MODIFYING THE SHIFT KEY FOR USE WITH DICE

DICE works well either using the ESC key for shifting or with the modified shift key. If your Apple is still under warranty (or under an extended Apple service contract), then you probably should stick with using the ESC key. However, if you feel you must use the shift key, then read on.

The first step is to remove the Apple's case. Remove the power cord, the cover, and all I/O boards and other cables. If you have an RF modulator then be sure to unplug it from the motherboard. Turn the Apple upside down, and remove the two phillips head screws at each side of the base plate, one screw at each rear corner, and the two center screws along the front edge. Turn the Apple right side up, with the keyboard hanging over the front edge of the desk, and remove the remaining two screws. Lift the case slightly, and unplug the keyboard cable. If you have an LCA-1 then it must be removed before removing the keyboard cable; simply set it aside temporarily. The case may now be removed.

Locate the shift key circuit. If you have an old style keyboard (with all components on a single PC board) then simply locate the contacts below the right-hand shift key (the one below the arrow keys). One of the contacts is tied to logic ground; you will see this line going to other keys. The other contact is the shift key circuit.

If you have the newer keyboard with the separate encoder board "piggy-backed" below the main keyboard, then hold the case so that you are looking at the bottom of the encoder board with the keyboard cable connector at the lower right. Locate the feed-through pad next to the small rectangular hole (see Figure 1). This is the shift key circuit.

Take a 15" piece of wire-wrap type wire, and strip 1/16" of insulation from one end. Solder it to the shift key circuit (which we located above), and leave the other end free for the time being. Lower the case over the computer, and reach under the front edge to plug in the keyboard cable. If you have an LCA-1, it should now be plugged back in. Then lower the case, and replace two of the screws at the front edge, but don't tighten them yet. Turn the Apple upside down, and start all of the other screws before tightening them all. Turn the Apple right side up.

Now is the time to strip 3/16" of insulation from the wire that we left dangling above, and insert it into pin 4 of the game I/O connector. Alternatively, if you have something plugged into the game connector, the wire may be soldered to pin #1 of the 74LS251 in location H14. As you can see in the schematic on page 114 of the Apple Reference Manual, this is where game switch two goes (labeled SW2 on the schematic). If you remove the 74LS251 from its socket and solder carefully to pin one right next to the plastics then the modification can later be removed at this point by simply replacing the chip with a new one. Tuck the wire out of the way, or tape it to the motherboard, to avoid tangling with I/O boards.

Reconnect the RF modulator, and replace any I/O boards and other cables. Turn on the computer, and check out its normal functions. (Will the disk boot? Will a BASIC program run? Do the game paddles work properly?) If any problems are noted, turn off the computer immediately and check again for shorts or incorrect wiring. This modification should not affect any of the standard features of the Apple, including the game paddles and switches.

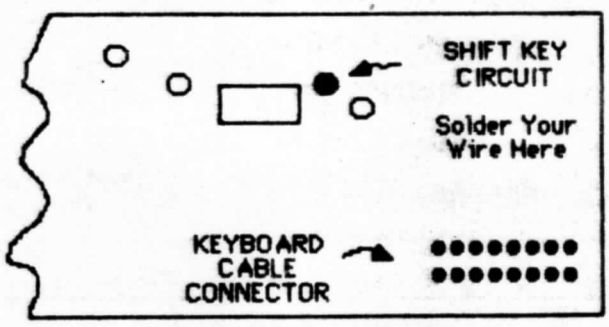

Fig. 1 : Bottom view of encoder board.