

# USB DigiVOX Interface



**Schematic diagram and notes**

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**<http://www.goboxgizmos.com/usbdigivox.html>**

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## Installation Notes

Thank you for purchasing the GoBoxGizmo's USB DigiVOX Interface. For updates to this document visit <http://www.goboxgizmos.com/usbdigivox.html>.

Your USB DigiVOX Interface is a sound card and sound card modes interface all rolled into one. It's all you need to get onto PSK31 tonight! The USB DigiVOX Interface is supplied as a "semi kit"; the surface mount part of the kit is already built leaving you with just the regular sized components left to build.

Another useful feature of your USB DigiVOX Interface is that unlike other USB devices it requires no drivers. You can use your Interface with Windows, Mac and Linux without having to look for those elusive drivers. Simply plug it into your computer's USB port and wait for it to be set up.

### **Construction**

Construction is quite straightforward. Parts orientation is obvious but take care to observe the polarity of the diodes and the primaries of the transformers (marked with a P on the primary side).

Construction should take you a little less than an hour. Inspect your work. Grab a cup of well earned coffee.

### **Testing and setup**

Close all the applications running on your computer and then connect the USB DigiVOX Interface to it. You should notice the light on the Interface come on. If you're using Windows (sorry about that!) you'll get the usual USB wizard pop up offering to install your newly added hardware. Follow the wizzard through to its completion. Linux/Mac users will find the device under ALSA/PulseAudio/Jack/etc as a USB Audio Codec.

Fire up your favorite sound card mode software (we use Fldigi) and configure it to use the new USB Audio Codec device. Set the volume on your sound card mixer software to maximum. Press the "tune" button in your software (if you don't have a "tune" button force the software to transmit).

With your volt meter measure the DC voltage between the left hand end of D2 and the right hand end of D1. Anything more than 2 VDC is more than enough to key up your radio.

If you have access to an oscilloscope check that you have audio on the primary and

secondary sides of TR1 and on the wiper of R4. The AF voltage should change as you fiddle with the pot.

Make up an interface cable suitable for your radio's data facilities and connect it between the radio and the Interface. Many modern rigs have a data port on the back which offers a fixed voltage output independent of your volume and mic controls. This would be the ideal place to attach your USB DigiVOX Interface. Otherwise, plug the Interface into the mic and speaker sockets on your radio.

You should immediately notice the waterfall display in your software change and if you are tuned in to a PSK31 frequency (e.g 14.070MHz) you should start to see stripes appear representing the different signals you are receiving. Clicking on a stripe should result in the data being decoded and printed on your screen.

There is no adjustment possible with the Codec chip on your Interface so if the incoming audio level is not enough try removing R1 and if that's still not enough replace R2 with a wire link. Conversely, if you have too much audio signal coming in reduce the volume on your radio.

We need to set up the TX levels of your Interface such that we get the most RF out of the radio (where appropriate) without over driving the mic input. Over driven signals lead to bad data on the air which in turn lead to unintelligible signals.

Connect your rig into a dummy load and a power meter capable of handling the rig's maximum RF power output. Turn the RF power up to maximum. Press the tune button in your software and observe the power output from your radio. Adjust the pot on your Interface such that you measure roughly 90% of your peak power output. A 100 Watt rig should easily achieve 90 Watts with this Interface.

When you are satisfied that your Interface and radio are set up correctly, you might like to find some 1.75" heat shrink tube (not included) to enclose your Interface. Slide the heat shrink tubing over the Interface and apply some heat (a small butane pencil torch is good for this). You'll notice that the sleeve is significantly larger than the Interface. Make sure to center the Interface in the sleeve as you apply heat evenly over all surfaces.

As the sleeve shrinks ensure that the Interface remains centered. The sleeve will shrink to the point where it tightly grips the Interface and you should see vague component outlines pressing against the plastic. Set to one side for about 15 minutes to properly cool off.

Get yourself a beer. You deserve it!

## **Operation**

It is beyond the scope of this document to teach you how to use your chosen software package. However, following these simple guidelines will allow years of on air operation of both your Interface and more importantly, your rig!

Less is more: The DSP abilities of your Interface mean that you can receive many QRP signals with 100% accuracy. Signals below the perceived noise floor are quite commonly decoded as if they were next door. Do yourself and your fellow operators a favor and reduce the RF power of your rig to the minimum level required for the contact. Most sound card modes are Continuous Wave in nature and so the duty cycle for your radio can get up to 80%+ during a busy data swapping session. Most operators reduce their output to around 25W for this reason and they find it more than sufficient to work the world.

More is less: A badly configured Interface and radio will lead to splattering on the bands. In turn this splattering prevents other operators from using the sub-band for your chosen mode. With narrow band modes such as PSK31 we are able to cram 100's of signals into the same space your voice would consume. Worse still, your harmonics could be arriving in another sub-band altogether!

Have fun on the air!

## **Warranty and limitation of liability**

No warranty is given or implied with this device. ENIcommunications Corp accepts no liability for damages caused by this device.

## **Credits**

Based in part on Howard Teller, KH6TY's sound card interface project; QST March 2011.