Apple II
Technical Notes

AppleTalk
#4:   Printing Through the Firmware

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This Technical Note discusses considerations of printing through the AppleTalk Remote Print Manager (RPM) interface from ProDOS 8 applications.

Changes since March 1990: Revised code sample to simplify finding the transparent network printing slot with the ROM 03 Apple IIGS. Please note that the method of finding the transparent network printing slot shown in the March 1990 revision of this Note *does* work correctly, the new method is just simpler. In addition, revised the wording of the Note to clarify that transparent network printing is the RPM interface.

The *AppleShare Programmer's Guide to the Apple IIGS* stated that the Remote Print Manager (RPM) interface allowed transparent network printing through Super Serial Card entry points in slot 7. This statement is pretty short-sighted. It's much like saying printing to an ImageWriter II is initiated when you do a `PR#1` command—it's only true if what you want is where you think it is—and usually it isn't.

Note: The *AppleShare Programmer's Guide to the Apple IIGS* has been superseded by the *AppleShare Programmer's Guide to the Apple II Family*.

An Apple IIe Workstation Card, although **recommended** for slot 7, can work in almost any slot (just like an ImageWriter II with a Super Serial Card can be connected to nearly any slot, except maybe slot 3 when the 80-column firmware is active). An Apple IIGS with ROM versions 00 or 01 may only have the firmware used by the RPM interface in slot 7. An Apple IIGS with ROM version 03 may only have the firmware used by the RPM interface in either slot 1 or 2.

Before printing through the RPM interface slot, take the same precautions you would take before printing to **any** slot—check to make sure you see the requested slot is a Pascal device before using Pascal entry points, and try to look for the signature bytes that indicate the features you want are present. In general, avoid hard-coding slot numbers for **anything**.

ProDOS 8 applications which offer network printing through the RPM interface should give users the choice of printing to any of the seven slots as well as the Network Printer. When Network Printer is selected, the application can find the slot used by the RPM interface by using the 6502 code sample included in this Note. Allowing the selection of Network Printer is especially important for applications that keep a configuration file containing a user's default

printer setup. If an application keeps only the slot number in the configuration file, users may
need to change the printer selection often if they print from several different machines.

Warning: Printing to a slot with no firmware generally results in a crash.

The code sample uses two methods to determine the slot the RPM interface is using. The first
method works with the Apple IIe Workstation card and the ROM 01 Apple IIGS. It looks at the
AppleTalk completion routine address returned by the AppleTalk `GetInfo` call, and if that
address is in the slot ROM space, then that slot is the slot used by the RPM interface. In other
words, if the completion routine points to $0000CnXX, where n is between 1 and 7, then n is the
slot to be used when printing through the RPM interface. If the completion routine address is not
in the slot ROM space, then the application cannot determine what slot the RPM interface is
using and must query the user. The second method works only with the ROM 03 Apple IIGS. It
retrieves the slot the RPM interface is using from location $E101C2.

This technique applies only to ProDOS 8 programs. Apple IIGS applications running under
GS/OS should do text printing over the network through the Remote Print Manager (.RPM)
driver, which can be identified by a `deviceID` of $001F as returned from the `DInfo` call.

```
;
; This routine will identify AppleTalk and the RPM interface slot (if possible).
; This routine is for ProDOS 8 applications only.
;
                    keep FindRPMSlot
                    longa off
                    longi off

FindRPMSlot         start
                    lda #$00
                    sta RPMSlot          default to no RPM interface slot

; Check for AppleTalk (see AppleTalk Technical Note #1)

                    jsr $BF00            ProDOS 8 MLI
                    dc  h'42'            $42 command for network calls
                    dc  a'InfoParams'    Parameter list address
                    bcs NoATalk          no AppleTalk; handle the error

; Get machine type & ROM version (see Apple II Miscellaneous Technical Note #7)

                    sec
                    jsr $FE1F            What kind of machine are we on?
                    bcs CheckCom         Not a IIGS, check completion address
                    cpy #$03
                    bcc CheckCom         Earlier than ROM 03 IIGS, check
;                                          completion address

ROM03               anop                 ROM 03 or greater IIGS' use location $E101C2
;                                            to find the RPM interface slot
                    lda $E101C2          get the RPM interface slot
                    sta RPMSlot

                    beq AskForSlot
                    bra HaveSlot

CheckCom            anop                 use completion address to find slot
                    lda ComReturn+2      bank $00?
                    ora ComReturn+3      high byte = 0?
```

```
                  bne AskForSlot       no, so slot can't be determined
                  lda ComReturn+1      get the address page
                  cmp #$C8
                  bcs AskForSlot       greater or equal to $C8 is bad
                  cmp #$C1
                  bcc AskForSlot       less than $C1 is bad
                  and #$0F             $Cn = $0n
                  sta RPMSlot
```

```
HaveSlot          anop                  AppleTalk is installed and RPM is using
;                                         slot #RPMSlot

AskForSlot        anop                  AppleTalk is installed but RPM interface slot
;                                         cannot be determined

NoATalk           anop                  AppleTalk is not installed

                  rts                   so this sample returns

RPMSlot           entry
                  dc  h'00'             Slot RPM interface is using

InfoParams        dc  h'00'             Synchronous only
                  dc  h'02'             GetInfo call number
                  ds  2                 result code
ComReturn         ds  4                 completion return address
                  ds  8                 space for other result info

                  end
```

Further Reference

- *AppleShare Programmer's Guide for the Apple II Family*
- Apple II AppleTalk Technical Note #1, Identifying AppleTalk
- Apple II Miscellaneous Technical Note #7, Apple II Family Identification
- Apple II Miscellaneous Technical Note #8, Pascal 1.1 Identification Bytes