

Circuit & Design Ideas

Quiz game adjudicator with digital scoring

Here's a gadget you can use to control quiz games like those seen on TV. It lights a lamp and sounds a buzzer to indicate which contestant pressed his button first and, in addition, displays the score for each contestant up to a maximum of 99.

The contestant's scores are displayed on 7-segment LED readouts and are incremented or decremented by the quiz master. Note, however, that negative scores are not possible.

Fig. 2 shows the quiz master's unit. This contains the power supply and an encoder (IC12a, b) for the three scoring pushbuttons: decrement, increment and clear. The decoder outputs, X1 and X2, connect to corresponding inputs on the contestant circuits. Note that the

contestant circuit (Fig. 1) must be duplicated for each contestant, and the OK terminals connected together.

The contestant circuitry functions as follows. Two 4-bit counters, IC5 and IC6, together with 7-segment decoders IC7 and IC8, drive the LED displays. When a contestant presses the answer pushbutton (PB4), the flipflop comprising NAND gates IC2c and IC2d is set — ie, pin 10 low and pin 11 high. Q1 turns on to light the lamp and IC9 is triggered, sounding the buzzer for about 1 second.

At the same time, the OK line is pulled low via diode D1 and prevents other contestant answer pushbuttons from functioning.

The X1 and X2 inputs are decoded by IC1, pin 11 going high whenever either input goes high. Thus, there is a positive-going signal to pin 4 of IC3 whenever

any of the three scoring pushbuttons (PB1-PB3) is pressed. IC3, a 4538 dual monostable, is connected to produce a 100ms pulse to allow time for the score counter to be clocked. At the end of this period, pin 7 triggers the second monostable in IC3 which produces a 33ms pulse from pin 10 to clear the flipflop (IC2c,d).

Dual monostable IC4 also decodes the X1, X2 inputs and uses this information to drive the 4510 BCD counters (IC5 and IC6). Pin 10 of IC4 is connected to the up/down control pins of the 4510s, while pin 7 clocks the counters. Pin 3 monitors the output of IC2d and enables the count output only if pin 11 (IC2d) is high, ie, if the contestant's button has been pressed.

A separate regulator is used for each contestant circuit to ensure a constant display brightness. This regulator can be omitted for the second and further contestant circuits if heavy gauge wiring is used for the supply connections.

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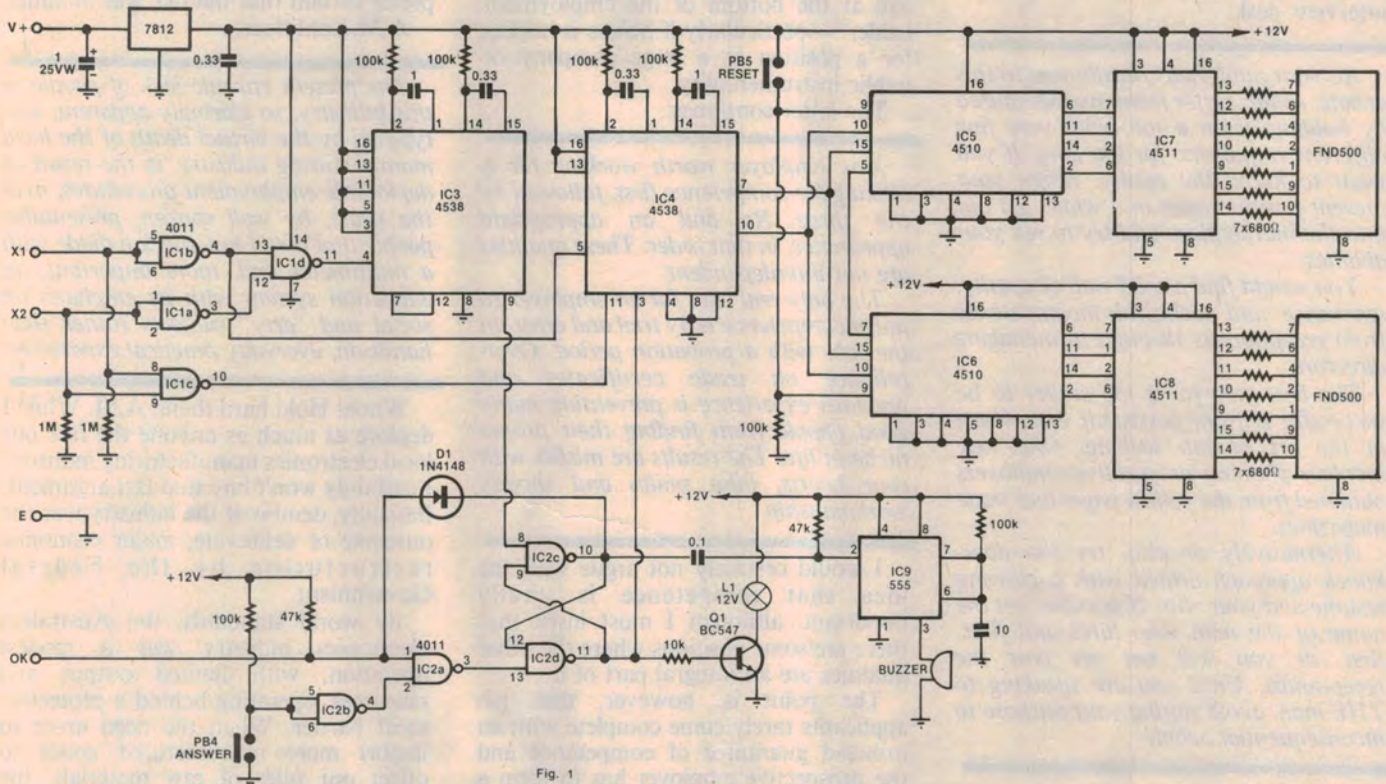


Fig. 1

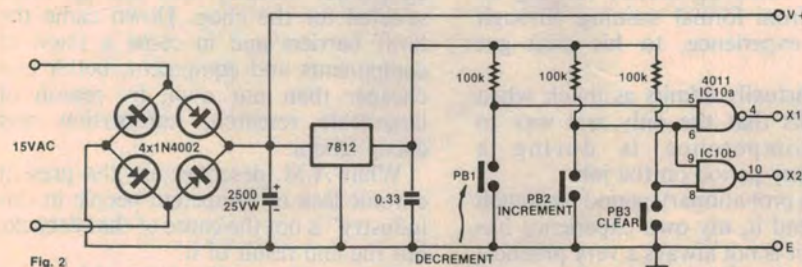


Fig. 2