APPLESOFT PAGE LISTER

At last, an easy way to get formatted listings of your Applesoft programs

W ish you could tear apart your Applesoft listings and put them in a binder? Here's a program that will make sure your printed listings don't run over the page perforations and that there's enough margin room for hole punches. It also adds a title and page numbers to your listings.

USING THE PROGRAMS

To create the formatted listing, the program to be listed must already be in memory — either freshly typed in or LOADed from disk. With the disk containing LISTER and LISTER.EXEC in a drive, type

EXEC LISTER.EXEC

You will be prompted for a title. Enter the title and press Return. If you make a mistake in the title, press Escape to start over. Be sure your printer is ready and the paper is positioned at the top of the page before you begin.

Note that the program to be listed must not contain any program lines numbered from one to five. This is because the program that you EXEC, LISTER.EXEC, creates these program lines and deletes them after the program has listed.

If your printer is in a slot other than slot one, see the Customization section.

ENTERING THE PROGRAMS

If you have an assembler, use the source code in **Listing 1** and save the object code in LISTER. If you don't have an assembler, enter the hex code in **Listing 2** and save it to disk with the command

BSAVE LISTER, A$300, L$A4

Enter the Applesoft program in **Listing 3** and save it to disk with

SAVE MAKE. EXEC

After you have saved MAKE.EXEC, RUN it to create the text file called LISTER.EXEC. MAKE.EXEC is used only once; LISTER.EXEC is used each time you create a formatted listing. For help with entering *Nibble* listings, see the Typing Tips section.

HOW IT WORKS

Let's first look at the EXEC program. The five numbered lines

are loaded and then run by the immediate execution RUN command at the end. The second line gets the title and the third line pokes it into the memory space identified on lines 114 and 115 of Listing 1. Lines 4 and 5 put the printer in slot up, the program listed, and the printer restored and turned off. The first five lines are then deleted.

Now let's look at the assembly language portion. The Apple uses a software switch to reroute its input and output. Addresses $36 and $37 point to the address of the current output routine. The Apple normally sends its output to the video screen, but it can be rerouted to a printer, to a modem for telephone output, to an 80 column card, or to a number of other output devices. When the LISTER is run, it changes the address of the current output routine to the program starting at line 35. This disconnects DOS 3.3 but the subroutine call at line 37 reconnects it with the new output routine intact. Then the title and page number are printed on the first page by calling the printer subroutine at address $C102 for each character. Finally, the RTS at line 87 returns to BASIC. The LIST instruction is executed with output being routed to the printer by way of the assembly language routine, which counts lines and inserts extra spaces and carriage returns to format the output.

CUSTOMIZATION

If your printer is in a slot other than slot one, and if you have an assembler, change the value $C102 in line 16 of Listing 1 to $Cn02, where *n* is the appropriate slot number. If you are not using an assembler, first enter and save Listing 2 as described above, then enter the following commands from the System Monitor:

```
BLOAD LISTER
325:Cn
337:Cn
356:Cn
359:Cn
364:Cn
38E:Cn
BSAVE LISTER, A$300, L$A4
```

In the above command lines, *n* is the appropriate slot number for your printer. You may also want to set your printer to 12 character-per-inch characters or include some other special printing mode such as boldface or italics. To do this, change the printer initialization string in line 4 of Listing 3. It is currently set to initialize the printer for 80-column printing. Consult your printer manual for the appropriate codes.

LISTING 1: LISTER Source Code

```
1     ;
2     ; - LISTER Source Code
3     ; - By Ed Hauschild
4     ; - Copyright 1988
5     ; - MicroSPARC, Inc.
6     ; - Concord, MA 01742
7     ; - Apple Toolkit Assembler
8     ; - ADDRESS SERIAL EQUATES
9     ;
10    ;
11 TRANSIO   EQU   $03EA       ;SUBRTN TO MOVE MONODOOD I/O ADDR TO DOS
12 CSWL      EQU   $0036       ;ADDRESS OF CHAR OUTPUT SWITCH
13 CSWH      EQU   $0037
14 IOSAVE    EQU   $FF4A       ;MONITOR SUBRTN TO SAVE REGISTERS
15 IORSTR    EQU   $FF3F       ;MONITOR SUBRTN TO RESTORE REGISTERS
16 PRINT     EQU   $C102       ;ADDRESS OF PRINTER OUTPUT PROGRAM
17 MSG       EQU   $00FF       ;ZERO PAGE POINTER TO MESSAGE
18 PRODOS    EQU   $BF00       ;CHECK FOR PRODOS ACTIVE
19    ;
20    ; - CONSTANT EQUATES
21    ;
22 SP        EQU   $A0         ;SPACE
23 FF        EQU   $8C         ;FORM FEED (NEW PAGE)
24 CR        EQU   $8D         ;CARRIAGE RETURN
25 LMAX      EQU   56          ;58 LINES/PAGE - 56 + 2 IN TITLE
26    ;
27    ; - ENTER HERE 1 TIME ON SETUP
28    ;
29              ORG   $300
30              LDA   R+PATCH         ;SET UP USER CHAR OUTPUT SWITCH ADDRESS
31              STA   CSWL
32              LDA   R+PATCH+H
33              STA   CSWH
34              LDA   PRODOS
35              CMP   #76
36              BEQ   YESPRO
37              JSR   TRANSIO         ;RECONNECT DOS 3.3
38 YESPRO       JMP   TTLOUT          ;SET UP FIRST PAGE
39    ;
40    ; - ENTER HERE FOR EACH CHARACTER TO BE PRINTED
41    ;
42 PATCH        JSR   IOSAVE          ;SAVE PROCESSOR REGISTERS
43              JSR   IORSTR          ;RECOVER REGISTERS
44              CMP   #FF             ;IS THE OUTPUT CHARACTER A FORM FEED
45              BEQ   NEWPAGE         ;IF SO ,JUMP
46              CMP   #CR             ;IS THE OUTPUT CHAR A CARRIAGE RET
47              BEQ   NEWLINE         ;IF SO ,JUMP
48              BNE   PRINT           ;OTHERWISE, PRINT THE CHARACTER
49              JMP   RESTORE
50 NEWLINE      DEC   LCNT            ;LAST LINE?
51              BNE   LS              ;IF NOT, SET UP THE INDENT
52 NEWPAGE      LDA   RLMAX           ;RESET THE LINE COUNTER
53              STA   LCNT
54              LDA   #FF             ;OUTPUT A FORMFEED (NEW PAGE)
55              JSR   PRINT
56 TTLOUT       LDY   #$PMRCNT        ;# CHARS IN 5 SPACE INDENT - 1
57              LDA   #+$PMSG         ;LOAD POINTER TO MESSAGE
58              LDX   #+$PMSG
59              JSR   MSGOUT          ;OUTPUT THE MESSAGE
60              LDY   #+TTLMSG        ;LOAD # CHARS IN TITLE
61              LDA   #+TTLMSG        ;LOAD POINTER TO TITLE
62              LDX   #+TTLMSG
63              JSR   MSGOUT          ;PRINT THE TITLE
64              LDY   #PGCNT          ;# OF CHARS IN THE PAGE MESSAGE - 1
65              LDA   #+PGMSG         ;LOAD POINTER TO PAGE
66              LDX   #+PGMSG
67              JSR   MSGOUT          ;PRINT THE PAGE
68              LDA   PCNT            ;PRINT THE PAGE #
69              JSR   PRINT
70              LDA   PCNT+1
71              JSR   PRINT
72              LDA   #CR             ;SKIP A LINE AFTER THE TITLE
73              JSR   PRINT
74              INC   PCNT+1          ;INCREMENT PAGE #
75              LDA   #$8A            ;CHECK FOR CARRY TO TENS DIGIT
76              CMP   PCNT+1
77              BNE   LS              ;IF NOT, START THE NEXT LINE
78              INC   PCNT            ;IF SO, INCREMENT THE TENS DIGIT
79              LDA   #$B0            ;AND ZERO THE ONES DIGIT
80              STA   PCNT+1
81 LS LS        LDY   #$PMRCNT        ;# CHARS IN NEWLINE MESSAGE - 1
82              LDA   #+$PMSG         ;LOAD POINTER TO MESSAGE
83              LDX   #+$PMSG
84              STA   MSG+1
85 RESTORE      JSR   MSGOUT          ;OUTPUT THE MESSAGE
86              JSR   IORSTR          ;RESTORE REGISTERS BEFORE RETURNING
87              RTS
88    ;
89    ; - SUBROUTINE TO PRINT A MESSAGE
90    ;
91 MSGOUT       STA   MSG             ;TRANSFER THE POINTER TO ZERO PAGE
92              STX   MSG+1
93 MSGLOOP      LDA   (MSG),Y         ;GET THE NEXT CHARACTER
94              JSR   PRINT           ;PRINT IT
95              DEY                   ;.LAST    CHARACTER?
96              BPL   MSGLOOP         ;IF NOT, PRINT THE NEXT ONE
97              RTS
98    ;
99    ; - DEFINE VARIABLE SPACE
100   ;
101 LCNT        DFB   LMAX            ;COUNTER FOR LINES PER PAGE
102 PCNT        ASC   '01'            ;COUNTER FOR NUMBER OF PAGES
103 $PMCNT      EQU   5               ;# OF CHARS IN SPACE MSG WITH CR - 1
104 $PMRCNT     EQU   4               ;# OF CHARS IN SPACE MSG W/O CR - 1
105 $PMSG       DFB   SP,SP,SP        ;5 SPACES
106              DFB   SP,SP
107              DFB   CR              ;CARRIAGE RETURN
108 PGCNT       EQU   7               ;OF CHARS IN PAGE MESSAGE - 1
109 PGMSG       DFB   SP              ;PAGE MESSAGE = ' PAGE '
110              ASC   'EGAP'
111              DFB   SP
112              ASC   ' '
113              DFB   SP
114 TTLCNT      EQU   -               ;SPACE FOR # OF CHARS IN TITLE - 1
115 TTLMSG      EQU   ++1             ;SPACE FOR TITLE - NEXT 32 CHARS
116              DFB   SP

END OF LISTING 1
```

LISTING 2: LISTER

```
Start: 300                     Length: A4

:7 0300:A9 15 85 36 A9 03 85 37
8A 0308:A0 00 BF C9 4C F0 03 20
00 0310:EA 03 4C 38 03 20 4A FF
B9 0318:20 3F FF C9 8C F0 0F C9
CD 0320:8D F0 06 20 02 C1 4C 82
62 0328:03 CE 93 03 D0 49 A9 38
8F 0330:8D 93 03 A9 8C 20 02 C1
A1 0338:A0 04 A9 96 A2 03 20 86
20 0340:03 AC A4 03 A9 A5 A2 03
20 0348:20 86 03 A0 07 A9 9C A2
EE 0350:03 20 86 03 A0 94 03 20
13 0358:02 C1 AD 95 03 20 02 C1
2C 0360:A9 8D 20 02 C1 EE 95 03
F2 0368:A9 BA CD 95 03 D0 08 EE
21 0370:94 03 A9 B0 8D 95 03 A0
23 0378:05 A9 96 A2 03 8D FF 20
F1 0380:86 03 20 3F FF 60 85 FE
FB 0388:86 FF 81 FE 20 02 C1 88
82 0390:10 F8 60 38 30 31 A0 A0
B2 0398:A0 A0 A0 A0 8D A0 A5 47 41
5A 03A0:50 A0 2D A0

TOTAL: EAC4

END OF LISTING 2
```

LISTING 3: MAKE.EXEC

```
13    0  D$ = CHR$ (4): GOTO 6
5A    1  HOME : PRINT  CHR$ (21):A$ = "":L = 0: PRINT
          "ENTER TITLE (32 CHARACTER MAXIMUM): VTAB
          22: PRINT "PRESS RETURN TO ACCEPT OR ":
          PRINT "ESCAPE TO RESTART". VTAB 9 : PRINT "
          >":: POKE 49152,0
2E    2  WAIT 49152,128:KEY$ =  CHR$ ( PEEK (49152) -
          128): POKE 49168,0: ON KEY$ =  CHR$ (13)
          GOTO 3: ON KEY$ =  CHR$ (27) GOTO 1: ON L
          > = 32 GOTO 2: IF L < 32 THEN L = L + 1:A
          $ = A$ + KEY$: PRINT KEY$;: GOTO 2
88    3  POKE 932,L - 1: FOR I = 0 TO L - 1: POKE 933
          + I, ASC ( MID$ (A$,L - I,1)): NEXT
28    4  PRINT  D$ =  CHR$ (4): PRINT D$"PR#1": PRINT
           CHR$ (9)"80N": PRINT D$"BRUN LISTER"
F9    5  LIST 6 : PRINT D$"PR#0"
D5    6  PRINT D$"OPEN LISTER.EXEC": PRINT D$"WRITE L
          ISTER.EXEC": LIST 1.5: PRINT "RUN": PRINT
          DEL 1.5": PRINT "HOME:VTAB 23": PRINT D$"CL
          OSE": END

TOTAL: 071D

END OF LISTING 3
```