```
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

                          HZG DEMO                                                  SGSVU               PAGE    1

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

 101                JOB   HZG DEMO
 102                CTL   6611
 103         *
 104         * CONTROL CARD LAYOUT
 105         *
 106         I3LEN  EQU   4    1-4     TAPE 3 RECORD LENGTH                        0004
 107         I3WMAX EQU   8    6-8     TAPE 3 RECORDS UNTIL REWIND                 0008
 108         I3PMAX EQU   11   10-11   TAPE 3 PROCESSING DELAY                     0011
 109         I3RDLY EQU   16   13-16   TAPE 3 REWIND DELAY                         0016
 110         I4LEN  EQU   21   18-21   TAPE 4 RECORD LENGTH                        0021
 111         I4WMAX EQU   25   23-25   TAPE 4 RECORDS UNTIL REWIND                 0025
 112         I4PMAX EQU   28   27-28   TAPE 4 PROCESSING DELAY                     0028
 113         I4RDLY EQU   33   30-33   TAPE 4 REWIND DELAY                         0033
 114         I5LEN  EQU   38   35-38   TAPE 5 RECORD LENGTH                        0038
 115         I5WMAX EQU   42   40-42   TAPE 5 RECORDS UNTIL REWIND                 0042
 116         I5PMAX EQU   45   44-45   TAPE 5 PROCESSING DELAY                     0045
 117         I5RDLY EQU   50   47-50   TAPE 5 REWIND DELAY                         0050
 118         I6LEN  EQU   55   52-55   TAPE 6 RECORD LENGTH                        0055
 119         I6WMAX EQU   59   57-59   TAPE 6 RECORDS UNTIL REWIND                 0059
 120         I6PMAX EQU   62   61-62   TAPE 6 PROCESSING DELAY                     0062
 121         I6RDLY EQU   67   64-67   TAPE 6 REWIND DELAY                         0067
 122         IRDLY  EQU   72   69-72   FULL REEL TAPE REWIND DELAY                 0072
 123         *
 124                ORG   81           RECORD MARK AT 81 WILL BE                        0081
 125                DC    @'@          SENTINEL AFTER LAST LINE OF IMAGE       1  0081                    4
 126         KP1    DCW   &1                                                     1  0082                    4
 127         KB     DCW   #1           CHANGES BSS C TO BRANCH                 1  0083                    4
 128         KC     DCW   @C@          CHANGES BRANCH TO BSS C                 1  0084                    4
 129                DC    @..@                                                 2  0086                    4
 130         X1     DCW   081                                                  3  0089                    4
 131                DC    @..@                                                 2  0091                    4
 132         X2     DCW   010                                                  3  0094                    5
 133                DC    @..@                                                 2  0096                    5
 134         X3     DCW   000                                                  3  0099                    5
 135         GMWM   DCW   @"@                                                  1  0100            GMARK   5
 136                ORG   336                                                        0336
 137         *
 138         * LOAD PARAMETERS
 139         *
 140         START  R                                                          1  0336  1                 6
 141                MCW   I3RDLY,T3RDLY      TAPE 3 REWIND DELAY              7  0337  M 016 853         6
 142                MCW                      TAPE 3 PROCESSING DELAY          1  0344  M                 6
 143                MCW                      TAPE 3 RECORDS UNTIL REWIND      1  0345  M                 6
 144                MCW   I4RDLY,T4RDLY      TAPE 4 REWIND DELAY              7  0346  M 033 881         6
 145                MCW                      TAPE 4 PROCESSING DELAY          1  0353  M                 6
 146                MCW                      TAPE 4 RECORDS UNTIL REWIND      1  0354  M                 6
 147                MCW   I5RDLY,T5RDLY      TAPE 5 REWIND DELAY              7  0355  M 050 909         7
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD
148                 MCW                     TAPE 5 PROCESSING DELAY      1  0362  M                    7
149                 MCW                     TAPE 5 RECORDS UNTIL REWIND  1  0363  M                    7
150                 MCW   I6RDLY,T6RDLY      TAPE 6 REWIND DELAY          7  0364  M 067 937            7
151                 MCW                     TAPE 6 PROCESSING DELAY      1  0371  M                    7
152                 MCW                     TAPE 6 RECORDS UNTIL REWIND  1  0372  M                    7
153                 MCW   IRDLY,RDELAY      REWIND FULL TAPE DELAY COUNT 7  0373  M 072 958            7
154         *
155         * CALCULATE TAPE WRITE ADDRESSES FROM RECORD LENGTHS
156         *
157                 B     GETOFF            CALULATE OFFSET = - I3LEN    4  0380  B 731                8
158                 DSA   I3LEN             TAPE 3 RECORD LENGTH         3  0386  004                  8
159                 DSA   TAPE3W&6          TAPE 3 WRITE INSTRUCTION     3  0389  860                  8
160                 B     GETOFF            CALULATE OFFSET = - I4LEN    4  0390  B 731                8
161                 DSA   I4LEN             TAPE 4 RECORD LENGTH         3  0396  021                  8
162                 DSA   TAPE4W&6          TAPE 4 WRITE INSTRUCTION     3  0399  888                  8
163                 B     GETOFF            CALULATE OFFSET = - I5LEN    4  0400  B 731                8
164                 DSA   I5LEN             TAPE 5 RECORD LENGTH         3  0406  038                  9
165                 DSA   TAPE5W&6          TAPE 5 WRITE INSTRUCTION     3  0409  916                  9
166                 B     GETOFF            CALULATE OFFSET = - I6LEN    4  0410  B 731                9
167                 DSA   I6LEN             TAPE 6 RECORD LENGTH         3  0416  055                  9
168                 DSA   TAPE6W&6          TAPE 6 WRITE INSTRUCTION     3  0419  944                  9
169         *
170                 SW    1                                              4  0420  , 001                9
171                 B     RDIMAG            READ AND STORE THE IMAGE     4  0424  B 473                9
172         *
173         * EVENT LOOP -- CHECK SWITCHES TO DETERMINE ACTIONS
174         *
175         SWLOOP BSS    PRINT,C           D-MOD CHANGED BY PRINT TO BLANK 5  0428  B 519 C           10
176                BSS    TAPEX,D           EXERCISE TAPE 3              5  0433  B 577 D             10
177         NOP    NOP    T3PAKT                                         4  0438  N 845               10
178                BSS    TAPEX,E           EXERCISE TAPE 4              5  0442  B 577 E             10
179                NOP    T4PAKT                                         4  0447  N 873               10
180                BSS    TAPEX,F           EXERCISE TAPE 5              5  0451  B 577 F             10
181                NOP    T5PAKT                                         4  0456  N 901               10
182                BSS    TAPEX,G           EXERCISE TAPE 6              5  0460  B 577 G             11
183                NOP    T6PAKT                                         4  0465  N 929               11
184                B      SWLOOP                                         4  0469  B 428               11
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SEQ PG LIN  LABEL  OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD

185                JOB   HZG DEMO -- PRINT THE PICTURE
186         *
187         * READ THE IMAGE AND STORE IT.  THE FIRST CHARACTER AFTER THE LAST
188         * ONE IN THE STORAGE AREA WILL BE A RECORD MARK.
189         *
190         RDIMAG SBR   RDEXIT&3                                   4  0473  H 518              12
191         RLOOP  R                                                1  0477  1                  12
192                LCA   81,IMAGE&X1        STORE ONE LINE OF THE IMAGE  7  0478  L 081 9W9        12
193                B     GOTEM,A            DONE?                     5  0485  B 501 A          12
194                SBR   X1,80&X1           ADD 80 TO X1              7  0490  H 089 0Y0        12
195                B     RLOOP              GET ANOTHER ONE           4  0497  B 477            12
196         *
197         GOTEM  SBR   X1,80              RESET X1 TO 80            7  0501  H 089 080        12
198                CS    332                                         4  0508  / 332             13
199                CS                                                1  0512  /                  13
200                CC    1                                           2  0513  F 1                13
201         RDEXIT H     0                  WAIT FOR THE SWITCHES TO BE SET  4  0515  . 000      13
202         *
203         * PRINT THE PICTURE
204         *
205         PRINT  SBR   PRINTX&3                                   4  0519  H 576              13
206                MCW   KB,SWLOOP&4        MAKE ENTRY TEST UNCONDITIONAL  7  0523  M 083 432    13
207                LCA   IMAGE&X1,306                                7  0530  L 9W9 306          13
208                W                                                 1  0537  2                  14
209                B     PRINTA,IMAGE&1&X1,'  LAST IMAGE?            8  0538  B 557 9X0 '        14
210                SBR   X1,80&X1           ADD 80 TO X1              7  0546  H 089 0Y0        14
211                B     PRINTX                                      4  0553  B 573            14
212         PRINTA SBR   X1,80              RESET X1 TO 80            7  0557  H 089 080        14
213                CC    1                                           2  0564  F 1                14
214                MCW   KC,SWLOOP&4        CHANGE ENTRY TEST TO BSS C  7  0566  M 084 432       14
215         PRINTX B     0                                           4  0573  B 000            15
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SEQ PG LIN  LABEL   OP    OPERANDS                                SFX CT  LOCN  INSTRUCTION TYPE  CARD

216                 JOB   HZG DEMO -- TAPE EXERCISER
217         *
218         * TAPE EXERCISER PACKET LAYOUT
219         *
220         TWMAX   EQU   2&X3    NUMBER OF RECORDS INITIAL VALUE          0002 X
221         TPMAX   EQU   5&X3    PROCESSING DELAY INITIAL VALUE           0005 X
222         TRDLY   EQU   10&X3   REWIND DELAY INITIAL VALUE               0010 X
223         TWRIT   EQU   18&X3   TAPE WRITE INSTRUCTION LAST CHAR         0018 X
224         TPCNT   EQU   20&X3   CURRENT PROCESSING DELAY COUNT           0020 X
225         TWCNT   EQU   23&X3   CURRENT RECORDS UNTIL REWIND             0023 X
226         TRCNT   EQU   27&X3   CURRENT REWIND DELAY COUNT               0027 X
227         *
228         * TAPE EXERCISER.  FOLLOW  B TAPEX  WITH  NOP PACKET
229         *
230         TAPEX   SBR   TAPEXX&3                                    4  0577  H 707              16
231                 SBR   X3                                          4  0581  H 099              16
232                 MCW   4&X3,X3           ADDRESS OF PACKET TO X3   7  0585  M 0?4 099          16
233                 BWZ   TAPEXA,TRCNT,K    ENOUGH REWIND DELAY?      8  0592  V 611 0B7 K        16
234                 S     KP1,TRCNT                                   7  0600  S 082 0B7          16
235                 B     TAPEXX                                      4  0607  B 704              16
236         TAPEXA  C     KONE,TPCNT        ENOUGH PROCESSING DELAY?  7  0611  C 968 0B0          17
237                 BE    TAPEXB                                      5  0618  B 641 S            17
238                 S     KP1,TPCNT         DECR PROCESSING DELAY COUNT 7  0623  S 082 0B0          17
239                 MZ    KZERO,TPCNT                                 7  0630  Y 965 0B0          17
240                 B     TAPEXX                                      4  0637  B 704              17
241         TAPEXB  LCA   TRDLY,TRCNT       RWD DELAY DEPENDING ON REC CNT 7  0641  L 0A0 0B7      17
242                 BWZ   TAPEXE,TWCNT,K    TIME TO REWIND?           8  0648  V 708 0B3 K        18
243                 LCA   RDELAY,TRCNT      DELAY FOR FULL REEL REWIND  7  0656  L 958 0B7          18
244                 BEF   TAPEXE                                      5  0663  B 708 K            18
245                 LCA   KM1,TRCNT         SET FOR NO REWIND DELAY   7  0668  L 962 0B7          18
246                 MCW   TWRIT,*&8         COPY TAPE WRITE INSTRUCTION 7  0675  M 0A8 689        18
247                 WT    3,GMWM                                      8  0682  M %U3 100 W        19
248                 S     KP1,TWCNT         DECREMENT WRITE COUNTER   7  0690  S 082 0B3          19
249                 MCW   TPMAX,TPCNT       STORE PROCESSING DELAY    7  0697  M 0?5 0B0          19
250         TAPEXX  B     0                                           4  0704  B 000              19
251         TAPEXE  MN    TWRIT-4,*&4       SET DRIVE NUMBER IN REWIND  7  0708  D 0A4 718        19
252                 RWD   3                                           5  0715  U %U3 R            19
253                 MCW   TWMAX,TWCNT       RE-INITIALIZE WRITE COUNT 7  0720  M 0?2 0B3          20
254                 B     TAPEXX                                      4  0727  B 704              20
255         *
256         * OFFSET THE TAPE WRITE ADDRESS, GIVEN THE RECORD LENGTH
257         * DO THIS BY MA-ING THE 16000-COMPLEMENT OF THE RECORD
258         * LENGTH TO THE ADDRESS IN THE TAPE WRITE INSTRUCTION
259         *
260         GETOFF  SBR   X3                                          4  0731  H 099              20
261                 SBR   GETXX&3,6&X3                                7  0735  H 825 0?6          20
262                 LCA   P16K,ROFF         START WITH 16001          7  0742  L 842 834          20
263                 MCW   2&X3,*&4          ADDRESS OF RECORD LENGTH  7  0749  M 0?2 759          20
264                 S     0,ROFF            DECREASE BY RECORD LENGTH 7  0756  S 000 834          21
265                 MZ    KZERO,ROFF        CLEAR ZONE                7  0763  Y 965 834          21
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD
266         GETL    S     KP1,RTHOU                                   7  0770  S 082 831           21
267                 BWZ   GETX,RTHOU,K       DONE?                    8  0777  V 796 831 K         21
268                 MA    K1000,ROFF         ADD 1000 TO OFFSET       7  0785  # 837 834           21
269                 B     GETL                                        4  0792  B 770               22
270         GETX    MCW   5&X3,X3            ADDRESS OF TAPE WRITE    7  0796  M 0?5 099           22
271                 CS    0                  GET LAST ADDRESS TO B REG 4 0803  / 000               22
272                 LCA   GMWM               GMWM TO TOP OF MEMORY    4  0807  L 100               22
273                 SBR   0&X3               LAST ADDRESS IN MEMORY - 1 4 0811  H 0?0               22
274                 MA    ROFF,0&X3          SUBTRACT RECORD LENGTH   7  0815  # 834 0?0           22
275         GETXX   B     0                                           4  0822  B 000               22
276         *
277         RLEN    DCW   0000               RECORD LENGTH            4  0829                      23
278         RTHOU   DCW   00                 THOUSANDS PART OF OFFSET 2  0831                      23
279         ROFF    DC    000                OFFSET TO TAPE ADDRESS = - RLEN 3 0834                 23
280         K1000   DSA   1000               ADDRESS CONSTANT 1000    3  0837  '00                 23
281         P16K    DCW   16001                                       5  0842                      23
282         *
283         * TAPE EXERCISER CONTROL PACKETS
284         *
285         T3PAKT  DCW   000     NUMBER OF RECORDS INITIAL VALUE     3  0845                      23
286                 DC    #1      FILLER FROM CONTROL CARD            1  0846                      23
287                 DCW   00      PROCESSING DELAY INITIAL VALUE      2  0848                      23
288                 DC    #1      FILLER FROM CONTROL CARD            1  0849                      23
289         T3RDLY  DCW   0000    REWIND DELAY INITIAL VALUE          4  0853                      23
290         TAPE3W  WT    3,0     TAPE WRITE INSTRUCTION              8  0854  M %U3 000 W         24
291                 DCW   00      CURRENT PROCESSING DELAY COUNT      2  0863                      24
292                 DCW   000     CURRENT RECORDS UNTIL REWIND        3  0866                      24
293                 DCW   -0001   CURRENT REWIND DELAY COUNT          4  0870                      24
294         *
295         T4PAKT  DCW   000     NUMBER OF RECORDS INITIAL VALUE     3  0873                      24
296                 DC    #1      FILLER FROM CONTROL CARD            1  0874                      24
297                 DCW   00      PROCESSING DELAY INITIAL VALUE      2  0876                      24
298                 DC    #1      FILLER FROM CONTROL CARD            1  0877                      24
299         T4RDLY  DCW   0000    REWIND DELAY INITIAL VALUE          4  0881                      24
300         TAPE4W  WT    4,0     TAPE WRITE INSTRUCTION              8  0882  M %U4 000 W         25
301                 DCW   00      CURRENT PROCESSING DELAY COUNT      2  0891                      25
302                 DCW   000     CURRENT RECORDS UNTIL REWIND        3  0894                      25
303                 DCW   -0001   CURRENT REWIND DELAY COUNT          4  0898                      25
304         *
305         T5PAKT  DCW   000     NUMBER OF RECORDS INITIAL VALUE     3  0901                      25
306                 DC    #1      FILLER FROM CONTROL CARD            1  0902                      25
307                 DCW   00      PROCESSING DELAY INITIAL VALUE      2  0904                      25
308                 DC    #1      FILLER FROM CONTROL CARD            1  0905                      25
309         T5RDLY  DCW   0000    REWIND DELAY INITIAL VALUE          4  0909                      25
310         TAPE5W  WT    5,0     TAPE WRITE INSTRUCTION              8  0910  M %U5 000 W         26
311                 DCW   00      CURRENT PROCESSING DELAY COUNT      2  0919                      26
312                 DCW   000     CURRENT RECORDS UNTIL REWIND        3  0922                      26
313                 DCW   -0001   CURRENT REWIND DELAY COUNT          4  0926                      26
314         *
315         T6PAKT  DCW   000     NUMBER OF RECORDS INITIAL VALUE     3  0929                      26
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SEQ PG LIN  LABEL   OP    OPERANDS                                  SFX CT  LOCN  INSTRUCTION TYPE  CARD

316                 DC    #1       FILLER FROM CONTROL CARD           1  0930                      26
317                 DCW   00       PROCESSING DELAY INITIAL VALUE     2  0932                      26
318                 DC    #1       FILLER FROM CONTROL CARD           1  0933                      26
319         T6RDLY  DCW   0000     REWIND DELAY INITIAL VALUE         4  0937                      26
320         TAPE6W  WT    6,0      TAPE WRITE INSTRUCTION             8  0938  M %U6 000 W         27
321                 DCW   00       CURRENT PROCESSING DELAY COUNT     2  0947                      27
322                 DCW   000      CURRENT RECORDS UNTIL REWIND       3  0950                      27
323                 DCW   -0001    CURRENT REWIND DELAY COUNT         4  0954                      27
324         *
325         RDELAY  DCW   0000     DELAY COUNTER FOR EOT REWINDS      4  0958                      27
326         KM1     DCW   -0001    CONSTANT -1                        4  0962                      27
327         *
328         KZERO   DCW   000                CONSTANT ZERO            3  0965                      27
329         KONE    DCW   001                                         3  0968                      28
330         IMAGE   DS    1        STORAGE FOR IMAGE STARTS HERE        0969
331                 END   START                                             / 336 080
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SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
GETL	770	GETOFF	731	GETX	796	GETXX	822	GMWM	100	GOTEM	501	I3LEN	4
I3PMAX	11	I3RDLY	16	I3WMAX	8	I4LEN	21	I4PMAX	28	I4RDLY	33	I4WMAX	25
I5LEN	38	I5PMAX	45	I5RDLY	50	I5WMAX	42	I6LEN	55	I6PMAX	62	I6RDLY	67
I6WMAX	59	IMAGE	969	IRDLY	72	K1000	837	KB	83	KC	84	KM1	962
KONE	968	KP1	82	KZERO	965	NOP	438	P16K	842	PRINT	519	PRINTA	557
PRINTX	573	RDELAY	958	RDEXIT	515	RDIMAG	473	RLEN	829	RLOOP	477	ROFF	834
RTHOU	831	START	336	SWLOOP	428	T3PAKT	845	T3RDLY	853	T4PAKT	873	T4RDLY	881
T5PAKT	901	T5RDLY	909	T6PAKT	929	T6RDLY	937	TAPE3W	854	TAPE4W	882	TAPE5W	910
TAPE6W	938	TAPEX	577	TAPEXA	611	TAPEXB	641	TAPEXE	708	TAPEXX	704	TPCNT	20+X3
TPMAX	5+X3	TRCNT	27+X3	TRDLY	10+X3	TWCNT	23+X3	TWMAX	2+X3	TWRIT	18+X3	X1	89
X2	94	X3	99										