

Scheme improves on low-cost keyboard

Martin O'Hara, Telematica Systems Ltd, Cranfield, Bedfordshire, UK

YOU CAN EASILY improve on a previous Design Idea to produce a slightly simpler resistor arrangement with better timing balance between switches, using a single resistor value (Reference 1, Figure 1). The use of a single resistor value, R_s , in a series chain

gives the timing parameters a simpler format and should reduce bill-of-mate-

rials cost. The timing balance between switches should now also be more even.

The improved balance eases extending the keyboard for adding key inputs. The additional benefit of this arrangement is to make the circuit easier to adapt for faster or slower microprocessors, because you can easily adapt the circuit by changing the single switch resistor or capacitor values to alter the charge-discharge characteristics (Figure 2). It can also make building the circuit into a keypad housing easier, especially if you use membrane keys. The entire circuit is

an SMD assembly with just two component types: switch and resistor. In the original idea, in cases of multiple keys being pressed, the timing is some odd multiple of parallel resistors and could accidentally represent a key that was not selected. With the arrangement of Figure 1, the lowest order key dominates; hence, the keypad has hard-wired priority setting and always results in a selected key timing, and no intermediate timing period should occur. □

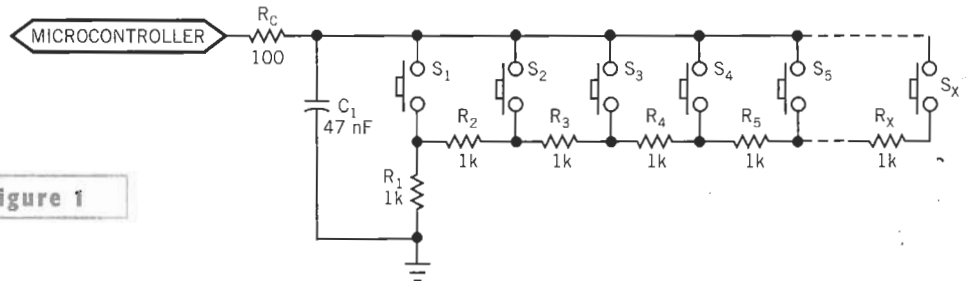


Figure 1

This simple keypad arrangement uses a single resistor value to select the switches.

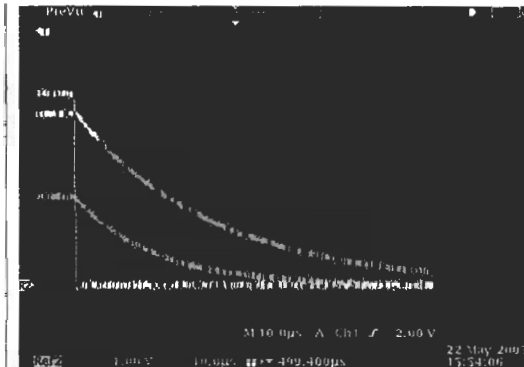


Figure 2

A 400-kHz square wave from the microprocessor shows no key, key 1, and key 5 pressed.