**Handy Dandy
Little Circuits**

Handy Dandy Little Circuits #22

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JEOPARDY

I had a few requests for a circuit for a first-response discriminator where the first to push a button would activate a lamp, horn or bell or all of them and also prevent others from activation.
The two circuit provides for a total of six or four stations (buttons) .

Circuit description

When one of the push-to-close switches is closed say #1 to input pin 4 (D1) of the CD4042 IC ,Q1 at pin 2 goes hight and activates the LED or relay through the CD4050 IC output pin 2 .
Simultaneously Q1 at pin 3 of the CD4042 IC goes low and is fed to one of the inputs of CD4023 IC or CD4012 IC which in turn send out a high input to the clock (pin 5) of the CD4042 and disables all the other inputs (D2,D3,D4) . At this point the System is locked and the LED or relay or both will stay on until the system is reactivated by the reset - button switch .
R1 to R6 (R1 to R4) are used to clamp down the inputs to prevent any spurious voltage noise to activate the inputs while off .
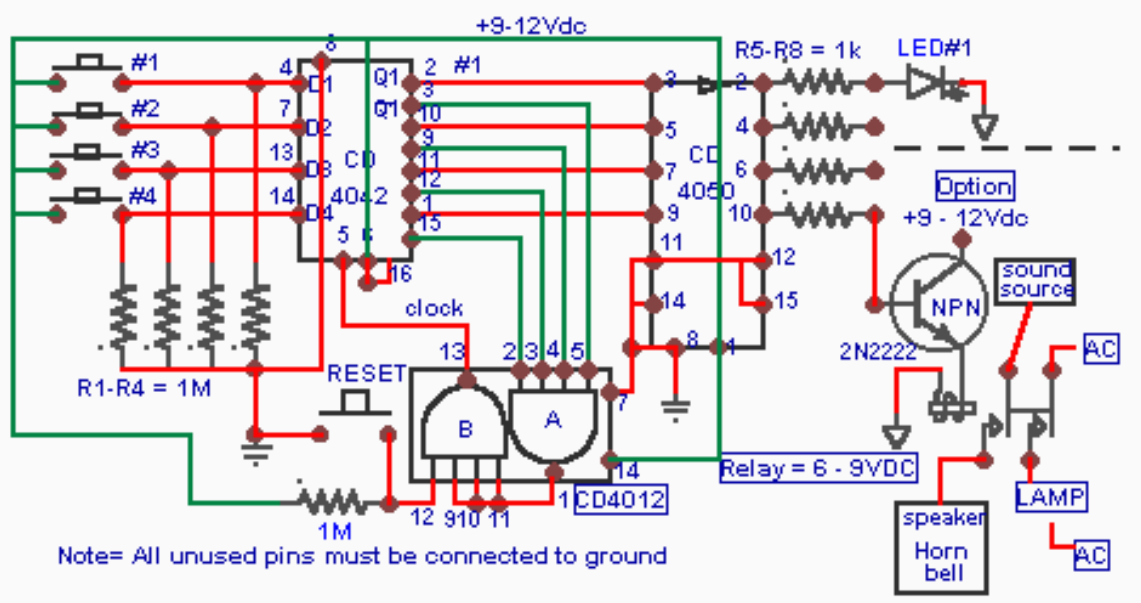R7 to R12 (R5 to R8) are used as current limiting to the LED's and transistors . The 1K value is used for a 9 Vdc supply for approx 9 mA and should be adjusted to match the voltage source.

Circuit for six buttons
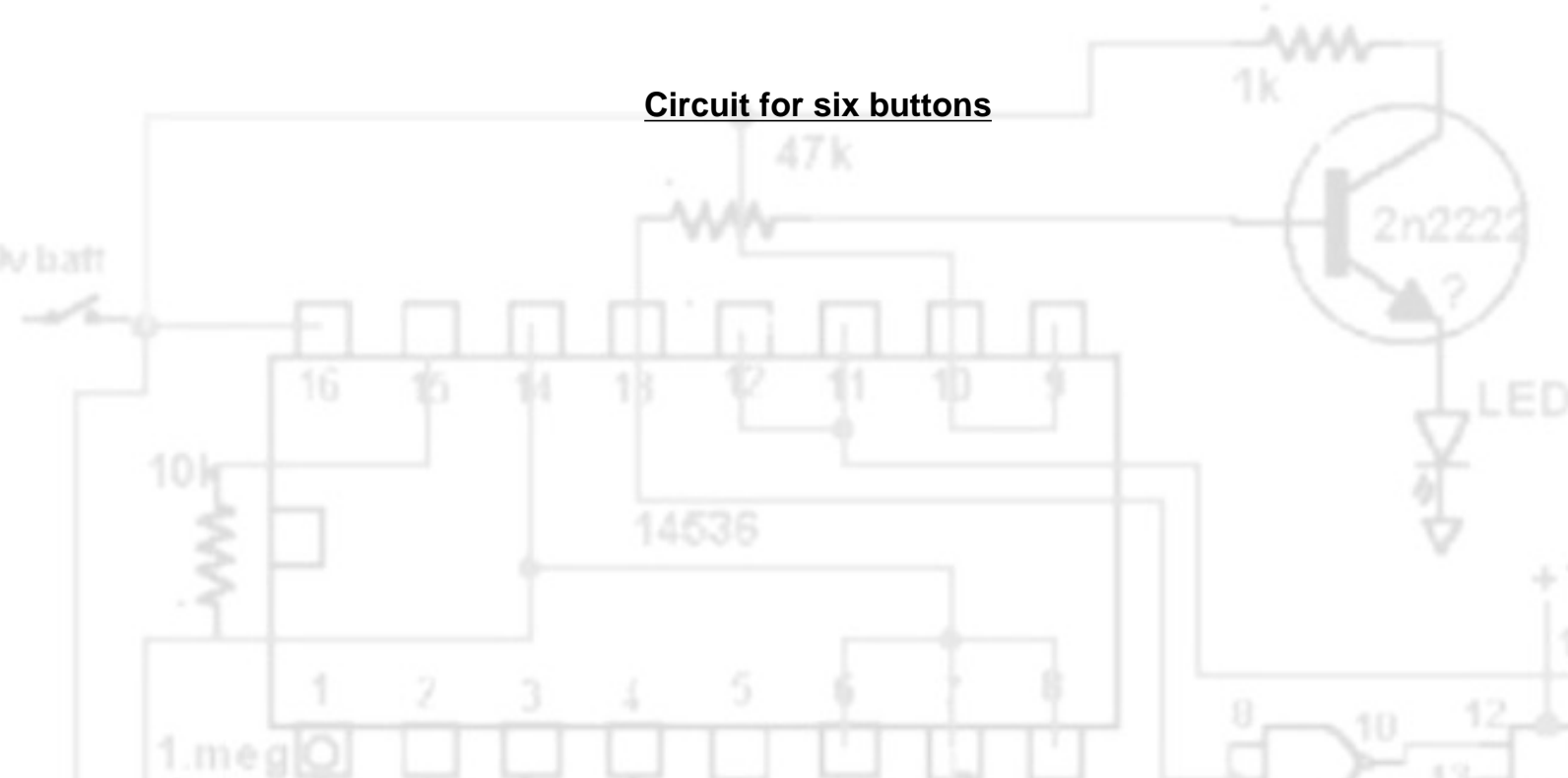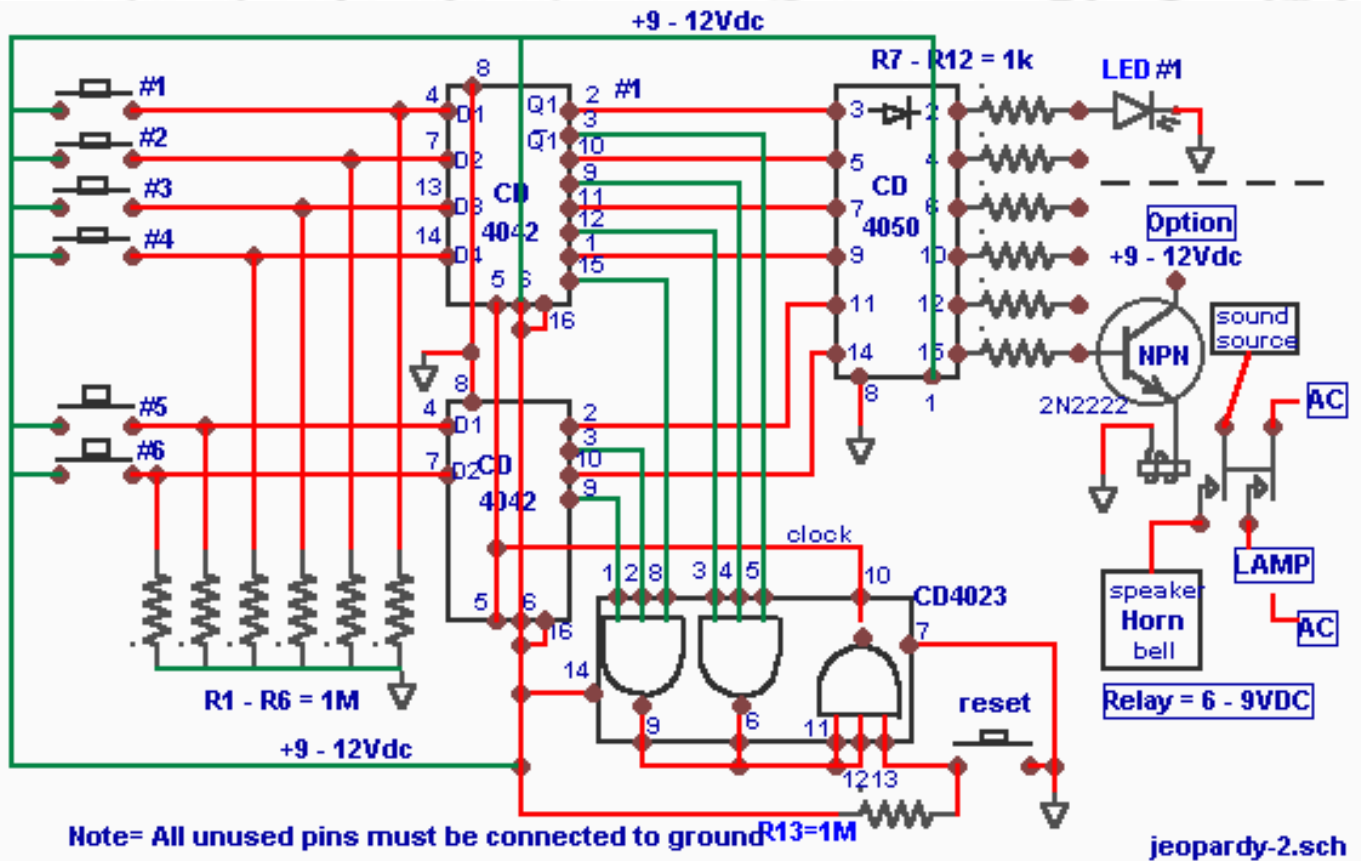
Circuit for four buttons

IC's

CD4042 = CMOS (Quad Latch) 16 pins
CD4050 = CMOS (Hex Buffer) 16 pins . Note = Pins 13 and 16 are not connected to the IC .
CD4023 = CMOS (Triple 3-input "NAND" gate) 14 pins . Note = used for six buttons .
CD4012 = CMOS (Dual 4-input "NAND" gate) 14 pins . Note = used for four buttons .

Notes

Relay = 6 to 9 volts miniature low current , normally open contacts.
A word of caution , CMOS IC's can easily be damaged by static voltage, IC sockets should be used and all connections made and supply buss tested before inserting the IC's.

You can use a CD4049 IC instead of the CD4050 (same pins connection), the diodes must be reversed in polarity and connected to 9VDC and PNP transistors must be used with supply polarity reversed.

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Questions? Email me at roma60@home.com

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