FUTURE KIT

HIGH QUALITY ELECTRONIC KITS

INFRARED BURGLAR ALARM TX-RX
CODE 505
LEVEL 2

The infrared burglar alarm circuit is an electronic device that makes a bell ring loudly if someone tries to enter a building by force. It utilizes unseenable infrared to be a checker and can be adjusted the delay to be proper with a place.

Technical specifications:
- power supply : 12VDC.
- consumption : 40mA.(stand by), 80mA.(working)
- delay on : 1 min.   - detect range : 8 m. (with len)
- maximum load: 10A@125VAC and 5A@220VAC
- PCB dimensions : 1.68 x 1.39 inches (TX)
                    3.43 x 2.13 inches (RX and control)

How to works:
There are 2 major functions as per following:

TRANSMITTER : IC1/1, IC1/2 and IC1/3 are created the different frequency. IC1/1 is created the low frequency 250Hz for control IC1/2 which IC1/2 will create the carrier frequency 37-41kHz. In the section IC1/4 is created the low frequency 10Hz. All frequency will be mixing by IC1/3 and transfer to TR1 for amplifying and presenting by LED infrared. For jumper J is used for display the operation of transmitter section.

RECEIVER AND CONTROL : The module receives the infrared light. IC in the module detect the low frequency through the OUT terminal and transmit to TR5 and TR4. The low frequency is amplified by TR5 and TR4. The collector of TR4 is connected passed on the switch. As the switch is turned to position 1, when someone blocked the circuit, IC1 functions to delay input about 30 seconds as well as LED3 lights. IC1 stop functioning and LED3 is unlighted. The IC2 works and LED4 light a minute. If the switch is turned to position 2, when the circuit was blocked, IC1 does not function and LED3 is unlighted so input time is not delayed. The input of IC2 is transmitted to TR9 to drive the relay to function. Everytime that IC3 works, the relay will also function. The OUT spot of the relay is connected to a warning alarm device. TR1 and TR2 are connected to be the output delay controlling IC1 and IC2. When the switch is firstly turned on, LED2 is unlighted and IC1 and IC2 do not function. The circuit delay approximately a minute. After that LED2 lights resulting IC1 and IC2 to work whenever the circuit is blocked. For jumper J is used for set LED5 to display the receiving of infrared module.

PCB assembly:
Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. All components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. The LED has a flat spot on the body which lines up with the line on the overlay. Now check that you really did mount them all the right way round!

Testing:
Turn the module to face LED INF in the distance of one meter. After that connect the power supply into the circuit. At this step the LED1 of the delay control section will light and after a minute, LED2 will light. Slice the switch to 1

position. Then cover the infrared module and undo.That results LED3 to light for 30 seconds and then be unlighted as well as LED4 light and the relay attract the contact face to contact. After that a minute later LED4 will be unlighted and the relay release the contact face. If the circuit functions in this fashion this indicates that it is pradtical. The distance between the transmitter and receiver can approximately be 8 meters. If the circuit is placed in a box and lens are provided for those sections. It can concise that the circuit delay a minute to work for owner's going out so if he accidentally blocks the infrared within that time, the circuit will not function. The delay time can be changed by adjusting C11.

NOTE: For LED5 is displayed the receiving signal from TX circuit. If RX circuit cannot receive the signal from TX circuit, LED5 is light off, adjust VR 10K at TX circuit until LED5 is blinking.

USING: For LED infrared at transmitter, you have to put the shrinkable tubing to LED infrared for control the infrared light. For MODLUE at receiver, you have to put the thick tube for protect the noise from sunlight.

Figure 1. Installing the componants

RESISTOR

R .....Ω

LED AND PHOTO DIODE

A   K

DIODE AND ZENER DIODE

JUMPER

JUMPER   OR   J

IC

IN GND OUT

ELECTROLYTIC CAPACITOR

C .....µF

Watch the polarity!

TRANSISTOR

B C E   B E   E C
NPN   PNP
TR   TR
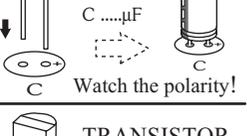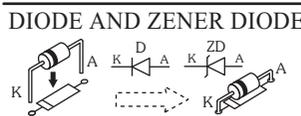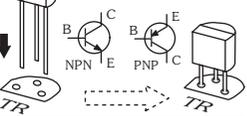
INFRARED MODULE

MODULE   MODULE
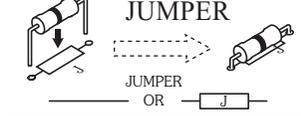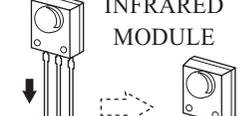
CERAMIC CAPACITOR

C .....µF
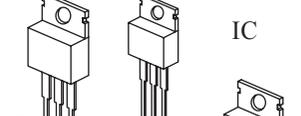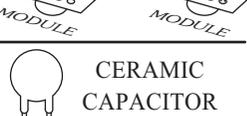
TRIMMER POTENTIOMETER
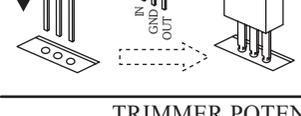
VR .....KΩ   VERTICAL   HORIZONTAL

1 3
2
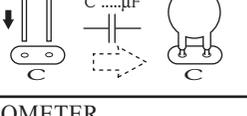
Troubleshooting:
The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.

TRANSMITTER
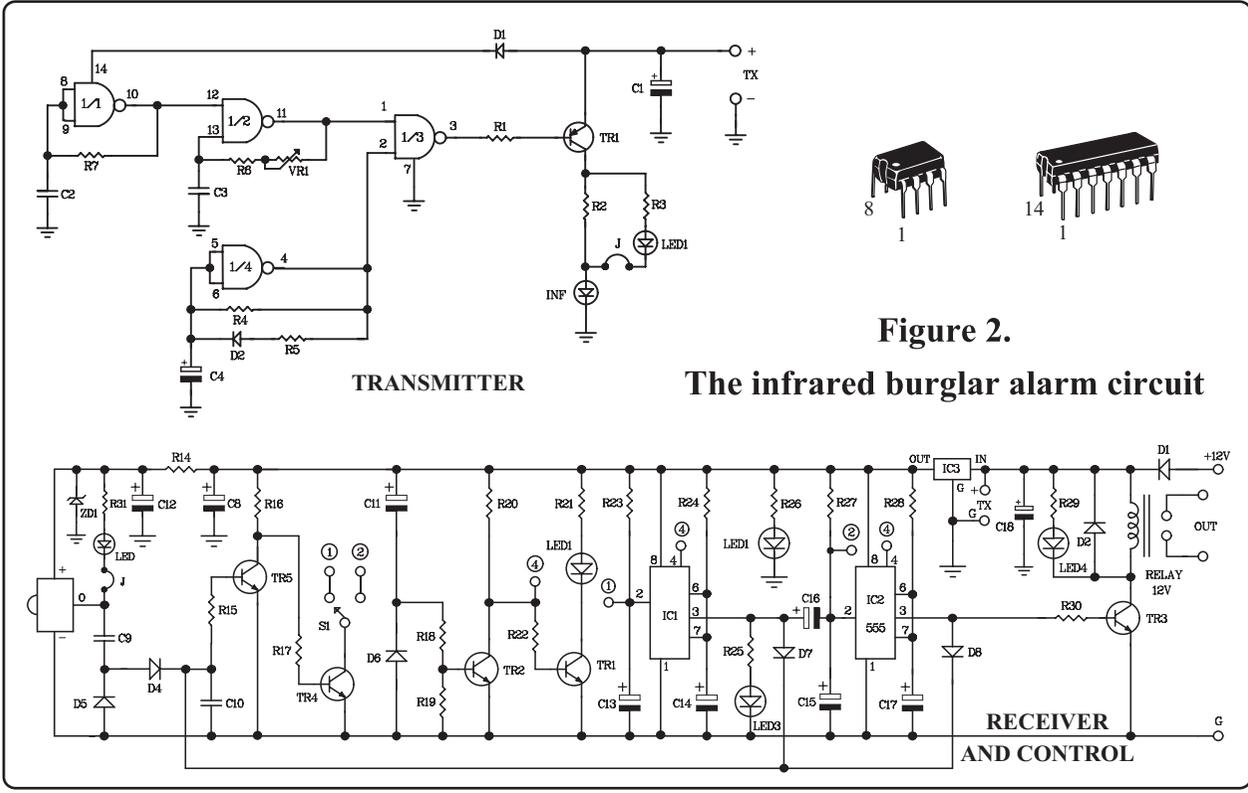
Figure 2.
The infrared burglar alarm circuit

RECEIVER AND CONTROL

Figure 3. Connections

NOTE:
FUTURE BOX FB17 is suitable for TX.
FUTURE BOX FB10 is suitable for RX.
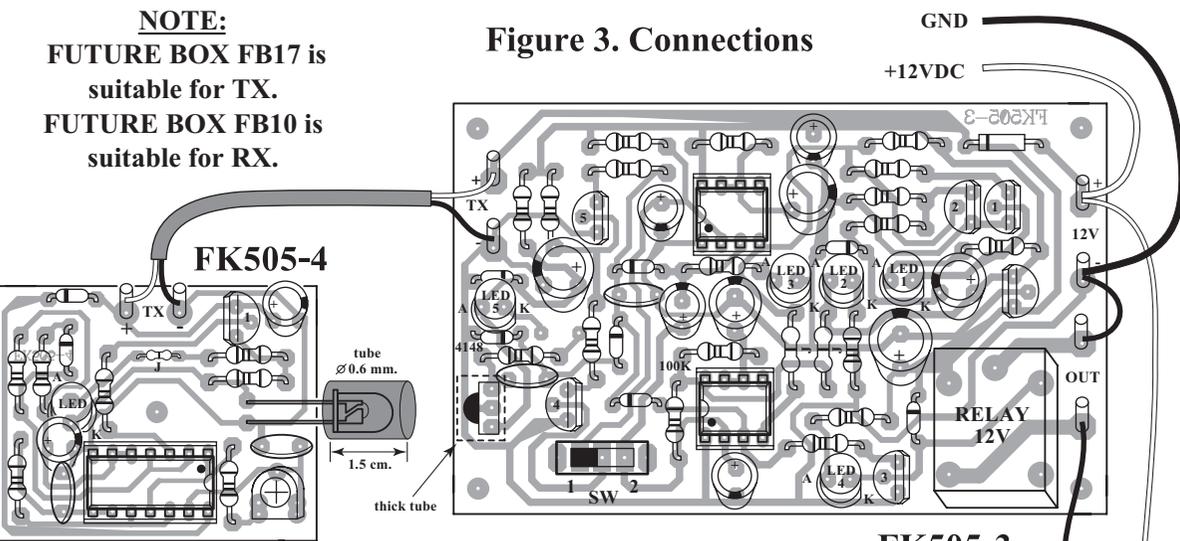
GND
+12VDC
12V
OUT
RELAY 12V
FK505-3
FK505-4
tube Ø 0.6 mm.
1.5 cm.
thick tube
SW
SIREN 12V

** Supposing the switch is at 1 position, when the infrared is blocked, LED3 will light. There is 30 seconds to turn off the switch before the connected warning alarm device will function. If the value of IC1 is increased, the delay time will be more. If the value is decreased, the time will be less. When the switch does not be turned off, after the delay time LED4 will light as well as the relay will connect the warning alarm circuit to function.

** Supposing the switch is at 2 position, when the infrared is blocked LED4 will immediately light and the relay connect the warning alarm device in a minute. Increase the value of C18 to let the alarm working longer and decrease to let the alarm functioning shorter. This position is suitable for a warehouse.