

## Using PC boom headsets with Amateur Transceivers

### Yaesu FT-857 FT-897 Icom IC-7000

Whilst operating various transceivers, I realised that a boom headset would be a very useful accessory

I initially used a cheap £1.50 (\$3.00) headset which I connected into the radio via small interface box. This broke out the headphone cables and provided somewhere to put a PTT switch.



These worked very well, and proved to be ideal for portable operation. Once I had used them for a while I decided to make a better version.

Based on my experiences with the first set, I decided to incorporate some ideas into a new design.

The main changes were:-

- Making a neater interface between the cable and the radio
- Putting the PTT switch on the headset
- Fitting a mic gain control on the headset

The basic circuits are shown at the end of this document

The mic gain pre-set and PTT switch are mounted on the edge of the earphone. Most headphones of this type can be dismantled by removing screws which are concealed by the foam ear pads. I used hot melt glue to hold the various components in place, in order to stop them rattling around with head movements.

The headphones shown in the photo are GENIUS HS-04SU which can be obtained in the UK for under £10.00. These have an electret microphone capsule with a tailored frequency response which is similar to the Heil HC-5 insert.



The original headphone cable has been removed and replaced with a length of pre-terminated CAT5 patch cord. I modified this by splicing the cable at about 50mm away from the end with the RJ45 connector.

As most microphone circuit input impedances are fairly high, I decided to add a low value termination resistor in order to reduce hum pickup on the unscreened CAT5 cable.

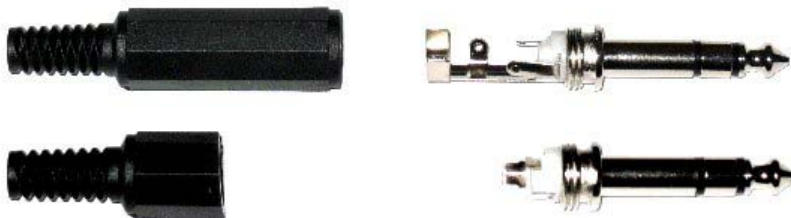
I didn't want to use the Up, Down or Fast buttons, so I used these cable cores for the headphone audio. Make sure that the unused ends of the cable cores are cut at different lengths to avoid the possibility of them shorting together when the cable is joined. Use heat shrink to insulate the soldered cable connections.

The jacket of the CAT5 is quite loose, so it is possible to cut the outer sheath and pull the un-terminated end back.

Splice the cable and then slide the outer sheath back into place. If you slip some heat shrink sleeving over the cable before you splice it, and then add another length after the splice you can make quite a neat and robust joint in the cable. The pictures below show the cable for the FT-897. Note that the FT-857 and IC-7000 use 1/8<sup>th</sup> inch (3.5mm) jacks.



I had problems finding a suitable 1/4 headphone jack, as most of them are quite long, and protrude too far from the radio. In the end I bought a cheap plug with a soft plastic shell, and cut down the solder tags and outer case. I then refitted the shell whilst applying hot melt glue and firm hand pressure. Some heat shrink sleeving made the whole assembly much more robust.





Here's another headset. This time I reinforced the mic boom with some small diameter plastic tubing I obtained from a model shop. I covered it in heat shrink sleeving and bent it into shape by heating it with a hot air gun.





I also built a speech compressor into this version, which can be selected with the second switch. The position of the components and circuit board can be seen in this photo. The compressor is screened with self adhesive copper foil to reduce the possibility of RF feedback.

A suitable circuit can be found here.

<http://g8jnj.webs.com/compressor.gif>



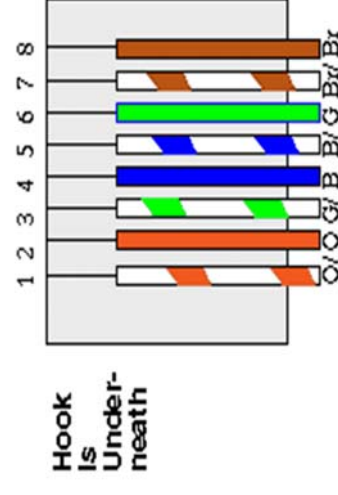
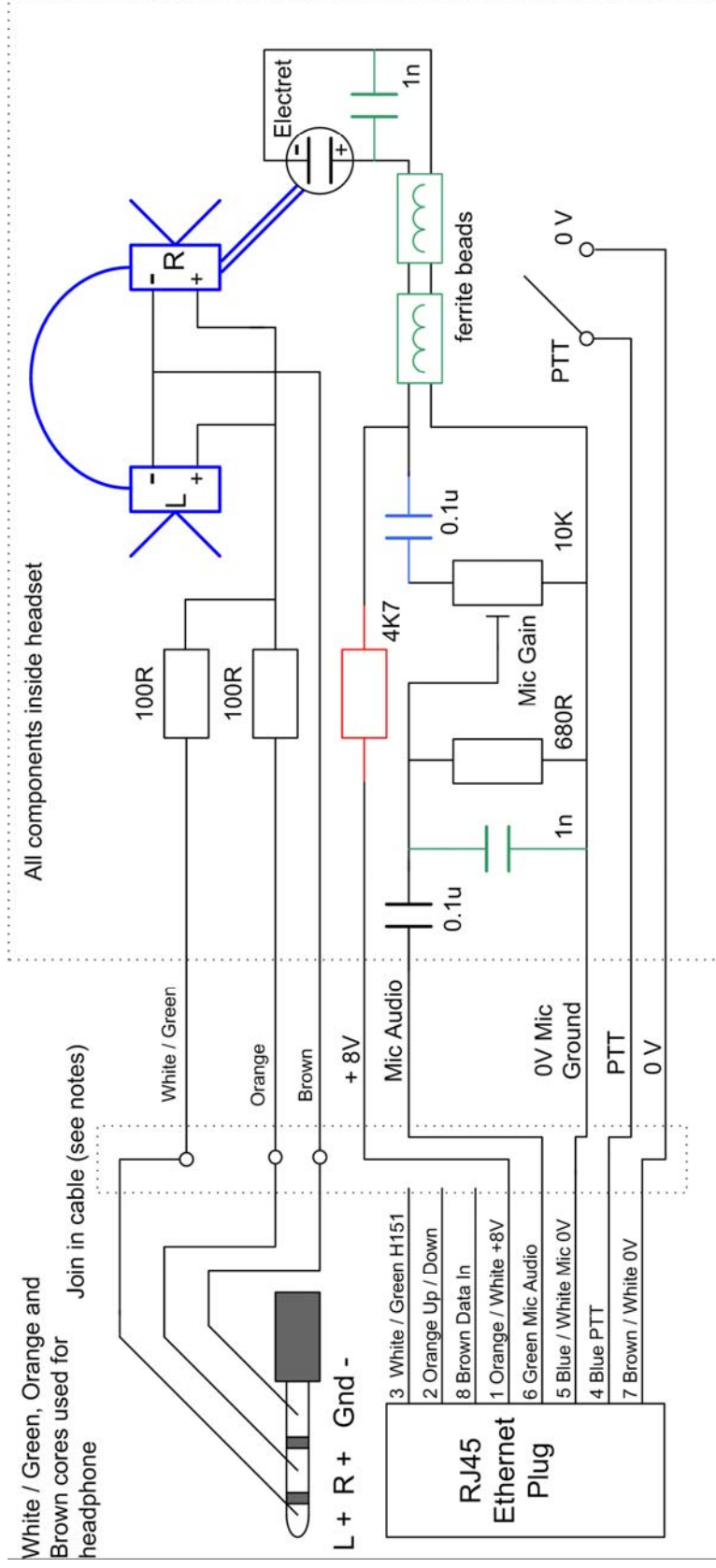
You may also wish to consider building a simple equaliser circuit into the headphones such as the one described in this article.

<http://g8jnj.webs.com/speechintelligibility.htm>

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<http://www.g8jnj.webs.com>





Use a pre-made Ethernet patch cable to the headphones. Make a join to connect the cable from the speaker jack and cover in heatshrink sleeving. Colour codes are for standard cable not cross over – check for correct pinout before use.

Green components provide RF filtering

Blue components provide Highpass audio filtering

Red components provide DC supply to electret capsule