

**P29**

# STEAM WHISTLE/HORN



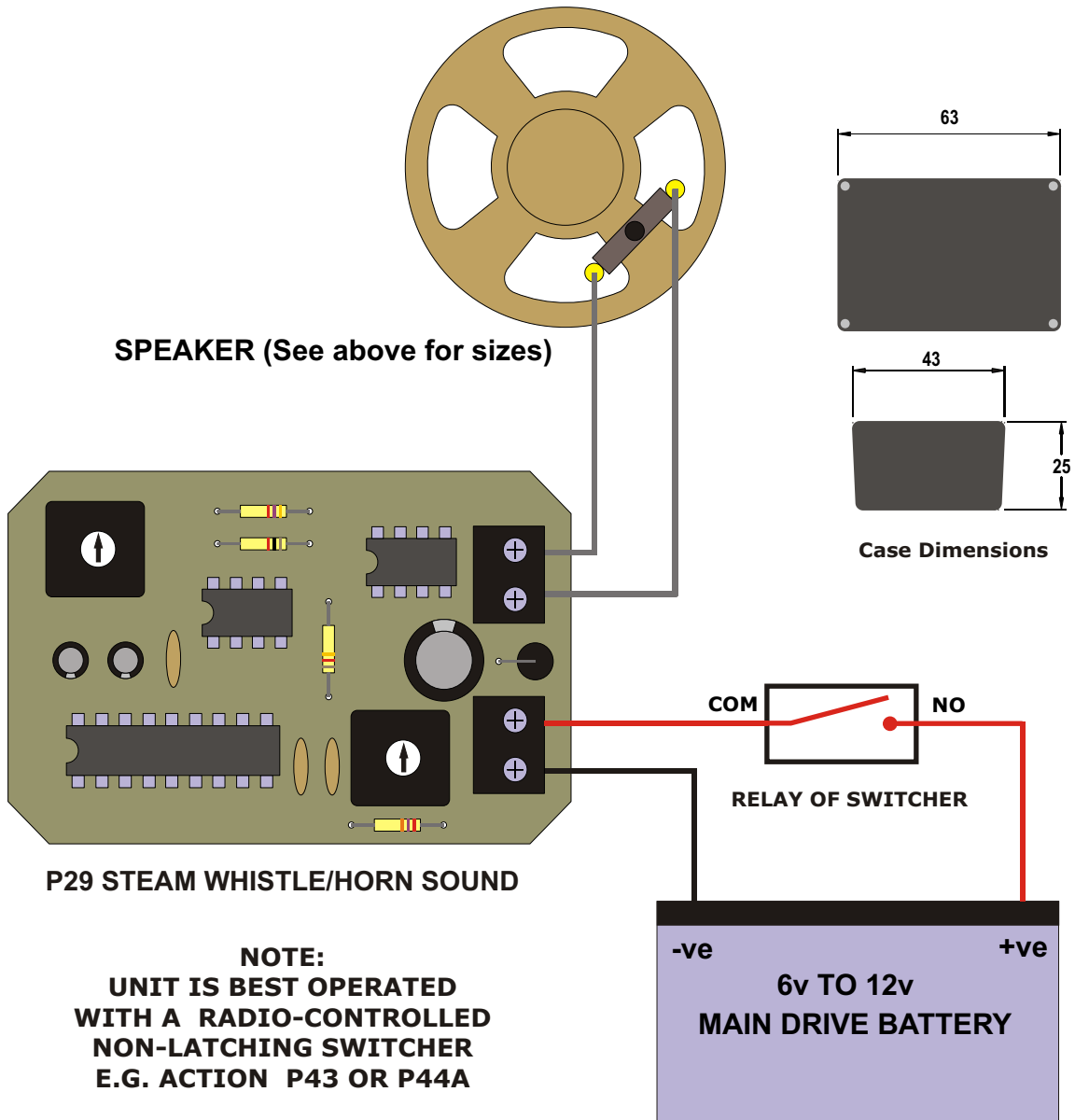
This Steam Whistle/Horn sound simulator is one of a series of sounds designed mainly for radio-controlled scale model boats. It has an on-board 1 watt amplifier and produces the typical high-pitched steam whistle or the deep throaty tone of a steam horn. Requiring a power source of between 6 volts and 12 volts and either a small speaker for whistle sounds or a large 8 ohm speaker for horn sounds (see below), it will enhance the appeal of many marine models. It will also require a switcher to operate it in a radio controlled model. See current ACTION lists for suitable units.

**Voltage requirement**  
**Whistle - horn tone**  
**Volume**

**6 volt to 12 volt**  
**Adjustable**  
**Adjustable**

**Connections**  
**Speaker impedance required**  
**Speaker size recommended for whistle**  
**Speaker size recommended for horn**

**Screw connection**  
**8 ohms (Not supplied)**  
**2 inch to 4 inch mylar cone**  
**4 inch mylar cone (Minimum)**



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Voltage requirement	6 volt to 12 volt
Whistle/Horn tone	Adjustable
Volume	Adjustable
Connections	Screw connection
Case size	64mm x 45mm x 25mm
Speaker impedance required	8 ohms (Not supplied)
Speaker size recommended for whistle	Minimum 2 inch to 4 inch mylar cone
Speaker size recommended for horn	Minimum 4 inch mylar cone or as large as possible.

**Note**

The speaker for this project will determine the final sound. If you wish to adjust the tone to a 'horn sound' it will require a minimum size of 4 inch speaker. If the unit is adjusted to a higher tone for a whistle then a 2" to 3" mylar cone speaker will cope.

**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 volume & tone trimmers.

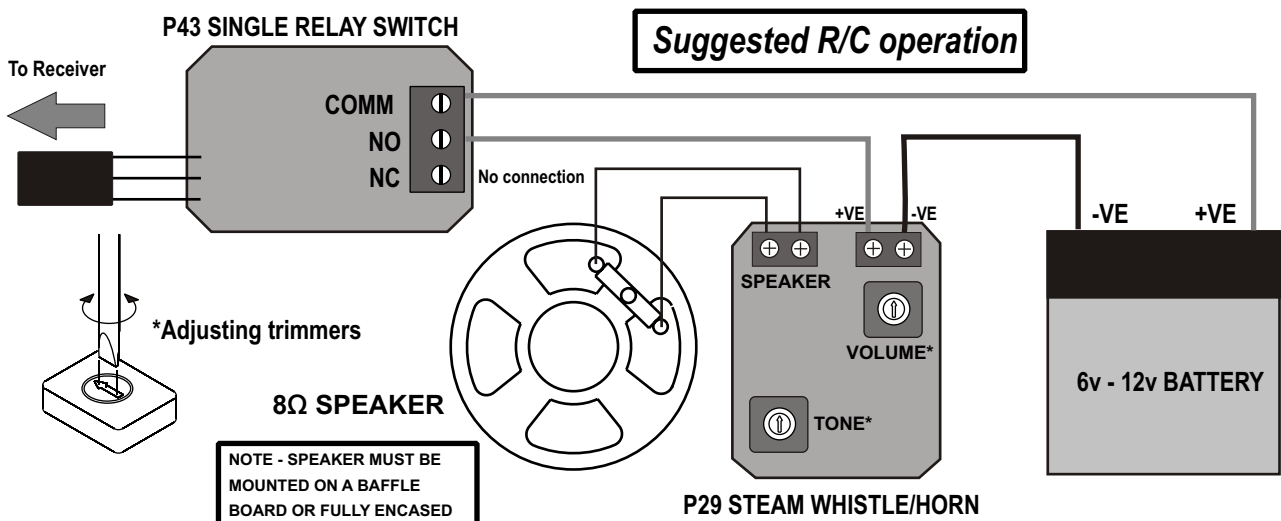
**RECOVERY SERVICE**

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 & Address of cardholder, Card Account Number, Expiry Date, Card Security Number)

**Action R/C Electronics, 1 Llwyn Bleddyn, Llanllechid, Bangor LL57 3EF, United Kingdom**



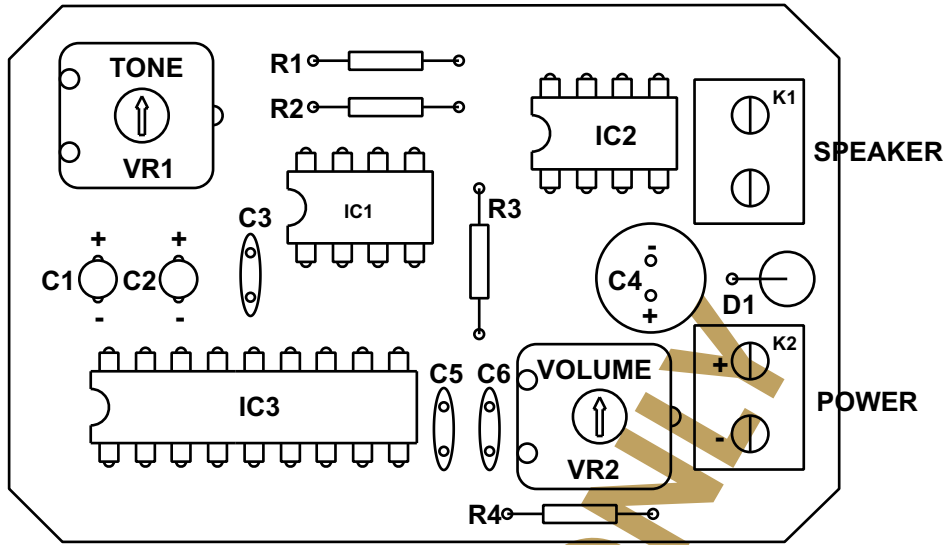
**These units are polarity-critical! Take care to connect the battery correctly!**

The small print.....

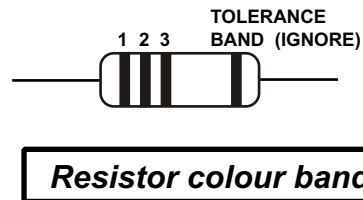
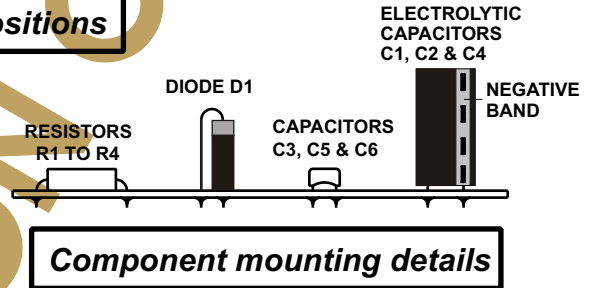
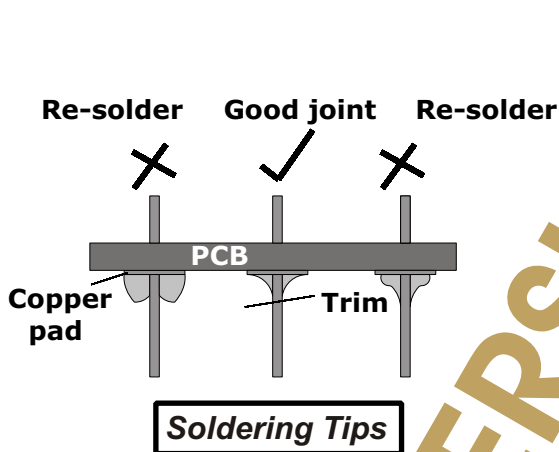
ACTION R/C Electronics guarantee all products to be free from manufacturing defects for 12 months from date of purchase. This does not cover suitability for specific applications; components worn or damaged by use, tampering or incorrect connection; alteration to original components; damage to batteries 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.



**P29 STEAM WHISTLE/HORN SOUND**  
Instructions for kit version



**Component positions**



**PARTS LIST**

- |         |  |
|---------|--|
| IC1     | NE555 IC + IC SOCKET   |
| IC2     | TDA7052 IC + IC SOCKET   |
| IC3     | UNMARKED CUSTOM IC (18 pin) + IC SOCKET                            |
| D1      | 1N4003 DIODE (black plastic)                                       |
| R1      | 4.7K RESISTOR 1/4 WATT (YELLOW/MAUVE/RED)                          |
| R2      | 1K RESISTOR 1/4 WATT (BROWN/BLACK/RED)                             |
| R3      | 120K RESISTOR 1/4 WATT (BROWN/RED/YELLOW)                          |
| R4      | 27K RESISTOR 1/4 WATT (RED/MAUVE/ORANGE)                           |
| VR1     | 220K MIN ENCLOSED HORIZONTAL PRESET                                |
| VR2     | 4K7 MIN ENCLOSED HORIZONTAL PRESET                                 |
| C1,2    | 1uF MIN RADIAL ELECTROLYIC CAPACITOR                               |
| C3,5,6  | 0.1uF MONOLITHIC CERAMIC (marked 104)                              |
| C4      | 220uF MIN RADIAL ELECTROLYIC CAPACITOR                             |
| K1, 2   | TWO WAY SCREW CONNECTOR BLOCKS                                     |
| CASE    | TYPE RX2009  |
| PCB     | TYPE P29A  |
| WIRE    | (not supplied with kit) - Any thin flexible will do                |
| SPEAKER | (not supplied with kit) - 8Ω, and as large as can be accommodated. |

## P29 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 the operation.

### 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

- All the parts for the kit should be laid out on a clean surface so that they can be correctly identified.
  - The short bars with colour bands and a wire at each end are resistors. They are colour coded as directed in Resistor Colour Bands and the Parts List.
  - The tubular Electrolytic Capacitors (C1,C2, C4) are marked with the value and working voltage; they also have a band down one side of the plastic sleeve with (-) Negative signs on it which signifies which leg goes to the negative Capacitor polarisations (+ and -) are clearly shown on Component Layout.
  - The small Monolithic Capacitors C3, C5, & C6 (usually coated Blue or Tan) are not polarised and can be fitted either way round.
  - Both 8-pin Integrated Circuits IC1 & IC2 are marked with their type code; see Component Positions together with the Parts List. IC3 is an 18-pin device unmarked (CUSTOM IC). All ICs 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 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. Bend its wire as per Component Mounting Details and fit as per Component Layout; that way it will be fitted the correct way round.
  - 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. Each have their value printed on one end.
  - The two 2-pin Screw Connectors are easily identified and are marked on the drawing as K1 and K2.

### CONSTRUCTION

- I would suggest that you fit the sockets for IC1, IC2 and IC3 first; it will help to give you your bearings as to what goes where. IC3 is an 18-pin and ICs 1 & 2 are 8-pin. Note the small notch at one end of the plastic moulding in each case and ensure that they are fitted as shown in the drawing, 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 layout 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 C3, C5 and C6 (marked 104) either way round, again cutting off the spare wires.
  - The Electrolytic capacitor, C1 & C2 (1uF) & C4 (220uF) can now be fitted and this type has to be fitted the correct way round. The negative lead is marked on the component and positive and negative signs are marked on the layout diagram. See also the Component Mounting Detail drawing, to make sure you connect them correctly.
  - Next components to be fitted are the adjustable presets VR1 (marked 220K); then VR2 (marked 4K7); both mounted as per the drawing.
  - The two twin connector blocks K1 & K2 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.
  - Last component to solder is the Diode D1. **IMPORTANT** Bend the wire as per Component Mounting Details then solder as per layout. If this is done as described, exactly as per the drawings, the component will be the right way round i.e. with the silver bar uppermost.
  - Time to fit the ICs IC1, IC2 & IC3 in their sockets. Ensure that in each case the notch is at the right end of the socket and that the right one goes into each 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.

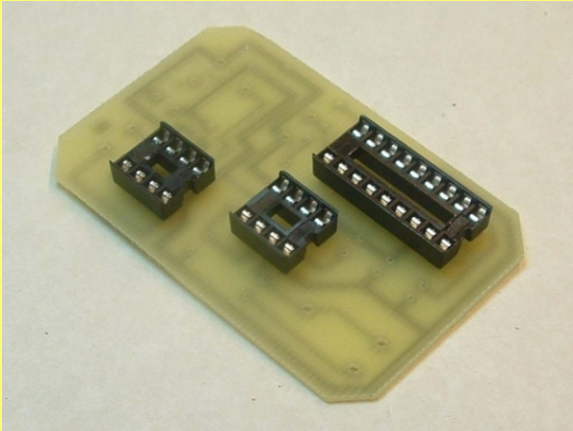
### COUPLING ACTION SOUND PROJECTS

The unit must have its own speaker but up to 4 SOUNDS can be mixed into one speaker with an ACTION Mixer Amplifier P34 or P97 6 Watt Audio Mixer/Booster Amplifier.

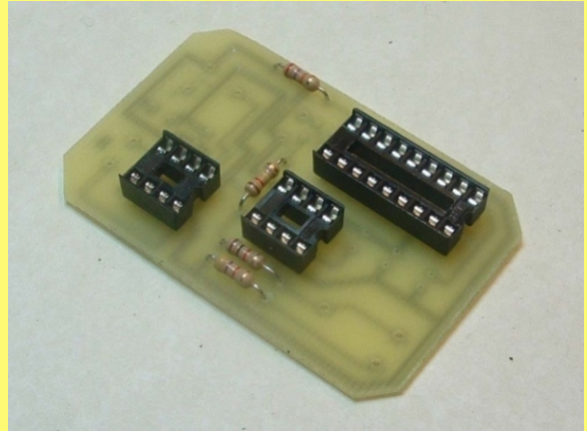


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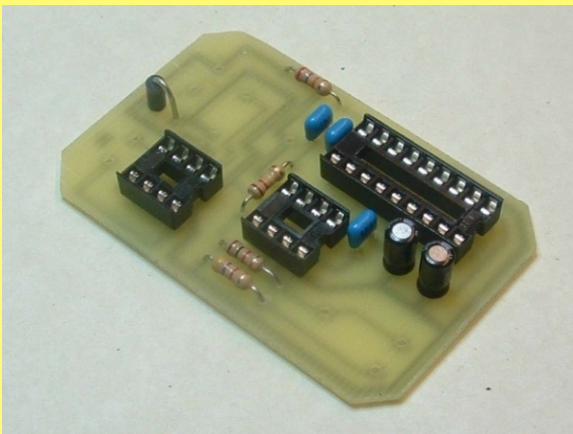
## PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



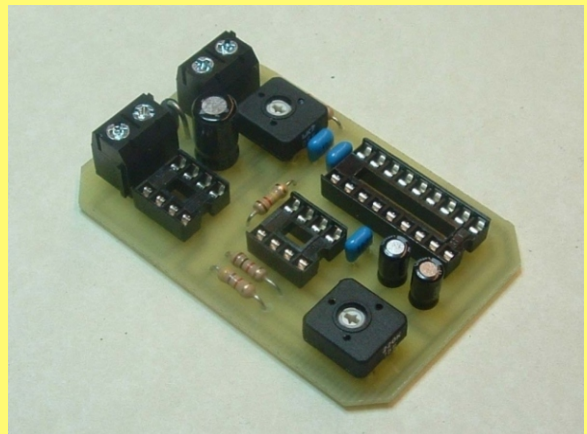
PICTURE 1: PCB with 3 x I/C sockets fitted



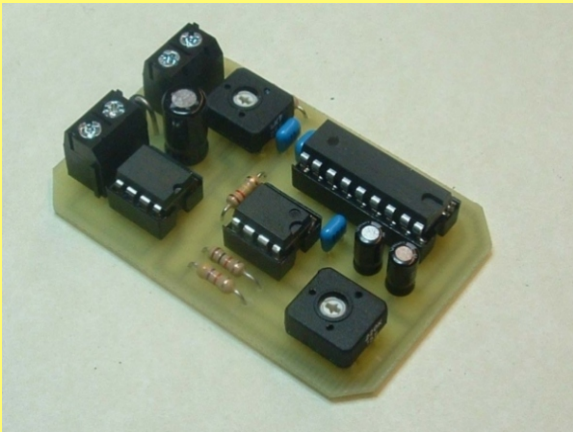
PICTURE 2: Resistors added



PICTURE 3: Monolithic and small electrolytic caps fitted; also diode D1



PICTURE 4: Large electrolytic cap, screw terminals and presets added



PICTURE 5: Fit 3 x I/Cs NOTE! ANTI-STATIC PRECAUTIONS REQUIRED



PICTURE 6: File slots in case for cables



PICTURE 7: Finished unit, cased with sticker