

The 65C02 stack

The 65C02 microprocessor uses page 1 as the **stack**—the place where subroutine return addresses are stored—in last-in, first-out sequence. Many programs also use the stack for temporary storage of the registers (via push and pull operations). You can do the same, but you should use it sparingly. The stack pointer is eight bits long, so the stack can hold only 256 bytes of information at a time. When you store the 257th byte in the stack, the stack pointer repeats itself, or wraps around, so that the new byte replaces the first byte stored, which is now lost. This writing over old data is called *stack overflow*, and when it happens, the program continues to run normally until the lost information is needed, whereupon the program terminates catastrophically.

The input buffer

The GETLN input routine, which is used by the Monitor and the BASIC interpreters, uses page 2 as its keyboard-input buffer. The size of this buffer sets the maximum size of input strings. (Applesoft uses only the first 237 bytes, although it permits you to type in 256 characters.) If you know that you won't be typing any long input strings, you can store temporary data at the upper end of page 2.

Link-address storage

For more information about links, see the section "Changing the Standard I/O Links" in Chapter 6.

The Monitor, ProDOS, and DOS 3.3 all use the upper part of page 3 for link addresses or vectors.

BASIC programs sometimes need short machine-language routines. These routines are usually stored in the lower part of page 3.

The display buffers

The primary text and low-resolution-graphics display buffer occupies memory pages 4 through 7 (locations 1024 through 2047, hexadecimal \$0400 through \$07FF). This entire 1024-byte area is called *text Page 1*, and it is not usable for program and data storage. There are 64 locations in this area that are not displayed on the screen; these locations are reserved for use by the peripheral cards.

See Chapter 6 for information on the memory locations that are reserved for peripheral cards.