREC	1149: 0
RDRECX	1184: 0	RDTAPE	1171: 0	RELENT	2132: 0	RELNZ1	1237: 0	RELNZ2	1288: 0	RELOC	1188: 0
RELOCX	1302: 0	RELTAB	0188: 0	RELX1	1259: 0	REREAD	1164: 0	RETUSR	0513: 0	SAVZON	1521: 0
SBR	1516: 0	SBRNOP	0475: 0	SERBAS	1512: 0	SINCOS	0118: 0	SKIP	1306: 0	SNAPEX	0564: 0
SNAPSH	0333: 0	SUBSC	0909: 0	SW	1525: 0	SWCW	0664: 0	SWICH1	0508: 0	SWICH2	0583: 0
SWITCH	1330: 0	SX2	0927: 0	SX3	1574: 0	SX3C	1580: 0	SX3D	1577: 0	TOP3	2600: 0
TOPCOR	0688: 0	TPERR	0728: 0	TPREAD	0704: 0	TSTREL	0543: 0	TSTUND	1089: 0	USER1	0876: 0
WHERE	1531: 0	X1	0089: 0	X2	0094: 0	X3	0099: 0				

UNREFERENCED SYMBOLS

AFMT1 AGM BEGIN3 CLR52C FMTBAS GMWM KP1 NGM NOOVFL OBLIST PHASLD RDTAPE RELENT REREAD SNAPEX SUBSC TOP3 TPREAD