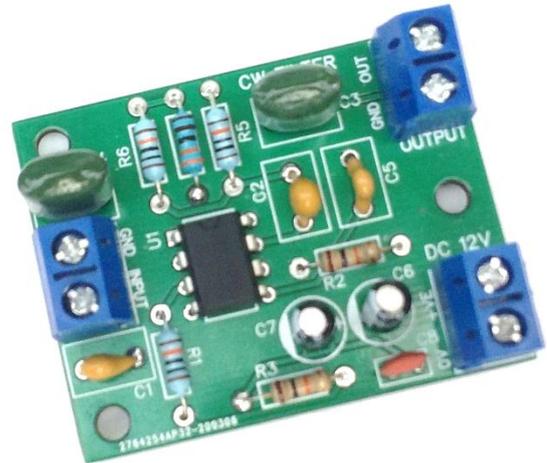


Active CW Filter

Many older (and many not so old) receivers do not have CW filters fitted, if they can be fitted as an option then they cost a small fortune.

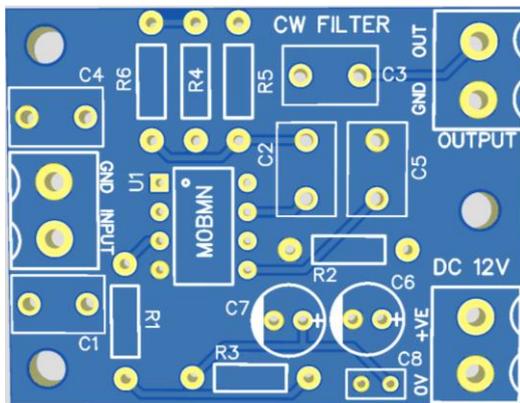
The easier option is to fit some form of audio CW filter. This filter is designed to be fitted INSIDE the radio. This Kit is not for people that don't want to 'get their hands dirty'. The filter needs to be fitted just in front of the volume control of your receiver. On most older radios the volume control will have real wires connecting it so this should not be difficult to do.



The filter circuit was designed by Tim Walford (G3PCJ) of Walford Electronics Ltd.

He has given me permission to reproduce it in this kit. Tim as a great range of 'real' kits that are good value and work well so why not have a look at his web site. All of his kits are designed in and offered from the UK they come with well written instructions that are clear and give instructions for testing each stage. Tim's web site can be seen here: <https://walfords.net> , take a look. Thanks Tim!

The Filter is built on a small PCB 45 x 35mm.

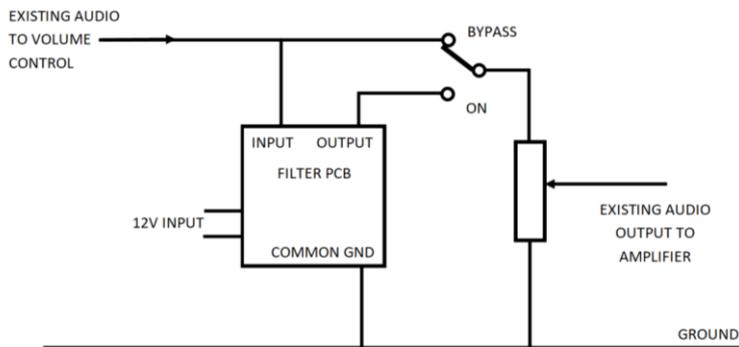


The filter is built around a low noise dual op-amp (TL072). The bandwidth is around 500Hz and centred at approx. 700Hz.

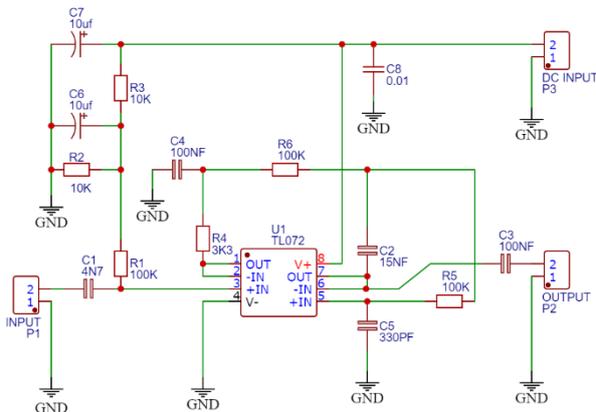
The use of a dual op-amp allows us to use the first amplifier as a high impedance buffer (Includes a High Pass Filter) to prevent any changes to the characteristics of the existing circuit. This buffer is followed by a humped low pass filter circuit that attenuates any signals

above 1Khz.

All connections to the filter board can be made via PCB mounting terminal blocks. If you wish these can be omitted and connections can be soldered directly to the board to reduce the profile of the filter board if needed.



The drawing here shows how the filter should be installed in your receiver, just before the existing volume Control. A simple bypass switch can be added to change from filtered to not filtered modes.



The Circuit for this filter

Parts List: - Tick off each parts as you check.

- 1 x Filter PCB
- 1 x TL072 Low Noise Op-Amp
- 3 x 2 way terminal blocks
- R1, R5, R6 100K Resistor
- R2, R3 10K Resistor
- R4 3k3 Resistor
- C1 4.7nF (0.0047uF) Capacitor
- C2 15nF (0.015uF) Capacitor
- C3,C4 100nF (0.1uF) Capacitor (Marked 104)
- C5 330pF Capacitor (Marked 331)
- C6,C7 10uF Electrolytic Capacitor
- C8 10nF (0.01uF) Capacitor (Marked 103)

Building the filter. Again tick of each line when its completed.

- 1) All Parts checked and correct.
- 2) Fit R1, R5, R6 which are all 100K resistors, make sure you check each resistor when fitting, some resistor are 4 band and others are 5 band, since we have 100K and 10K values in this kit it could be easy to mix them up, if you have a test

meter then use it to make sure you have the right part. Other wise find out all six resistors, 3 will be the same colour bands, that's the 100K ones.

The resistors can be fitted either way round but I like to install them all the same way so its easier to read the colour bands at a later time (Up to you).

3) Fit R2 and R3, these are 10K resistor. There are only two resistor in the kit with the same bands so they should be easy to find but if you have a meter use it to be sure.

4) Fit the last resistor R4 which is a 3K3 resisitor.

Double check all the resistor now. Check the soldering for dry joints or any solder bridges.

5) Fit C1 which is a 4.7nF Capacitor (Marked 472)

6) Fit C2 which is a 15nF Capacitor (Marked 153)

7) Fit C3 and C4 which are 100nF Capacitors (These are marked 014 and are large Green Capacitors)

8) Fit C5 which is a 330pF Capacitor (marked 331)

9) Fit C6 and C7 which are both 10uF Electrolytic Capacitors. These Capacitors MUST be fitted the correct way round. One of the leads of the capcitor is longer that the other this is the +Ve side. On the screen printing for these parts a small '+' sign shows which side the long leg must go into.

10) Fit the last Capacitor C8 which is 0.01uF (Marked 103)



Now stop work and double check all the parts fitted so far. Check that all the solder joints look good and none have been missed.

11) Now time to fit the active part of this filter the dual op-amp. Myself, I do not like IC sockets for the sake of it, they can cause more problems than they solve. If you wish to use a socket please feel free to do so but I have not supplied one with the kit. Look carefully at the top of the chip and you will see a small dot near one pin, this is pin 1. Look at the PCB layout and you will see a small dot near one of the holes for the I.C. Make sure that you insert the chip so its dot and the boards dot line up. Take care when soldering the chip. Just a few seconds of heat on each pin will do the job. Once fitted check for any shorts

between pins and that none have been missed.

12) The last parts, the terminal blocks. Now before you fit these think about how you want to install the filter, will fitting these blocks make it difficult to fit the board? You can solder directly to the board if you need to and leave the blocks in your spares tub.

Ok we are done, connect 12v to the board (can be anything around 10-24V if you need to) look at the drawing above that shows how to install the filter in the radio, of course I can not give you full details on installing it as each radio is different but the drawing above should give you the idea and show its easy to fit. The bypass switch is up to you too, if you have a radio that's only used for CW you could leave it in circuit all the time.

I hope you like the performance of the filter, The cost is much less than fitting a commercial filter and you will get a significant improvement in selectivity and QRM reduction.

If you want a stand alone filter that doesn't need any modifications to your radio look at the LPSCAF filter that is also available as a kit.

73 Paul MOBMAN