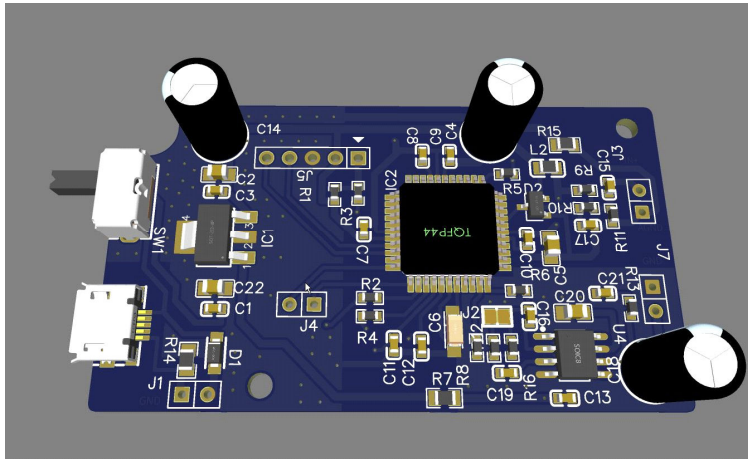
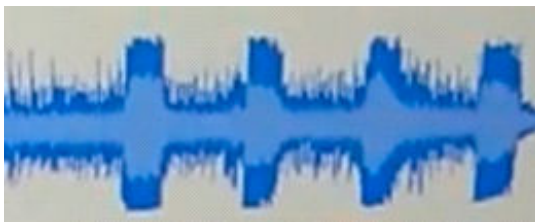


BLUEDSP Audio/Noise Reduction Filter Kit



Designed by IW2NDH
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The BLUEDSP filter project is a uniquely designed digital audio filter incorporating five user selectable bandwidths combined with a digital noise reduction filter offering four user selectable levels. The noise reduction filter is an adaptive filter, constantly sampling and storing the noise spectrum every 10 msec when no voice is present. The filter processes the received signal and differentiates noise from voice and attenuates the unwanted noise.



Signal before noise reduction processing



Signal after processing

The audio and noise reduction filters are controlled through two momentary switches and the status On/Off of filters is displayed by 2 LEDs. See "OPERATION" for details.

The BLUEDSP is shipped as a fully functional unit. It is described as a 'KIT' because the users must decide the best method of installing the filter for their particular use and set up the installation accordingly. See "INSTALLATION" for options.

SPECIFICATIONS:

Voltage: 5-13.8VDC @ 100mA

Audio Input Impedance: 4 K Ω

Audio Output: Typ 700 mW (VS = 9 V, RL = 8 Ω , THD = 10%)

Audio Filters: 5

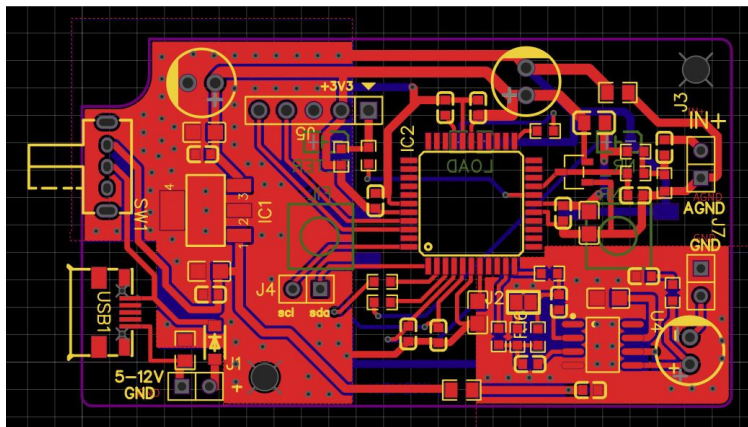
{(1) 300-2400, (2) 300-2100, (3) 300-1800, (4) 550-850, (5) 650-750} Hz

Noise Reduction Filter Levels: 4

{(1) 11, (2) 15, (3) 17, (4) 20} dB

INSTALLATION (Basic DSP Module):

The printed circuit board of the filter has been designed to allow for a custom installation based on how the filter is to be enclosed. The pcb, as delivered, measures 34 X 60 mm.



The output of the filter does NOT require amplification. It can be connected to headphones or loudspeaker (impedance between 4 and 32 Ohm)

Connections: 3 (DC In / Audio In / External Speaker)

Power supply: microUSB or 5 to 12VDC (J1) square pad is ground, round pad is +.

Input Signal: (J3) square pad is ground, round pad is audio in from receiver.

Output Signal: (J7) square pad to external speaker minus (-), round pad to external speaker plus (+).

Hammond Box Installation:

The PCB, without the optional OLED display, fits Hammond Box mod 1551KTBU

(<https://www.hammfg.com/part/1551KTBU?referer=742>) and with the optional display the PCB fits Hammond box 1591ATBU (<https://www.hammfg.com/part/1591ATBU?referer=1190>).



On the website you can download a pdf that maps the holes for the face of the box.

Print it in A4 format, put it on the face of your box and drill it.

ATTENTION: for 1551KTBU be sure to align the 2 screw holes of pcb with the 2 present in the bottom of the box and consider the thickness of the material of the box

OPERATION:

THE LEDs

The LED display has 3 colored LEDs:

Green represents the On/Off state of noise reduction;

Amber represents the On/Off state of bandpass filter;

Red represents the overload of the input, long press of Button NR enable/disable SQUELCH with short flash of the LED)

THE SWITCHES

Two momentary switches control which function is active and the selected level of that function.

A short press on the right switch (Filter) increases the selected filter level from 1 thru 5 and then resets to off.

A short press on the left switch (NR) increases the selected noise reduction level from 1 thru 4 and then resets to off.

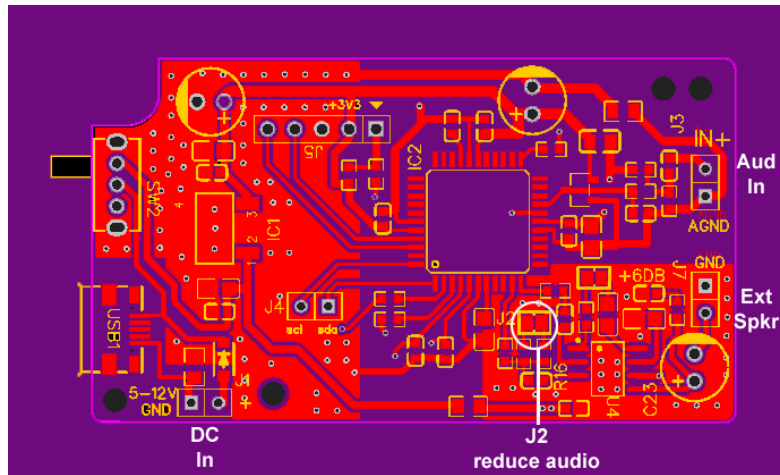
A long press (1 or more seconds) on the left switch (NR) changes the On/Off state of SQUELCH (red LED will flash briefly)

AUDIO LEVEL ADJUSTMENT:

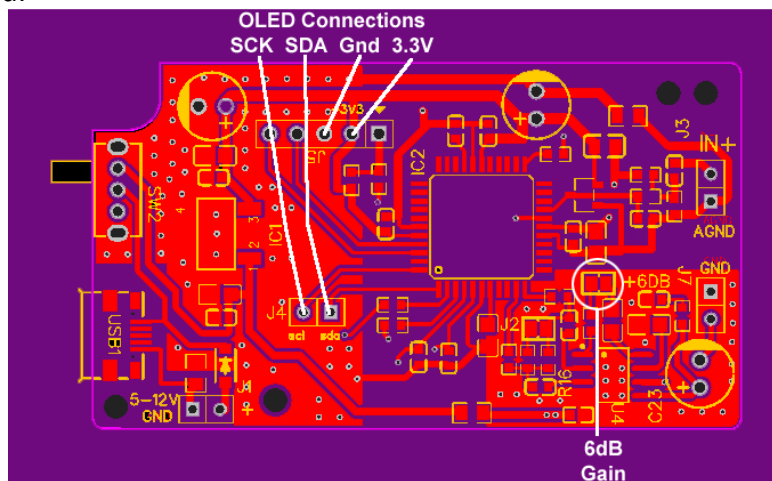
Connect the DSP to your radio external speaker or headphone jack.

For optimal performance: While receiving a station the audio input level should be increased until the overload **red** LED blinks and then reduced to switch off the LED. If audio distortion is experienced, or to

reduce the output level (i.e. with headphones), you can reduce the level by soldering the pads at J2 closed.



The onboard LM386 is set up for a gain of 20 (26dB). For an additional 6dB gain, solder the pads marked "+6dB" closed.

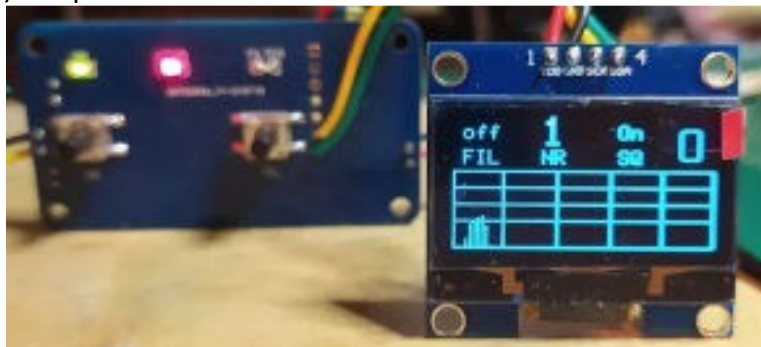


OLED DISPLAY:

An OLED Display 1.3", I2C, SH1106 can be connected to the DSP module.

3.3 Volts are available on pin 2 (3.3V) and pin 3 (GND) of J5.

SDA pin 1 (square pad) SCL pin 2 of J4.



The vertical lines on the OLED graph represent 800Hz per division. The horizontal lines have no specific value but are relative to the input audio level.



STL files to print an enclosure for the Blue DSP are available for download on the website.

For further information of the BLUEDSP, visit the website at:

<http://jackdev23.wixsite.com/iw2ndh-dsp>