

HS3600T2 MOTION DETECTOR & XMTR -- CIRCUIT DESCRIPTION

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I. GENERAL CIRCUIT DESCRIPTION:

The general operation of this circuit starts with the detection of motion, through an amplifier and comparator section. A positive output from this section engages a timer of a "short" duration, which engages a 600Hz modulator. The first timer activates a second timer, which shuts down the motion detector, while the RF transmission is taking place. A photocell and a switch is also used to shut down the motion detector output, based upon user selection for day/night operation. The modulator is now engaged and outputting a 600HZ square wave, with a 50% duty cycle, which is fed into a duty cycle reducer, resulting in an output of about 12% --> 15% duty cycle. The latter result in turn activates the transmitter for the duration of the first timer. The RF output is tuned to 304.3MHZ.

II. MOTION DETECTOR:

The motion detector function with a PIR (Q4--passive infrared detector), whose function is to detect motion and generate a motion pulse. the pulse is then amplified and detected by dual comparators (U1B & U1C -- on positive going and one negative going). The two comparator outputs are summed by diodes D1 and D2, then activate the Shutdown, Switching, and Timing block.

III. SHUTDOWN, SWITCHING & TIMING:

The output from the motion detector activates a timer in the Shutdown, Switching and Timing block, comprised of D4, C11, R18 and U2D. This timer activates the modulator and transmitter for a couple of seconds and at the same time starts a second timer comprised of R19, D5, C12, U2E, D3, R17, C10, R16, and Q2. This second timer clamps down the motion detector output from the two diodes, preventing further transmission until the first transmission is complete.

Another function of this block is to provide an photocell input. The photocell can be chosen whether to be used or not by user, via a slide switch (SW1). If the switch is closed, the photocell will allow the circuit to function at night and will deactivate the circuit during the daylight hours. If the switch is open the cell is disconnected and the circuit will function both day and night.

IV. MODULATOR OPERATION:

R20, R21, C13, U2A, and U2B comprise the modulator, with R20 being the adjustment for the modulator frequency. U2C just provides an inversion for the Duty Cycle Reduction circuit.

V. DUTY CYCLE REDUCTION CIRCUIT:

Duty cycle reduction is done by D7, R22, C14, U3C, and U3D. Duty cycle is adjusted by varying the values of R22 and C14. D7 provides a fast turn-off. U3D provides inversion of the signal to the xmtr.

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VI. TRANSMITTER:

The transmitter is tuned to transmit at 304.3MHZ, via C17 tuning adjustment. L2A and L2B are circuit board traces and serve as the antenna. L1 is a supply filter. R25 is used to adjust for power output.

VII. COMMENTS:

Un-used gates are U3A and U3B, inputs being tied to ground. The unit is powered by four AA alkaline cells.