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

 101               JOB   FORTRAN COMPILER -- SORT THREE PHASE -- PHASE 06
 102               CTL   6611
 103         *
 104         * SORT THREE PHASE: SORT STATEMENTS BY TYPE, SHIFT TO LOW
 105         * MEMORY.
 106         * 81-83 IS THE ADDRESS OF THE LAST CHARACTER (LOWEST IN CORE,
 107         * ONE ABOVE GMWM) OF THE LAST (LOWEST IN CORE) STATEMENT.
 108         *
 109         X1     EQU   89                                                  0089
 110         X2     EQU   94                                                  0094
 111         X3     EQU   99                                                  0099
 112         *
 113         * STUFF IN THE RESIDENT AREA
 114         *
 115         PHASID EQU   110  PHASE ID, FOR SNAPSHOT DUMPS                  0110
 116         SNAPSH EQU   333  CORE DUMP SNAPSHOT                            0333
 117         TOPCOR EQU   688  TOP CORE ADDRESS FROM PARAM CARD              0688
 118         LOADNX EQU   700  LOAD NEXT OVERLAY                             0700
 119         CLEARL EQU   707  CS AT START OF OVERLAY LOADER                  0707
 120         CDOVLY EQU   769  1 IF RUNNING FROM CARDS, N IF FROM TAPE       0769
 121         TPREAD EQU   780  TAPE READ INSTRUCTION IN OVERLAY LOADER        0780
 122         LOADXX EQU   793  EXIT FROM OVERLAY LOADER                       0793
 123         CLRBOT EQU   833  BOTTOM OF CORE TO CLEAR IN OVERLAY LOADER     0833
 124         TYPTAB EQU   840  TYPE TABLE (WORD MARKS SET IN PHASE 3)        0840
 125         *                 INDEXED BY 30*(ZONE OF STATEMENT CODE) +
 126         *                 3*(NUMERIC PART OF STATEMENT CODE).  EACH
 127         *                 ENTRY IS THE ADDRESS OF THE EARLIEST (HIGHEST
 128         *                 ADDRESS) STATEMENT OF A TYPE.  EACH STATEMENT
 129         *                 HAS A POINTER TO THE NEXT ONE (LOWER IN CORE)
 130         *                 OF THE SAME TYPE AS ITS FIRST THREE (HIGHEST
 131         *                 ADDRESS) CHARACTERS.
 132         *
 133               ORG   1022                                                      1022
 134         LOADDD EQU   *&1          LOAD ADDRESS                          1022
 135  1 022  BEGINN MCW   83,X3  ADDRESS AT END OF LAST STATEMENT          7  1022  M 083 099           4
 136  1 029         SW    GM                                              4  1029  , Y06               4
 137  1 033         SBR   X1,2899  BOTTOM OF FREE STORAGE                  7  1033  H 089 Q99           4
 138  1 040         SW    2900                                            4  1040  , R00               4
 139  1 044         MN    0&X3   COMPUTE ADDRESS BELOW LAST STATEMENT,     4  1044  D 0?0               4
 140  1 048         LCA   GM       PUT A GMWM THERE                       4  1048  L Y06               4
 141  1 052         SBR   SAVE&6     AND STORE ADDRESS BELOW GMWM          4  1052  H /10               4
 142  1 056         SBR   W3,TABIXS  GET LAST TYPTAB INDEX                 7  1056  H Y10 X99           5
 143  1 063  LOOP   MCW   W3,X3      GET NEXT HEAD                         7  1063  M Y10 099           5
 144  1 070         MCW   0&X3,X3      OF CHAIN TO X3                     7  1070  M 0?0 099           5
 145  1 077         SAR   W3                                              4  1077  Q Y10               5
 146  1 081         BCE   DONE,X3,X  END OF THE TABLE?                    8  1081  B W47 099 X         5
 147  1 089         MCW   TYPTAB&X3,X3  HEAD OF LIST OF STATEMENTS OF TYPE  7  1089  M 8D0 099           6
```

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SEQ PG LIN  LABEL  OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD
148  1 096         BCE   LOOP,X3,   NO STATEMENTS OF THE TYPE                8  1096  B |63 099            6
149         *
150         * MOVE ALL STATEMENTS OF THE TYPE DOWN TO LOW CORE
151         *
152  1 104  SAVE   MCW   0&X3,0-0   MOVE STATEMENT TO SAVE AREA               7  1104  M 0?0 000            6
153  1 111         SAR   X2                                                  4  1111  Q 094                6
154  1 115         BCE   *&5,1&X2,}  DID WE MOVE THE GM?                     8  1115  B /27 0!1 } GMARK    6
155  1 123         B     NOROOM     NO, MAYBE WE'RE OUT OF SPACE             4  1123  B S95                6
156  1 127         SBR   X2,2&X2    GET BACK ABOVE GMWM, TO BOTTOM OF STMT    7  1127  H 094 0!2            7
157  1 134  MORE   MCM   0&X2       COMPUTE ADDRESS ABOVE TOP OF STATEMENT    4  1134  P 0!0                7
158  1 138         SBR   SX2&6        AND SAVE IT                           4  1138  H /67                7
159  1 142         MCM   0&X2,1&X1  MOVE STATEMENT TO BOTTOM OF FREE AREA,   7  1142  P 0!0 0|1            7
160  1 149         SBR   X1           BUMP POINTER TO BOTTOM,                4  1149  H 089                7
161  1 153         MN    0&X1           THEN BACK DOWN TO GM                4  1153  D 0|0                7
162  1 157         SBR   X1               AND SAVE IT                       4  1157  H 089                7
163  1 161  SX2    SBR   X2,0-0     MOVE UP TO RECORD MARK OR GM             7  1161  H 094 000            8
164  1 168         BCE   MORE,0&X1,|  MORE TO GO IF STMT CONTAINS RM        8  1168  B /34 0|0 |          8
165  1 176         SBR   X1,1&X1    BUMP POINTER ABOVE GM                    7  1176  H 089 0|1            8
166  1 183         CW    BIGFLG                                             4  1183  ) Y07                8
167  1 187         MN    0&X1       NOW SUBTRACT                            4  1187  D 0|0                8
168  1 191         MN                 FOUR FROM                             1  1191  D                    8
169  1 192         MN                   X1 TO RECOVER                       1  1192  D                    8
170  1 193         MN                     SPACE USED FOR                    1  1193  D                    9
171  1 194         SAR   X1                 SAME-TYPE LINK                  4  1194  Q 089                9
172  1 198         LCA   GM,0&X1    MARK TOP OF STATEMENT                    7  1198  L Y06 0|0            9
173  1 205         SBR   83         STORE ADDRESS OF TOP OF STATEMENT        4  1205  H 083                9
174  1 209         SBR   X1           AND IN X1                             4  1209  H 089                9
175  1 213  MORE2  MCM   1&X1       COMPUTE ADDRESS ABOVE TOP OF STATEMENT,  4  1213  P 0|1                9
176  1 217         MN                 GET BACK DOWN TO RM OR GMWM           1  1217  D                    9
177  1 218         SAR   X1             AND SAVE IT                         4  1218  Q 089               10
178  1 222         BCE   MORE2,0&X1,|  MORE TO GO IF STMT CONTAINS RM        8  1222  B S13 0|0 |         10
179  1 230         MN    0&X3       SUBTRACT                                4  1230  D 0?0               10
180  1 234         MN                 SIX                                   1  1234  D                   10
181  1 235         MN                   FROM                                1  1235  D                   10
182  1 236         MN                     X3                                1  1236  D                   10
183  1 237         MN                     ,,                                1  1237  D                   10
184  1 238         MN                     ,,                                1  1238  D                   11
185  1 239         SAR   X3               ,,                                4  1239  Q 099               11
186  1 243         MN    0&X1       COMPUTE -1&X1 INTO B-STAR               4  1243  D 0|0               11
187  1 247         LCA   3&X3       COPY SEQUENCE NUMBER                    4  1247  L 0?3               11
188  1 251         MCW   POUND,0&X3                                         7  1251  M Y11 0?0           11
189  1 258  MORE3  MCM   2&X3       POINT X3                                4  1258  P 0?2               11
190  1 262         MN                 BACK AT                               1  1262  D                   11
191  1 263         MN                   TOP OF                              1  1263  D                   12
192  1 264         SAR   X3             STATEMENT                           4  1264  Q 099               12
193  1 268         BCE   MORE3,1&X3,|  MORE TO GO IF STMT CONTAINS RM        8  1268  B S58 0?1 |         12
194  1 276         BCE   LOOP,0&X3,  LAST STATEMENT ON CHAIN?               8  1276  B |63 0?0           12
195  1 284         MCW   0&X3,X3     NO, GET NEXT STATEMENT IN CHAIN         7  1284  M 0?0 099           12
196  1 291         B     SAVE          AND SAVE IT                         4  1291  B /04               12
197         *
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SEQ PG LIN  LABEL  OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD
198         * NO ROOM TO MOVE STATEMENT BELOW BOTTOM STATEMENT
199         *
200  1 295  NOROOM BW    TOOBIG,BIGFLG                                     8  1295  V W88 Y07 1         13
201  1 303         SW    BIGFLG                                            4  1303  , Y07               13
202  1 307         MCW   TOPCOR,X2                                         7  1307  M 688 094           13
203  1 314         MN    0&X2                                              4  1314  D 0!0               13
204  1 318         SAR   X2          X2 IS TOPCOR-1 NOW                  4  1318  Q 094               13
205  1 322         MCW   X2,X3                                            7  1322  M 094 099           13
206  1 329  MOVEUP LCA   0&X2,0&X3  MOVE STATEMENT UP                     7  1329  L 0!0 0?0           14
207  1 336         SAR   X2                                              4  1336  Q 094               14
208  1 340         MCW   0&X3,PREFIX                                       7  1340  M 0?0 Y20           14
209  1 347         BCE   MOVED,PREFIX-6,#  STATEMENT ALREADY MOVED?       8  1347  B T66 Y14 #         14
210  1 355         LCA   0&X3,0&X3  NO, DECREMENT X3 SO AS NOT TO          7  1355  L 0?0 0?0           14
211  1 362         SAR   X3            CLOBBER RECENTLY MOVED STATEMENT    4  1362  Q 099               14
212  1 366  MOVED  C     SAVE&6,X2  DONE?                                  7  1366  C /10 094           15
213  1 373         BU    MOVEUP     NO, MOVE ANOTHER ONE                   5  1373  B T29 /             15
214  1 378         MCW   X3,SAVE&6  BELOW LAST MOVED STATEMENT             7  1378  M 099 /10           15
215  1 385         MCW   X3,X2                                           7  1385  M 099 094           15
216  1 392         MZ    X3,X3999   COMPUTE X3 & X00 - 1                  7  1392  Y 099 Y05           15
217  1 399         MZ                                                    1  1399  Y                   15
218  1 400         MCW                                                   1  1400  M                   15
219  1 401         MZ    X1,X1999   COMPUTE X1 & X00 - 1                  7  1401  Y 089 Y02           16
220  1 408         MZ                                                    1  1408  Y                   16
221  1 409         MCW                                                   1  1409  M                   16
222  1 410         C     X1999,X3999                                     7  1410  C Y02 Y05           16
223  1 417         BE    NOCLR                                           5  1417  B U42 S             16
224  1 422  CLR    CS    0&X3       CLEAR FROM X3 DOWN TO X1 & X00       4  1422  / 0?0               16
225  1 426         SBR   X3                                            4  1426  H 099               16
226  1 430         C     X3,X1999                                        7  1430  C 099 Y02           17
227  1 437         BU    CLR                                             5  1437  B U22 /             17
228  1 442  NOCLR  ZA    TABLEN,TABCNT  TABLE LENGTH TO TABLE COUNTER    7  1442  ? Y22 !03           17
229  1 449         S     X3&1                                            4  1449  S 100               17
230         *
231         * FILL TYPE TABLE WITH BLANKS
232         *
233  1 453  CLRTAB MCW   KB3,TYPTAB&X3  MARK END OF CHAIN                 7  1453  M Y25 8D0           17
234  1 460         S     KP1,TABCNT                                      7  1460  S Y26 !03           17
235  1 467         BM    CLRFIN,TABCNT  DONE CLEARING TABLE?             8  1467  V U86 !03 K         18
236  1 475         A     KP3,X3                                          7  1475  A Y27 099           18
237  1 482         B     CLRTAB                                          4  1482  B U53               18
238         *
239         * RELINK MOVED STATEMENTS INTO TYPE TABLE
240         *
241  1 486  CLRFIN MCM   1&X2       GET X1 TO TOP OF STATEMENT           4  1486  P 0!1               18
242  1 490         MN                                                    1  1490  D                   18
243  1 491         SAR   X2                                              4  1491  Q 094               18
244  1 495         BCE   CLRFIN,0&X2,|  MORE TO DO IF RM INSTEAD OF GMWM  8  1495  B U86 0!0 |         18
245  1 503         SBR   X2,1&X2    X2 IS NOW BOTTOM OF NEXT STATEMENT     7  1503  H 094 0!1           19
246  1 510         S     X3&1                                            4  1510  S 100               19
247  1 514         C     0&X2                                            4  1514  C 0!0               19
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                        FORTRAN COMPILER -- SORT THREE PHASE -- PHASE 06                          PAGE    4

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

 248  1 518         SAR   *&4                                                  4  1518  Q V25               19
 249  1 522         MCW   0-0,PREFIX   SAVE PREFIX                            7  1522  M 000 Y20           19
 250  1 529         MN    PREFIX-6,X3  3 TIMES                               7  1529  D Y14 099           19
 251  1 536         MCW   X3,TABCNT      NUMERIC PART OF                     7  1536  M 099 !03           20
 252  1 543         A     X3               STATEMENT CODE                    4  1543  A 099               20
 253  1 547         A     TABCNT,X3          TO X3                           7  1547  A !03 099           20
 254  1 554         BWZ   ZONFIN,PREFIX-6,2  ADD 30 TIMES                    8  1554  V V99 Y14 2         20
 255  1 562         A     KP30,X3              ZONE PART                     7  1562  A Y29 099           20
 256  1 569         BWZ   ZONFIN,PREFIX-6,S      OF STATEMENT                8  1569  V V99 Y14 S         21
 257  1 577         A     KP30,X3                CODE                        7  1577  A Y29 099           21
 258  1 584         BM    ZONFIN,PREFIX-6          TO X3                     8  1584  V V99 Y14 K         21
 259  1 592         A     KP30,X3                                            7  1592  A Y29 099           21
 260  1 599  ZONFIN MN    0&X2       MINUS 2                                 4  1599  D 0!0               21
 261  1 603         MN                                                       1  1603  D                   21
 262  1 604         MCW   TYPTAB&X3  LINK TO NEXT STATEMENT SAME TYPE        4  1604  M 8D0               21
 263  1 608         C     0&X2       DOWN TO NEXT WORD MARK                  4  1608  C 0!0               22
 264  1 612         SAR   TYPTAB&X3  LINK TYPE TABLE TO STATEMENT TYPE       4  1612  Q 8D0               22
 265  1 616         C     X2,TOPCOR  DONE?                                   7  1616  C 094 688           22
 266  1 623         BU    CLRFIN                                             5  1623  B U86 /             22
 267  1 628         MCW   W3,X3      RECOVER X3                              7  1628  M Y10 099           22
 268  1 635         NOP   3&X3                                               4  1635  N 0?3               22
 269  1 639         SAR   W3           PLUS 3                                4  1639  Q Y10               22
 270  1 643         B     LOOP       BACK TO SORTING                         4  1643  B |63               23
 271         *
 272         * LOAD NEXT OVERLAY
 273         *
 274  1 647  DONE   BSS   SNAPSH,C                                           5  1647  B 333 C             23
 275  1 652         SBR   TPREAD&6,TYPTAB-2  NEXT OVERLAY READ ADDRESS       7  1652  H 786 838           23
 276  1 659         SBR   CLRBOT               AND BOTTOM OF CLEAR AREA      4  1659  H 833               23
 277  1 663         SBR   LOADXX&3,TYPTAB-2  NEXT OVERLAY ENTRY ADDRESS      7  1663  H 796 838           23
 278  1 670         SBR   CLEARL&3,TABCNT    TOP OF CLEAR                    7  1670  H 710 !03           23
 279  1 677         LCA   GMMSG,PHASID       NEXT PHASE ID                   7  1677  L Y39 110           24
 280  1 684         B     LOADNX             LOAD IT                         4  1684  B 700               24
 281         *
 282         * PROGRAM IS TOO BIG
 283         *
 284  1 688  TOOBIG CS    332                                                4  1688  / 332               24
 285  1 692         CS                                                       1  1692  /                   24
 286  1 693         CC    1                                                  2  1693  F 1                 24
 287  1 695         MCW   MSG2,270                                           7  1695  M Y75 270           24
 288  1 702         W                                                        1  1702  2                   24
 289  1 703         CC    1                                                  2  1703  F 1                 25
 290  1 705         BCE   HALT,CDOVLY,1                                     8  1705  B X18 769 1         25
 291  1 713         RWD   1                                                  5  1713  U %U1 R             25
 292  1 718  HALT   H     HALT                                               4  1718  . X18               25
 293         *
 294         * DATA
 295         *
 296         * FIRST IS TABLE OF TABLE INDEXES IN THE REVERSE ORDER
 297         * WE WANT STATEMENTS SORTED INTO LOW CORE
```

```
SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD
298         *
299  1 724          DCW   @XXX@  END-OF-TABLE SENTINEL                       3  1724                      25
300  1 727          DSA   117  I DIMENSION                                   3  1727  117                 25
301  1 730          DSA   84   Q                                             3  1730  084                 25
302  1 733          DSA   108  F FORMAT                                      3  1733  108                 26
303  1 736          DSA   9    3 WRITE TAPE                                 3  1736  009                 26
304  1 739          DSA   3    1 READ                                       3  1739  003                 26
305  1 742          DSA   18   6 WRITE OUTPUT TAPE                          3  1742  018                 26
306  1 745          DSA   81   M                                             3  1745  081                 26
307  1 748          DSA   42   U PUNCH                                      3  1748  042                 26
308  1 751          DSA   15   5 READ INPUT TAPE                            3  1751  015                 26
309  1 754          DSA   69   L                                             3  1754  069                 27
310  1 757          DSA   87   R ARITHMETIC                                 3  1757  087                 27
311  1 760          DSA   105  E IF                                         3  1760  105                 27
312  1 763          DSA   27   9                                             3  1763  027                 27
313  1 766          DSA   96   B BACKSPACE                                  3  1766  096                 27
314  1 769          DSA   57   Z REWIND                                     3  1769  057                 27
315  1 772          DSA   75   N ENDFILE                                    3  1772  075                 27
316  1 775          DSA   39   T COMPUTED GOTO                              3  1775  039                 28
317  1 778          DSA   111  G GOTO                                       3  1778  111                 28
318  1 781          DSA   36   S STOP                                       3  1781  036                 28
319  1 784          DSA   93   A PAUSE                                      3  1784  093                 28
320  1 787          DSA   63   J SENSE LIGHT                                3  1787  063                 28
321  1 790          DSA   66   K IF SENSE LIGHT                             3  1790  066                 28
322  1 793          DSA   48   W IF SENSE SWITCH                            3  1793  048                 28
323  1 796          DSA   99   C CONTINUE                                   3  1796  099                 29
324  1 799  TABIXS  DSA   102  D DO                LAST OF TABLE INDEXES    3  1799  102                 29
325         *
326  1 802  X1999   DSA   999  X1 & X00 - 1                                 3  1802  999                 29
327  1 805  X3999   DCW   999  X3 & X00 - 1                                 3  1805                      29
328  1 806  GM      DC    @}@                                               1  1806             GMARK    29
329  1 807  BIGFLG  DC    0  WORD MARK SET IF TOO BIG                        1  1807                      29
330  1 810  W3      DCW   #3                                                3  1810                      29
331  1 811  POUND   DCW   @#@                                               1  1811                      29
332  1 820  PREFIX  DCW   #9         STATEMENT PREFIX                       9  1820                      29
333  1 822  TABLEN  DCW   &39        TYPE TABLE LENGTH                      2  1822                      30
334  1 825  KB3     DCW   #3         THREE BLANKS -- END OF CHAIN SENTINEL  3  1825                      30
335  1 826  KP1     DCW   &1                                                1  1826                      30
336  1 827  KP3     DCW   &3                                                1  1827                      30
337  1 829  KP30    DCW   &30                                               2  1829                      30
338  1 839  GMMSG   DCW   @GROUP MARK@                                     10  1839                      30
339  1 875  MSG2    DCW   @MESSAGE 2 - OBJECT PROGRAM TOO LARGE@           36  1875                      31
340                 ORG   2001                                                    2001
341  2 003  TABCNT  DCW   #3                                                3  2003                      32
342                 ORG   2900                                                    2900
343  2 900  GMWM    DCW   @}@                                               1  2900             GMARK    33
344                 ORG   201                                                     0201
345    203          DSA   LOADDD    LOAD ADDRESS FOR CARD-TO-TAPE PROGRAM   3  0203  |22                 34
346                 EX    BEGINN                                                B |22                 35
347                 END                                                         / 000 080
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| SYMBOL | ADDRESS | SYMBOL | ADDRESS | SYMBOL | ADDRESS | SYMBOL | ADDRESS | SYMBOL | ADDRESS | SYMBOL | ADDRESS | SYMBOL | ADDRESS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEGINN | 1022 | BIGFLG | 1807 | CDOVLY | 769 | CLEARL | 707 | CLR | 1422 | CLRBOT | 833 | CLRFIN | 1486 |
| CLRTAB | 1453 | DONE | 1647 | GM | 1806 | GMMSG | 1839 | GMWM | 2900 | HALT | 1718 | KB3 | 1825 |
| KP1 | 1826 | KP3 | 1827 | KP30 | 1829 | LOADDD | 1022 | LOADNX | 700 | LOADXX | 793 | LOOP | 1063 |
| MORE | 1134 | MORE2 | 1213 | MORE3 | 1258 | MOVED | 1366 | MOVEUP | 1329 | MSG2 | 1875 | NOCLR | 1442 |
| NOROOM | 1295 | PHASID | 110 | POUND | 1811 | PREFIX | 1820 | SAVE | 1104 | SNAPSH | 333 | SX2 | 1161 |
| TABCNT | 2003 | TABIXS | 1799 | TABLEN | 1822 | TOOBIG | 1688 | TOPCOR | 688 | TPREAD | 780 | TYPTAB | 840 |
| W3 | 1810 | X1 | 89 | X1999 | 1802 | X2 | 94 | X3 | 99 | X3999 | 1805 | ZONFIN | 1599 |