

ULTRA-SONIC SWITCH KIT

This circuit is an ultra sonic transmitter and a receiver. The transmitter transmits an ultra high frequency signal (41.5KHz) to the receiver through a pair of ultra sonic transducers by two transistors osc. circuit. On the receiver side, the transducer picks up the 41.5KHz signal and converts it to an AC voltage, and amplified by the transistors Q1 & Q2 to approx 70db. On this stage the DC regulation is controlled by R1 & R3, C1 connected to the 41.5KHz AC signal feed-back circuit as a decoupler to make the stage work more stable. The output from Q2 will be rectified by D1. If the input signal increases at Pin #2 of I.C. 1, the voltage from that point will move to negative. If the input signal is too great, the amplifier will cut off the output signal and change to a square wave form. I.C. 1 acts as a comparator. If the voltage at pin #2 is lower than pin #3, the output of I.C. 1 will become high (approx 10.5V) and make Q3 conduct and drive the output relay coil (not included w/kit) If the voltage at pin #2 is higher than pin #3, the situation will be opposite. R9 supplies a small amount of positive feed-back to avoid any false triggering by the relay. If R9 is substituted by a capacitor C4, I.C. 1 will become a stabilizer and if the signal is not present (cut off) even for a very short period, the relay will open, until the signal input appears again. (ideal for ultra sonic detector or counter)

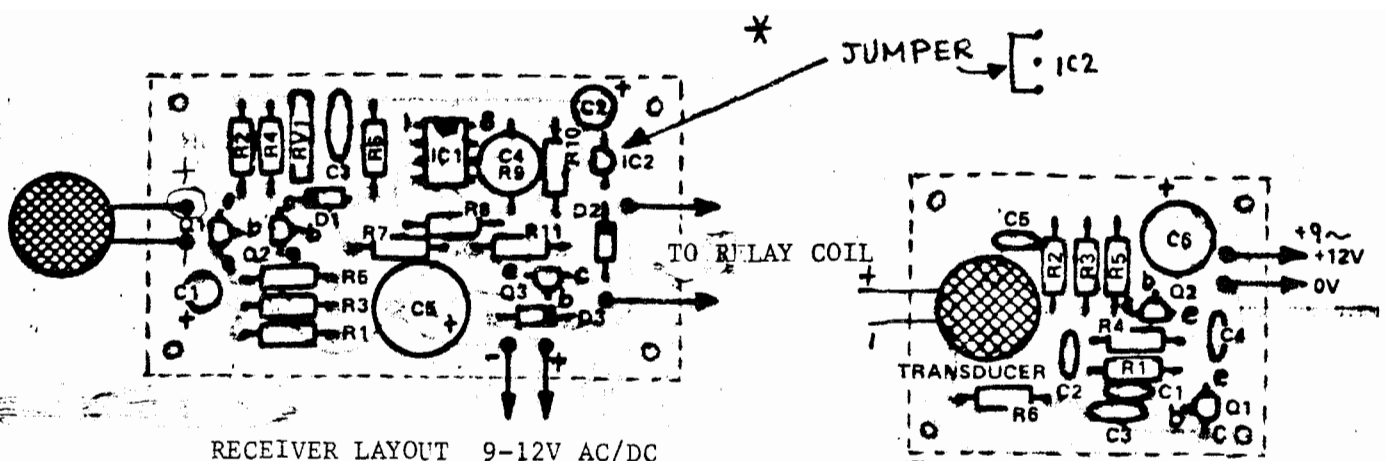
Adjusting the receiving sensitivity is very important after assembling the kit. First make sure every part was correctly soldered to the P.C. board at the right place. (specially the pin configuration of the IC and transistors) then apply a DC voltage of 9-12Volts to the input of the receiver, and connect the output of the receiver where it is marked "TO RLY COIL" to a DC voltage meter (multitester 30V DC range) and turn the trim-pot RV1 to read the same voltage on the meter as applied to the receiver, then turn the RV1 slowly until the voltage just drops to zero. (open circuit). This zero point is the most efficient point. The control range between the transmitter and the receiver is approx 16 feet. Supply voltage for the transmitter is 9-12DC voltage.

PARTS LIST TRANSMITTER

R1	120K res	lpc
R2	6.8K "	lpc
R3	100K "	lpc
R4	8.2K "	lpc
R5	1K "	lpc
R6	2.7 "	lpc
C1	.001uF cap	lpc
C2	.01uF cap	lpc
C3	.047 uF cap	lpc
C4	650 pf cap	lpc
C5	.0022 uF cap	lpc
C6	100 uF cap	lpc
Q1 Q2	NPN transistor	2pcs
U2T	ultrasonic transducer	lpc
P.C. Bd		lpc
RCA plug connector		lpc

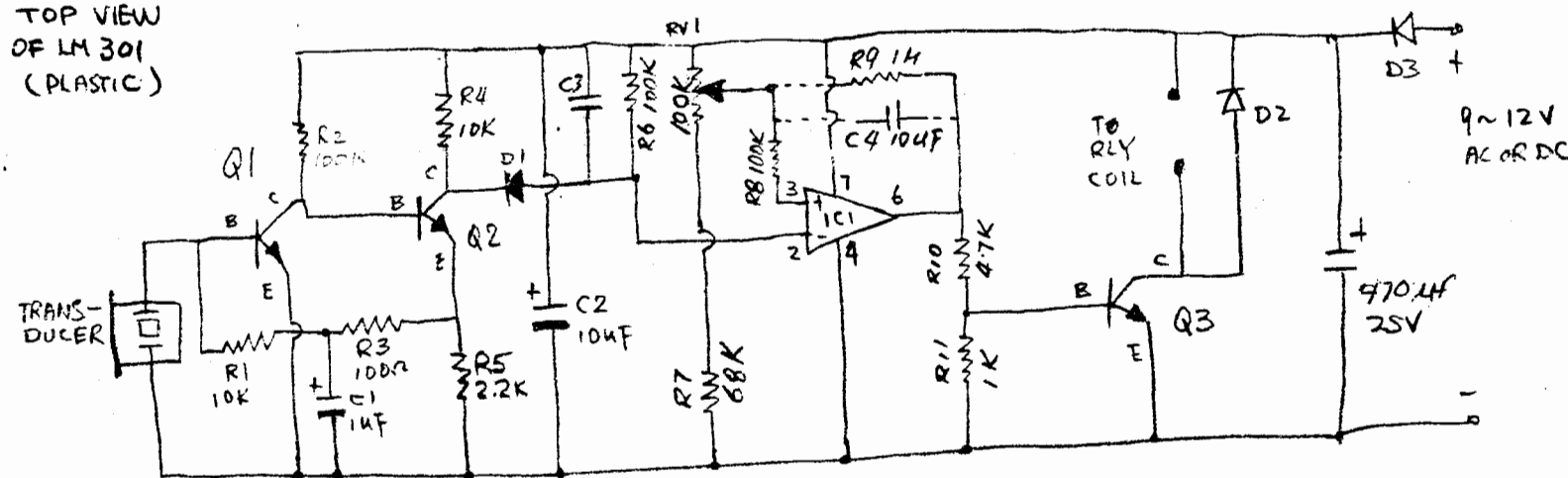
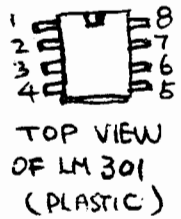
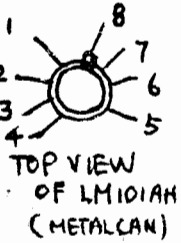
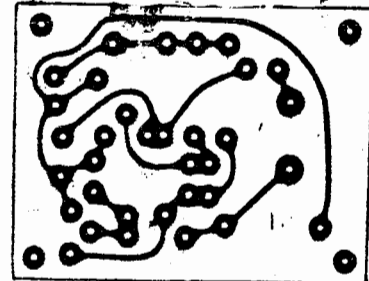
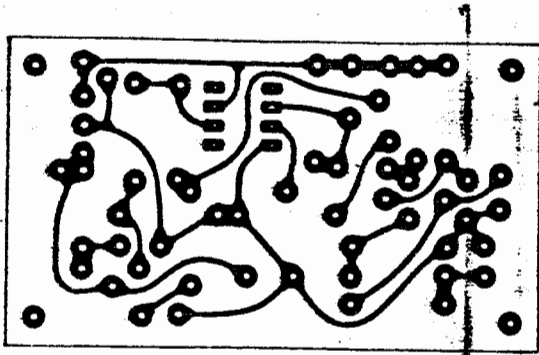
RECEIVER

R1 R4	10K res	2pc
R2 R6 R8	100K "	3pc
R3	100 "	lpc
R5	2.2K "	lpc
R7	68K "	lpc
R9	1M "	lpc
R10	4.7K "	lpc
R11	1K "	lpc
RV1	TRIM POT 50K	lpc
C1	1uF 25V cap	lpc
C2	10uF 25V cap	lpc
C3	0.47uF cap	lpc
C4	10uF non polarized cap	(not included)
C5 CAP	470uF 25V	lpc
Q1 Q2 Q3	NpN transistors	3pcs
IC 1	LM 301 or LM 301 op amp	lpc
D1	IN 914 switching diode	lpc
D2 D3	IN 4001 rectifire diode	2pc
UIR	ultra sonic transducer	lpc
P.C. board		lpc
RCA plug connector		lpc

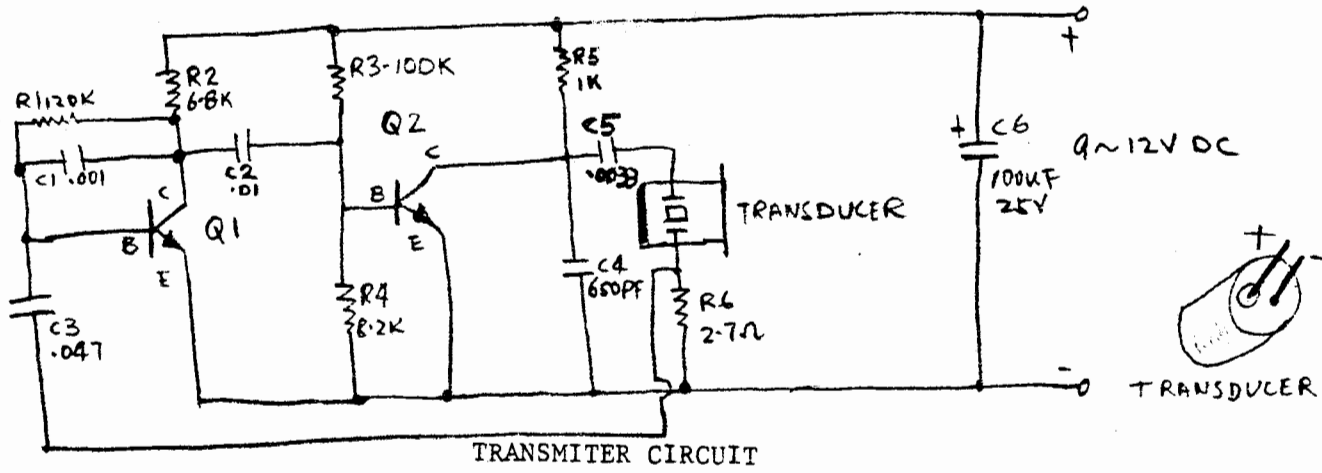


RECEIVER P.C. BOARD

TRANSMITTER P.C BOARD



* We do not use IC2 in the kit, connect the two holes with jumper wire.



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ERROR INFORMATION

PLEASE READ THIS BEFORE ASSEMBLY.

The silk screen on both the transmitter and receiver boards for the transistors is wrong. Originally it looks like FIG. 1. When you insert the transistors, you should do it according to FIG. 2.



FIG. 1

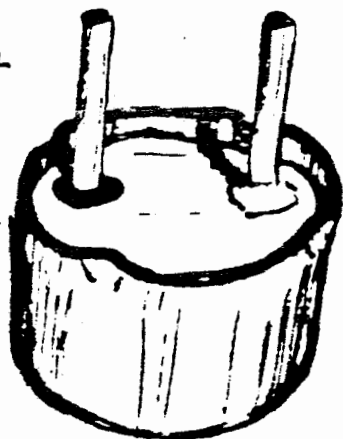


FIG. 2

RECEIVER TRANSMITTER
U1-R U2-T

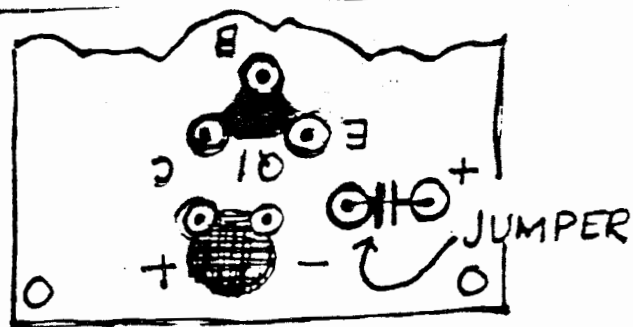
TRANSDUCERS

+ - GROUND

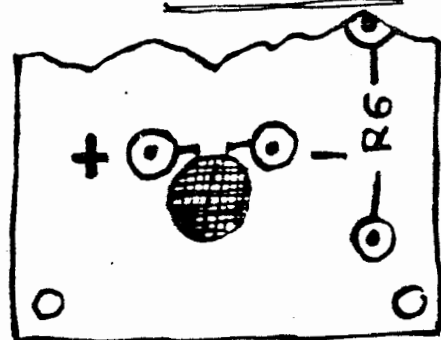


TRANSMITTER - SCS-4

RECEIVER - SCM-4



RECEIVER
TOP VIEW



TRANSMITTER