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Description:

This is a selection of small self-contained alarm circuits. They have a very low standby current; and are suitable for battery operation.

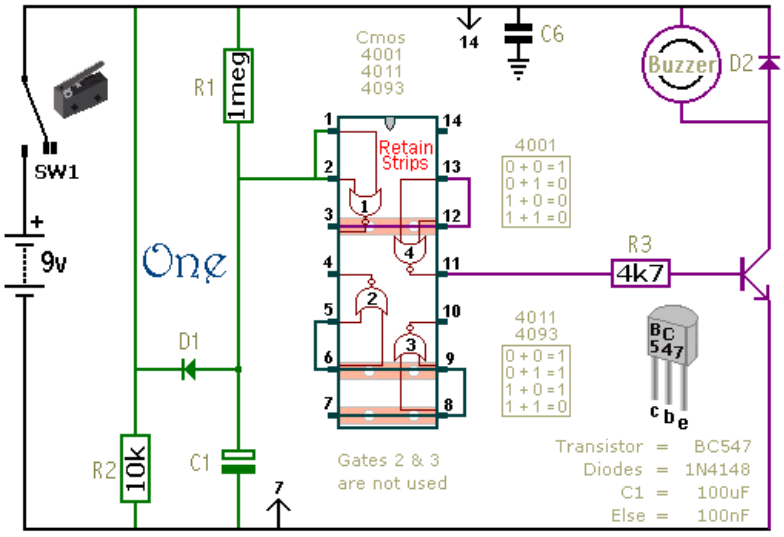
Notes

Sw1 is drawn as either a micro-switch or a magnetic-reed contact; but so long as it does the job you can use whatever type of switch you like. Use more than one switch if it suits your application. The output device is a "piezo" buzzer, requiring a current of about 10mA. Provided the buzzer's voltage is suitable, the circuits will work from 5 to 15-volts. The main features of each alarm are described on the circuit diagram itself. Each pair of circuits will print out on an A4 sheet.

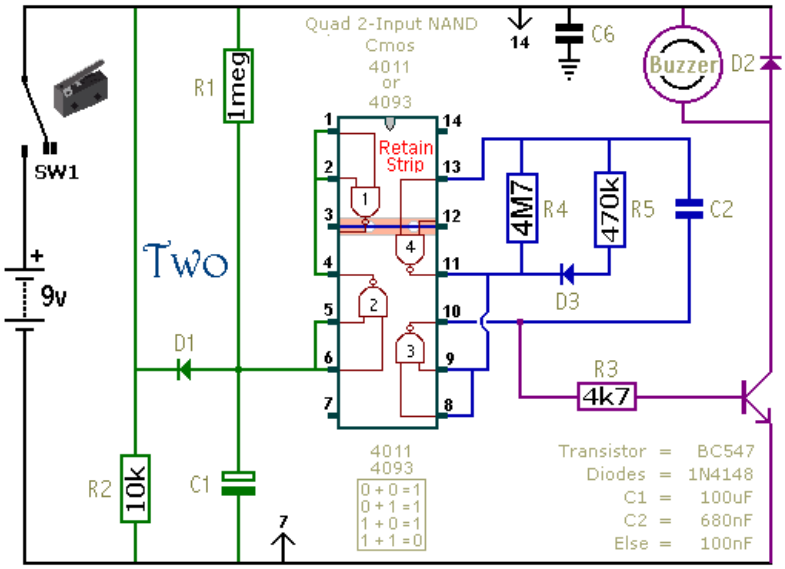
The Cmos 4093 is the Schmidt-trigger version of the Cmos 4011. For present purposes the two are interchangeable. However, the 4093 has an improved switching performance that is most noticeable if the time periods are substantially extended.
The precise length of any time period will depend on the characteristics of the actual components used; especially the tolerance of the capacitors and the exact switching points of the Cmos Gates.

In the case of circuits 11 & 12, treat the values of R6 & R7 as a rough guide. The switching point of Gate 3 and the characteristics of the thermistor will determine the actual temperature range available. Changing the value of R6 will allow you to access different areas of the temperature scale; while changing the value of R7 will allow you to alter the width of adjustment available.
Although they are described as alarm circuits, they will have other applications. The buzzer may be replaced by a small relay or an optical isolator; and the timing components may be changed to produce the required output performance. Any relay should have a coil resistance of at least 270 ohms; but for battery operation, the higher the better. If you're using an optical isolator, connect a 1k resistor in series with its LED.

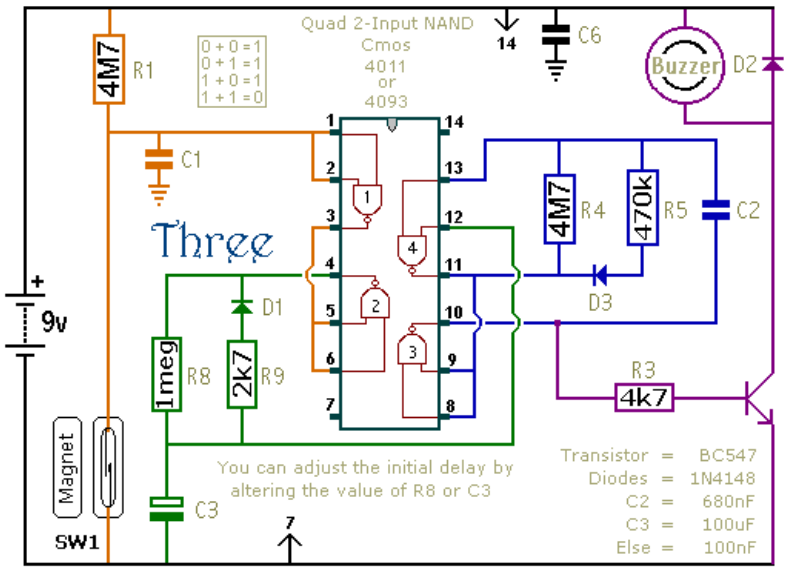
1. Until SW1 is CLOSED the circuit uses no current.
About 90 seconds after SW1 is closed the Buzzer will sound.
The exact delay depends on the actual components used.
You can adjust the delay by altering the values of R1 and/or C1.
Any of the three Cmos ICs may be used.



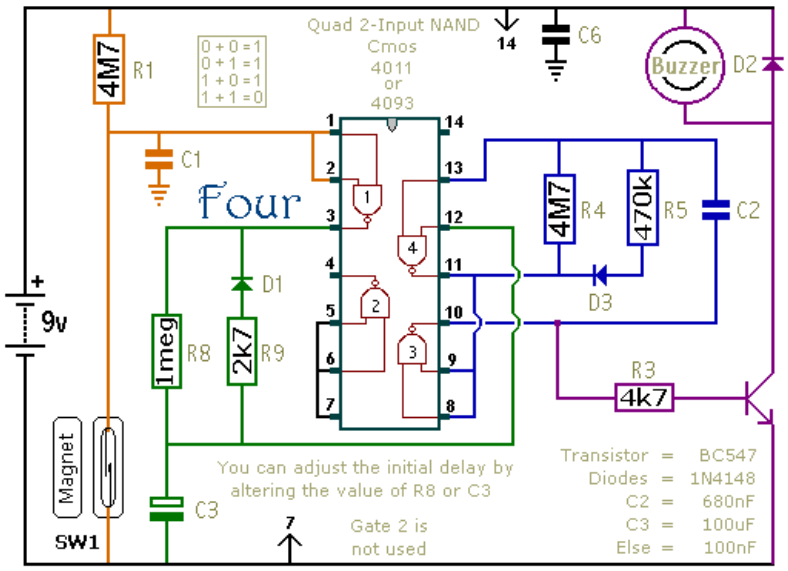
2. Until SW1 is CLOSED the circuit uses no current.
About 90 seconds after SW1 is closed the Buzzer will begin a
series of short Beeps, 3 to 5 seconds apart. This saves battery power.
R5 & C2 set the length of the beeps; R4 & C2 the delay between them.
A Cmos 4001 IC is NOT suitable for this circuit.



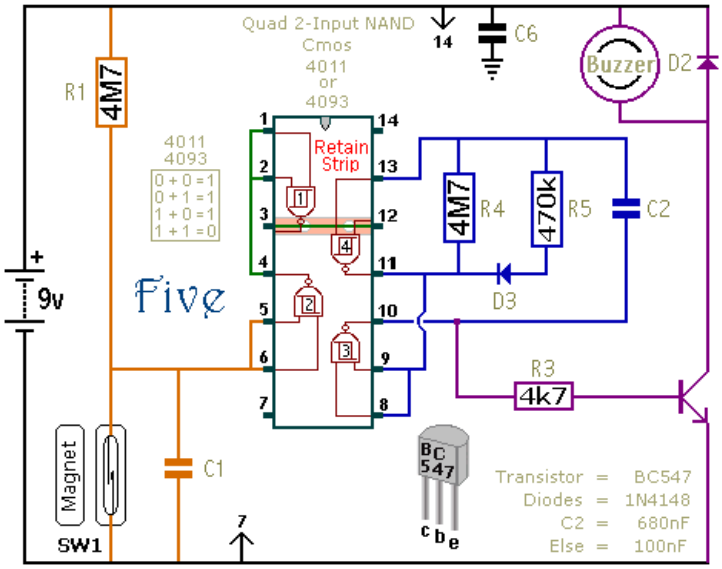
3. While Sw1 remains CLOSED the circuit uses virtually no current. About 90 seconds after SW1 is OPENED, the Buzzer will begin a series of short Beeps, 3 to 5 seconds apart. This saves battery power. R5 & C2 set the length of the beeps; R4 & C2 the delay between them. A Cmos 4001 CANNOT be used for this circuit.



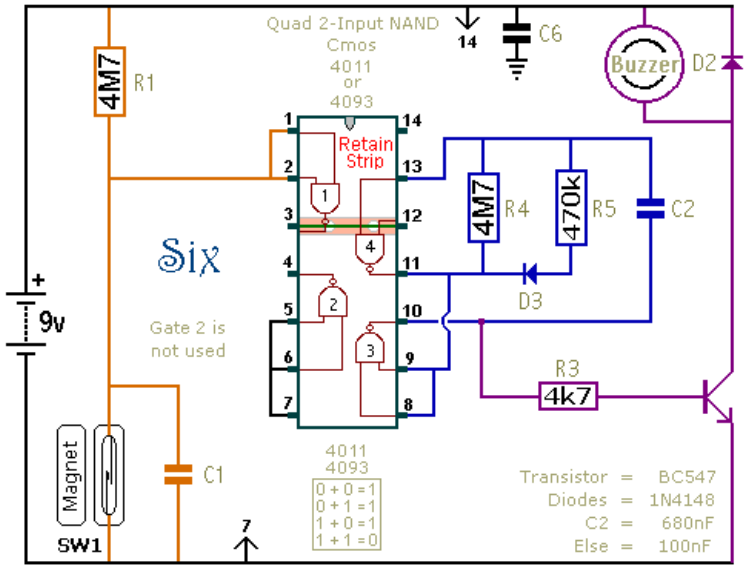
4. While Sw1 remains OPEN the circuit uses virtually no current. About 90 seconds after SW1 is CLOSED, the Buzzer will begin a series of short Beeps, 3 to 5 seconds apart. This saves battery power. R5 & C2 set the length of the beeps; R4 & C2 the delay between them. A Cmos 4001 CANNOT be used for this circuit.



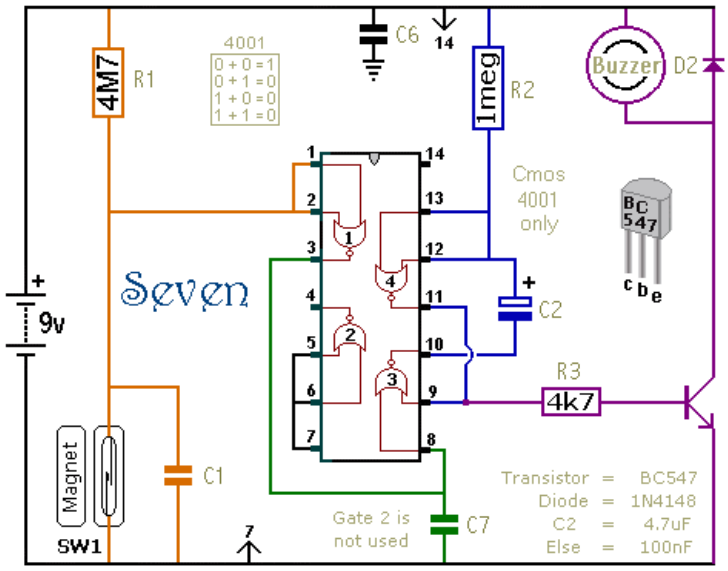
5. While Sw1 remains CLOSED the circuit uses virtually no current.
When the switch is OPENED the Buzzer produces a series of beeps
at 3 to 5 second intervals. This increases battery life.
R5 & C2 set the length of the beeps; R4 & C2 the delay between them.
A Cmos 4001 CANNOT be used for this circuit.



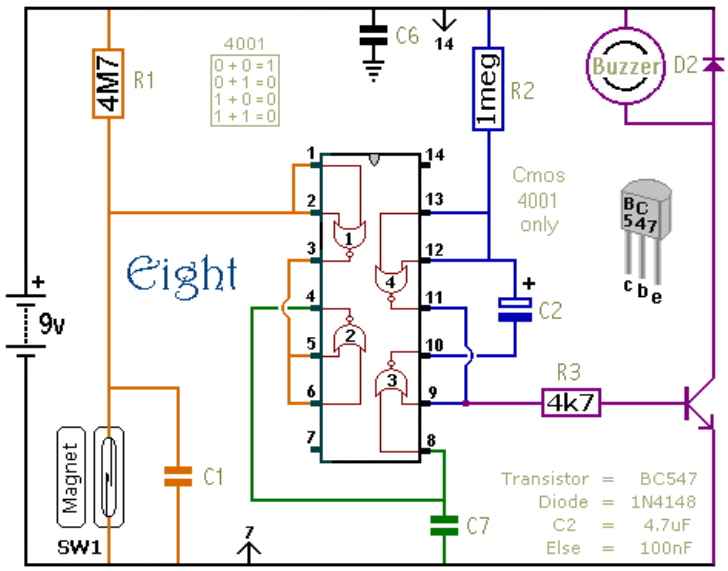
6. While Sw1 remains OPEN the circuit uses virtually no current.
When the switch is CLOSED the Buzzer produces a series of beeps
at 3 to 5 second intervals. This increases battery life.
R5 & C2 set the length of the beeps; R4 & C2 the delay between them.
A Cmos 4001 CANNOT be used for this circuit.



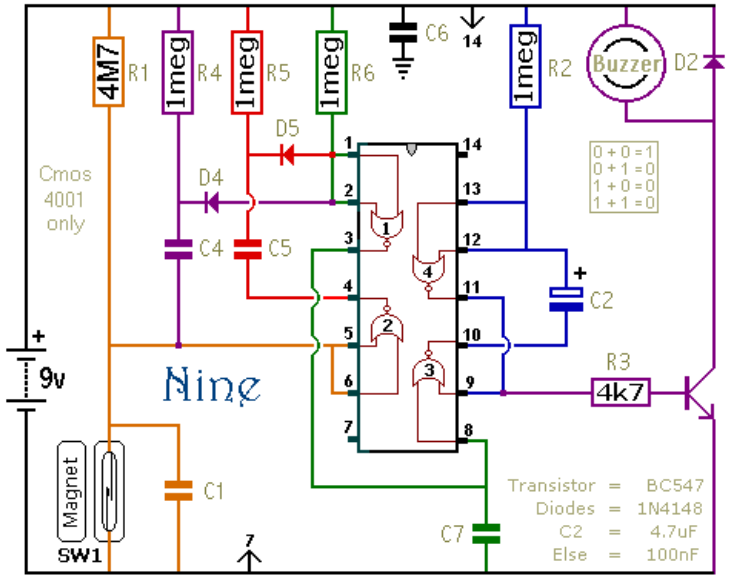
7. While Sw1 remains OPEN the circuit uses virtually no current.
Every time Sw1 is CLOSED the Buzzer will sound for 3 to 5 seconds.
The length of time depends on R2 & C2.
A Cmos 4001 MUST be used for this circuit.



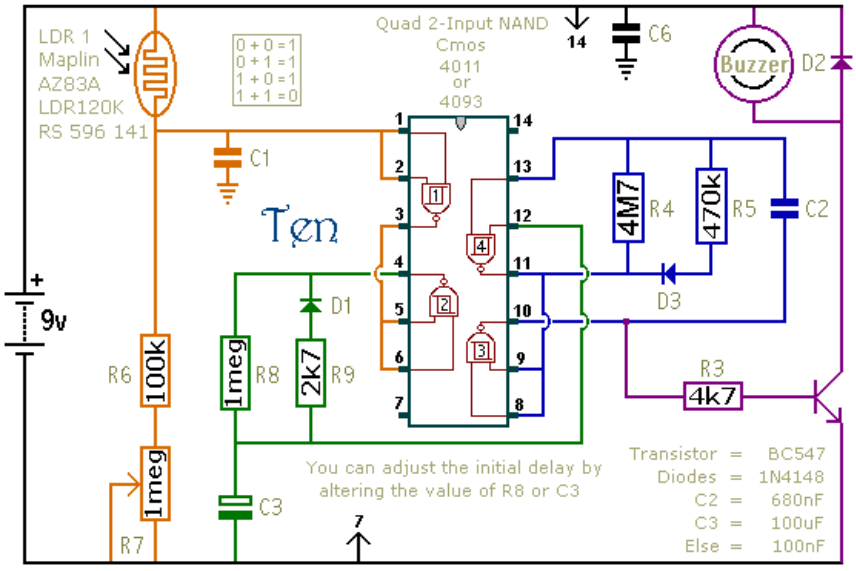
8. While Sw1 remains CLOSED the circuit uses virtually no current.
Every time Sw1 is OPENED the Buzzer will sound for 3 to 5 seconds.
The length of time depends on R2 & C2.
A Cmos 4001 MUST be used for this circuit.



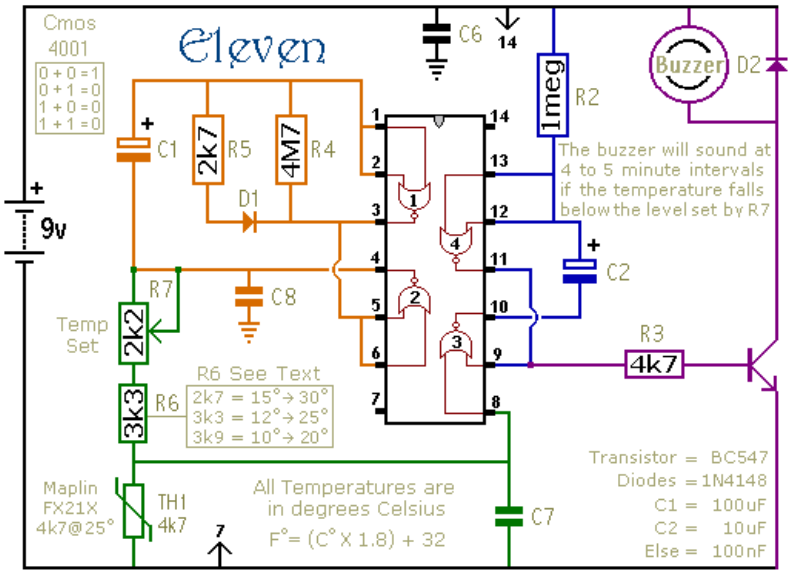
9. In standby mode this circuit uses virtually no current.
When Sw1 is EITHER opened or closed, the buzzer will sound
for 3 to 5 seconds. The length of time depends on R2 & C2.
A Cmos 4001 MUST be used for this circuit.



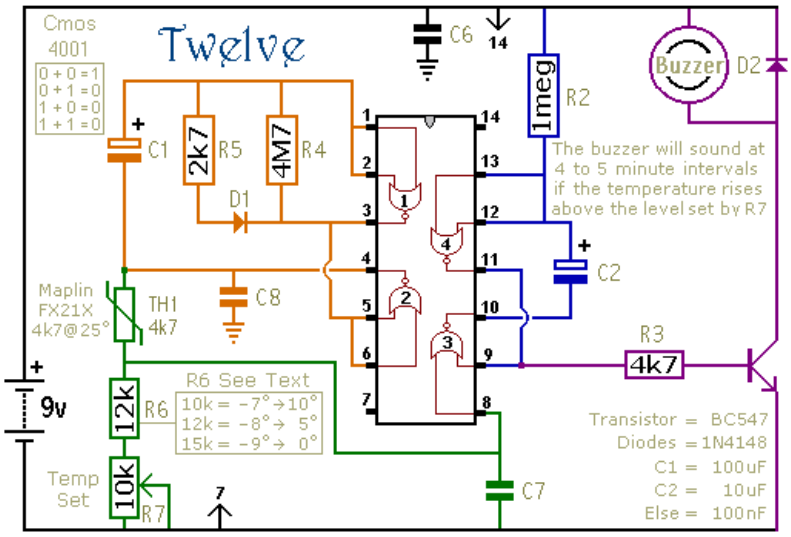
10. The dark resistance of The LDR should be 2 Megs or more.
While the LDR is in TOTAL darkness the circuit uses virtually no current.
About 60 to 90 seconds after it's exposed to the light,
the Buzzer will begin a series of short Beeps, 3 to 5 seconds apart.
R5 & C2 set the length of the beeps; R4 & C2 the delay between them.
A Cmos 4001 CANNOT be used for this circuit.



11. Every 4 to 5 minutes the circuit measures the temperature.
If it's BELOW the level set by R7, the Buzzer will sound for about 5 seconds.
The frequency of measurement is set by C1 & R4
and the length of the Buzz is set by C2 & R2.
A Cmos 4001 MUST be used for this circuit.



12. Every 4 to 5 minutes the circuit measures the temperature.
If it's ABOVE the level set by R7, the Buzzer will sound for about 5 seconds.
The frequency of measurement is set by C1 & R4
and the length of the Buzz is set by C2 & R2.
A Cmos 4001 MUST be used for this circuit.



If you're new to using Cmos ICs - you might like to take a look at my guide to The Cmos 4001 and The Cmos 4011