```
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

                          LOAD A DECK ONTO TAPE                                        PAGE    1

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

 101                JOB   LOAD A DECK ONTO TAPE
 102                CTL   6611
 103         *
 104         * WRITE A LOADER ROUTINE ON THE BEGINNING OF UNIT 3, THEN WRITE
 105         * AN OBJECT DECK, MODIFIED SO THAT THE LOADER CAN LOAD IT.
 106         *
 107         * AN END-OF-FILE MARK IS WRITTEN AFTER THE PROGRAM.
 108         *
 109         * THE TAPE IS NOT REWOUND BEFORE OR AFTER COPYING THE PROGRAM.
 110         *
 111         * THIS PROGRAM AND THE LOADER READER LOADER USE SBR, WHICH IS
 112         * ALWAYS ACCOMPANIED BY INDEXING, SO THERE IS NO COMPUNCTION
 113         * AGAINST USING INDEXING.  IT WILL RUN ON ANY SIZE MACHINE EXCEPT
 114         * 1.4K.  IT DOESN'T NEED HIGH-LOW-EQUAL COMPARE OR SENSE SWITCHES.
 115         *
 116         * THERE ARE TWO WAYS TO LOAD PROGRAMS ONTO TAPE.
 117         *
 118         * THE FIRST METHOD IS TO PRESS START WHEN THIS PROGRAM STOPS WITH
 119         * IAR 604 AND AAR 611, IN WHICH CASE THIS PROGRAM WRITES A RECORD
 120         * THAT THE LOADER READER USES TO RESET WORD MARKS FOR LOADING
 121         * BEFORE EACH OVERLAY.
 122         *
 123         * THE SECOND METHOD IS TO PRESS START RESET AND START, IN WHICH
 124         * CASE THIS PROGRAM WRITES THE LOADER READER LOADER, WITHOUT A
 125         * CLEAR ROUTINE, AND THE LOADER READER, BEFORE EACH OVERLAY.
 126         *
 127         * IN EITHER CASE, WHEN THE LOADED PROGRAM IS RUN FROM TAPE, THE
 128         * LOADER AUTOMATICALLY DETERMINES CORE SIZE AND LOADS A READER AT
 129         * X919-X999, WHERE X IS CORE SIZE / 1000 - 1.  THE LOADER READER
 130         * PUTS A BRANCH TO ITSELF IN 81-84.
 131         *
 132         * THERE ARE TWO WAYS TO LOAD OVERLAYS, DEPENDING UPON HOW THE TAPE
 133         * IS WRITTEN.  A PROGRAM SHOULD HAVE ,,R 40,, AT 81-84 AND A WM AT
 134         * 85.  THIS WILL BE PRESERVED IF THE PROGRAM IS LOADED FROM CARDS.
 135         *
 136         * IF THE TAPE IS WRITTEN USING THE FIRST METHOD, THE PROGRAM MUST
 137         * NOT USE X919-X999.  IT CAN LOAD OVERLAYS BY BRANCHING TO 81.  IF
 138         * WORD MARKS IN THE READ AREA HAVE BEEN CHANGED THE READ AREA
 139         * SHOULD BE CLEARED AND A WM SET AT 40.  THIS METHOD WORKS TO LOAD
 140         * OVERLAYS FROM CARDS AS WELL.
 141         *
 142         * IF THE TAPE IS WRITTEN USING THE SECOND METHOD, THE PROGRAM
 143         * SHOULD CLEAR 1-80 IF THERE MIGHT BE A GMWM THERE, READ THE NEXT
 144         * TAPE RECORD INTO 1 WITH WORD MARKS, AND BRANCH TO 1 TO LOAD THE
 145         * LOADER READER LOADER, WHICH CLEARS X900-X999 AND USES X1.  THE
 146         * LOADER READER LOADER RUNS ENTIRELY IN 1-80.  A PROGRAM CAN
 147         * DETERMINE WHETHER TO DO THIS OR TO BRANCH TO 81 TO LOAD AN
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SEQ PG LIN  LABEL  OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD

148         * OVERLAY FROM CARDS USING
149         *
150         * BCE  81,81,1
151         * RTW  1,1
152         * B    1
153         * WORD MARK OR BLANK HERE.
154         *
155         * THIS IS ONLY 64 CHARACTERS SHORTER THAN THE FIRST METHOD.  IT
156         * ALSO WORKS IF THE TAPE WAS WRITTEN USING THE FIRST METHOD,
157         * ASSUMING X919-X999 ARE NOT DAMAGED.
158         *
159         * HALTS DURING WRITING THE TAPE
160         *   IAR   AAR   BAR
161         *   604   611   ---  START TO WRITE LOADER ONLY AT THE
162         *                    BEGINNING OF THE TAPE, START RESET AND
163         *                    START TO WRITE IT BEFORE EVERY OVERLAY.
164         *   794   777   777  PROGRAM SUCCESSFULLY LOADED TO TAPE.
165         *   830   666   666  ERROR WHILE WRITING PROGRAM TO TAPE.
166         *
167         * HALTS DURING LOADING THE PROGRAM
168         *   IAR   AAR   BAR
169         *   015   08X   08X  ERROR READING LOADER READER LOADER
170         *                    RECORD X FROM TAPE.  ZERO FOR OVERLAY.
171         *   033   ---   067  ERROR READING LOADER READER FROM TAPE.
172         *  X927  X923   ---  ERROR LOADING PROGRAM RECORD, WHERE X
173         *                    IS CORE SIZE / 1000 - 1.
174         *
175         OUT    EQU   %U3               OUTPUT TAPE NUMBER                       %U3
176         X1     EQU   089                                                        0089
177         *
178                ORG   600                                                               0600
179         *
180         * START IF LOADER READER WILL NOT BE CLOBBERED BY THE PROGRAM,
181         * IN WHICH CASE AN ERSATZ OVERLAY RELOADER WILL BE WRITTEN AFTER
182         * EACH EX RECORD.
183         *
184         * START RESET AND START TO WRITE THE LOADER READER AND ITS
185         * LOADER AFTER EACH EX RECORD.
186         *
187         START  H     WRITEM                                                 4  0600  . 611              4
188                SBR   BOVLY&3,WRITE2     SETUP TO RELOAD LOADER FOR OVLY     7  0604  H 733 624          4
189         *
190         * WRITE THE LOADER READER LOADER FIRST TWO RECORDS
191         *
192         WRITEM WTW   OUT,FIRST                                              8  0611  L %U3 101 W        4
193                BER   WTERR                                                  5  0619  B 794 L            4
194         WRITE2 WTW   OUT,SECOND                                             8  0624  L %U3 201 W        4
195                BER   WTERR                                                  5  0632  B 794 L            4
196         *
197         * WRITE THE LOADER READER
```

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

            *
                   WTW   OUT,BREAD                                                8  0637  L %U3 I19 W          5
                   BER   WTERR                                                    5  0645  B 794 L              5
            *
            * WRITE THE RELOCATOR AND CLEANUP RECORDS
            *
                   WTW   OUT,THIRD                                                8  0650  L %U3 301 W          5
                   BER   WTERR                                                    5  0658  B 794 L              5
                   WTW   OUT,FOURTH                                               8  0663  L %U3 401 W          5
                   BER   WTERR                                                    5  0671  B 794 L              5
            *
            * COPY THE DECK TO TAPE.  SKIP CLEAR CORE CARDS.  REPLACE
            * OVERLAY RELOADER CARDS.
            *
            CARDS  BLC   DONE                                                     5  0676  B 780 A              6
                   R                                                              1  0681  1                    6
                   BCE   LCARD,40,L         Q. LOAD CARD                          8  0682  B 759 040 L          6
                   BCE   WCARD,40,N         Q. EX CARD                            8  0690  B 710 040 N          6
                   C     46,@080@           Q. END CARD                           7  0698  C 046 983            6
                   BU    CARDS              NO                                    5  0705  B 676 /              6
            WCARD  LCA   GMWM,80                                                  7  0710  L 980 080            7
                   WT    OUT,1                                                    8  0717  M %U3 001 W          7
                   BER   WTERR                                                    5  0725  B 794 L              7
            BOVLY  BCE   *&5,68,B           EX CARD                               8  0730  B 742 068 B          7
                   B     CARDS                                                    4  0738  B 676                7
                   WT    OUT,OVLAY          WRITE A NEW OVERLAY RELOADER          8  0742  M %U3 901 W          8
                   BER   WTERR                                                    5  0750  B 794 L              8
                   B     CARDS                                                    4  0755  B 676                8
            LCARD  LCA   LINK&8,76          INSERT BRANCH TO BRANCH TO READ       7  0759  L 779 076            8
                   LCA                                                            1  0766  L                    8
                   B     WCARD                                                    4  0767  B 710                8
            LINK   SW    85                                                       4  0771  , 085                8
                   BIN   81,                                                      5  0775  B 081                9
            *
            * ALL DONE
            *
            DONE   WTM   OUT                                                      5  0780  U %U3 M              9
            HDONE  NOP   777                                                      4  0785  N 777                9
                   H                                                              1  0789  .                    9
                   B     HDONE                                                    4  0790  B 785                9
            *
            * TAPE WRITE ERROR ROUTINE
            *
            WTERR  SBR   X1                                                       4  0794  H 089                9
                   SBR   X1,16000-13        BACK UP TO WT INSTRUCTION             7  0798  H 089 I8G            9
                   BSP   OUT                                                      5  0805  U %U3 B             10
                   A     *-6,WERC                                                 7  0810  A 810 844           10
                   BCE   WTERRX,WERC-1,0                                          8  0817  B 839 843 0         10
                   NOP   666                                                      4  0825  N 666               10
                   H                                                              1  0829  .                   10
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SEQ PG LIN  LABEL   OP    OPERANDS                                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD

248                 SKP   OUT                                                            5  0830  U %U3 E             10
249                 ZA    WERC                                                           4  0835  ? 844               10
250         WTERRX B      0&X1                                                           4  0839  B 0|0               11
251         WERC    DCW   00                                                             2  0844                      11
252         *
253         * ERSATZ OVERLAY RELOADER CARD.  THIS WORKS EITHER IF THE PROGRAM
254         * BRANCHES TO 81 TO READ THE RECORD USING THE LOADER READER, OR
255         * LOADS THE RECORD AT 1 WITH WORD MARKS AND BRANCHES TO 1.
256         *
257                 ORG   901                                                                  0901
258         OVLAY   BER   BAD-900                                                        5  0901  B 010 L             12
259                 B     SETWMS-900                                                     4  0906  B 036               12
260         BAD     NOP   080                                                            4  0910  N 080               12
261                 H                                                                    1  0914  .                   12
262                 BSP   1                                                              5  0915  U %U1 B             12
263                 RTW   1,1                                                            8  0920  L %U1 001 R         12
264                 B     1                                                              4  0928  B 001               12
265                 DC    #4                                                             4  0935                      12
266         SETWMS CS     39                                                             4  0936  / 039               13
267                 SW    47,54                                                          7  0940  , 047 054           13
268                 SW    61,68                                                          7  0947  , 061 068           13
269                 SW    72,76                                                          7  0954  , 072 076           13
270                 SW    85,1                                                           7  0961  , 085 001           13
271                 B     81                                                             4  0968  B 081               13
272                 DC    #8                                                             8  0979                      14
273         GMWM    DCW   @}@                                                            1  0980            GMARK     14
274                 LTORG *                                                                    0981
                    DCW   @080@                                                          3  0983            LIT       14
275         *
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD

       JOB   LOADER FOR I/O ROUTINE FOR LOADING CARD IMAGES
*
* CLEAR CORE.  THE LOADER READER LOADER RECORDS ARE ALL LOADED
* INTO 1-80, BUT WE CAN'T ASSEMBLE THEM THERE.
*
       ORG   101                                                          0101
FIRST  BER   BAD1-100          THIS RECORD IS IN ERROR               5  0101  B 010 L               15
       B     SW100-100                                               4  0106  B 032                 15
BAD1   NOP   081               THIS RECORD IS IN ERROR.              4  0110  N 081                 15
       H                       HALT WITH AAR AND BAR 81              1  0114  .                     15
       BSP   1                                                       5  0115  U %U1 B               15
RTW1A  RTW   1,1                                                     8  0120  L %U1 001 R           15
       B     1                                                       4  0128  B 001                 15
SW100  SW    100                                                     4  0132  , 100                 16
CLEAR  CS    19                CLEAR CORE FROM                       4  0136  / 019                 16
       SBR   CLEAR&3-100         TOP DOWN                            4  0140  H 039                 16
       BW    CLEAR-100,100         TO 100                            8  0144  V 036 100 1           16
       SW    1                                                       4  0152  , 001                 16
       LCA   19,99             CLEAR 81-99                           7  0156  L 019 099             16
       CW    81                  AND THE WM LEFT BY CLEARING         4  0163  ) 081                 16
       B     RTW1A-100                                               4  0167  B 020                 17
       DCW   #9                                                      9  0179                        17
       DCW   @}@                                                     1  0180              GMARK     17
*
* COMPUTE WHERE TO LOAD THE LOADER READER AND LOAD IT
*
       ORG   201                                                          0201
SECOND BER   BAD2-200          THIS RECORD IS IN ERROR               5  0201  B 010 L               18
       B     BEGIN2-200                                              4  0206  B 038                 18
BAD2   NOP   082               THIS RECORD IS IN ERROR.              4  0210  N 082                 18
       H                       HALT WITH AAR AND BAR 82              1  0214  .                     18
       BSP   1                                                       5  0215  U %U1 B               18
RTW1B  RTW   1,1                                                     8  0220  L %U1 001 R           18
       B     1                                                       4  0228  B 001                 18
BADTOP H                       LOADER I/O ROUTINE RECORD             1  0232  .                     19
       BSP   1                   IS IN ERROR                         5  0233  U %U1 B               19
BEGIN2 CS    0                 CLEAR TOP 100 OF CORE TO              4  0238  / 000                 19
       CS                        MAKE SURE THERE IS NO GMWM          1  0242  /                     19
       SBR   X1                X1 BECOMES 0, 4K, 8K OR 12K           4  0243  H 089                 19
       SBR   X1,12101&X1         FOR CORE 4K, 8K, 12K OR 16K         7  0247  H 089 1|A             19
       RTW   1,BREAD&X1        READ THE LOADER READ ROUTINE          8  0254  L %U1 I/9 R           19
       BER   BADTOP-200                                              5  0262  B 032 L               20
       MZ    *-206,TNOIZ&7&X1  A-ZONE BIT FOR NOISE TESTING          7  0267  Y 067 IX9             20
       B     RTW1B-200                                               4  0274  B 020                 20
       DCW   #2                                                      2  0279                        20
       DCW   @}@                                                     1  0280              GMARK     20
*
* RELOCATE THE ADDRESSES IN THE LOADER READER ACCORDING TO WHERE
* IT WAS LOADED.
*
```

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

326                ORG   301                                                                   0301
327         THIRD  BER   BAD3-300           THIS RECORD IS IN ERROR                      5  0301  B 010 L            21
328                B     RELOC3-300                                                      4  0306  B 032              21
329         BAD3   NOP   083                THIS RECORD IS IN ERROR.                     4  0310  N 083              21
330                H                        HALT WITH AAR AND BAR 83                     1  0314  .                  21
331                BSP   1                                                               5  0315  U %U1 B            21
332         RTW1C  RTW   1,1                                                             8  0320  L %U1 001 R        21
333                B     1                                                               4  0328  B 001              21
334         RELOC3 SBR   BREAD&3&X1,READ&X1                                              7  0332  H IS2 IV1          22
335                SBR   TNOIZ&3&X1                                                      4  0339  H IX5              22
336                SBR   EHALT&3&X1,EHALT&X1                                             7  0343  H IS6 IS3          22
337                SBR   L4&3&X1                                                         4  0350  H IU1              22
338                SBR   L2&3&X1,ERRCT&X1                                                7  0354  H IT0 IZ9          22
339                SBR   RDERR&6&X1                                                      4  0361  H IT7              22
340                LCA   K00-300,ERRCT&X1   INITIALIZE ERROR COUNTER                     7  0365  L 077 IZ9          23
341                B     RTW1C-300                                                       4  0372  B 020              23
342         K00    DCW   00                                                              2  0377                     23
343                DCW   #2                                                              2  0379                     23
344                DCW   @}@                                                             1  0380            GMARK    23
345         *
346         * RELOCATE MORE OF THE ADDRESSES IN THE LOADER READER.
347         *
348                ORG   401                                                                   0401
349         FOURTH BER   BAD4-400           THIS RECORD IS IN ERROR                      5  0401  B 010 L            24
350                B     RELOC4-400                                                      4  0406  B 033              24
351         BAD4   NOP   084                THIS RECORD IS IN ERROR.                     4  0410  N 084              24
352                H                        HALT WITH AAR AND BAR 84                     1  0414  .                  24
353                BSP   1                                                               5  0415  U %U1 B            24
354                RTW   1,1                                                             8  0420  L %U1 001 R        24
355                BIN   1,                                                              5  0428  B 001              24
356         RELOC4 SBR   L4&6&X1,ERRCT-1&X1                                              7  0433  H IU4 IZ8          25
357                SBR   READ&3&X1,TNOIZ&7&X1                                            7  0440  H IV4 IX9          25
358                SBR   L9&3&X1,RDERR&X1                                                7  0447  H IX0 IT1          25
359                SBR   RDERR&3&X1,RDERR&X1                                             7  0454  H IT4 IT1          25
360                SBR   L13&3&X1,BREAD&3&X1                                             7  0461  H IY3 IS2          25
361                CS    39                 CLEAR WMS IN 1-39                            4  0468  / 039              25
362                B     READ&X1            ENTER LOADER READER                          4  0472  B IV1              26
363                DCW   #1                                                              1  0476                     26
364                DCW   @}@                                                             1  0477            GMARK    26
```

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

365                JOB   HIGH CORE I/O ROUTINE FOR LOADING CARD IMAGES
366         *
367         * THE LOADER READER HAS A BETTER ERROR HANDLER, AND A NOISE
368         * RECORD TEST.
369         *
370         * IT ALWAYS CLEARS 1-39 IN CASE 1 WAS A GM ON A PREVIOUS READ.
371         * THEREFORE, UNLIKE THE ONE THAT SORT 7 PUTS ON TAPES, THIS ONE
372         * DOESN'T NEED RECORDS TO BE FIDDLED IF THEY HAVE GM IN 1.
373         *
374         * IT LEAVES ,,B  READ,, IN 81-84, WHICH PROGRAMS CAN USE TO
375         * LOAD OVERLAYS WITHOUT KNOWING WHERE THE LOADER READER IS
376         * LOADED.
377         *
378                ORG   3919                                                                3919
379         BREAD  B     READ                                                     4  3919  B I51             27
380         EHALT  H     EHALT              START RESET TO TRY AGAIN              4  3923  . I23             27
381         L2     ZA    ERRCT              CLEAR ERROR COUNTER                   4  3927  ? I99             27
382         RDERR  A     RDERR,ERRCT        BUMP ERROR COUNTER                    7  3931  A I31 I99         27
383         L4     BCE   EHALT,ERRCT-1,9    Q. 90 ERRORS ALTOGETHER               8  3938  B I23 I98 9       27
384                BSP   1                                                        5  3946  U %U1 B           27
385         READ   MCW   TNOIZ&7,40         A-ZONE BIT FOR NOISE TESTING          7  3951  M I79 040         27
386                CS                       CLEAR ANY GMARKS IN 1-39              1  3958  /                 28
387                RT    1,1                READ A LOADER RECORD                  8  3959  M %U1 001 R       28
388         L9     BER   RDERR              Q. TAPE READ ERROR                    5  3967  B I31 L           28
389         TNOIZ  BCE   READ,40,           TEST FOR A-ZONE BIT                   8  3972  B I51 040         28
390         L13    LCA   BREAD&3,84         SET LINK TO HERE INTO 81-84           7  3980  L I22 084         28
391                SW    1,40               WM IN 40 FOR OVERLAY RELOADER         7  3987  , 001 040         28
392                B     40                 RUN THE LOADER IN THE RECORD          4  3994  B 040             29
393                DCW   @}@                                                      1  3998           GMARK    29
394         ERRCT  DC    #1                                                       1  3999                    29
395                END   START                                                         / 600 080
```

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
BAD	910	BAD1	110	BAD2	210	BAD3	310	BAD4	410	BADTOP	232	BEGIN2	238
BOVLY	730	BREAD	3919	CARDS	676	CLEAR	136	DONE	780	EHALT	3923	ERRCT	3999
FIRST	101	FOURTH	401	GMWM	980	HDONE	785	K00	377	L13	3980	L2	3927
L4	3938	L9	3967	LCARD	759	LINK	771	OUT	%U3	OVLAY	901	RDERR	3931
READ	3951	RELOC3	332	RELOC4	433	RTW1A	120	RTW1B	220	RTW1C	320	SECOND	201
SETWMS	936	START	600	SW100	132	THIRD	301	TNOIZ	3972	WCARD	710	WERC	844
WRITE2	624	WRITEM	611	WTERR	794	WTERRX	839	X1	89				