```
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         RELENT EQU   2132  ENTER HERE FROM RELOCATABLE FUNCTION TABLE       2132      GEN
178         AFMT1  EQU   4280                                                    4280      GEN
179         AGM    EQU   4646                                                    4646      GEN
180         *
181                EXT03   START, TOP OF PHASE 3                                  MACRO
182         BEGIN3 EQU   838                                                     0838      GEN
183         TOP3   EQU   2600                                                    2600      GEN
184         *
185         * THIS PHASE IS SPLIT INTO TWO NONCONTIGUOUS PIECES.  THE FIRST,
186         * WHICH LOADS THE RELOCATABLE FUNCTIONS, REPLACES THE SNAPSHOT
187         * DUMP. THEN A GAP MUST BE LEFT TO AVOID CLOBBERING THE PHASE
188         * LOADER. THE FIRST INTERPHASE LOADS THE FIRST HALF, AND THEN
189         * RUNS THE LOADER AGAIN. PHASE 52B (FUNLOAD B) IS HERE INSTEAD
190         * OF IN HIGHER CORE BECAUSE THERE MIGHT ALREADY BE OBJECT CODE
191         * GENERATED.
192         *
193         PHS52B LDPH  FUNLOAD B,LOADD1,LOADNX,,,52B                                 MACRO
            * PHAZ   LDPH [PHASID],LOADAD,ENTAD[,SKIPFG,SKIP],[NUMBER][,HALT]       GEN
            *        XFR  PHASZ     PROHIBITED IN A MACRO                          GEN
            *                                                                      GEN
            * LOAD A BLOCK                                                        GEN
            *                                                                      GEN
194         )6J005 EQU   110  PHASE ID                                           0110      GEN
195         )6K005 EQU   700  LOAD NEXT PHASE                                    0700      GEN
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SEQ PG LIN  LABEL    OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

196         )6L005   EQU   704  TAPE READ INSTRUCTION                              0704            GEN
197         )6M005   EQU   728  TAPE ERROR HANDLER                                 0728            GEN
            *                                                                                     GEN
198                  ORG   201                                                          0201
199         PHS52B   BSS   )8J005,G                                             5  0201  B 257 G     GEN      2   257
200                  NOP     TO PATCH IN TRAPS FOR DEBUGGING                     1  0206  N           GEN      2
201         )0J005   EQU   *&1                                                       0207            GEN
202                  LCA   )9J005,)6J005                                         7  0207  L 281 110   GEN      2   281     110
203                  BCE   )1J005,)6K005,1    Q: LOADING FROM CARDS?            8  0214  B 250 700 1 GEN      2   250     700
204                  BCE   )1J005,)6L005&4,0  Q: LOADING FROM AUTOCODER TAPE?    8  0222  B 250 708 0 GEN      2   250     708
205                  RTW   1,LOADD1           READ THE BLOCK                    8  0230  L %U1 333 R GEN      2   %U1     333
206                  BER   )6M005             Q: TAPE ERROR?                    5  0238  B 728 L     GEN      3   728
207                  CS    LOADNX,)9R005      ENTER THE BLOCK                   7  0243  / 700 286   GEN      3   700     286
208         )1J005   CS    )6K005,)9R005      LOAD CARDS OR AUTOCODER TAPE      7  0250  / 700 286   GEN      3   700     286
209         )8J005   SW    )9R005                                               4  0257  , 286       GEN      3   286
210                  MU    %T0,)8K005,W                                         8  0261  M %T0 273 W GEN      3   %T0     273
211                  H     )0J005                                               4  0269  . 207       GEN      3   207
212         )8K005   EQU   *&1                                                       0273            GEN
213         )9J005   DCW   @FUNLOAD B@          PHASE ID                       9  0281            GEN      4
214                  DCW   #1                                                    1  0282            GEN      4
215                  DC    @52B@          PHASE NUMBER                        3  0285            GEN      4
216         )9R005   DCW   @}@                                                  1  0286            GEN      4
217                  XFR   PHS52B                                                     B 201               5   201
218         *
219                  ORG   SNAPSH                                                       0333
220         LOADD1   EQU   *&1          LOAD ADDRESS                                 0333
221    333           H     333                                                  4  0333  . 333               6   333
222    337  BEG52B   CS    80                                                   4  0337  / 080               6   080
223    341           MCW   X3,SX3                                               7  0341  M 099 V78           6   099    1578
224    348           SBR   X3,1&X3                                             7  0348  H 099 0?1           6   099     001+3
225    355           SW    1,40           SET WORD                            7  0355  , 001 040           6   001     040
226    362           SW    47,54            MARKS TO                          7  0362  , 047 054           6   047     054
227    369           SW    61,68              READ RELOCATABLE                7  0369  , 061 068           7   061     068
228    376           SW    72                   SUBPROGRAMS                   4  0376  , 072               7   072
229    380           MCW   CDOVLY,RDCARD  CARDS IF 1, TAPE IF NOP              7  0380  M 700 /60           7   700    1160
230    387           B     RDREC          SKIP BOUNDARY -- FIVE BRACKETS      4  0387  B /49              7  1149
231    391           MCW   83,X2                                              7  0391  M 083 094           7   083     094
232    398           MN    0&X2                                                4  0398  D 0!0               7   000+2
233    402           MN                                                        1  0402  D                   7
234    403           SBR   TSTUND&6                                           4  0403  H |95               8  1095
235    407           MCW   KUND1       TOO BIG IF THIS GETS CLOBBERED          4  0407  M V08               8  1508
236    411           NOP                                                       1  0411  N                   8
237    412  OUTER    MCW   X3,ADD14K&3                                         7  0412  M 099 436           8   099     436
238    419           MZ    BRANCH,ADD14K&2  X3 ZONE                            7  0419  Y V09 435           8  1509     435
239    426           MCW   K14K,X3                                            7  0426  M V03 099           8  1503     099
240         * WHY NOT SBR  X3,0-0 ???
241    433  ADD14K   NOP   0-0          SUBTRACT 2000 FROM X3 BECAUSE          4  0433  N 000               8   000
242    437           SAR   X3             RELOCTABLES ORG AT 2000             4  0437  Q 099               9   099
243    441  GETUND   B     RDREC                                               4  0441  B /49              9  1149
244    445  CHKUND   C     5,KUND4     DOES RECORD BEGIN WITH UNDERLINES       7  0445  C 005 V13           9   005    1513
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
245    452          BU    NOTUND      NO                                        5  0452  B 468 /             9   468
246    457          MCW   X3,SERBAS   SAVE BASE ADDRESS FOR SERIES FUNCTION      7  0457  M 099 V16           9   099    1516
247    464          B     GETUND      YES, GET ANOTHER RECORD                   4  0464  B 441               9   441
248    468  NOTUND  MCW   AFUNC1,X1   NEXT LOAD SWITCH                         7  0468  M V06 089           9  1506     089
249    475  SBRNOP  SBR   AFUNC1,1&X1   NOP FOR SECOND PASS SIN FLAG           7  0475  H V06 0|1          10  1506     001+1
250    482          C     X1,AFUNCN   END OF LOAD FLAGS?                       7  0482  C 089 V19          10   089    1519
251    489          BE    SWITCH      YES                                       5  0489  B T34 S            10  1334
252    494          MCW   SBR,SBRNOP                                          7  0494  M V20 475          10  1520     475
253    501          C     SX2,AUSER1                                          7  0501  C 927 V23          10   927    1523
254    508  SWICH1  BE    GOTUSR      USER FUNCTIONS?                           5  0508  B T98 S            10  1398
255    513  RETUSR  MCW   SX2,X2      DECREMENT                                 7  0513  M 927 094          11   927     094
256    520          C     0&X2          FUNCTION TABLE                        4  0520  C 0!0              11   000+2
257    524          SAR   SX2             POINTER                             4  0524  Q 927              11   927
258    528          BW    SKIP,0&X1   DON'T NEED DECK IF WM IN LOAD FLAG        8  0528  V T10 0|0 1        11  1310     000+1
259    536  MCWNOP  MCW   NOP,SWICH2  ALLOW STORING LOAD ADDRESS UNLESS NOP     7  0536  M V24 583          11  1524     583
260    543  TSTREL  BWZ   NOREL,42,2  NO RELOCATION                             8  0543  V /31 042 2        11  1131     042
261    551          MN    46,LOAD&6   LOAD FROM WHERE                           7  0551  D 046 578          12   046     578
262    558          CHAIN 5                                                                                  MACRO
263                 MN                                                        1  0558  D                  GEN   12
264                 MN                                                        1  0559  D                  GEN   12
265                 MN                                                        1  0560  D                  GEN   12
266                 MN                                                        1  0561  D                  GEN   12
267                 MN                                                        1  0562  D                  GEN   12
268    563          MZ    46,LOAD&6   LOAD TO WHERE                             7  0563  Y 046 578          12   046     578
269    570          MN                DONT CLOBBER X3 ZONE TAG                  1  0570  D                  13
270    571          MZ                                                        1  0571  Y                  13
271    572  LOAD    LCA   0,0&X3      LOAD THE FIELD FROM THE RECORD            7  0572  L 000 0?0          13   000     000+3
272    579          SBR   X2                                                  4  0579  H 094              13   094
273    583  SWICH2  NOP   MZ45        SKIP STORING LOAD ADDRESS IF BRANCH       4  0583  N 608              13   608
274    587          MCW   SX2,X1                                              7  0587  M 927 089          13   927     089
275    594          SBR   3&X1,1&X2   STORE FUNCTION LOAD ADDRESS              7  0594  H 0|3 0!1          13   003+1   001+2
276    601          MCW   BRANCH,SWICH2  SKIP OVER STORING LOAD ADDRESS       7  0601  M V09 583          14  1509     583
277    608  MZ45    MZ    45,SAVZON   RELOCATION TAG FOR FIRST FIELD             7  0608  Y 045 V25          14   045    1525
278    615          B     RELOC                                                 4  0615  B /92              14  1192
279    619          S     X1&1                                                  4  0619  S 090              14   090
280    623  LOOP    C     50&X1,A40   WHY NOT BCE NORELX,50&X1,0 ???            7  0623  C 0V0 V28          14   050+1  1528
281    630          BE    NORELX      AT WM ADDRESS 040 OR AT 1040 INSTR        5  0630  B |11 S            14  1011
282    635          MCW   50&X1,SWCW&3                                         7  0635  M 0V0 667          15   050+1   667
283    642          MZ    BRANCH,SWCW&2  X3 TAG                               7  0642  Y V09 666          15  1509     666
284    649          BCE   SWCW,SWCW,)                                         8  0649  B 664 664 )        15   664     664
285    657          MCW   SW,SWCW     IN CASE WE ARE DOING THE B FIELD         7  0657  M V29 664          15  1529     664
286    664  SWCW    SW    0&X3  SET OR CLEAR RELOCATED WORD MARK               4  0664  , 0?0              15   000+3
287    668          SAR   X2                                                  4  0668  Q 094              15   094
288    672          B     BEG52C  BRANCH AROUND PHASE LOADER                  4  0672  B 934              16   934
289    676          NOP   0                                                   4  0676  N 000              16   000
290    680          DCW   @}@                                                 1  0680                GMARK  16
291                 XFR   LOADNX    LOAD THE INTERPHASE LOADER FOR PART C                B 700              17   700
292         *
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SEQ PG LIN  LABEL   OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

293             JOB   FORTRAN COMPILER -- LOADER PHASE -- PHASE 52C
294         *
295         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
296         )6J006 EQU   110  PHASE ID                                          0110                    GEN
297         )6K006 EQU   700  LOAD NEXT PHASE                                   0700                    GEN
298         )6L006 EQU   704  TAPE READ INSTRUCTION                             0704                    GEN
299         )6M006 EQU   728  TAPE ERROR HANDLER                                0728                    GEN
            *                                                                                           GEN
300             ORG   201                                                             0201
301         PHS52C BSS   )8J006,G                                           5   0201  B 257 G     GEN     18   257
302             NOP     TO PATCH IN TRAPS FOR DEBUGGING                     1   0206  N           GEN     18
303         )0J006 EQU   *&1                                                    0207                GEN
304             LCA   )9J006,)6J006                                         7   0207  L 281 110   GEN     18   281     110
305             BCE   )1J006,)6K006,1    Q: LOADING FROM CARDS?             8   0214  B 250 700 1 GEN     18   250     700
306             BCE   )1J006,)6L006&4,0  Q: LOADING FROM AUTOCODER TAPE?     8   0222  B 250 708 0 GEN     18   250     708
307             RTW   1,LOADAD           READ THE BLOCK                     8   0230  L %U1 934 R GEN     18   %U1     934
308             BER   )6M006             Q: TAPE ERROR?                     5   0238  B 728 L     GEN     19   728
309             CS    BEG52B,)9R006      ENTER THE BLOCK                    7   0243  / 337 286   GEN     19   337     286
310         )1J006 CS    )6K006,)9R006      LOAD CARDS OR AUTOCODER TAPE       7   0250  / 700 286   GEN     19   700     286
311         )8J006 SW    )9R006                                             4   0257  , 286       GEN     19   286
312             MU    %T0,)8K006,W                                           8   0261  M %T0 273 W GEN     19   %T0     273
313             H     )0J006                                                 4   0269  . 207       GEN     19   207
314         )8K006 EQU   *&1                                                    0273                GEN
315         )9J006 DCW   @FUNLOAD C@          PHASE ID                     9   0281                GEN     20
316             DCW   #1                                                     1   0282                GEN     20
317             DC    @52C@          PHASE NUMBER                          3   0285                GEN     20
318         )9R006 DCW   @}@                                                 1   0286                GEN     20
319             XFR   PHS52C                                                       B 201               21   201
320         *
321         110     DCW   @FUNLOAD C@                                       9   0110                    22
322             ORG   BEG52A                                                          0934
323         LOADAD EQU   *&1                                                    0934
324         *
325 *  934  BEG52C MZ    49&X1,SAVZON  RELOCATION TAG FROM SW INSTRUCTION    7   0934  Y 0U9 V25       23   049+1   1525
326    941         B     RELOC                                               4   0941  B /92           23  1192
327         * ADD EITHER 3 OR 4 TO X1 TO GET TO NEXT SW ADDRESS
328         * THIS WOULD BE SIMPLER IF SBR/NOP X1,1&X1 THEN SBR X1,3&X1 ???
329    945  NOPADD NOP   K4,X1  SOMETIMES ADD, SOMETIMES NOP                  7   0945  N V30 089       23  1530     089
330    952  ADDNOP A     K3,X1  SOMETIMES ADD, SOMETIMES NOP                  7   0952  A V31 089       23  1531     089
331    959         BCE   EXCH43,NOPADD,A                                     8   0959  B 993 945 A     23   993     945
332    967         MCW   ADD,NOPADD                                          7   0967  M V32 945       24  1532     945
333    974         MCW   NOP,ADDNOP                                          7   0974  M V24 952       24  1524     952
334    981         BCE   NOPADD,SWCW,)  ???                                 8   0981  B 945 664 )     24   945     664
335    989         B     LOOP                                                4   0989  B 623           24   623
336    993  EXCH43 MCW   NOP,NOPADD                                          7   0993  M V24 945       24  1524     945
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SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

337  1 000         MCW   ADD,ADDNOP                                          7  1000  M V32 952           25  1532     952
338  1 007         B     LOOP                                                4  1007  B 623               25   623
339          *
340          * DONE WITH RELOCATION OF ONE DECK
341          *
342  1 011  NORELX MCW   46,WHERE    TOP ADDRESS LOADED?                     7  1011  M 046 V35           25   046    1535
343  1 018         MCW   NOP,NOPADD  RESET ADD 3/4                          7  1018  M V24 945           25  1524     945
344  1 025         MCW   ADD,ADDNOP    TOGGLE                              7  1025  M V32 952           25  1532     952
345  1 032         B     RDREC                                               4  1032  B /49               25  1149
346  1 036         BCE   EXEND,68,B  EX CARD?                              8  1036  B |56 068 B         26  1056     068
347  1 044         BCE   EXEND,40,/  END CARD?                             8  1044  B |56 040 /         26  1056     040
348  1 052         B     TSTREL                                              4  1052  B 543               26   543
349  1 056  EXEND  MCW   WHERE,*&11  CAN WE USE LOAD&6 HERE ???             7  1056  M V35 |73           26  1535    1073
350  1 063         MZ    BRANCH,*&3  X3 TAG                                  7  1063  Y V09 |72           26  1509    1072
351  1 070         NOP   0&X3                                                4  1070  N 0?0               26   000+3
352  1 074         SAR   X3                                                  4  1074  Q 099               27   099
353  1 078         SBR   SX3                                                 4  1078  H V78               27  1578
354  1 082         SBR   X3,1&X3     NEXT FUNCTION LOAD ADDRESS              7  1082  H 099 0?1           27   099     001+3
355  1 089  TSTUND BCE   OUTER,0,_   NOT TOO BIG IF STILL UNDERLINE          8  1089  B 412 000 _         27   412     000
356  1 097         CS    332                                                 4  1097  / 332               27   332
357  1 101         CS                                                        1  1101  /                   27
358  1 102         CC    1                                                   2  1102  F 1                 27
359  1 104         MCW   ERROR2,270                                          7  1104  M V71 270           28  1571     270
360  1 111         W                                                         1  1111  2                   28
361  1 112         CC    1                                                   2  1112  F 1                 28
362  1 114         BCE   HALT,CDOVLY,1                                      8  1114  B /27 700 1         28  1127     700
363  1 122         RWD   1                                                   5  1122  U %U1 R             28   %U1
364  1 127  HALT   H     HALT                                                4  1127  . /27               28  1127
365          *
366          * NO RELOCATION, SIMPLY EXECUTE THE LOAD CODE
367          *
368  1 131  NOREL  SBR   71,NORELX                                           7  1131  H 071 |11           28   071    1011
369  1 138         MCW   BRANCH,68                                           7  1138  M V09 068           29  1509     068
370  1 145         B     40                                                  4  1145  B 040               29   040
371          *
372          * READ A RECORD OF THE RELOCATABLE LIBRARY EITHER
373          * FROM CARD OR TAPE
374          *
375  1 149  RDREC  SBR   RDRECX&3                                            4  1149  H /91               29  1191
376  1 153         MCW   KB1,1   IN CASE IT WAS A GM IN THE PREV RECORD      7  1153  M V72 001           29  1572     001
377  1 160  RDCARD R     RDRECX  NOP IF LOADED FROM TAPE                     4  1160  1 /88               29  1188
378  1 164  RDTAPE SW    GMWM                                                4  1164  , V88               29  1588
379                LCA   GMWM,80  WVS AUTOCODER BOOT RECORD IS LONG          7  1168  L V88 080           29  1588     080
380  1 171         RT    1,1                                                 8  1175  M %U1 001 R         30   %U1     001
381  1 179         BER   TPERR  BACKS UP ITS RETURN TO RT                    5  1183  B 728 L             30   728
382  1 184  RDRECX B     0                                                   4  1188  B 000               30   000
383          *
384          * RELOCATE FIELDS OF LOADED INSTRUCTIONS
385          *
386  1 217  RELOC  SBR   RELOCX&3                                            4  1192  H T09               30  1309
```

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

387  1 221          BWZ   RELOCX,SAVZON,2  NO RELOCATION                8  1196  V T06 V25 2         30  1306    1525
388  1 229          BWZ   RELX1,SAVZON,S   B FIELD RELOCATION ONLY       8  1204  V S63 V25 S         30  1263    1525
389  1 237          MCW   X3,SX3                                        7  1212  M 099 V78           31   099    1578
390  1 244          BWZ   RELNZ1,4&X2,2    IS RELOCATED FIELD BELOW 4K  8  1219  V S41 0!4 2         31  1241     004+2
391  1 252          MCW   SERBAS,X3        NO, MUST BE ABOVE 14K = 16K-2K 7  1227  M V16 099           31  1516     099
392  1 259          MZ    *-4,4&X2         THOUSANDS TAG SET TO 2       7  1234  Y S36 0!4           31  1236     004+2
393  1 266  RELNZ1  MA    X3,4&X2          RELOCATE A FIELD             7  1241  # 099 0!4           31   099     004+2
394  1 273          MCW   SX3,X3                                        7  1248  M V78 099           32  1578     099
395  1 280          BM    RELOCX,SAVZON    A FIELD RELOCATION ONLY      8  1255  V T06 V25 K         32  1306    1525
396  1 288  RELX1   MCW   X3,SX3                                        7  1263  M 099 V78           32   099    1578
397  1 295          BWZ   RELNZ2,7&X2,2    IS RELOCATED FIELD BELOW 4K  8  1270  V S92 0!7 2         32  1292     007+2
398  1 303          MCW   SERBAS,X3        NO, MUST BE ABOVE 14K = 16K-2K 7  1278  M V16 099           32  1516     099
399  1 310          MZ    *-4,7&X2         THOUSANDS TAG SET TO 2       7  1285  Y S87 0!7           33  1287     007+2
400  1 317  RELNZ2  MA    X3,7&X2          RELOCATE B FIELD             7  1292  # 099 0!7           33   099     007+2
401  1 324          MCW   SX3,X3                                        7  1299  M V78 099           33  1578     099
402  1 331  RELOCX  B     0                                             4  1306  B 000               33   000
403          *
404          * DON'T NEED THE FUNCTION
405          * SKIP UNTIL END OR XFR RECORD
406          *
407  1 335  SKIP    B     RDREC                                         4  1310  B /49               33  1149
408  1 339          BCE   GETUND,40,/                                   8  1314  B 441 040 /         33   441     040
409  1 347          BCE   GETUND,68,B                                   8  1322  B 441 068 B         34   441     068
410  1 355          B     SKIP                                          4  1330  B T10               34  1310
411          *
412          * GOT TO END OF LOAD FLAGS
413          * START OVER AT SINCOS TO STORE THE ENTRY TABLE
414          *
415  1 359  SWITCH  NOP   DONE           SECOND TIME IT IS A BRANCH     4  1334  N U16               34  1416
416  1 363          MCW   BRANCH,SWITCH  ONLY DO THIS ONCE              7  1338  M V09 T34           34  1509    1334
417  1 370          SBR   AFUNC1,SINCOS  START OVER AT SINCOS           7  1345  H V06 118           34  1506     118
418  1 377          MCW   SX3,X2                                        7  1352  M V78 094           34  1578     094
419  1 384          SBR   RELTAB,1&X2    RELOCATABLE ENTRY TABLE ADDRESS 7  1359  H 188 0!1           35   188     001+2
420  1 391          MCW   NOP,SBRNOP                                   7  1366  M V24 475           35  1524     475
421  1 398          MCW   NOP,MCWNOP                                   7  1373  M V24 536           35  1524     536
422  1 405          MCW   BRANCH,SWICH2  SKIP STORING LOAD ADDRESS      7  1380  M V09 583           35  1509     583
423  1 412          MCW   SX3,SX3D                                     7  1387  M V78 V81           35  1578    1581
424  1 419          B     CHKUND                                       4  1394  B 445               35   445
425          *
426          * DOWN TO USER FUNCTIONS IN THE ADDRESS TABLE
427          *
428  1 423  GOTUSR  MCW   SX3,SX3C  SAVE FIRST USER FUNCTION ADDRESS    7  1398  M V78 V84           36  1578    1584
429  1 430          MCW   NOP,SWICH1                                    7  1405  M V24 508           36  1524     508
430  1 437          B     RETUSR                                        4  1412  B 513               36   513
431          *
432  1 441  DONE    MCW   SX3,X3          TOP OF FUNCTION ENTRY TABLE   7  1416  M V78 099           36  1578     099
433  1 448          MCW   TOPCOR,X2                                     7  1423  M 688 094           36   688     094
434  1 455          C     0&X2                                          4  1430  C 0!0               36   000+2
435  1 459          SAR   X2                                          4  1434  Q 094               37   094
436  1 463          SBR   ARYBOT          BOTTOM OF ARRAYS - 1          4  1438  H 933               37   933
```

```
SEQ PG LIN  LABEL   OP    OPERANDS                                    SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR
437  1 467          C     0&X2                                          4  1442  C 0!0               37   000+2
438  1 471          SAR   CONBOT          BOTTOM OF CONSTANTS - 1       4  1446  Q 930               37   930
439  1 475          BCE   BLANK,EXLINK,   IS XLINKF LOADED             8  1450  B U83 840           37  1483     840
440  1 483          MCW   EXLINK,X1       YES                           7  1458  M 840 089           37   840     089
441  1 490          MA    A13,X1          WHY NOT MCW  ARYTOP,13&X1 ??? 7  1465  # V87 089           37  1587     089
442  1 497          MCW   ARYTOP,0&X1     STORE WITHIN XLINKF           7  1472  M 194 0|0           38   194     000+1
443  1 504          CW    GOTXL                                         4  1479  ) 185               38   185
444  1 508  BLANK   MCW   SX3C,X1  FIRST USER FUNCTION ADDRESS          7  1483  M V84 089           38  1584     089
445  1 515          MCW   SX3D,X2  LAST FUNCTION LOAD ADDRESS & 1       7  1490  M V81 094           38  1581     094
446  1 554          B     LOADNX                                        4  1497  B 700               38   700
447          *
448          * DATA
449          *
450  1 560  K14K    DSA   14000    14000 IS 16000-2000                  3  1503  !0?                 38 14000
451  1 563  AFUNC1  DCW   FUNC1    ADDRESS OF FIRST FUNCTION SWITCH     3  1506  111                 38   111
452  1 564          DC    #1                                            1  1507                      38
453  1 565  KUND1   DCW   @_@      ONE UNDERLINE CHARACTER              1  1508                      39
454  1 566  BRANCH  B                                                   1  1509  B                   39
455  1 570  KUND4   DCW   @____@   FOUR UNDERLINE CHARACTERS (11-7-8)   4  1513                      39
456  1 573  SERBAS  DCW   #3       BASE ADDRESS FOR SERIES FUNCTION     3  1516                      39
457  1 576  AFUNCN  DSA   FUNCN&1  ADDRESS OF LAST FUNCTION SWITCH      3  1519  140                 39   140
458  1 577  SBR     SBR                                                 1  1520  H                   39
459  1 580  AUSER1  DSA   USER1    FIRST USER FUNCTION ENTRY            3  1523  876                 39   876
460  1 581  NOP     NOP                                                 1  1524  N                   40
461  1 582  SAVZON  DCW   #1                                            1  1525                      40
462  1 585  A40     DSA   40                                            3  1528  040                 40   040
463  1 586  SW      SW                                                  1  1529  ,                   40
464  1 587  K4      DCW   4                                             1  1530                      40
465  1 588  K3      DCW   3                                             1  1531                      40
466  1 589  ADD     A                                                   1  1532  A                   40
467  1 592  WHERE   DCW   #3                                            3  1535                      41
468  1 628  ERROR2  DCW   @MESSAGE 2 - OBJECT PROGRAM TOO LARGE@       36  1571                      41
469  1 629  KB1     DCW   #1                                            1  1572                      42
470  1 630  KP9     DCW   &9                                            1  1573                      42
471  1 631  ERRCNT  DCW   #1  TAPE ERROR COUNTER                        1  1574                      42
472  1 632  KP1     DCW   &1                                            1  1575                      42
473  1 635  SX3     DCW   #3                                            3  1578                      42
474  1 638  SX3D    DCW   #3                                            3  1581                      42
475  1 641  SX3C    DCW   #3                                            3  1584                      42
476  1 644  A13     DSA   13                                            3  1587  013                 43   013
477  1 654  GMWM    DCW   @}@                                           1  1588            GMARK   43
478          CLRTOP  EQU   1696  MOKOTOFF V3M0.LST LINE 105771             1696
479 *        CLR52C  EQU   CLRTOP                                         1696
480          * CAN'T CLEAR HERE BECAUSE THE RELOCATABLE LIBRARY APPEARS NEXT
481                  XFR   BEG52B                                              B 337               44   337
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
)0J005	0207: 0	)0J006	0207: 0	)1J005	0250: 0	)1J006	0250: 0	)6J005	0110: 0	)6J006	0110: 0
)6K005	0700: 0	)6K006	0700: 0	)6L005	0704: 0	)6L006	0704: 0	)6M005	0728: 0	)6M006	0728: 0
)8J005	0257: 0	)8J006	0257: 0	)8K005	0273: 0	)8K006	0273: 0	)9J005	0281: 0	)9J006	0281: 0
)9R005	0286: 0	)9R006	0286: 0	A13	1587: 0	A40	1528: 0	ADD	1532: 0	ADD14K	0433: 0
ADDNOP	0952: 0	AFMT1	4280: 0	AFUNC1	1506: 0	AFUNCN	1519: 0	AGM	4646: 0	ARYBOT	0933: 0
ARYTOP	0194: 0	AUSER1	1523: 0	BEG52A	0934: 0	BEG52B	0337: 0	BEG52C	0934: 0	BEGIN3	0838: 0
BLANK	1483: 0	BRANCH	1509: 0	CDOVLY	0700: 0	CHKUND	0445: 0	CLR52C	1696: 0	CLRTOP	1696: 0
CONBOT	0930: 0	DONE	1416: 0	ERRCNT	1574: 0	ERROR2	1571: 0	EXCH43	0993: 0	EXEND	1056: 0
EXLINK	0840: 0	FUNC1	0111: 0	FUNCN	0139: 0	GETUND	0441: 0	GMWM	1588: 0	GOTUSR	1398: 0
GOTXL	0185: 0	HALT	1127: 0	K14K	1503: 0	K3	1531: 0	K4	1530: 0	KB1	1572: 0
KP1	1575: 0	KP9	1573: 0	KUND1	1508: 0	KUND4	1513: 0	LOAD	0572: 0	LOADAD	0934: 0
LOADD1	0333: 0	LOADNX	0700: 0	LOOP	0623: 0	MCWNOP	0536: 0	MZ45	0608: 0	NOP	1524: 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	1188: 0
RDTAPE	1164: 0	RELENT	2132: 0	RELNZ1	1241: 0	RELNZ2	1292: 0	RELOC	1192: 0	RELOCX	1306: 0
RELTAB	0188: 0	RELX1	1263: 0	RETUSR	0513: 0	SAVZON	1525: 0	SBR	1520: 0	SBRNOP	0475: 0
SERBAS	1516: 0	SINCOS	0118: 0	SKIP	1310: 0	SNAPEX	0564: 0	SNAPSH	0333: 0	SUBSC	0909: 0
SW	1529: 0	SWCW	0664: 0	SWICH1	0508: 0	SWICH2	0583: 0	SWITCH	1334: 0	SX2	0927: 0
SX3	1578: 0	SX3C	1584: 0	SX3D	1581: 0	TOP3	2600: 0	TOPCOR	0688: 0	TPERR	0728: 0
TPREAD	0704: 0	TSTREL	0543: 0	TSTUND	1089: 0	USER1	0876: 0	WHERE	1535: 0	X1	0089: 0
X2	0094: 0	X3	0099: 0								

UNREFERENCED SYMBOLS

AFMT1 AGM BEGIN3 CLR52C ERRCNT KP1 KP9 OBLIST PHASLD RDTAPE RELENT SNAPEX SUBSC TOP3 TPREAD