YEAR 9 ALARM/TARGET

The circuit is built using the following components. Switch (SPST), Tilt Switch, Resistor(3), Thyristor, LED, Buzzer.

CIRCUIT THEORY

INPUT PROCESS OUTPUT

Tilt Switch Thyristor LED,Buzzer

INPUT

The combination of the Tilt Switch and Resistor in series creates a Potential Divider. Voltage will drop across the Tilt Switch and Resistor. The voltage is divided.

The actual division of voltage depends on the values of the Tilt Switch and Resistor. As the Tilt Switch resistance varies between infinite and 0 this voltage is always +9v or 0v. This is a digital signal.

When the switch is horizontal it has an infinite resistance so the output of the potential divider is 0V.

When the switch is titled by 10 degrees it has a resistance of 0 so the output of the potential divider is 9v.

PROCESS

The Thyristor behaves in a similar way to the transistor. It has 3 legs which are called the Gate, Anode and Cathode. When a voltage is applied to its Gate it “switches on” and allows a flow of electricity from its Anode to its Cathode. In this circuit this will happen the switch is titled (When the switch is titled by 10 degrees it has a resistance of 0 so the output of the potential divider is 9v).

It is different to the transistor because once the thyristor has been triggered it continues to allow the current to flow between its Anode and Cathode legs (similar to flood gates being opened!) One way of stopping this is to interrupt the flow by creating a break in the circuit. In this circuit this can be achieved with the SPST switch.

Thyristors are said to LATCH a circuit on.

OUTPUT

The output consists of a LED and a Buzzer. The LED indicates when the circuit is switched on and “armed”. Diodes allow current to flow in 1 direction only. This is from its positive (anode) leg to its negative (cathode) leg.

The Buzzer is connected to the cathode of the thyristor. This will sound only when the thyristor allows a current to flow from its anode leg to its cathode leg (once it has been tilted!)