

The Apple IIe's memory is switched according to the following rules at both powerup and reset:

- If there is a ROM card in slot 3, but no text card in the auxiliary slot, the firmware on the ROM card is switched in. This is necessary for Pascal to work.
- If there is a text card in the auxiliary slot, but no ROM card in slot 3, the internal \$C3 firmware is switched in.
- If there is both a text card in the auxiliary slot and a ROM card in slot 3, the firmware on the ROM card is switched in.

Important

See the section "Developing Cards for Slot 3" earlier in this chapter.

These rules mean that systems without 80-column text cards in the auxiliary slot do not have their internal \$C3 firmware switched in. Such systems cannot handle interrupts or breaks (the software equivalent of interrupts). An application program must swap in the \$C3 firmware both on initialization and after reset to make interrupts function properly on such a machine configuration. (ProDOS versions 1.1 and later do this for you during startup.)

Another implication of the decision to have interrupt code in the \$C3 page affects the shared \$C800 space in the Apple IIe. When the \$C3 page is referenced, the IIe hardware automatically switches in its own \$C800 space. When the interrupt handler finishes, it restores the \$C800 space to the original owner using MSLOT (\$07F8). This means that it is very important for a peripheral card to place its slot address in MSLOT to support interrupts while code is being executed in its \$C800 space.

Interrupt handling on the 65C02 and 6502

There are three possible conditions that will allow interrupts on the 65C02 and 6502:

- The IRQ line on the microprocessor is pulled low after a CLI instruction has been used (interrupts are not masked). This is the standard technique that devices use when they need immediate attention.
- The microprocessor executes a break instruction (BRK = opcode \$00).
- A nonmaskable interrupt (NMI) occurs. The microprocessor services this interrupt whether or not the CLI instruction has been used. An NMI is completely independent of the interrupts discussed in this manual.