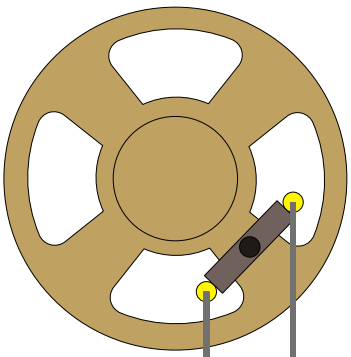
P14 DESTROYER SOUND SIMULATOR

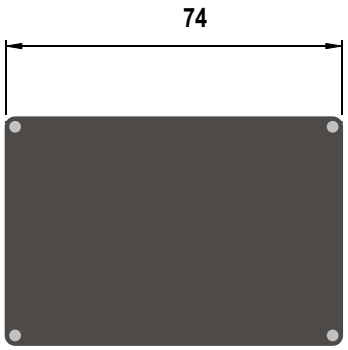
ACTion R/C ELECTRONICS

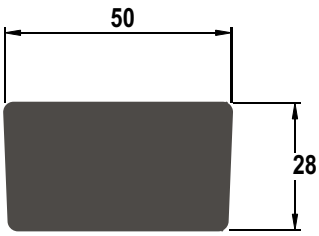
This destroyer sound gives a simulation of the well known "whoop whoop" of a destroyer. Sounds similar to this can be heard from warships around the world. Differences in tone and rate of ramp can be adjusted for the various versions used by the world's navies. The unit can be switched on by radio and a drawing is supplied which gives details of using a switch or switcher connection. You will require a spare channel (i.e. more than 2 channels) to operate it. It will enhance the appeal of many greyship subjects. See ACTion lists for details of suitable switchers.

Voltage requirement	**6 volt to 12 volt**
Connections	**Screw connection**
Speaker	**8 ohm x 2 inch to 3 inch mylar**
Maximum wattage output	**1 watt**

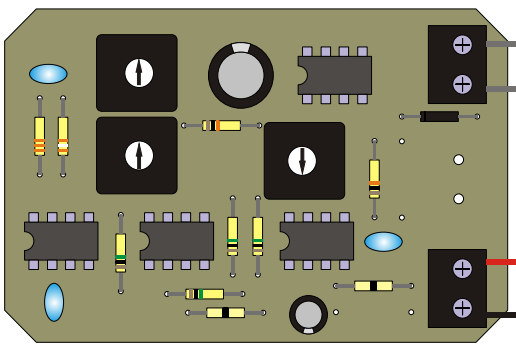


2in TO 3in SPEAKER





Case Dimensions



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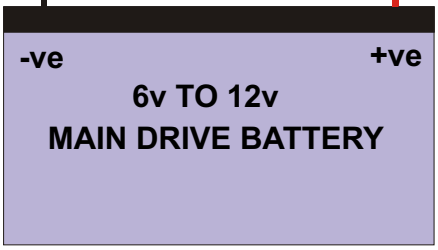
RELAY OF SWITCHER



***NOTE:**
UNIT IS BEST OPERATED WITH A NON-LATCHING R/C SWITCHER E.G. ACTION P43 OR P44A

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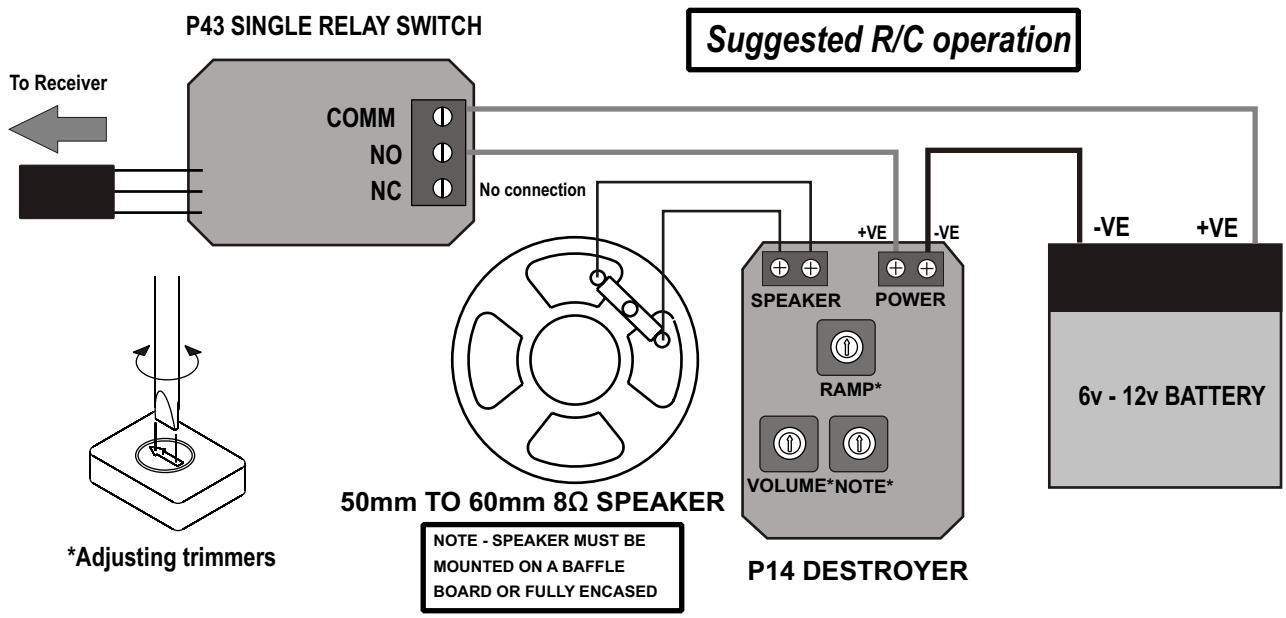
This sound card gives a simulation of the well known "whoop whoop" of a destroyer. Sounds similar to this can be heard from warships around the world. Differences in tone and rate of ramp can be adjusted for the various versions used by the world's navies. The unit can be switched on by radio and the drawing shows the use of an ACTion P43 switch. You will require a spare channel (i.e. more than 2 channels) to operate it. It will enhance the appeal of many grey-ship subjects.
The TDA7052 amplifier chip fitted to P14 can get uncomfortably hot to touch with continuous use so it's best to restrict the sound to short blasts.
For increased volume you might consider fitting an ACTion P97 6 Watt Audio Mixer/Booster Amplifier.

Voltage requirement	6 volt to 12 volt
Connections	Screw connection
Speaker	8 ohm x 50mm to 66mm mylar would be most suitable.
Maximum wattage output	1 watt
Case size with screws	73.5mm x 49.5mm x 28.5mm

Installation/Operation
The unit will require either a switch or a radio-controlled relay switcher for operation e.g. ACTion P43. 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. Connect as shown; use a fine screwdriver to adjust volume etc.

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 within the UK).
All returns should include full Credit Card details (Name & Address of cardholder, Card 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!

ACTion R/C ELECTRONICS

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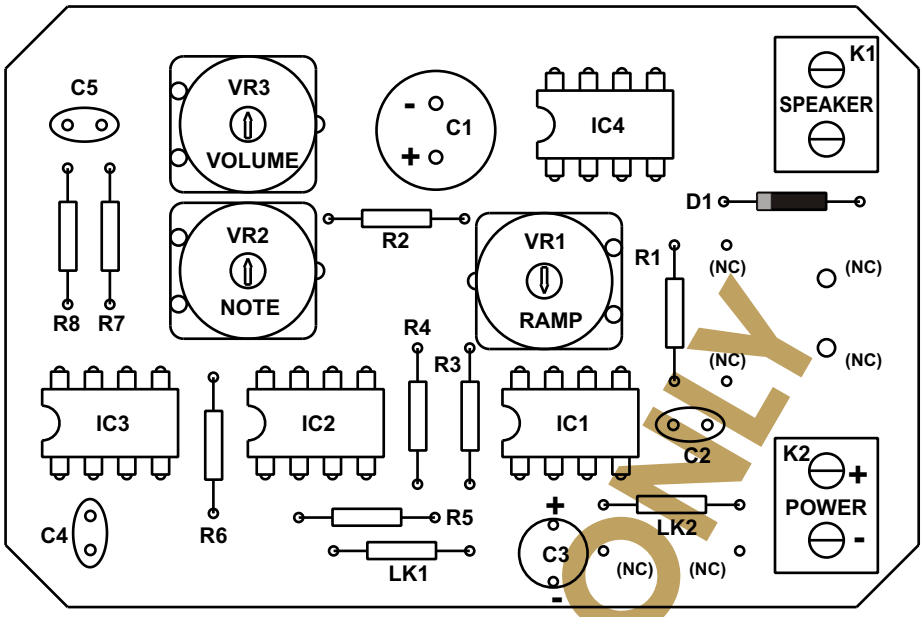
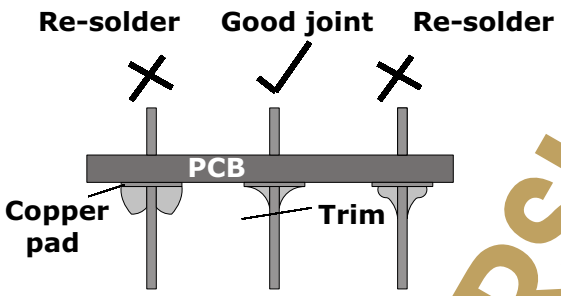
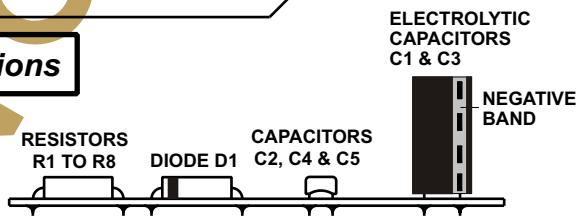
Instructions for kit version



Component positions



Soldering Tips



Component mounting details

Resistor colour bands

PARTS LIST

IC1,3	555 IC & 8 PIN IC HOLDERS
IC2	LM358 IC & 8 PIN IC HOLDER
IC4	TDA7052 IC 8 PIN IC HOLDER
D1	PLASTIC 1 AMP DIODE 1N4003
R1,2,	10K RESISTOR 1/4 WATT (BROWN/BLACK/ORANGE)
R3,4,5,6,	1M RESISTOR 1/4 WATT (BROWN/BLACK/GREEN)
R7	39K RESISTOR 1/4 WATT (ORANGE/WHITE/ORANGE)
R8	33K RESISTOR 1/4 WATT (ORANGE/ORANGE/ORANGE)
LK1,2	ZERO OHM RESISTOR or LINK (CENTRAL BLACK BAND)
VR1	1M MIN ENCLOSED HORIZONTAL PRESET
VR2	220K MIN ENCLOSED HORIZONTAL PRESET
VR3	4K7 MIN ENCLOSED HORIZONTAL PRESET
C1	220uF 16V MIN RADIAL ELECTROLYIC CAPACITOR
C2,4,5	0.01 uF MONOLITHIC CERAMICS (marked 103)
C3	2.2uF 63V MIN RADIAL ELECTROLYIC CAPACITOR
CONNS	TWO x TWIN SCREW-CONNECTOR BLOCKS
CASE	TYPE RX2010 with 4 screws
WIRE	Any flexible type. Not supplied with kit.
SPEAKER	8 Ohm impedance x 2.5" diameter (or larger if possible). Not supplied with kit.

P14 Kit Instructions

REQUIREMENTS
This Sound Project requires a drive battery in the range of 6 Volts to 12 Volts. It can be controlled by a simple toggle/push button switch or a radio-controlled switcher (see current ACTion lists for details). The unit will drive an 8 Ohm speaker at up to 1 Watt. Mixing this and up to three other ACTion sounds into one speaker will require a P34 or P97 Mixer Amp. This has inputs and power distribution for up to four ACTion sound units.

PCB
The PCB for this Project is fully prepared and requires no additional work.

TOOLS
For construction you will require a soldering iron and flux cored solder; a small pair of wire cutters; a small screwdriver for adjustment and connection. A good level of light is recommended.

PARTS
All the parts for the kit should be laid out on a clean surface so that they can be correctly identified.
The resistors are colour coded as directed in the Parts List, see also Resistor Colour Bands diagram. The resistor-looking items with one black central band are in fact Zero Ohm resistors or links (LK1 and 2).
The Electrolytic Capacitors are marked with the value and working voltage and a vertical bar with Negative signs on it which signifies which leg goes to the negative. The opposite leg of the capacitor, of course, goes to the positive. All capacitor polarizations are shown on Component Positions.
The small Monolithic Ceramic (coated) Capacitors are not polarised and can be fitted either way round.
All four ICs are marked with their type code, see Component Positions together with the Parts List.
The black plastic rod with a wire at each end is a diode. It has a silver band printed around one end which signifies the way round it should be mounted. It is coded 1N4003.

CONSTRUCTION
As the PCB layout for this project is well spaced and most components can easily be fitted at any stage of the construction, a list of construction instructions is not required. Just points to watch out for have been listed. Components can be fitted in whatever order you wish. "Soldering Tips" is an attempt to help the inexperienced to recognise a satisfactory soldered joint.

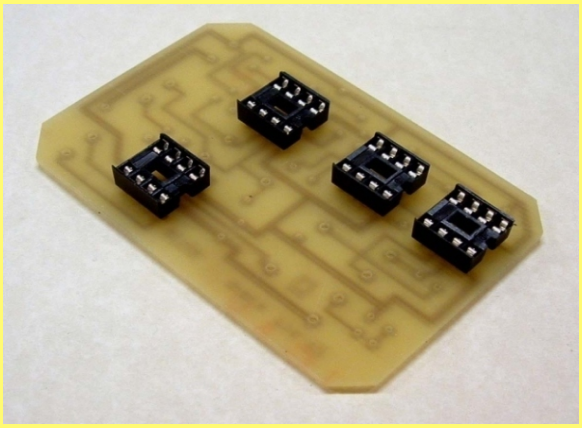
When fitting ICs, ensure that the small notch at one end is in accordance with the Component Positions illustration.
The polarity of capacitors C1 and C3 must be observed, see Component Layout and Component Mounting Detail drawings. The + and - are marked.
All resistors and other non-polarised capacitors can be fitted either way round; just ensure that the correct value goes in the right place.
When fitting VR1, VR2 and VR3, note that they have different values. Ensure that the correct value is fitted in each case.
The 2-way screw connector blocks K1 and K2 are to allow easy connection when installing the finished unit into the model.
When the PCB construction is complete, set the little volume control preset VR3 to almost fully anti-clockwise (low volume). The rear of the board can now be cleaned with something like an old toothbrush and some spirit cleaner. Then check all over the soldered side of the board for good joints and no solder bridges between tracks. Time now to tackle the case; not a lot to it really it's just a matter of either drilling small holes for the wires at the appropriate positions along the side of the case or anywhere else that suits you. I personally just file a narrow slot at the top end of the case by the connector blocks. This is all that the case requires.

TESTING
Having built the unit it's simply a matter of connecting your speaker and power wires (from whatever battery pack you are using). You don't need a switch to test it initially. The circuit produces a continuous series of rising tone ramps for as long as the switch is connected. Practice will give you the precise sequence you are looking for. The first 'whoop' of a sequence is slightly longer than subsequent 'whoops'. VR1 will control the length and hence the slope of the ramp up; VR2 controls the frequency of the note, and VR3 is the volume control for the output amplifier. Use a volume setting that suits the speaker you are using. The range of control had to take into account units that are run on 6 & 12volts.

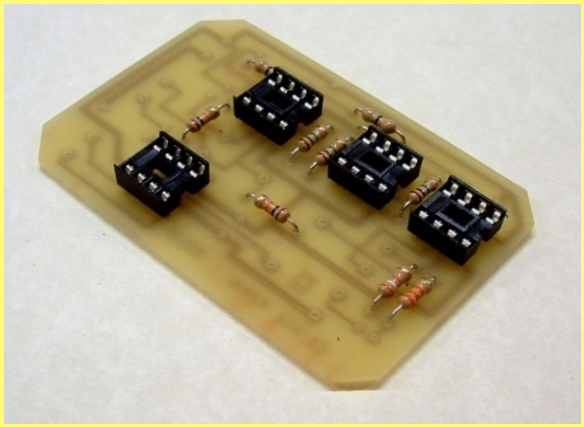
SPEAKER
The absolute minimum requirement for speaker mounting is a baffle; a flat piece of plywood, plasticard or similar about twice the speaker cone area with a hole cut, almost as big in diameter as the speaker (which should be fastened to it). Evostick or other contact adhesive gives a good bond in most cases. A hole will be required to permit the sound to be heard outside the model. This can be through a porthole or through a funnel, a grating or a slightly-open hatch. Semi-waterproof, mylar-cone speakers are the obvious choice for a marine model. A speaker of 50mm or 66mm will be ideal (see ACTion price list).

P14 DESTROYER SOUND

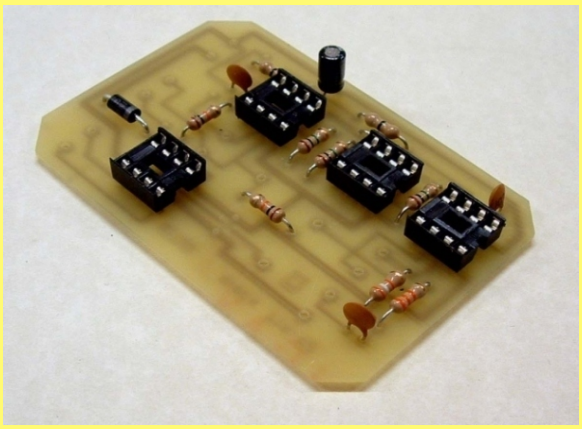
PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



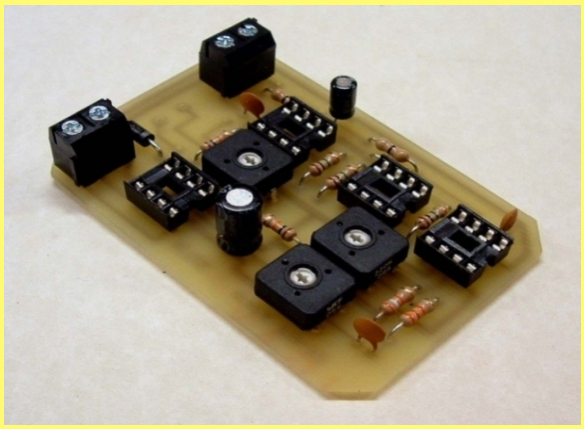
Picture 1 - Fitting the four IC sockets



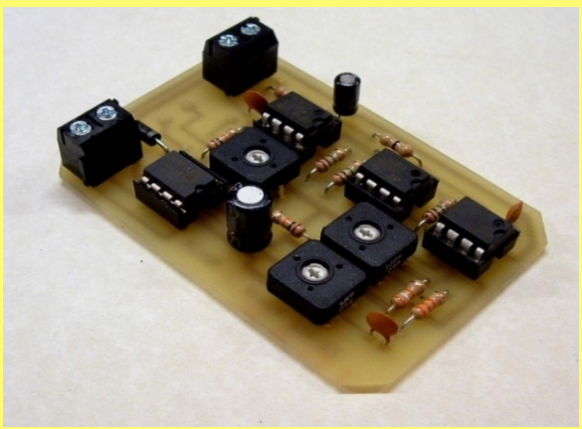
Picture 2 - Fitting the resistors



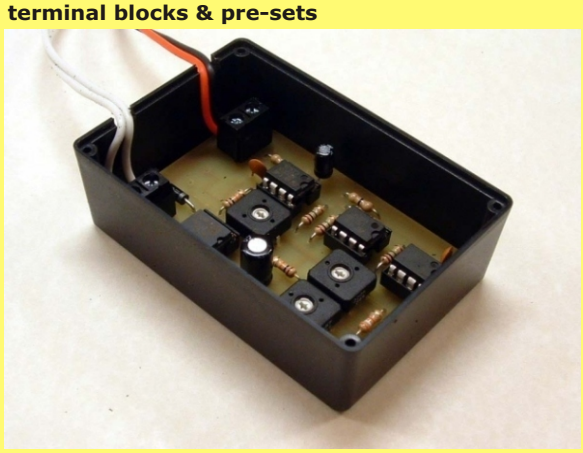
Picture 3 - Fitting the small capacitors & diode



Picture 4 - Fitting the large capacitor, screw terminal blocks & pre-sets



Picture 5- Fitting the IC chips - NB ANTI-STATIC PRECAUTIONS REQUIRED!



Picture 6- File slots in case for cables

Picture 7- Finished unit, cased with sticker