

For information about these shared address spaces, see the section “Bank-Switched Memory” in this chapter and the sections “Other Uses of I/O Memory Space” and “Expansion ROM Space” in Chapter 6.

For details of the built-in I/O feature, refer to the descriptions in Chapters 2 and 3.

For information about I/O operations with peripheral cards, refer to Chapter 6.

The Apple IIe’s microprocessor can address 65,536 (64K) locations in memory. All of the Apple IIe’s RAM, ROM, and I/O devices are allocated locations in this 64K address range. Because each device or function requires a certain block of memory, there are more devices and functions than there are legal addresses, which means that the legal addresses must be shared. This sharing is accomplished through a technique called *bank-switching*, which is explained under the “Bank-Switched Memory” and “Auxiliary Memory and Firmware” sections in this chapter.

All input and output in the Apple IIe is *memory mapped*. This means that all devices connected to the Apple IIe appear to be a set of memory locations to the computer. In this chapter, the I/O memory spaces are described simply as blocks of memory.

Programmers often refer to the Apple IIe’s memory in 256-byte blocks called **pages**. One reason for this is that a one-byte address counter or index register can specify one of 256 different locations. Thus, *page 0* consists of memory locations from 0 to 255 (hexadecimal \$00 to \$FF), inclusive; *page 1* consists of locations 256 to 511 (hexadecimal \$0100 to \$01FF). Note that the page number is the high-order part of the hexadecimal address. Don’t confuse this kind of page with the display buffers in the Apple IIe, which are sometimes referred to as *Page 1* and *Page 2*.

Main memory map

The map of the main memory address space in Figure 4-1 shows the functions of the major areas of memory. For more details on the I/O space from 48K to 52K (\$C000 through \$CFFF), refer to Chapter 2 and Chapter 6; the bank-switched memory in the memory space from 52K to 64K (\$D000 through \$FFFF) is described in the section “Bank-Switched Memory” later in this chapter.