
Pascal 1.1 firmware protocol

The Pascal 1.1 firmware protocol was originally developed to be used with Apple Pascal 1.1 programs. The protocol is followed by all succeeding versions of Apple II Pascal, and can be used by programmers using other languages as well.

The Pascal 1.1 firmware protocol provides Apple IIe programmers with

- a standard way to uniquely identify new peripheral cards
- a standard way to address the firmware routines in peripheral cards

Table 6-6
Peripheral-card device-class assignments

Digit	Device class
\$0	Reserved
\$1	Printer
\$2	Joystick or other X-Y input device
\$3	Serial or parallel I/O card
\$4	Modem
\$5	Sound or speech device
\$6	Clock
\$7	Mass storage device
\$8	80-column card
\$9	Network or bus interface
\$A	Special purpose (none of the above)
\$B-F	Reserved for future expansion

Device Identification

The Pascal 1.1 firmware protocol uses four bytes near the beginning of the peripheral card's firmware to identify the peripheral card.

Address	Value
\$Cs05	\$38 (like the old Apple II Serial Interface Card)
\$Cs07	\$18 (like the old Apple II Serial Interface Card)
\$Cs0B	\$01 (the generic signature of new cards)
\$Cs0C	\$ci (the device signature)

The first hexadecimal digit, *c*, of the device signature byte identifies the device class; and the second hexadecimal digit, *i*, of the device signature byte is a unique identifier for the card, used by some manufacturers for their cards. Table 6-6 shows the device-class assignments.

For example, the Apple II Super Serial Card has a device signature of \$31: the 3 signifies that it is a serial or parallel I/O card, and the 1 is the low-order digit supplied by Apple Technical Support.

Although version 1.1 of Pascal ignores the device signature, applications programs can use them to identify specific devices.

I/O routine entry points

Indirect calls to the firmware in a peripheral card are done through a branch table in the card's firmware. The branch table of I/O routine entry points is located near the beginning of the Cs00 address space (*s* being the slot number where the peripheral card is installed).