

When you issue an IN#n command from BASIC or an n Control-K from the Monitor, the Apple IIe changes this link address to \$Cn00, the beginning of the ROM memory space that is allocated to slot number n. Subsequent calls for character input are thus transferred to the program on the accessory card. That program can use the instruction sequences given above to find its slot number and use the I/O and RAM locations allocated to it. The program should put the input character, with its high bit set, into the accumulator and execute an RTS instruction to return control to the program that requested input.

When a disk operating system (ProDOS or DOS 3.3) is running, one or both of the standard I/O links hold addresses of the operating system's input and output routines. The operating system has internal locations that hold the addresses of the character input and output routines that are currently active.

#### **Important**

See the *ProDOS Technical Reference Manual* for more about using link addresses.

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If a program that is running with ProDOS or DOS 3.3 changes the standard link addresses, either directly or via IN# and PR# commands, the operating system is disconnected.

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Refer to the section on input and output link registers in the *DOS Programmer's Manual* and the *ProDOS Technical Reference Manual* for further details.

To avoid disconnecting the operating system each time a BASIC program initiates I/O to a slot, it should use either an IN# or a PR# command from inside a PRINT statement that starts with a Control-D character. For assembly-language programs, there is a DOS 3.3 subroutine call to use when changing the link addresses. After changing CSW or KSW, the program calls this subroutine at location \$03EA (decimal 1002). The subroutine transfers the link address to a location inside the operating system and then restores the operating system address in the standard link location.

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## **Other uses of I/O memory space**

The portion of memory space from location \$C000 through \$CFFF (decimal 49152 through 53247) is normally allocated to I/O and program memory on the peripheral cards, but there are two other functions that also use this memory space: the built-in self-test firmware and the 80-column display firmware. The soft switches that control the allocation of this memory space are described in the next section.