STARTUP NAME CHANGER

Like DOS 3.3, ProDOS and BASIC.SYSTEM will allow any program to be the "HELLO" program on a disk

ach time you boot ProDOS 8 into BASIC.SYSTEM, the operating system looks for a program called Startup. If a program by that name is on the disk, ProDOS automatically runs it. It's a handy feature, but "Startup" isn't a descriptive name. You have to remember what each Startup program does. Another disadvantage is that your program must be in the top (disk) level of the directory. Since you can have only 51 files in the disk directory, this can be an annoying limitation.

Startup Name Changer fixes these problems. As long as your program's name conforms to standard ProDOS rules and the full pathname is 64 characters or less, you can automatically RUN any program when you boot up, and it can be located in any directory.

BEHIND THE SCENES

BASIC.SYSTEM is a system program that extends the power of Applesoft. The program gives you disk and file commands. It also gives programmers a number of conveniences, including the ability to specify which program will be executed next. This "auto run protocol" is what we hook into.


```
2000: 4C 47 20   START    JMP EXECUTE   ;SKIP BUFFER
2003: EE                  DFB $EE       ;ID BYTE 1
2004: EE                  DFB $EE       ;ID BYTE 2
2005: 41                  DFB $41       ;DEFAULT BUFFER LENGTH
2006: 07                  DFB $07       ;LENGTH OF PROGRAM NAME
2007: 53 54 51            ASC "STARTUP" ;PROGRAM NAME
200A: 52 54 55
200D: 50
            .
            .
            .
2047: A9 9A     EXECUTE   LDA #$9A      ;REST OF BASIC.SYSTEM
```

Figure 1: BASIC.SYSTEM's Auto-Run Protocol

Figure 1 shows the first few lines of code that make up BASIC.SYSTEM. The first line tells the Apple to skip over a number of bytes and begin executing the code found at the EXECUTE label, some 67 bytes away. The memory the Apple skips includes two identification bytes, a byte describing the size of the gap, the length of the name of the startup program, and then the name itself.

When you boot a ProDOS disk, ProDOS checks that buffer for a filename and executes the program named within. If you modify this buffer by inserting your own program's name, you can trick BASIC.SYSTEM into RUNning your program instead of Startup.

ENTERING THE PROGRAM

Type in the NAME.CHANGER program found in Listing 1. Save the program with the command

SAVE NAME.CHANGER

For help entering *Nibble* programs, see the Typing Tips section.

HOW THE PROGRAM WORKS

The program begins by checking the version of BASIC.SYSTEM in memory in line 110. It relocates itself higher in memory so it won't be overwritten by BASIC.SYSTEM when it's reloaded. Lines 120-150 check to see what slot and drive were last used and the prefix of the disk in that slot and drive (for later use).

Lines 160-270 display the main menu, from which you may select the location of the copy of BASIC.SYSTEM to be modified. If the copy of BASIC.SYSTEM isn't on the current disk and prefix, lines 280-600 help you select the new location, either by inserting a new prefix or by choosing a different slot and drive.

BASIC.SYSTEM is loaded into memory for modification in lines 610 and 620. Line 630 checks BASIC.SYSTEM to be sure it follows the startup protocol. If this version

doesn't follow this protocol, line 640 displays an error message and exits the program. This feature will allow Startup Name Changer to work with future versions of BASIC.SYSTEM as long as those versions allow startup programs.

The old greeting program name is displayed and the new one is requested by lines 650-880. You have the opportunity to review the new greeting program's name and decide whether or not it's correct using lines 810-880. Note that you can't name your program with the names listed in lines 720-750. BASIC.SYSTEM would continuously loop if you were directed to reload itself or ProDOS. If your new greeting program name is valid, lines 890-990 insert this new name into BASIC.SYSTEM, save the modified version of BASIC.SYSTEM, and exit the program.

Lines 1000-1170 form a subroutine that tests program filenames and prefixes for proDOS naming errors. These lines convert all the characters to uppercase, check for invalid characters, and display error messages (remember, valid characters are letters, numbers, a period, and a slash).

Lines 1180-1290 intercept DOS errors that might occur during program execution. These errors include removing the required disk from the drive, trying to read BASIC.SYSTEM from a directory or disk not containing BASIC.SYSTEM, writing the modified BASIC.SYSTEM to a write-protected disk, and other general errors. You're also notified if your new greeting program doesn't yet exist on the disk, though this doesn't necessarily constitute an error.

Remember that in ProDOS, your startup program (by any name) doesn't have to be written in Applesoft BASIC. You may automatically run an EXEC file or a binary file if you wish. This nice feature allows you to run those neat assembly language utilities, or whatever, without first having to BRUN them from an Applesoft program.

Also notice that you can have BASIC.SYSTEM run the greeting program from a subdirectory. Just be sure you change the name to the complete prefix. That is, include the volume name with the greeting program's name. This is especially handy for those of you with hard drives, as now you no longer have to clutter the root prefix with a Startup file. (ProDOS limits the number of files in the root directory to a precious few: 51, which is not many for someone with a 20-megabyte hard drive!)

LISTING 1: NAME.CHANGER

```
37    10 REM   *******************
C8    20 REM   *                 *
A2    30 REM   *  NAME.CHANGER   *
AE    40 REM   *  BY KENN SCRIBNER *
CB    50 REM   *  COPYRIGHT (C) 1988 *
C4    60 REM   *  BY MICROSPARC, INC. *
45    70 REM   *  CONCORD, MA 01742  *
A3    80 REM   *                 *
41    90 REM   *******************
8B   100 IF PEEK (104) < > 80 THEN POKE 103,1:
          POKE 104,80 POKE 20480,0: PRINT CHR$ (4)
          ;"RUN NAME.CHANGER"
2E   110 IF PEEK (49149) = 0 THEN HOME : PRINT
          CHR$ (7): PRINT "YOU MUST RUN THIS PROGRAM
          ": PRINT "USING BASIC.SYSTEM VERSION 1.1
          ": PRINT "OR GREATER.": END
```

86   120 DRS = "1": DEVNUM = PEEK (48944): IF DEVNUM
         > 128 THEN DEVNUM = DEVNUM - 128: DRS = "2"
         : REM >>> DEVNUM, $BF30, IS SLOT/DRIVE OF
         LAST DISK ACCESS
E2   130 SLS = STR$ (INT (DEVNUM / 16)): DS = CHR$
         (4)
16   140 PRINT D$; "PREFIX": INPUT VN$
16   150 ONERR GOTO 1180
26   160 PRINT D$; "PR#3"
8D   170 HOME : PRINT TAB(17) "STARTUP NAME CHANGE
         R (C)1988 MICROSPARC, INC.": FOR I = 1 TO
         80: PRINT "-";: NEXT I: POKE 34,3
20   180 HOME : PRINT : PRINT : PRINT TAB(5) "THI
         S PROGRAM ENABLES YOU TO MODIFY BASIC.SYSTE
         M TO AUTOMATICALLY RUN A"
11   190 PRINT : PRINT "GREETING PROGRAM NAMED OTHE
         R THAN 'STARTUP'. IT WILL WORK WITH A COPY
          OF": PRINT : PRINT "BASIC.SYSTEM USING EIT
         HER THIS OR ANOTHER PREFIX. THE CURRENT PR
         EFIX IS"
51   200 PRINT : PRINT SLS$, " FOUND ON THE DISK RE
         SIDING IN SLOT ";SL$;", DRIVE "; DR$;"."
E1   210 PRINT : PRINT TAB(5) "WOULD YOU LIKE TO
         MODIFY YOUR COPY OF BASIC.SYSTEM"
E6   220 PRINT : PRINT TAB(25);(T)HIS DISK AND P
         REFIX": PRINT : PRINT TAB(25);"(A)NOTHER
         DISK OR PREFIX": PRINT : PRINT TAB(25);"(
         Q)UIT PROGRAM"
A3   230 PRINT : PRINT TAB(25);"YOUR CHOICE (T, A
         , OR Q)? ";
63   240 POKE - 16368,0: GET A$
52   250 IF A$ = "T" OR A$ = "t" THEN A$ = "BASIC.
         SYSTEM": GOTO 610
8A   260 IF A$ = "Q" OR A$ = "q" THEN 990
E9   270 IF A$ < > "A" AND A$ < > "a" THEN GOTO
         240
8F   280 HOME : PRINT : PRINT : PRINT TAB(5)"YOU
         MUST SELECT THE LOCATION FROM WHERE BASIC.SY
         STEM WILL BE LOADED"
F6   290 PRINT MODIFIED AND MODIFIED BY PREFIX OR B
         Y SLOT AND DRIVE."
95   300 PRINT : PRINT TAB(25);"(N)EW PREFIX":
         PRINT : PRINT TAB(25);"(S)LOT AND DRIVE":
         PRINT : PRINT TAB(25);"(RETURN) ALONE T
         O EXIT TO PREVIOUS MENU"
10   310 PRINT : PRINT TAB(25);"YOUR CHOICE (N, S
         , OR RETURN)? ";
22   320 POKE - 16368,0: GET A$
10   330 IF A$ = CHR$ (13) THEN GOTO 180
14   340 IF A$ = "N" OR A$ = "n" THEN GOTO 530
20   350 IF A$ = "S" AND A$ < > "s" THEN GOTO
         320
EA   360 HOME : PRINT : PRINT : PRINT TAB(5) "PLE
         ASE SELECT THE PROPER SLOT AND DRIVE FOR TH
         E DISK CONTAINING": PRINT : PRINT BASIC.SY
         STEM (RETURN ALONE WILL EXIT TO PREVIOUS ME
         NU)."
33   370 PRINT : PRINT TAB(25);"SLOT (1 - 7)? ";
26   380 POKE - 16368,0: GET A$
FE   390 IF A$ = CHR$ (13) THEN GOTO 280
26   400 IF A$ < "1" OR A$ > "7" THEN HTAB (40):
         CALL - 958: GOTO 380
41   410 PRINT A$:SL$ = A$
71   420 PRINT : PRINT TAB(25);"DRIVE (1 OR 2)?
         ";
43   430 POKE - 16368,0: GET A$
4C   440 IF A$ = CHR$ (13) THEN GOTO 360
7C   450 IF A$ < "1" AND A$ < > "2" THEN HTAB
         (42): CALL - 958: GOTO 430
47   460 PRINT A$:DR$ = A$
5A   470 SDS = ",S" + SL$ + ",D" + DR$
30   480 PRINT D$; "PREFIX":SD$
41   500 PRINT D$; "PREFIX":SD$
C2   510 INPUT VN$:PN$ = VN$ + "BASIC.SYSTEM"
52   520 GOTO 610
F8   530 HOME : PRINT : PRINT : PRINT TAB(5) "PLE
         ASE TYPE THE NEW, COMPLETE PREFIX WHERE THE
         COPY OF BASIC.SYSTEM IS": PRINT : PRINT "IF
          IT FOUND. THE OLD PREFIX HAS BEEN DISPLAYE
         D FOR REFERENCE AND MODIFICATION.
A9   540 PRINT : PRINT (RETURN ALONE EXITS TO PREV
         IOUS MENU). ";:VN$:
         HTAB (3): GOSUB 1000

LISTING 1: NAME.CHANGER

```
DA  550 IF TP$ = "" THEN GOTO 280
CC  560 IF LEFT$ (TP$,1) < > "/" THEN TP$ = "/"
         + TP$
AE  570 IF RIGHT$ (TP$,1) < > "/" THEN TP$ = TP$
         + "/"
3E  580 TP$ : TP$ = TP$ + "BASIC.SYSTEM"
6C  590 ONERR GOTO 1210
DB  600 PRINT D$;"VERIFY ";TP$
9D  610 HOME : VTAB (12) : HTAB (24) : PRINT "LOADIN
         G BASIC SYSTEM INTO MEMORY"
70  620 PRINT D$; "BLOAD ";PN$;,A$2000,TSYS"
1E  630 IF PEEK (8192) = 74 AND PEEK (8195) = 23
         AND PEEK (8196) = 238 THEN GOTO 650
CE  640 HOME : PRINT : PRINT : PRINT TAB (5);"THE
         VERSION OF BASIC SYSTEM YOU'RE USING
         DOESN'T ADHERE TO THE AUTO RUN": PRINT
         "PROTOCOL THIS PROGRAM IS DESIGNED TO MODI
         FY. PRESS RETURN TO EXIT...": POKE -1636
         8,0: GET A$: GOTO 1090
BD  650 N1$ = "": TP$ = ""
A9  660 HOME : PRINT : PRINT : PRINT TAB (5);"THE
         OLD GREETING PROGRAM NAME (  PEEK (8198);"
         CHAR'S FOUND IN PREFIX ";VN$;"):" : N1 =
         8199 TO 8199 + ( PEEK (8198) - 1) : N1 =
         N1 + CHR$ ( PEEK (8199) : NEXT : PRINT :
         N1$
A0  670 HOME : PRINT : PRINT TAB (5);"THE NEW GREETING P
         ROGRAM'S NAME MUST BE LESS THAN 64 CHARACTE
         RS LONG AND": PRINT : PRINT "CONFORM TO PRO
         DOS NAMEING CONVENTIONS. ENTER THE
         NEW GREETING"
FD  680 PRINT "PROGRAM'S NAME IS APPENDED TO THE
         FILENAME FOR YOU.
76  690 PRINT "AND RETURN ALONE EXITS TO THE
         INITIAL PROGRAM MENU!"
04  700 HOME : PRINT : PRINT TAB (5);"THE NEW GREETING PR
         OGRAM'S NAME?": PRINT : PRINT "> ";VN$:
         GOSUB 1000
8D  710 IF " " THEN GOTO 180
9E  720 IF LEFT$ (TP$,12) = "BASIC.SYSTEM" THEN
         GOTO 760
3A  730 IF LEFT$ (TP$,6) = "PRODOS" THEN GOTO 76
         0
7A  740 IF RIGHT$ (TP$,3) = "P16" THEN GOTO 760
57  750 IF RIGHT$ (TP$,2) < > "P8" THEN GOTO 76
         0
A9  760 HOME : PRINT : PRINT TAB (7) : HTAB (21) :
         INVERSE : PRINT "***ERROR***":
         NORMAL : PRINT "YOU CAN'T NAME YOUR
         NEW GREETING PROGRAM " : PRINT
         TAB (8);"PRESS RETURN TO RE
         SUME PROGRAM OPERATION...": POKE 16368
         ,0: GET A$: GOTO 700
1F  780 ONERR GOTO 1240
DA  790 PRINT D$;"VERIFY ";TP$
C6  800 IF LEFT$ (N2$, ( LEN (VN$))) = VN$ THEN
         N2$ = VN$ + N2$
C6  810 HOME : PRINT : PRINT "THE NEW GREETING
         PROGRAM NAME (N2$); CHAR'S":
         PRINT : PRINT "> ";N2$
A2  820 PRINT TAB (7);"IS THIS T
         HE NEW GREETING PROGRAM'S NAME?": IS T
         HIS NAME CORRECT?
A2  830 IF A$ = "Y" THEN PRINT "YES, THE NAME
         IS CORRECT": PRINT : PRINT "(N)O,
         THE NAME IS NOT CORRECT: PRINT : PRINT
         TAB (25);"(RETURN) ALONE EXITS TO THE PREV
         IOUS MENU"
5F  840 PRINT TAB (5);"YOUR CHOICE  (Y, N
         , OR RETURN)?"
15  850 POKE 16368,0: GET A$
FD  870 IF A$ = CHR$ (13) THEN GOTO 650
A9  880 IF A$ < > "Y" AND A$ < > "N" THEN GOTO
         850
         890 L = LEN (N2$): FOR X = 1 TO L
1A  900 A = ASC ( MID$ (N2$,X,1)): POKE 8198 + X,A
         : NEXT
F5  910 FOR X = 8199 + L TO 8262: POKE X,0: NEXT
24  920 REM  >>> NOW SAVE MODIFIED BASIC.SYSTEM <
         <<
```

```
83  930 HOME : VTAB (12) : HTAB (34) : PRINT "NOW SA
CD  940 ONERR GOTO 1250
F7  950 PRINT "UNLOCK ";PN$
5D  960 PRINT D$;"SAVE ";PN$;,A$2000,L$28
         00,TSYS"
07  970 PRINT D$; "LOCK ";PN$
1E  980 HOME : VTAB (12) : HTAB (17) : PRINT "CHANGE
         S SAVED TO DISK, PRESS RETURN TO EXIT...":
90  990 POKE 34,0: HOME : VTAB 23: END
93 1000 X = 3:CV = PEEK (37) : INPUT "";TP$
6C 1010 IF  LEN (TP$) > 64 THEN GOTO 1120: REM
         >>> INPUT STRING FOR PRODOS NAMING CON
         VENTIONS <<<
       1020 BL$ = "":N3 = ""
9C 1030 IF TP$ = "" THEN TP$ = "/": REM >>>
         SPACE INDICATES RETURN ONLY SEL
         ECTED <<<
41 1040 FOR X = 1 TO  LEN (TP$)
5B 1050 IF  MID$ (TP$,X,1) = "/" THEN BL$ = "/":
         GOTO 1150
16 1060 IF  ASC (MID$ (TP$,X,1)) > 90 THEN BL$ =
         "/": GOTO 1150
17 1070 IF  ASC (MID$ (TP$,X,1)) > 97 AND AS
         C ( MID$ (TP$,X,1) < 122 TIEN BL$ = :
         ( ASC (MID$ (TP$,X,1)) - 32) : GOTO 1
         150
       1080 IF  ASC (MID$ (TP$,X,1)) = 65 AND
         C ( MID$ (TP$,X,1) = 90 THEN BL$ = MID
         $ (TP$,X,1): GOTO 1150
       1090 IF  ASC (MID$ (TP$,X,1)) = 57 THEN
         ( MID$ (TP$,X,1) = 57 THEN GOTO 1150
1E 1100 PRINT CHR$ (7) : PRINT : VTAB (21) : HTAB
         (8) : INVERSE : PRINT "***ERROR***":
         NORMAL : PRINT "INVALID PRODOS CHARACTERS INPUT
         , PLEASE RE-ENTER.: GOTO 1130
7F 1110 PRINT CHR$ (7) : PRINT : VTAB (21) :
         HTAB (3) : INVERSE : PRINT "***ERROR***":
         NORMAL : PRINT "FIRST CHARACTER OF NAME CAN'T B
         E A NUMBER, PLEASE RE-ENTER.": GOTO 1130
D3 1120 PRINT CHR$ (7) : PRINT : VTAB (21) :
         HTAB (13) : INVERSE : PRINT "***ERROR***":
         NORMA L : PRINT "VOLUME NAME TOO LONG, PLEASE R
         E-ENTER."
B3 1130 PRINT TAB (18);"PRESS RETURN TO
         RESUME PROGRAM OPERATION...": POKE -1636
         8,0: GET A$: PRINT : VTAB 21: CALL  - 958:
         VTAB (CV) : PRINT : HTAB (CH) : INPUT "";TP$
         : GOTO 1010
DF 1140 N3 = N3$ + BL$ (TP$,X,1) : NEXT
9E 1150 N2$ = N3$ + BL$ : NEXT
1E 1160 IF LEFT$ (N2$,1) > = "0" AND ( N2
         $,1) < = "9" THEN GOTO 1110
       1170 RETURN
F7 1180 IF  PEEK (222) = 3 THEN  INVERSE : PRINT CHR$
         (7) : VTAB (21) : HTAB (1) : INVERSE : PRINT "***E
         RROR***": NORMAL : PRINT "THERE IS NO DIS
         K DRIVE CONNECTED TO THE SLOT, PLEASE RE-E
         NTER.": CALL  - 3288: GOTO 35
C9 1190 PRINT CHR$ (7) : VTAB (21) : HTAB (1) : INVERSE
         : PRINT "***E
         RROR***": NORMAL : INVERSE : PRINT "***E
         RROR***": NORMAL : PRINT "BASIC.SYSTE
         M FOUND WHERE SPECIFIED, PLEASE RE-ENTER.
         ": GOSUB 1290 CALL  - 3288: GOTO 35
7C 1200 PRINT CHR$ (7) : VTAB (21) : INVERSE : PRINT "UN
         KNOWN PRODOS I/O ERROR, PLEASE RE-ENTER.
         ": STR$ (222) : NORMAL : PRINT "UN
         KNOWN PRODOS I/O ERROR.": PLEASE CORRECT AND RE-TRY.
         ": CALL  - 3288: GOTO 548
7C 1210 IF  PEEK (222) = 6 THEN  INVERSE : PRINT "***E
         RROR***": NORMAL : INVERSE : PRINT "***E
         RROR***": NORMAL : PRINT "BASIC.SYSTEM N
         T FOUND WHERE SPECIFIED, PLEASE RE-ENTER.
         ": GOSUB 1290 CALL  - 3288: GOTO 548
30 1220 IF  PEEK (222) = 16 THEN  PRINT CHR$ (7) :
         VTAB (21) : HTAB (2) : INVERSE : PRINT "***E
         RROR***": NORMAL : PRINT "FIRST CHARACT
         ER AFTER '/' MUST BE A LETTER, PLEASE RE-EN
         TER.": CALL  - 3288: GOSUB 1130: GOTO 550
```

```
A7  | 1230  PRINT  CHR$ (7): VTAB (21): INVERSE :
    |       PRINT "***ERROR***": NORMAL : PRINT "  UN
    |       KNOWN PRODOS I/O ERROR, NUMBER "; STR$ (
    |       PEEK (222));", PLEASE CORRECT AND RE-TRY .
    |       ..": GOSUB 1290: CALL  - 3288: GOTO 530
1E  | 1240  IF  PEEK (222) = 6 THEN  VTAB (21): HTAB
    |       (13): INVERSE : PRINT "***NOTE***": NORMAL
    |       : PRINT "  THAT FILE DOES NOT YET EXIST ON
    |        THAT DISK...": GOSUB 1290: CALL  - 3288
    |       : GOTO 800
C8  | 1250  IF  PEEK (222) = 4 THEN  PRINT  CHR$ (7):
    |       VTAB (21): HTAB (6): INVERSE : PRINT "***E
    |       RROR***": NORMAL : PRINT "  DISK IS WRITE P
    |       ROTECTED, PLEASE DE-PROTECT AND RE-TRY ..":
    |       GOSUB 1290: CALL  - 3288: GOTO 930
CD  | 1260  IF  PEEK (222) = 6 THEN  VTAB (21): HTAB
    |       (5): INVERSE : PRINT "***E
    |       RROR***": NORMAL : PRINT "  PLEASE RE-INSE
    |       RT ";VN$: GOSUB 1290: CALL  - 3288: GOTO 93
    |       0
A1  | 1270  IF  PEEK (222) = 16 THEN  VTAB (21): HTAB (7)
    |       : INVERSE : PRINT "***
    |       ERROR***";: NORMAL : PRINT "  FIRST CHARACT
    |       ER AFTER '/' MUST BE A LETTER, PLEASE RE-EN
    |       TER ..": CALL  - 3288: GOTO 1130: GOTO 710
28  | 1280  PRINT  CHR$ (7): VTAB (21): INVERSE :
    |       PRINT "***ERROR***": NORMAL : PRINT "  UN
    |       KNOWN PRODOS I/O ERROR, NUMBER "; STR$ (
    |       PEEK (222));", PLEASE CORRECT AND RE-TRY .
    |       ..": GOSUB 1290: CALL  - 3288: GOTO 930
2A  | 1290  PRINT : PRINT  TAB( 18);"PRESS RETURN TO
    |       RESUME PROGRAM OPERATION ..": POKE  - 1636
    |       8,0: GET A$: PRINT : VTAB (21): CALL  - 958
    |       : RETURN

TOTAL:  6273

END OF LISTING 1
```