```
  0001  .MAIN
01
02                ;                                                  PAGE 1 OF 8
03                ;       RCSL:   44-RT 1885
04
05                ;       VERSION:        2.0     5.5.79  JEP
06
07                ;               PROGRAM:
08                ;               ********
09                ;
10                ;       RC 3600 - BINARY LOADER TS
11                ;
12                ;               PROGRAM SOURCE:
13                ;
14                ;       S-BINARY TAPE:  RCSL 44-RT 1886 (SELFSTART AUTOLOAD HEAD
15                ;       ASCII SOURCE:   RCSL 44-RT 1887 TAPE 1 - 7
16                ;       BINARY CARD:    RCSL 44-RT 1888
17                ;
18                ;0. INDEX
19                ;       1. ABSTRACT                                PAGE 1
20                ;       2. MACHINE REQUIREMENTS                    PAGE 1
21                ;       3. STANDARD OPERATING PROCEDURE            PAGE 2
22                ;             BOOTSTRAP FOR S-BINARY TAPE          PAGE 6
23                ;       4. ADDITIONAL OPERATING PROCEDURE          PAGE 7
24                ;       5. PROGRAM DESCRIPTION                     PAGE 7
25                ;       6. MESSAGES FROM THIS PROGRAM              PAGE 8
26                ;
27                ;1. ABSTRACT
28                ;       A BINARY LOADER PROGRAM PLACED IN THE FIRST 8K OF
29                ;       MEMORY USED FOR HAVING THE POSSIBILITY FOR INPUT OF
30                ;       THE BINARY LOADER FROM ANY AUTOLOAD DEVICE OR FROM THE
31                ;       SYSTEM SOFTWARE. AFTER LOADING THE PROGRAM FROM DISC,
32                ;       TAPE, CARD (OR AUTOLOAD FROM PTR) IT RELOADS THE BINARY
33                ;       (AND BOOTSTRAP) LOADER TO THE TOP OF MEMORY (MAX 32K).
34
35                ;2. MACHINE REQUIREMENTS
36                ;       RC 3600 FAMILY PROCESSOR                   CPU
37                ;       MINIMUM 8K READ/WRITE MEMORY               MEM
38                ;       TELETYPE OR OPERATORS CONTROL PANEL        TTY/OCP *NOTE
39                ;       LOADING UNIT (DISC, TAPE ETC.)
40                ;       LINEPRINTER, OPTIONALLY                    LPT     *NOTE
41                ;
42                ;       *NOTE: IF THIS DEVICES IS SET ONLINE AFTER PROGRAM
43                ;       START, THE PROGRAM MUST BE RESTARTED TO GET OUTPUT.
```

```
^ 0002  .MAIN
01
02                ;                                                    PAGE 2 OF 8
03                ;3. STANDARD OPERATING PROCEDURE.
04                ;
05                ;       3.1 LOADING:
06                ;
07                ;               IF FROM PTR:
08                ;       1       AUTOLOAD TAPE
09                ;       OR 2    USE BOOTSTRAP FOR AUTOLOAD-TAPE (END OF CHAPTER)
10                ;       OR 3    USE BINARY LOADER STARTING TAPE AFTER 1. BLOCK
11                ;
12                ;               IF FROM ANOTHER DEVICE:
13                ;               READ THE INSTRUCTIONS ATTACHED TO THE MEDIUM.
14                ;
15                ;       3.2 LOADING MESSAGE:
16                ;               AFTER LOADING THE PROGRAM WILL WRITE FOLLOWING:
17                ;
18                ;               ACTUAL PROGRAM NAME
19                ;               SWITCHES: 000030
20                ;               SET SWITCHES TO CONTROL, (3.6), STARTADDR 400 ?
21                ;
22                ;       3.3 START
23                ;               OF PROGRAM AFTER LOADING:
24                ;               SET SWITCHES TO CONTROL, READ 3.6
25                ;               BEFORE START READ ADDITIONAL OPERATING PROCEDURE
26                ;
27                ;       3.4 ANSWERING TO QUESTIONS:
28                ;
29                ;               IF THE SUGGESTED ANSWER IS OK,
30                ;               ANSWER ONLY NL (RETURN),
31                ;
32                ;               ELSE INPUT YOUR CHOICE.
33                ;
34                ;               THE LAST DIGIT ANSWERED CAN BE ERASED WITH
35                ;               RUBOUT (CANCEL OR DELETE).
36                ;               MORE DIGITS CAN'T BUT PASS LIMIT BY GIVING TO
37                ;               MANY DIGITS.
38                ;
39                ;               IF THE ANSWER IS BEYOND LIMITS THE QUESTION
40                ;               IS REPEATED.
41                ;
42                ;       3.5 PROGRAM DATA:
43                ;
44                ;               AFTER LOADING IT IS POSSIBLE TO KNOW MORE ABOUT
45                ;               THE PROGRAM AND THE MACHINE BY STARTING IN
46                ;               SA 2226. FOLLOWING DATA ARE PRINTED:
47                ;
48                ;               ACTUAL PROGRAM NAME
49                ;               RCSL 44-RT XXXX  DATE: DD.MM.YEAR  VERSION: 0.0
50                ;               CPU TYPE: 000021 RC 3600 NORMAL
51                ;               MIKROPROG VERSION:     0, CPU 708
52                ;               LAST LOC. 077777
53                ;               BINARY LOADER OK         ; SEE 3.14
54                ;               SWITCHES: 000030
55                ;               SET SWITCHES TO CONTROL, (3.6), STARTADDR 400 ?
56                ;
57                ;               GO TO 3.3 START
```

```
01
02                ;
03                ;       3.6 SWITCH CONTROL: NORMAL ALL ZERO.
04
05                ;               SW0:  LOOP IN TEST IN CASE OF ERROR. ( SCOPING).
06                ;               SW10: INHIBIT PRINTOUT IN TESTLOOP-PROGRAM.
07                ;               SW11: PRINT FAILURE RATE IN TESTLOOP-PROGRAM.
08                ;               SW12: NO HALT IN CASE OF ERROR IN TESTLOOP-PROGR
09                ;               SW13: WAIT AFTER DIS MESSAGE.  DIS IS THE 16 CHA
10                ;               SW14: HALT AFTER DIS MESSAGE.  DISPLAY AT OPERAT
11                ;               SW15: CLEAR DIS AFTER MESSAGE. CONTROL PANEL. OCP
12
13                ;       3.7 UTILITY START ADDRESSES:
14
15                ;               2202 GET A NEW PRINTER ALPHABETH
16                ;               2204 SET TO 64K WORDS MODE, MEM SIZE ?
17                ;               2206 SET TO 32K WORDS MODE, MEM SIZE ?
18                ;               2210 EXAMINE MEMORY
19                ;               2212 DEPOSIT MEMORY
20                ;               2214 TROUBLE BREAKPOINT HALT
21                ;               2216 TROUBLE BREAKPOINT LOOP REPORT
22                ;               2220 TROUBLE BREAKPOINT RESET
23                ;               2222 START BINARY LOADER, READ FROM PTR/TTI (SW 0
24                ;               2224 RESTART PROGRAM AS WHEN LOADED
25                ;               2226 PRINT PROGRAM DATA
26                ;               2230 INCREASE/DECREASE VOLTAGE UNIT ADMINISTRATION
27                ;
28                ;       3.8 TERMINATE:
29                ;
30                ;               NORMALLY IT IS POSSIBLE TO TERMINATE THE PROGRAM
31                ;               BY PRESSING ESC AT MAIN CONSOLE (TTI) OR PRESSING
32                ;               INT AT OPERATORS CONTROL PANEL (OCP).
33                ;
34                ;               IF THE PROGRAM IS WAITING FOR INPUT TO A QUESTION
35                ;               ANSWER ENOUGH DIGITS TO PASS THE LIMIT, AND WHEN
36                ;               THE QUESTION STARTS REPEATING, PRESS ESC
37                ;               IMMEDIATELY.
38                ;
39                ;       3.9 RESTART FROM TTI:
40                ;
41                ;               ANSWER THE START ADDRESS QUESTION AFTER
42                ;               TERMINATING.
43                ;
44                ;       3.10 RESTART FROM TCP:
45                ;               THE BEST WAY TO INSURE
46                ;               CORRECT SWITCH SETTINGS:
47                ;               RESET
48                ;               SET SWITCHES TO START ADDR. (3.1).
49                ;               EXAMINE
50                ;               SET SWITCHES TO CONTROL. (3.2).
51                ;               CONTINUE.
52                ;               THE START ADDR IS LISTED AT TTO, LPT AND DIS.
```

```
^ 0004  .MAIN
01
02                ;                                                  PAGE 4 OF 8
03                ;
04                ;       3.11 RESTART FROM CPU FRONT EDGE
05                ;            ONLY IF RESTART OPTION (RC 3603):
06                ;            SET DATASWITCH 0, 10 - 15 UP (1)
07                ;            SET RESET PARITY ERROR DOWN (ON)
08                ;            PRESS AUTOLOAD AND RELEASE
09                ;            SET RESET PARITY ERROR UP (OFF)
10                ;            SET SWITCHES TO CONTROL (3.2).
11                ;            ANSWER THE QUESTION WRITTEN ON TTY/OCP.
12                ;
13                ;       3.12 POWER RESTART
14                ;            ONLY IF POWER MONITOR OPTION:
15                ;            SET KEY IN LOCK BEFORE REMOVING POWER
16                ;            AFTER POWERING UP THE PROGRAM WRITES:
17                ;            POWER
18                ;            ACTUAL PROGRAM NAME
19                ;            SET SWITCHES TO CONTROL. (3.2).
20                ;            ANSWER THE START ADDRESS QUESTION.
21                ;
22                ;       3.13 RESTART WITH BREAK OPTION (RC 3603):
23                ;            RESET
24                ;            SET SWITCHES TO HALT INSTR        063077
25                ;            SET REGISTER SELECT TO 6
26                ;            DEPOSIT INTO REGISTER
27                ;            SET SWITCHES TO ADDRESS           000003
28                ;            SET REGISTER SELECT TO 5
29                ;            DEPOSIT INTO REGISTER
30                ;            SET BREAK SWITCH TO ON
31                ;            GO TO 3.3 RESTART WITH SA = 2224
32
33                ;       3.14 BINARY LOADER
34                ;            THE BINARY LOADER FOR PAPER TAPES IS PLACED
35                ;            IN TOP OF MEMORY (MAX 32K) AFTER LOADING OF THIS
36                ;            PROGRAM REGARDLESS OF WHICH LOAD MEDIUM THERE
37                ;            WAS USED TO INPUT THIS PROGRAM. RESTART IN
38                ;            SA 2222 WILL RESTORE THE LOADER AGAIN. IT IS A
39                ;            SLIGHTLY MODIFIED VERSION (TS) INCL BOOTSTRAP.
40                ;            IF SUMCHECK OR OVERWRITING CHECK REACTS:
41                ;                    ERRORHALT: XX7751
42                ;            IF USED TO LOAD NOT SELFSTARTING PROGRAMS:
43                ;                    READYHALT: XX7676
44                ;
45                ;       3.15 CPUNO
46                ;            FOR TIMING PURPOSE THE PROGRAM DETERMINES IN
47                ;            WHICH CPU IT RESIDUES. IF IT FAILS THE PROGRAM
48                ;            WILL TRY TO CONTINUE AFTER THE MESSAGE
49                ;            "MISERABLE TIMING". IF IMPOSSIBLE THE PROGRAM
50                ;            WILL ASK YOU TO IDENTIFY THE CPU WITH A NUMBER
51                ;            BETWEEN 0 AND 6. USE 2 FOR NOVA1200, RC3603-BREAK
52                ;                                 4 FOR RC3603
53                ;                                 5 FOR NOVA 2-16K
54                ;                                 6 FOR NOVA 2-8K WHERE
55                ;            THE MEMORY TYPE FOR THE FIRST 8K IS RELEVANT.
56                ;            STANDARD QUESTION FORMAT USED.
```

```
^ 0005  .MAIN
01
02                ;                                                  PAGE 5 OF 8
03                ;
04                ;       3.16 PRINTER ALPHABETH
05                ;               THIS PROGRAM CONTAINS 4 PRINTER ALPHABETHS.
06                ;               AFTER LOADING OF THE PROGRAM THE ASCII IS USED.
07                ;               IF ANOTHER IS WANTED OR YOU WANT TO DESIGN YOUR
08                ;               OWN SPECIAL TABLE, READ FOLLOWING.
09                ;
10                ;       PRINTER ALPHABETH CHANGE:
11                ;AT ANY TIME AFTER LOADING THIS PROGRAM IT IS POSSIBLE TO CHANGE
12                ;THE ALPHABETH USED ON THE LINEPRINTER. THERE ARE 2 METHODS:
13                ;  1.                    GET ONE OF THE BUILD-IN ALPHABETHS:
14                ;       START PROGRAM IN SA 2202
15                ;       REMEMBER SWITCHES TO CONTROL. (3.6).
16                ;       ANSWER ALPHABETH #, SEE EXISTING BELOW
17                ;THE PROGRAM WILL RESTART AFTER CHANGING THE ALPHABETH.
18                ;       ANSWER NEXT START ADDRESS.
19                ;  2.                          GET AN -ADD ON- TAPE WITH
20                ;A NEW ALPHABETH AND LOAD THIS UPON THE PROGRAM AND RESTART. THE
21                ;TAPES WITH PRINTER TABLE ALPHABETH ARE DESCRIBED BELOW:
22                ;EXISTING: #1    44-RT 535       ASCII
23                ;          #2    44-RT 529       RC STANDARD TYPE 71/78 STARTING .
24                ;          #3    44-RT 532       RC STANDARD TYPE 71/78 STARTING C
25                ;                                      (SKEWED 4 POSITIONS)
26                ;          #4    44-RT 1213      PL 1, TYPE 70
27                ;
28                ;HOW TO PRODUCE A NEW TABLE:
29                ;THE TABLE HAS 200 OKTAL (128 DECIMAL) BOXES. INPUT KEY
30                ;IS THE ASCII VALUE OF THE CHARACTER TO PRINT ADDED TO 2000.
31                ;THE RESULT IS ADDRESS OF A BOX. EACH BOX OCCUPIES A CORE WORD.
32                ;IT IS BUILT UP OF TWO FIGURES. THE FIRST IS THE CLASS OF THE
33                ;CHARACTER TO BE PRINTED: 0 FOR PRINT, 6 FOR BLIND. THE SECOND
34                ;IS THE CHARACTER VALUE AT THE PRESENT PRINT DRUM. BELOW
35                ;VALUE 40 OCTAL FOLLOWING CHARACTERS MAY BE USED: 11 TAB,
36                ;12 LF, 14 FF AND 15 CR. ALL OTHERS BELOW 40 WILL GIVE SPACE.
37                ;THE FIRST BOX SHOULD CONTAIN THE VALUE FOR THE NULL CHAR
38                ;AND THE LAST THE VALUE FOR THE DEL CHAR, WHICH BOTH NORMALLY
39                ;ARE BLIND. IF YOU COUNT 0,1,2, ,7,10, , THE BOX 101 SHALL
40                ;CONTAIN THE PRINT DRUM VALUE FOR AN A. IF THE DRUM DO NOT
41                ;HAVE SMALL LETTERS, FILL IN THE VALUE FOR BIG ONES. NOW PUNCH
42                ;AN ASCII TAPE LIKE THIS:
43                ;    .LOC 2000
44                ;    .RDX 8          ;WHICH RDX YOU WANT
45                ;    .TXTE?
46                ;    (6)(0)          ;(2000) FIRST BOX, BOX 0
47                ;    (6)(0)
48                ;    .
49                ;    .
50                ;    .
51                ;    (0)(101)        ;(2101) BOX 101 FOR A. FOR ASCII DRUM
52                ;    .               ;101 IS USED, FOR TYPE 71 137 IS USED.
53                ;    .
54                ;    .
55                ;    (6)(0)?         ;(2177) BOX 177, LAST
56                ;    .RDX 8
57                ;    .END 101        ;AUTOMATIC RESTART OF MAIN PROGRAM.
58                ;PRODUCE A BINARY TAPE AND LOAD THIS TO MEMORY WITH
59                ;BINARY LOADER AFTER LOADING OF MAIN PROGRAM.
```

```
  0006  .MAIN
01
02                                                                  PAGE 6 OF 8
03                ;       BOOTSTRAP FOR AUTOLOAD-TAPES, PTR.
04                ;       ***********************************
05
06                ;SELF, A PROGRAM SIMILAR TO AUTOLOAD PROM FOR PTR, BUT
07                ;READ TO MEMORY BY THE OPERATOR THROUGH FRONT PANEL SWITCHES.
08
09                ;DEPOSIT SELF PROGRAM.
10                ;START IN LOCATION 50.
11
12 00050 060112 BEGIN:  NIOS    PTR       ;START READER
13 00051 126440         SUBO    1,1       ;CLEAR AC1, CLEAR CARRY
14 00052 004413 LOOP:   JSR     GET1      ;GET A BYTE
15 00053 101065         MOVC    0,0,SNR   ;IS IT ZERO ?
16 00054 000776         JMP     LOOP      ;YES, IGNORE AND GET NEXT
17 00055 030420         LDA     2,SAPRE   ;NO, IT WAS TAPE SYNCRONIZER, DROP IT
18                                        ;AND SET AC2 TO FIRST MEM LOC FOR PREAM
19 00056 004406 LOOP1:  JSR     GET       ;GET A FULL WORD, FIRST = WORD COUNT
20 00057 045000         STA     1,0,2     ;STORE INTO MEMORY FROM COUNT
21 00060 151400         INC     2,2       ;INCREMENT ADDR TO NEXT
22 00061 010417         ISZ     COUNT     ;BUMP WORD COUNT, DONE ?
23 00062 000774         JMP     LOOP1     ;NO, REPEAT, STILL DATA
24 00063 000416         JMP     PREAM     ;YES, FINISHED, GIVE CONTROL TO
25                                        ;FIRST WORD IN PREAM PROGRAM
26 00064 126420 GET:    SUBZ    1,1       ;CLEAR AC1, SET CARRY
27 00065 063512 GET1:   SKPBZ   PTR       ;
28 00066 000777         JMP     .-1       ;WAIT NON-BUSY
29 00067 060412         DIA     0,PTR     ;READ A BYTE TO AC0
30 00070 060112         NIOS    PTR       ;START READER FOR NEXT BYTE
31 00071 107363         ADDCS   0,1,SNC   ;ADD 2 BYTES SWAPPED, GOT SECOND ?
32 00072 000773         JMP     GET1      ;NO, GO BACK AFTER IT
33 00073 125300         MOVS    1,1       ;YES, SWAP AC1
34 00074 001400         JMP     0,3       ;RETURN WITH FULL WORD
35 00075 000100 SAPRE:  .+3               ;START ADDR FOR LOADING PREAM
36 00076 000050 SADDR:  50                ;SPARE, NOT USED ,(START ADDR FOR SELF)
37
38                ;AFTER DEPOSITING ABOVE PROGRAM, SET SWITCHES TO 000050 AND
39                ;LOAD THE PAPER TAPE READER WITH SUITABLE TAPE (S-BIN OR H-BIN).
40                ;PRESS RESET, START. NOW THE BINARY LOADER IN NORMAL OR
41                ;SELFSTART VERSION IS READ IN, THEN THE MAIN PROGRAM.
42
43                ;TAPES WHICH CAN BE READ BY THIS BOOTSTRAP:
44
45                ;       1       TESTPROGAMS IN S-BIN FORMAT (WITH S-BIN HEAD).
46
47                ;       OR 2    S-BIN HEAD ITSELF (RCSL 44-RT 1711), WHEN PTR
48                ;               HAS FINISHED LOAD NORMAL ABS BINARY TAPE (A-BIN)
49                ;               AND THE PTR CONTINUES AUTOMATICALLY.
50                ;               (OR CONNECT THE TAPES TO ONE WITH ADHESIVE TAPE)
51
52                ;       OR 3    H-BIN TAPE (RCSL 44-RT 1712) WHICH LOADS THE
53                ;               BINARY LOADER AND HALTS. SWITCH=1X7777, START.
54
55                ;       FOR MORE INFORMATION READ RCSL 44-RT 1710, PROGRAM LOAD.
```

```
^ 0007  .MAIN
01
02                ;                                                  PAGE 7 OF 8
03                ;
04                ;4. ADDITIONAL OPERATING PROCEDURE FOR THIS PROGRAM.
05                ;
06                ;       THE PROGRAM IS SELFSTARTING.
07                ;
08                ;       START ADDRESSES:
09                ;               400     MAIN PROGRAM
10                ;
11                ;       AFTER START FOLLOWING MESSAGES ARE PRINTED:
12                ;
13                ;       BINARY LOADER TS
14                ;       000400 STARTADDR
15                ;       (SWITCHES 100073)
16                ;       LOAD READER AND SET SWITCH 0
17                ;       1 FOR PTR, 0 FOR TTI
18                ;       WAITING
19                ;
20                ;       THEN THE PROGRAM WAITS FOR CORRECT STATE OF
21                ;       SWITCH 0, LOADING OF THE TAPE IN THE READER AND AN
22                ;       ANSWER FROM THE OPERATOR: NL (TTY) OR PRESS CONTINUE (OCI
23
24                ;       IF RESTARTING THE BINARY LOADER ITSELF (WITHOUT THIS
25                ;       PROGRAM) THE METHOD IS AS FOR THE ORIGINAL BINARY
26                ;       LOADER. START ADDRESS IS EQUAL TO LAST LOC MESSAGE
27                ;       WHICH WAS WRITTEN WHEN THE PROGRAM WAS LOADED.
28
29
30                ;       READY HALT ADDRESS FOR THE BINARY LOADER IS 0X7676
31                ;       IF LOADED PROGRAM ISN'T SELFSTARTING.
32
33
34                ;       ERROR HALT ADDRESS IS 0X7751 IF CHECKSUM ERROR
35                ;       OR THE LOADED PROGRAM TRYES TO OVERWRITE THIS LOADER.
36                ;
37                ;5. DESCRIPTION.
38                ;       THIS PROGRAM SEARCH FOR LAST LOCATION IN MEMORY
39                ;       AND THEN RELOAD THE BINARY LOADER AND THE BOOTSTRAP
40                ;       LOADER TO THE TOP OF MEMORY (MAX 32K). IT IS ISSUED AS A
41                ;       NORMAL BINARY PROGRAM WHICH OCCUPIES THE FIRST 8K OF
42                ;       MEMORY. IT IS POSSIBLE TO LOAD IT FROM ANY LOADING
43                ;       DEVICE AND IT FITS THE FORMAT OF BOOT IN RDOS/DOMUS.
```

```
^ 0008  .MAIN
01
02                ;                                                  PAGE 8 OF 8
03                ;
04                ;6. MESSAGES FROM THIS PROGRAM.
05                ;       ALL MESSAGES ARE WRITTEN ON TTY, LPT AND THE 16 CHAR DIS
06                ;       ON OPERATORS CONTROL PANEL. IT IS POSSIBLE TO ANSWER
07                ;       QUESTIONS AT TTY OR NUK, NUMERIC KEYBOARD ON OPERATORS
08                ;       CONTROL PANEL.
09                ;       ABOUT THE NUMBERS:
10                ;               0-5 DIGITS IS A DECIMAL NUMBER
11                ;                   RANGE -32768 TO -1 AND 0 TO 32767
12                ;                 6 DIGITS IS AN OCTAL NUMBER
13                ;               0-6 DIGITS IS AN OCTAL NUMBER WITH
14                ;                   LEADING ZEROES SUPPRESSED, DON'T USE.
15                ;                 8 DIGITS IS A BINARY NUMBER.
16                ;
17                ;       MESSAGES:
18                ;
19                ;       BINARY LOADER TS
20                ;       000400 STARTADDR
21                ;       SWITCHES 100073
22                ;       LOAD READER AND SET SWITCH 0
23                ;       1 FOR PTR, 0 FOR TTI
24                ;       WAITING $
25                ;
26
27                ;TAPE 1
28
29                .EOT
```

```
  0009  .MAIN
01
02                ;TAPE 2          PAGE ZERO FOR TAPE 3,4,5
03
04        000000 .LOC 0
05
06 00000 003074 LOC0:    2*MELOC           ;MESS AFTER RDOS LOAD, LATER USED FOR
07                                          ;POWER INTR (POWZE) OR PC IF NORMAL INTR
08 00001 010420           SERINT            ;ADDR OF INTR. SERVICE ROUTINE
09 00002 001403           REBIN             ;SELFSTART ADDR FOR RDOS ETC.
10 00003 000001 LOC3:     1                 ;0=HALT, 1=SELFSTART PROG AFTER REBIN
11 00004 000400 LOC4:     400               ;@ADDR FOR SELFSTART PROG AFTER REBIN
12 00005 000000 LOC5:     0                 ;FOR LOAD RDOS, USED BY POW. INTR, FITYP
13 00006 006007 PROIN:    JSR      @PROAD   ;PROGRAM BREAK INSTRUCTION
14 00007 006143 PROAD:    PROAK             ;ADDR OF PROGRAM BREAK ROUTINE.
15
16        000020 .LOC 20
17
18 00020 000000 IDX0:     0                 ;AUTO INCREMENT LOCATION
19 00021 000000 IDX1:     0                 ;AUTO INCREMENT LOCATION
20 00022 000000 IDX2:     0                 ;AUTO INCREMENT LOCATION
21 00023 000000 IDX3:     0                 ;AUTO INCREMENT LOCATION
22
23        000040 .LOC 40                    ;INDIRECT ADDRESSES
24                                          ;NOT IN AUTO INC,DEC LOC.
25 00040 000412 IMESS:    XMESS
26 00041 000716 ICHAR:    XCHAR
27 00042 000724 ITYPE:    XTYPE
28 00043 001045 ICRLF:    XCRLF
29 00044 001133 IDISP:    XDISP
30 00045 001167 IDOUT:    XDOUT
31 00046 001215 IDICL:    XDICL
32 00047 001237 IDATT:    DISATT
33 00050 001265 IHAAT:    HAATT
34 00051 001015 ITBIN:    XTBIN
35 00052 000554 ITOCT:    XTOCT
36 00053 000465 ITDEC:    XTDEC
37 00054 000544 ITZOC:    XTZOC
38 00055 001021 IDBIN:    XDBIN
39 00056 000560 IDOCT:    XDOCT
40 00057 000461 IDDEC:    XDDEC
41 00060 000550 IDZOC:    XDZOC
42 00061 003050 IWAIT:    XWAIT
43 00062 002651 IWAOP:    XWTOP
44 00063 003120 ITISK:    RTIME
45 00064 003177 ITIMS:    MSTIM
46 00065 003326 ITIRO:    XTIMS
47 00066 003277 IMULT:    XMULT
48 00067 003311 IDIVS:    XDIVS
49 00070 003312 IDIVD:    XDIVD
50 00071 006470 IQUES:    XQUES
51 00072 001531 ISAMS:    XSAMS
52 00073 001314 IRESW:    XRESW
53 00074 003011 IBILO:    XBILO
54 00075 000000 HMEND:    0                 ;TOP OF MEMORY, LOADER PROTECT
55 00076 000000 DIGIN:    0                 ;INPUT BUFFER FOR INPUT ROUTINES.
```

```
^ 0010  .MAIN
01
02              ;PRINTER TABLE HANDLING AND (POWER) RESTART:
03
04        000077 .LOC 77
05
06 00077 006141 IRESA:  SWISA           ;PROGRAM RESTART ADDR.
07 00100 006054 POWRE:  POWON           ;POWER RESTART ADDR. IMPORTANT KEEP NEXT
08 00101 002077 RETAB:  JMP     @IRESA  ;IN 101 BECAUSE PRINTER TABLE SELFSTART
09 00102 002100 POWZE:  JMP     @POWRE  ;INSTRUCTION TO BE STORED IN LOC ZERO
10
11 00103 007373 IGTBI:  GETBI
12 00104 007245 IGTOK:  GETOK
13 00105 006733 IGTDC:  GETDC
14 00106 007164 IGTSC:  GETSC
15 00107 007502 IGTTX:  GETTX
16 00110 010014 ISTP0:  ENTP0
17 00111 010021 ISTP1:  ENTP1
18 00112 010026 ISTP2:  ENTP2
19 00113 007737 ILOOP:  CYCLE
20 00114 010156 IHALT:  ERROR
21 00115 010251 ISTAA:  XSTAA
22 00116 010264 ISTAN:  XSTAN
23 00117 010273 ISTAW:  XSTAW
24 00120 010326 ISTAS:  XSTAS
25 00121 010311 ISTAP:  XSTAP
26 00122 011533 JHALT:  XHALT
27 00123 011515 ILORE:  XLORE
28 00124 010631 IPASS:  XPASS
29 00125 002446 ITHLT:  XTHLT
30 00126 010531 IDRST:  XDRST
31 00127 000000 SHALT:  0               ;AC3 SAVED FOR HALT ROUTINE
32 00130 000000 INDEV:  0               ;DEVICE NUMBER AFTER INTA IN SERINT
33 00131 000000 INFLG:  0               ;INTR FLAG, AFTER INTR = -1
34
35 00132 000000 QCSTA:  0               ;STATUS BITS FOR STATW, FIXED.
36
37              ;  DEFINITIONS
38
39        000032 FUN=32
40        000033 FUB=33
41        000034 NUK=34
42        000035 DIS=35
43        000010 XTTI=TTI         ;TTI=10
44        000011 XTTO=TTO         ;TTO=11
45        000014 XRTC=RTC         ;RTC=14
46        000017 XLPT=LPT         ;LPT=17
```

```
^ 0011   .MAIN
01
02          063077 RHALT=HALT
03          062677 ALRST=IORST
04          076701 MEMEX=DICP       3,1
05          070477 RDSWI=READS      2
06          006040 CMESS=JSR        @IMESS  ;EACH DEFINITION BELOW CORRESPONDS
07          006041 CCHAR=JSR        @ICHAR  ;WITH A CALL OF A ROUTINE.
08          006042 CTYPE=JSR        @ITYPE
09          006043 CCRLF=JSR        @ICRLF
10          006044 CDISP=JSR        @IDISP
11          006045 CDOUT=JSR        @IDOUT
12          006046 CDICL=JSR        @IDICL
13          006047 CDATT=JSR        @IDATT
14          006050 CHAAT=JSR        @IHAAT
15          006051 CTBIN=JSR        @ITBIN
16          006052 CTOCT=JSR        @ITOCT
17          006053 CTDEC=JSR        @ITDEC
18          006054 CTZOC=JSR        @ITZOC
19          006055 CDBIN=JSR        @IDBIN
20          006056 CDOCT=JSR        @IDOCT
21          006057 CDDEC=JSR        @IDDEC
22          006060 CDZOC=JSR        @IDZOC
23          006061 CWAIT=JSR        @IWAIT
24          006062 WATOP=JSR        @IWAOP
25          006063 TIMSK=JSR        @ITISK
26          006064 TIMMS=JSR        @ITIMS
27          006065 TIMRO=JSR        @ITIRO
28          006066 MULTI=JSR        @IMULT
29          006067 DIVIS=JSR        @IDIVS
30          006070 DIVID=JSR        @IDIVD
31          006071 CQUES=JSR        @IQUES
32          006072 CSAMS=JSR        @ISAMS
33          006073 CRESW=JSR        @IRESW
34          006074 BINLO=JSR        @IBILO
35          006125 THALT=JSR        @ITHLT
36          006126 RESET=JSR        @IDRST
37          006103 CGTBI=JSR        @IGTBI
38          006104 CGTOK=JSR        @IGTOK
39          006105 CGTDC=JSR        @IGTDC
40          006106 CGTSC=JSR        @IGTSC
41          006107 CGTTX=JSR        @IGTTX
42          006110 SETP0=JSR        @ISTP0
43          006111 SETP1=JSR        @ISTP1
44          006112 SETP2=JSR        @ISTP2
45          006113 LOOP=JSR         @ILOOP
46          006114 EHALT=JSR        @IHALT
47          006115 STATA=JSR        @ISTAA
48          006116 STATN=JSR        @ISTAN
49          006117 STATW=JSR        @ISTAW
50          006120 STATS=JSR        @ISTAS
51          006121 STATP=JSR        @ISTAP
52          006122 CHALT=JSR        @JHALT
53          006123 CLORE=JSR        @ILORE
54          006124 CPASS=JSR        @IPASS
55
56          000030 DEV=30
57
58 00133 000030 DEVNQ:  DEV                 ;DEVICE CODE QUEST.
59 00134 000000 DEVNA:  0                   ;ACTUAL DEVICE CODE, ANSWER
```

```
^ 0012  .MAIN
01
02 00135 000000 RTEST:  0               ;RETURN ADDR FROM TESTLOOPS
03
04       000400 .LOC 400
05 00400 006401         JSR     @IPROG  ;PROGRAM (RE)START ADDR
06
07 00401 011741 IPROG:  XPROG
08
09              ;THIS PROGRAM USES STANDARD TEST ROUTINES, NOT LISTED.
10              ;IF NEEDED, ASK FOR SPECIAL LISTNING FOR STANDARD TEST ROUTINES.
11
12              ;THE STANDARD ROUTINES ARE NOT MODIFIED.
13              ;IF MODIFICATIONS, LIST HERE:
14
15              ;       LOC3    1
16              ;       LOC4    400     SELFSTARTING
17              ;       LOC400/401      LABELS
18              ;       XNITI   ROUTINE CHANGED, NO PRINT INHIBIT WARNING.
19
20
21
22              ;THIS PROGRAM WILL USE FOLLOWING MEMORY LOCATIONS ALLTHOUGH
23              ;NOT DIRECTLY SHOWN IN THE ASSEMBLING LIST:
24
25              ;       VMEND + 100000  USED IN MEMSIZE ROUTINE, PLUS A LDA/STA
26              ;                       FOR EACH 4K SLICE, CONTENT RESTORED.
27              ;       0X7600 (0X7635) TO 0X7777, BINARY LOADER, SA 2222
28              ;
29              ;       NOT USED MEM ABOVE LASTP IS FILLED WITH PROGRAM BREAK
30              ;       COMMAND (SEE LOC 6).
31              ;
32              ;       LASTP + XXX     SEE XREFF LIST, BUFFERS ETC.
33
34
35              ;TAPE 2
36
37              .EOT
```

```
  0013  .MAIN
01
02                ;TAPE 6
03
04 11602 011602 TRGTB:  .                ;ADDRESS TABLE FOR LOOPS WITH
05                                        ;AUTO BREAKPOINTS.
06 11603 000000          0                ;END OF TABLE
07
08                       ;TABLE FOR ADDRESSES TO CORRECT DEVICE NUMBER.
09
10 11604 010254 COTB1:   SDEV1
11 11605 010267          SDEV2
12 11606 010303          SDEV3
13 11607 010317          SDEV4
14 11610 010331          SDEV5
15 11611 000000          0                ;END OF TABLE
16
17                PROG:  .TXT !BINARY LOADER TS! ;"BINARY LOADER TS"
   11612 044502
   11613 040516
   11614 054522
   11615 046040
   11616 040517
   11617 042504
   11620 020122
   11621 051524
   11622 000000
18
19                PROGA: .TXT !RCSL 44-RT 1885   DATE: 05.05.1979   VERSION: 2.0!
   11623 041522
   11624 046123
   11625 032040
   11626 026464
   11627 052122
   11630 030440
   11631 034070
   11632 020065
   11633 020040
   11634 040504
   11635 042524
   11636 020072
   11637 032460
   11640 030056
   11641 027065
   11642 034461
   11643 034467
   11644 020040
   11645 053040
   11646 051105
   11647 044523
   11650 047117
   11651 020072
   11652 027062
   11653 000060
20                       ;"RCSL 44-RT 1885   DATE: 05.05.1979   VERSION: 2.0"
21
22 11654 000012 PASSM:   10.              ;USER DEFINITION OF PASS: # OF RUNS
23                                        ;THROUGH ALL TESTLOOPS BEFORE PASS
24                                        ;MESSAGE IS PRINTED. MAX 99 DECIMAL.
```

```
  0014  .MAIN
01
02                ;THE PAGES MISSING UP TO PAGE 123
03                ;ARE THE STANDARD TEST ROUTINES.
04                ;IF THE LISTNING IS IMPORTANT FOR YOU,
05                ;ORDER THE ASCII TAPES FOR THIS PROGRAM,
06                ;RCSL 44-RT 1887.
07                ;PRODUCE YOUR OWN COMPLETE LISTNING
08                ;BY MEANS OF THE ASSEMBLER.
```

```
^ 0123  .MAIN
01
02                          ;ROUTINE USER INITIALIZE.
03                          ;USED IF SPECIAL INITIALIZATION IS REQUIRED FOR UNIT
04                          ;UNDER TEST. THIS ROUTINE IS CALLED FROM STANDARD
05                          ;INITIALIZING ROUTINE (XNITI).
06 11655 054402 USINI:  STA     3,USINR
07                                  ;INSERT HERE
08 11656 002401         JMP     @USINR
09 11657 000000 USINR:  0
10
11                          ;ROUTINE USER RESET.
12                          ;USED IF SPECIAL RESETTING IS REQUIRED FOR UNIT
13                          ;UNDER TEST. THIS ROUTINE IS CALLED FROM STANDARD
14                          ;RESET ROUTINE (RESET).
15                          ;SAVE/RESTORE ALL USED AC'S !
16 11660 054402 USDER:  STA     3,USDRR
17                                  ;INSERT HERE, SAVE AC'S
18                          ;INTEN          ;IF INTR ON WANTED AFTER RESET
19 11661 002401         JMP     @USDRR
20 11662 000000 USDRR:  0
21
22                          ;ROUTINE USER SETUP.
23                          ;USED IF SPECIAL SETUP IS REQUIRED FOR UNIT
24                          ;UNDER TEST. THIS ROUTINE IS CALLED FROM STANDARD
25                          ;SETUP ROUTINE (SETP0, SETP1, SETP2).
26 11663 054403 USSET:  STA     3,USSTR
27 11664 006126         RESET           ;INSERT/CHANGE HERE (RESET CHECKS TERMW)
28                          ;JSR    @USRTW  ;IS TERMINATION WAITING ?
29 11665 002401         JMP     @USSTR
30 11666 000000 USSTR:  0
31
32                          ;ROUTINE USER LOOP.
33                          ;USED IF SPECIAL LOOP ACTION IS REQUIRED FOR UNIT
34                          ;UNDER TEST. THIS ROUTINE IS CALLED FROM STANDARD
35                          ;LOOP ROUTINE (LOOP).
36 11667 054404 USLOP:  STA     3,USLOR
37 11670 006126         RESET           ;INSERT/CHANGE HERE (RESET CHECKS TERMW)
38                          ;JSR    @USTRW  ;IS TERMINATION WAITING ?
39 11671 002402         JMP     @USLOR
40 11672 010404 USTRW:  TERMW
41 11673 000000 USLOR:  0
42
43                          ;ROUTINE USER SERVICE INTERRUPT.
44                          ;USED IF SPECIAL INTERRUPT HANDLING IS REQUIRED.
45                          ;THIS ROUTINE IS CALLED FROM STANDARD SERVICE INTERRUPT
46                          ;(SERINT), WHICH HAS STORED RETURN ADDR IN LOC 5 AND
47                          ;DEVICE NUMBER AFTER INTA IN PAGE ZERO (INDEV) AND
48                          ;RESTORED LOC 0 FOR POWER RESTART AND STORED -1 IN
49                          ;PAGE ZERO (INFLG), INTR FLAG.
50 11674 054402 USSEI:  STA     3,USSER ;ALL AC'S AND CARRY ARE SAVED/RESTORED
51                                  ;IN SERINT. ANY RESULT FROM THIS ROUTINE
52                                  ;HAVE TO BE STORED IN MEM.
53                          ;ISZ    USSER   ;IF USED: INTEN COMMAND WHEN LEAVING
54                                  ;INTR SERVICE ROUTINE (SERINT).
55 11675 002401         JMP     @USSER
56 11676 000000 USSER:  0
```

```
^ 0124  .MAIN
01
02                          ;ROUTINE TO MONITOR QUESTIONS AND ANSWERS.
03 11677 054426 XNIQA:  STA     3,RNIQA
04 11700 001400         JMP     0,3         ;;;NO QUESTIONS
05
06
07 11701 006071 RPDVN:  CQUES
08 11702 011731         TXDVN               ;DEVICE NO ?
09 11703 011731         TXDVN
10 11704 000133         DEVNQ
11 11705 006054         CTZOC
12 11706 006060         CDZOC
13 11707 006104         CGTOK
14 11710 000402         JMP     .+2         ;SUGGESTED ACCEPTED
15 11711 000770         JMP     RPDVN       ;ERROR RETURN
16 11712 020076         LDA     0,DIGIN     ;ANSWER INPUT'ED
17 11713 024415         LDA     1,DVNUL     ;UPPER LIMIT
18 11714 030413         LDA     2,DVNLL     ;LOWER LIMIT
19 11715 122033         ADCZ#   1,0,SNC
20 11716 112032         ADCZ#   0,2,SZC     ;AC2=<AC0=<AC1 ?
21 11717 000762         JMP     RPDVN       ;OUTSIDE LIMITS
22 11720 040134         STA     0,DEVNA     ;INPUT ACCEPTED
23 11721 006405         JSR     @ICORD      ;CORRECT OLD DEV NO.
24 11722 102440 RPEND:  SUBO    0,0         ;NO, CLEAR STATUS
25 11723 040132         STA     0,QCSTA     ;KNOWN STATUS CONSTANTS
26 11724 002401         JMP     @RNIQA
27 11725 000000 RNIQA:  0
28 11726 010346 ICORD:  CORDN
29 11727 000002 DVNLL:  2
30 11730 000076 DVNUL:  76
31
32                      TXDVN:  .TXT !DEVICE NO!        ;"DEVICE NO"
   11731 042504
   11732 044526
   11733 042503
   11734 047040
   11735 000117
```

```
^ 0125  .MAIN
01
02 11736 011743 RENOQ:  XPROG+2 ;RESTART NO QUESTION, ASM VALUE TO POINT FOR
03                              ;MAX # OF QUES IN CASE OF START BEFORE ANY QUES
04                              ;IS ANSWERED, DON'T FORGET HOW USED: JMP 1,RENOQ
05
06 11737 011677 INIQA:  XNIQA
07 11740 010707 INITI:  XNITI
08
09 11741 165000 XPROG:  MOV     3,1     ;PRINT START ADDR
10 11742 006072         CSAMS
11 11743 006774         JSR     @INIQA  ;ANSWER QUESTIONS
12 11744 006774         JSR     @INITI  ;INITIALIZE (PASSCOUNT, BUFFER ETC.)
13 11745 004401         JSR     .+1     ;NO QUESTION RESTART ADDR
14 11746 054770         STA     3,RENOQ ;THIS 2 INSTR JUST ABOVE LOOP LABEL
15 11747 002401         JMP     @.+1    ;START ROUTINE BINARY LOADER
16 11750 003001         LOADB+2         ;LIKE SA 2222 WITHOUT START MESS
```

```
^ 0126  .MAIN
01
02                ;TAPE 6
03
04 11751 011751 LASTP:  .                ;LAST LOC OF PROGRAM
05
06       001403 .END REBIN
```