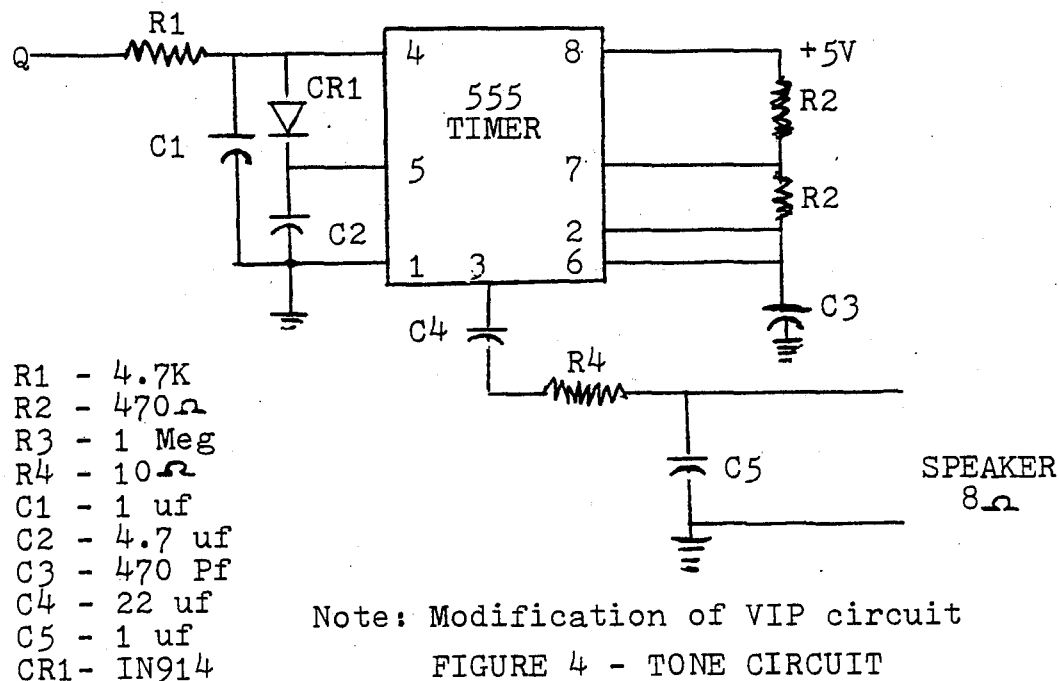


For a keyboard, I used a small CASIO calculator keyboard, because I like the feel of the keys. Any 16 key matrix will do. I used a 7-strand cable about three feet long, with a 14-pin dip header to plug into my Giant Board.

As a precaution, it is recommended that a +5V regulator be added to the Giant Board in the space provided, to ensure that you don't overload the motherboard regulator.

Many of the VIP games have a "beep" tone built into them, so I've included the tone circuit to be added to Q if you want the tone. See figure 4 for the circuit, and note the modifications to the VIP circuit.



#### SOFTWARE MODIFICATIONS

First, we'll discuss the changes to be made to the operating system. The OS for the VIP is contained in ROM at addresses 8000 through 81FF. Although this code could be loaded at any page boundary, we'll put it in address 0D00 through 0EFF. You will need to obtain a copy of the VIP manual, or back issues of the VIPER for a complete hexadecimal listing of the OS and the CHIP-8 interpreter. See Table 1 for a summary of instructions that must be changed in the OS to be compatible with the ELF-II. Once you have loaded the OS, with the modifications, put it on tape before