

**P13**

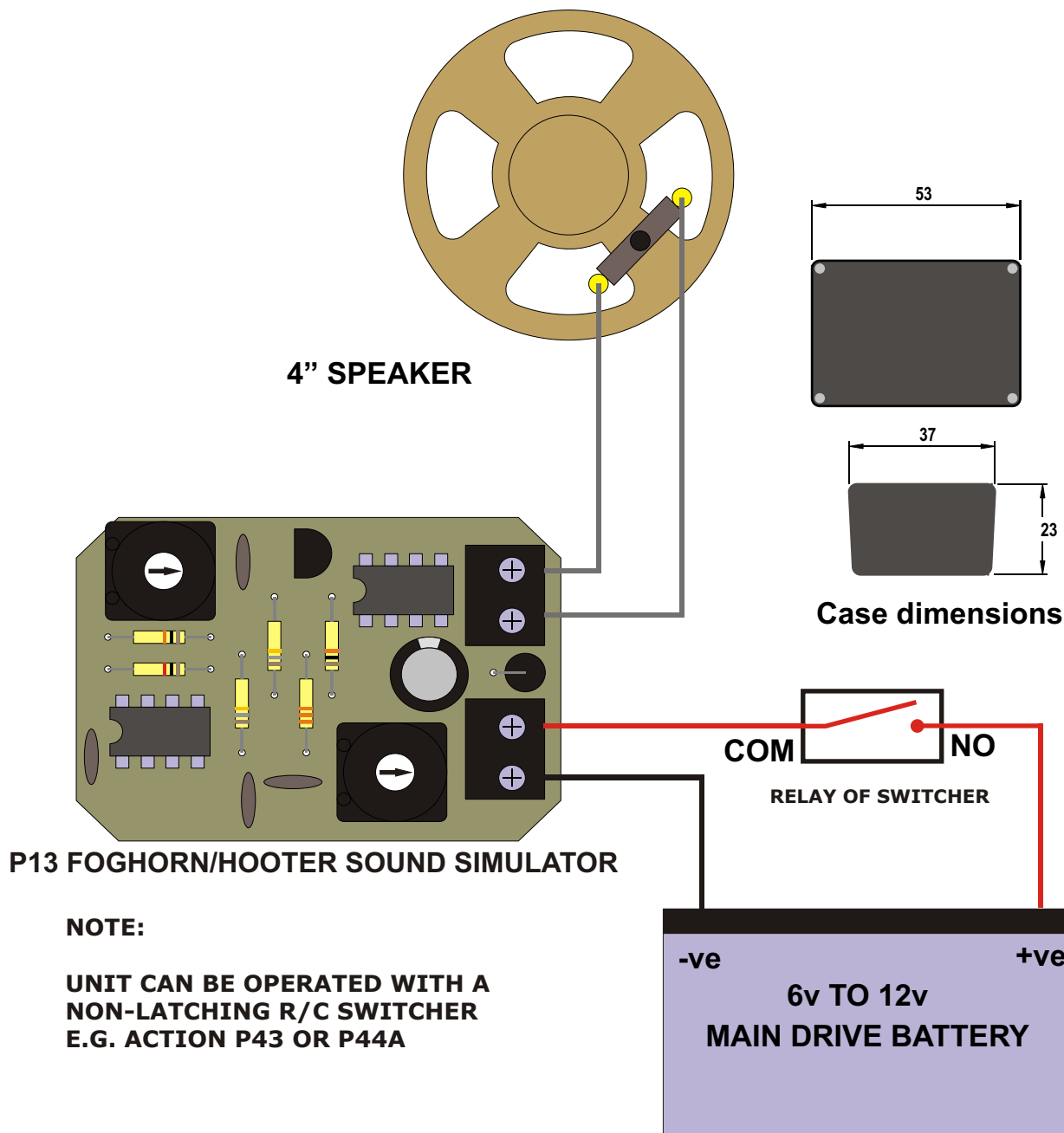
**FOGHORN/HOOTER**



This Foghorn/Hooter sound simulator is one of a series of sounds designed mainly for radio controlled scale model boats. It has an on-board 1 watt amplifier and produces the typical deep throaty tone of a ship's foghorn. Requiring a power supply of between 6 volts and 12 volts and a large 8 ohm speaker (see spec), it will enhance the appeal of many marine models. It will also require a non-latching switcher to operate it in a radio controlled model e.g. ACTION P43 or P44.

Voltage requirement  
Horn tone  
Volume control  
Connections  
Speaker  
Speaker impedance required  
Speaker size recommended

6 volt to 12 volt  
Adjustable  
Adjustable  
Screw connection  
(Not supplied)  
8 ohms  
Minimum 4 inch paper cone  
or as large as possible.



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Voltage requirement	6 volt to 12 volt
Horn tone	Adjustable
Volume control	Adjustable
Case size	54mm x 38mm x 23mm
Speaker	(Not supplied)
Speaker impedance required	8 ohms
Speaker size recommended	Minimum 4 inch diameter

**Note** The speaker for this project will determine the final sound. If you wish to adjust the tone to a foghorn sound it will require a minimum size of 4 inch cone speaker. If the unit is adjusted to a higher tone for a hooter a 3 inch mylar cone speaker will cope. For increased volume you might consider purchasing our P97 6Watt Audio Mixer/Booster Amplifier. See our website for details.

**Installation**

When the unit is installed in a radio controlled model, a switch of some kind will have to be inserted in the positive power line. The drawing shows an ACTION P43 fitted for this purpose; you will need a spare channel to operate it. Drill suitable holes in the ABS case for the wires to reach the screw terminal connector blocks, and use Velcro pads to secure the case to the inside of the model. Use a fine screwdriver to adjust the trimmers for volume and tone.

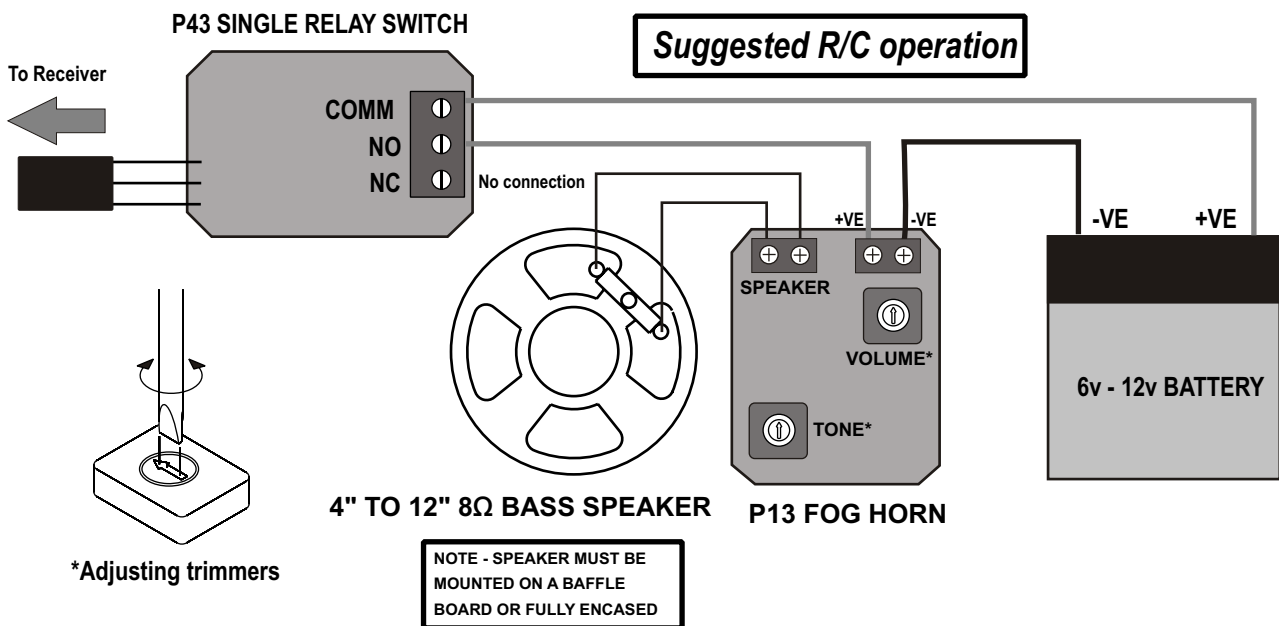
**Recovery service**

A recovery or repairs service ensures that you will not be left with a dead unit for any reason. The Service Charge for this kit is £13.00 including parts (including return shipping cost IN UK).

All returns should include full credit/debit card details:

Name of cardholder, Postal address, Card number, Expiry Date, Card Security Number)

**Action R/C Electronics, 1 Llwyn Bleddyn, Llanllechid, Bangor LI57 3EF, United Kingdom**

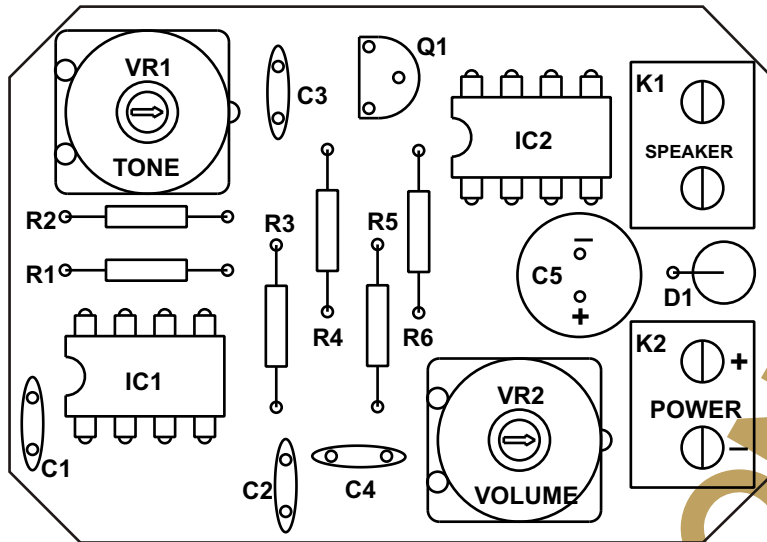


**These units are polarity-critical! Take care to connect the battery correctly!**

The small print.....  
 ACTION R/C Electronics guarantee all products to be free from manufacturing defects for 12 months from date of purchase. This does not cover suitability for specific applications; components worn or damaged by use, tampering or incorrect connection; alteration to original components; damage to batteries or other equipment through use; misuse, or shipping damage. Where goods are found to be faulty, the customer shall return them to ACTION R/C Electronics in their original condition and with their original instructions, packaging etc. Our liability is limited to repairing or replacing goods to their original specification and will not exceed the cost of the goods. By using the product the user accepts all liability. Where a fixed repair charge is applicable, ACTION R/C Electronics shall undertake repairs to the extent that they are judged economically viable. Where such is not the case then the customer will be offered the option of crediting the repair charge towards the cost of a new unit or having the faulty unit returned and the charge refunded (less the cost of return carriage). We reserve the right to modify this guarantee without notice.

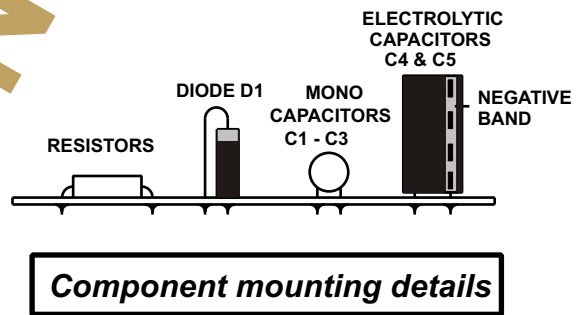
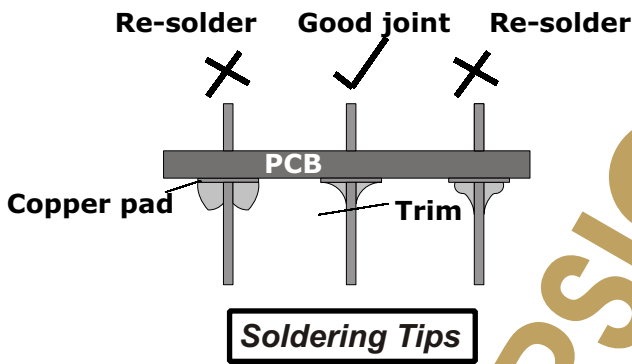


**P13 FOGHORN/HOOTER**  
Instructions for kit version



**Component positions**

**Resistor colour bands**



**PARTS LIST**

IC1	NE555 IC + IC SOCKET
IC2	TDA7052 IC + IC SOCKET
D1	1N4003 DIODE (black plastic)
Q1	2N3904 TRANSISTOR
R1	1K RESISTOR 1/4 WATT (BROWN/BLACK/RED)
R2,6	10K RESISTOR 1/4 WATT (BROWN/BLACK/ORANGE)
R3,4	180K RESISTOR 1/4 WATT (BROWN/GREY/YELLOW)
R5	33K RESISTOR 1/4 WATT (ORANGE/ORANGE/ORANGE)
VR1	220K MIN ENCLOSED HORIZONTAL PRESET
VR2	4K7 MIN ENCLOSED HORIZONTAL PRESET
C1,3,4	0.1uF MONOLITHIC CERAMIC (marked 104)
C2	0.01uF MONOLITHIC CERAMIC (marked 103)
C5	220uF MIN RADIAL ELECTROLYTIC CAPACITOR
CONNS	TWO TWIN CONNECTOR BLOCKS
CASE	TYPE RX2008
PCB	TYPE P13V2
WIRE	not supplied - Any thin flexible
SPEAKER	not supplied - 8 Ohm impedance, and as large a diameter as can be accommodated.

## P13 Kit Instructions

### PCB

The PCB for this Project is fully prepared and requires no additional work. Look carefully at the area of the PCB you are working on when soldering to ensure that you do not apply an "extra" connection with a splash of solder during assembly.

### TOOLS

For construction you will require a soldering iron and flux-cored solder (22 SWG recommended); a small pair of wire cutters; a small screwdriver for adjustment and a good level of light.

### PARTS

- The short bars with colour bands and a wire at each end are resistors. They are coded as directed in Resistor Colour Bands & Parts List.
  - The tubular Electrolytic Capacitor (C5) is marked with the value and working voltage; it also has a band down one side of the plastic sleeve with (-) Negative signs on it which signifies which leg goes to the negative. Capacitor polarisation (+ and -) are clearly shown on Component Positions.
  - The small Monolithic Capacitors C1, C2, C3 & C4 (usually coated Blue or Tan) are not polarised and can be fitted either way.
  - Both 8 pin Integrated Circuits (ICs) are marked with their type code, see Parts List. They are supplied with sockets. This will enable the builder to solder in the sockets during construction, then fit the ICs at the end of construction.
  - The Transistor Q1 is a 2N3904 and has this type code printed on it.
  - The black rod with a wire each end and the type code printed on it (1N4003) is a Diode (D1). It also has a silver bar printed around one end which is used to identify which way round it goes.
  - The adjustable trimmers VR1 and VR2 have a screwdriver slot in the middle which is used to make adjustments to tone and volume. Note that the two are different values in this kit. Both have the value printed on one end.
  - The two 2 pin Screw Connectors describe themselves and are marked on Component Positions as K1 and K2.

### CONSTRUCTION

- I would suggest that you fit the sockets for IC1 and IC2 first; it will help to give you your bearings as to what goes where. Note the small notch at one end of the plastic moulding and ensure that it is fitted as shown in the drawing Component Positions, soldering all pins carefully. The ICs themselves can be plugged into the sockets as the last operation of construction.
  - The resistors can be fitted next; the only thing to watch for is that the correct values go to the right places. It should all be clear with reference to the Component Positions drawing, Component Mounting Details and the Parts List. As each resistor is fitted and soldered, the spare wire should be cut off close to the PCB to keep the whole job looking tidy. Soldering Tips may help if you are inexperienced with a soldering iron.
  - When all the resistors have been fitted, the small capacitors come next. Fit the monolithic ceramic capacitors C2 (marked 103) and C1, C3 & C4 (marked 104) either way round, again cutting off the spare wires.
  - The Electrolytic capacitor, C5 (220uF) can now be fitted and this type has to be fitted the correct way round. As was said in the PARTS section, the negative is marked on the component and positive and negative signs are marked on the diagram Component Positions (see also Component Mounting Details) to make sure you connect it correctly.
  - Next components to be fitted are the adjustable presets VR1 (marked 220K) then VR2 (marked 4K7), mounted as per Component Positions
  - The two twin connector blocks can now be soldered into the appropriate positions (the four larger holes at one end of the PCB). Note that the wire-insertion holes face to the outside of the PCB.
  - The small 3 legged transistor Q1 can now be fitted and soldered. The shape, and hence fitting direction, is shown clearly on Component Positions. Cut off the spare wires.
  - Last component to solder is the Diode D1. IMPORTANT Bend the wire as per Component Mounting Details then solder as per Component Positions layout. If this is done as described, exactly as drawn, the component will be the right way round i.e. with the silver bar at the top of the component and the bare lead in the hole nearest to C5. Again cut off the spare wires.
  - Time to fit IC1 & IC2 in their sockets. Ensure that the notch is exactly as per Component Positions and that the right one goes in the right socket, then all will be well.
  - That's it; the PCB construction is complete. Set the little volume control and tone control presets to centre position. The rear of the board can now be cleaned with something like an old toothbrush and some spirit cleaner. Meths will do but Isopropyl is very much better. Then check all over the soldered side of the board for good joints and no solder bridges between tracks or round pads.

### TESTING

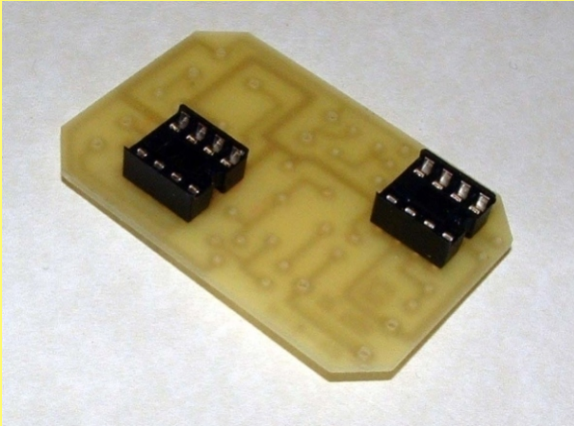
Having built the unit it's simply a matter of connecting two wires from the Block marked SPEAKER to your speaker; red (+) and black (-) power wires to whatever battery pack you are using. When the power is applied sound will be heard. Adjust the tone and the volume control to a setting that suits you and the speaker you are using. The amplifier IC (TDA7052) gets uncomfortably hot to the touch if the unit is run for anything more than a short blast; don't worry, it has temperature protection built in. The range of control had to take into account units that are run on low voltages.

### SPEAKER

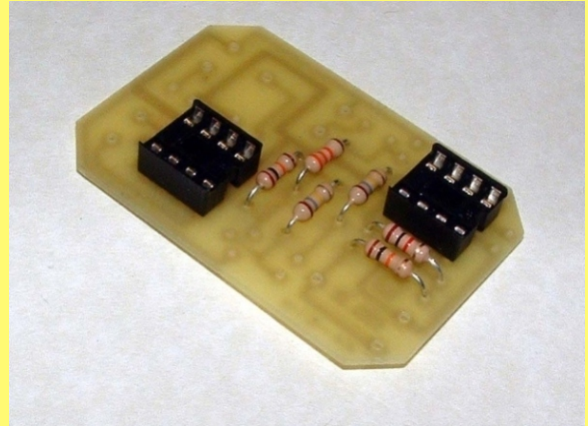
This will determine the final sound output to a great degree. In straightforward terms, the bigger the better, with an absolute minimum diameter of 100mm for this project. A speaker requires a case or rather an enclosure of some kind to present the best sound. The minimum requirement is a baffle (a flat piece of plywood, plasticard or similar about twice the speaker cone area, with a hole cut almost as big in diameter as the speaker) which should be fastened to it. Speakers of 100mm and above are normally screw-mounted and holes are provided in the speaker for them. You would need small nuts and bolts if the board is 6mm or less in thickness. Of course, the baffle could be the deck or superstructure; it is the problem of disguising the screws and sound hole that would cause the biggest problem. The speaker can be mounted at the bottom of the hull and a plastic drainpipe tube can bring the sound up to deck level, where a small hole (say 25mm diameter) would let the sound out. The secret is stopping the sound from the front of the cone reaching the sound from the rear of the cone; if they meet, they cancel out and produce zero sound. If you can provide an enclosed area (usually easy on a model boat but can be difficult in other models) and mount this baffle so as to seal up the space, you will be providing the best installation for the Project. Mylar cone, waterproof speakers are a good idea for marine installations but unfortunately will not handle bass (low) frequencies.

# P13 FOGHORN SOUND

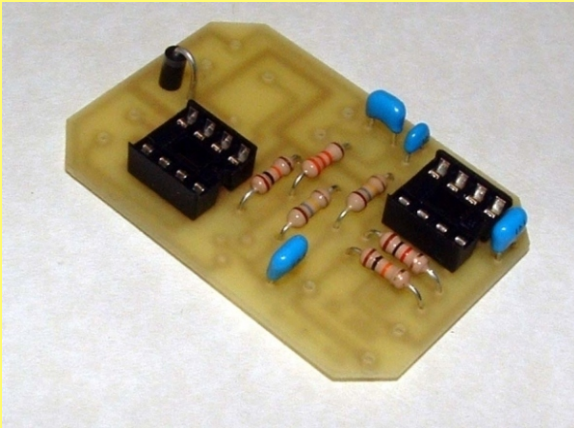
## PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



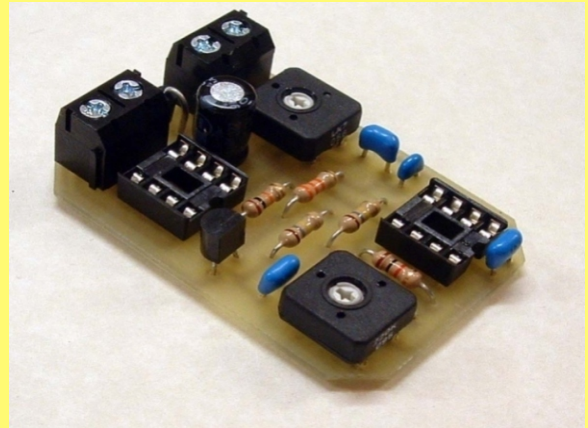
Picture 1 - PCB with two I/C sockets fitted.



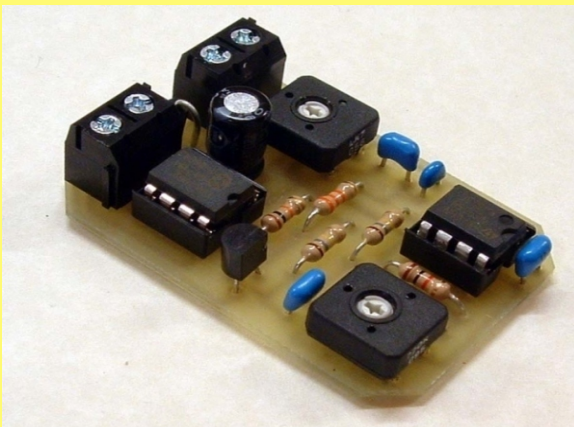
Picture 2 - PCB with resistors added.



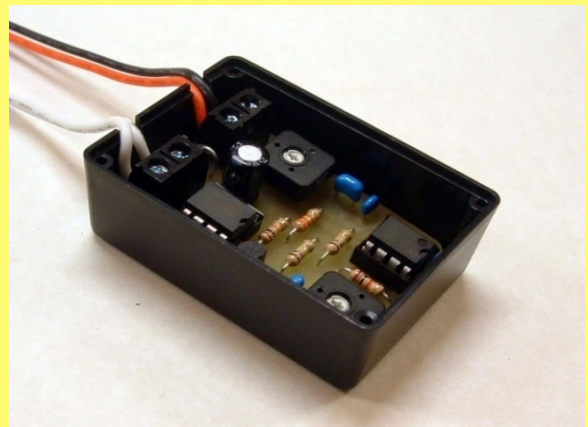
Picture 3 - Fit monolithic capacitors & diode



Picture 4 - Fit transistor, electrolytic cap, screw terminal blocks & pre-sets



Picture 5 - Fit I/C chips. NOTE ANTI-STATIC PRECAUTIONS ARE REQUIRED!



Picture 6 - File slots in case for cables.



Picture7 - Finished unit, cased with sticker