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Baofeng UV5R Digital mode audio cable assembly:

Here is a little 'how to' on how to make an audio interface cable for use with a computer sound card and a Baoefeng UV5R.

This article came about from interest in 2 meter digital from several members within the K4TLH club and I could not have accomplished this without their help and guidance.

The parts list is of course just what I chose to use. Any 2.5mm & 3.5mm plugs can be used but **they must be stereo.** Also just about any audio isolation transformer may be used but I chose the one listed below because there small and cheap albeit a bit tough to solder in. For added protection you may wish to install an isolation transformer in both leads.

The article refers to orange and green, those are just the colors I chose you can use chartreuse and violet if you prefer.

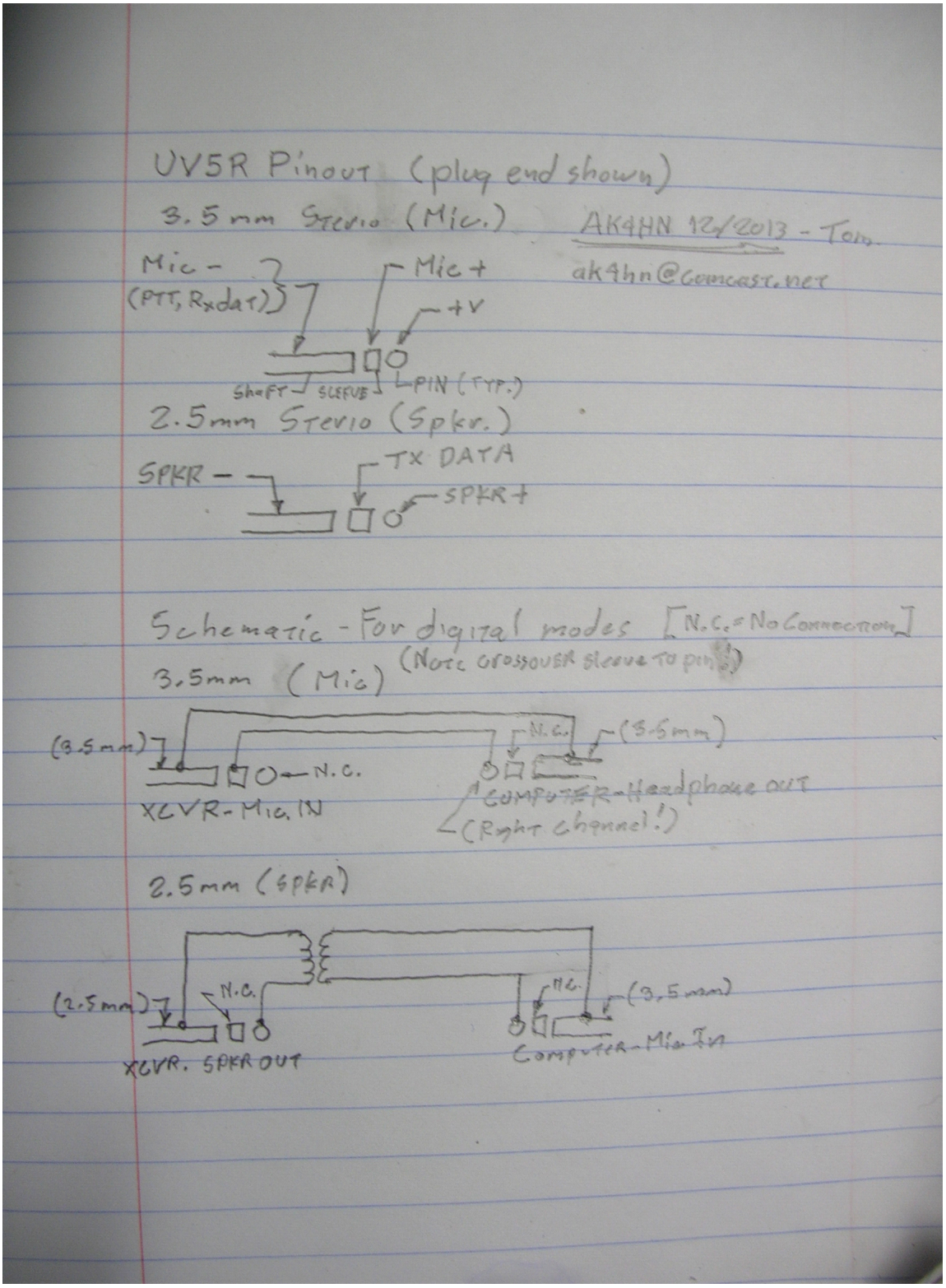
The whole thing is low cost and not all that difficult. It can be made for less than 10 bucks and an hour or so of work. I have gotten decent reports on signal quality and have used it with fldigi and flmsg with good success! Someday I will figure out how to get it to work with DRM780!

Hope you enjoy the article and find it understandable. If you have any suggestions, comments, or questions I can be reached at the email address given in the header of the article.

Most of all enjoy it and have fun!!

Off to the nuts and volts!!

The pin-outs and schematic

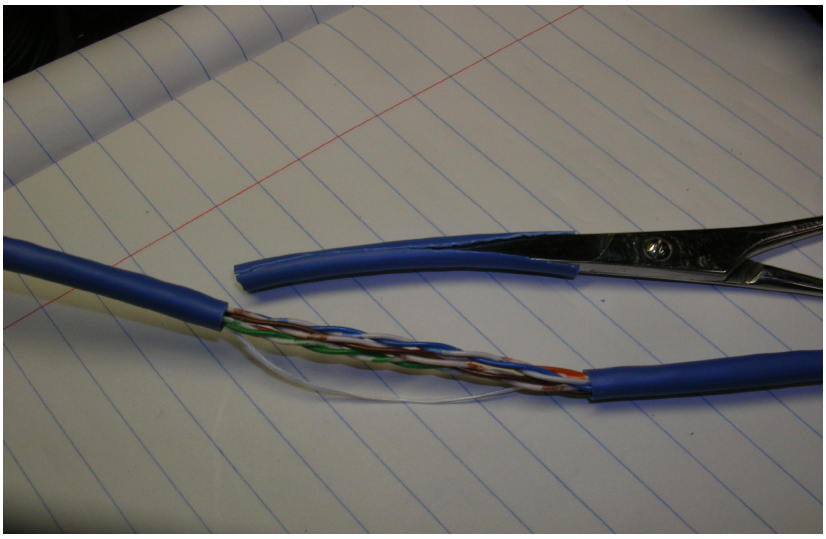


The parts list!

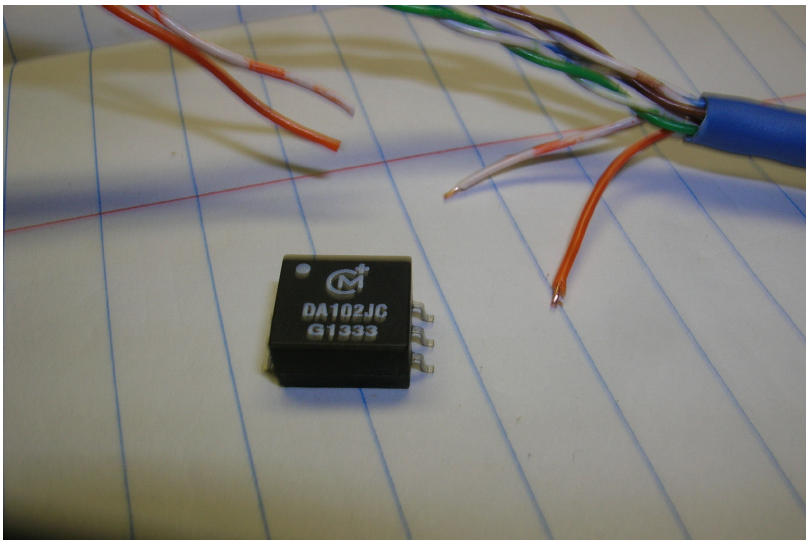
Start by preparing the cable. I use a length of Cat 5 cable about 3 foot long. Length is not really critical but I would think the shorter the better. I chose 3 foot as that is what I needed to reach my laptop from my radio.

I start in the center of the cable since this is the most difficult part. This is where the audio isolation xfmr will go. I don’tt know if there is any difference in the placement of the xfmr closer to the xcver or computer so I put it in the middle. I am open to suggestions.

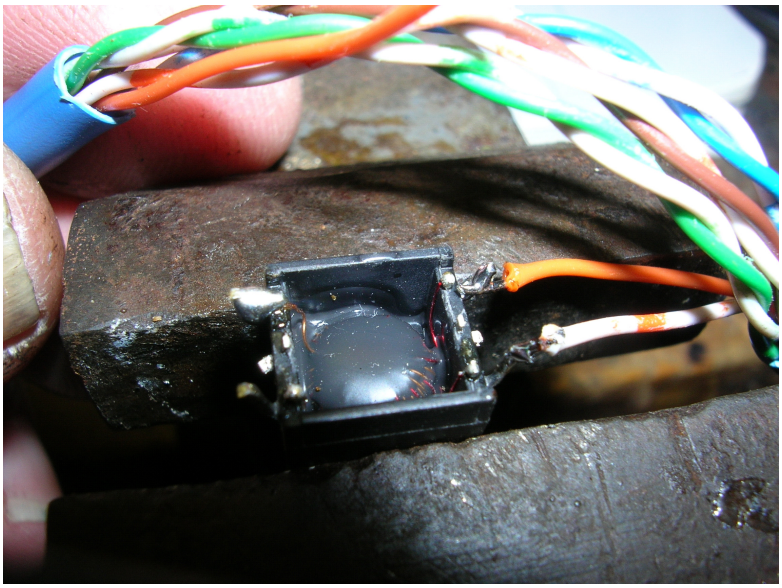
Carefully strip away a couple of inches of insulation taking care to not damage the conductors inside. A pair of small scissors is handy for this task.



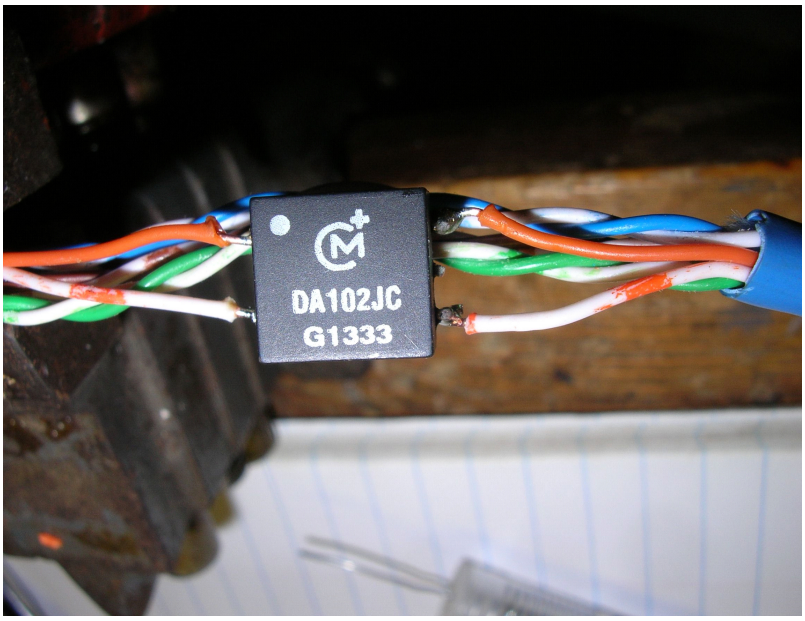
Cut one of the pairs in half, I chose Orange/Orange white. Shorten one end of the now cut off pairs about 1/8" to allow clean installation of the xfmr. Strip a tiny bit of insulation from the shortened pair only about 1/32" or so.



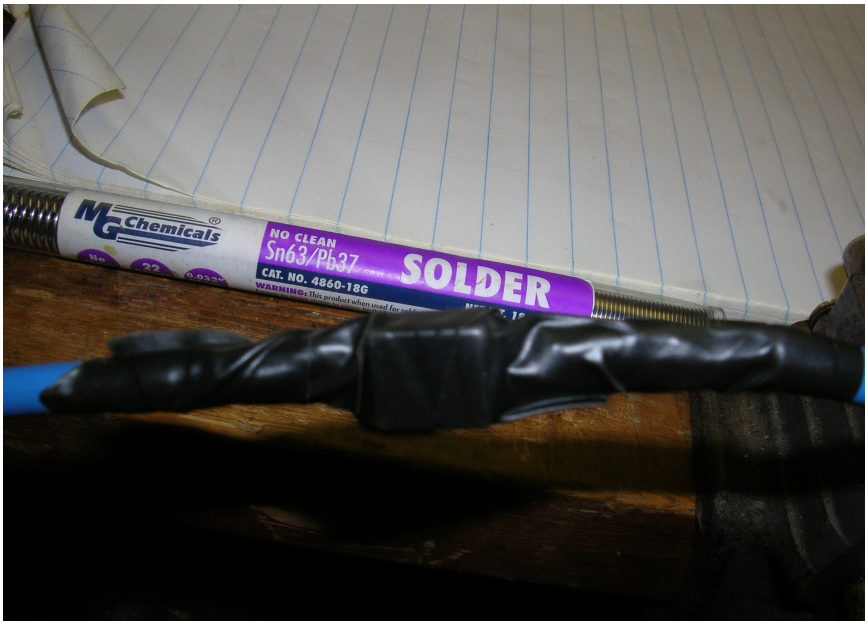
Now for the fun part. Pre tin both the conductors and the leads of the xfmr to make the initial soldering easier. Use a good quality electronic solder! Note I use a small vise to hold on to the unwieldy cable. A third hand sure would be handy for this part!! Now that the ends are pre tinned 'tack' them into position. Not pretty but it will work. You may note that I broke off the center leads of the xfmr. They have no connection and get in the way. Speaking of breaking the leads do NOT try to bend or straighten them as they break very easily.



Now that is done you can trim the other side of the pair to the correct length to allow a tidy installation of the xfmr. Strip a tiny bit of insulation off the ends of the now trimmed conductors, tin them, and tack them to the other side of the xfmr. Observe polarity as in orange is opposite orange etc.

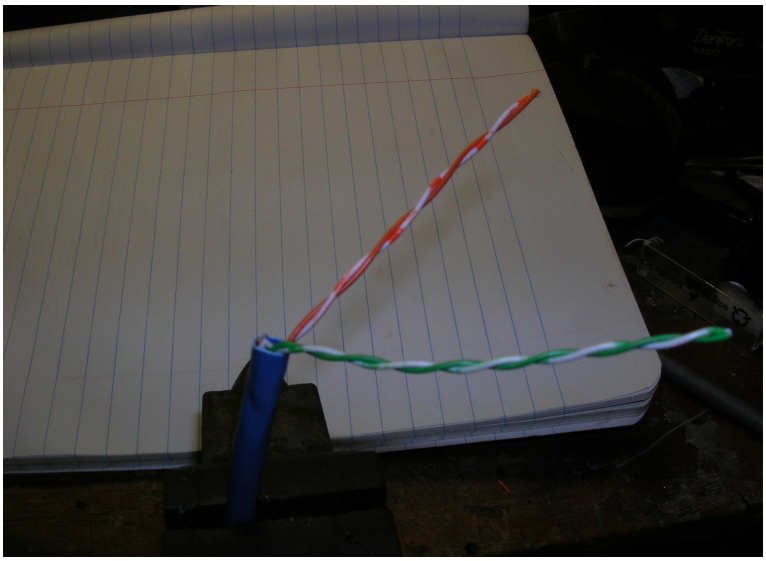


Some heat shrink tubing would be nice to clean this up but I did not have any big enough to cover the xfmr chip so I wrap it in tape. In the future I may mount the chips on perfboard for a bit of strain relief and to make the assembly a little easier but I did not have any perfboard. The undisturbed conductor pairs provide some strain relief but I don't know how well it will hold up after months/years of use.



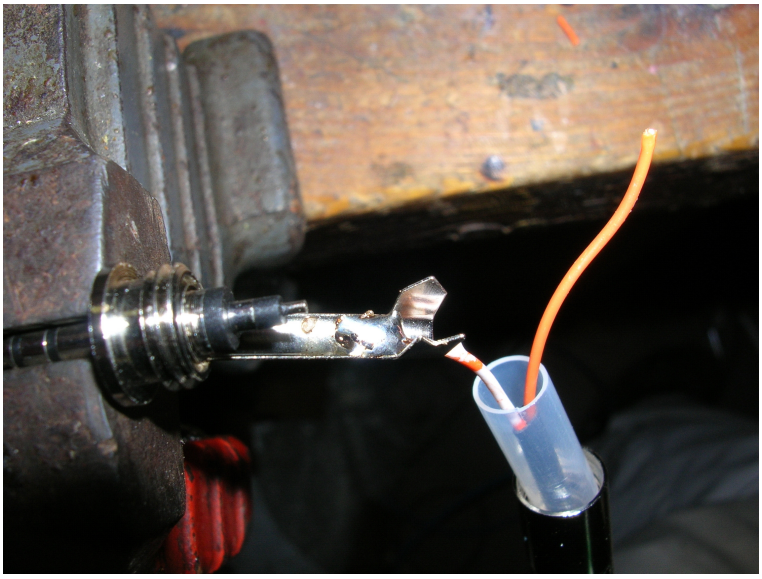
Now for the other ends. I will start with the 2.5mm that is intended for the radio speaker out. This will get connected to the orange/orange white pair that we just installed the xfmr on. I start with the 2.5 because it is a real pain with tack solder joints.

Strip away a few inches of the outer jacket then Choose two pairs, one of which will be the orange/orange white I use green/green white for the second pair. Cut the unused pairs off even with the jacket.



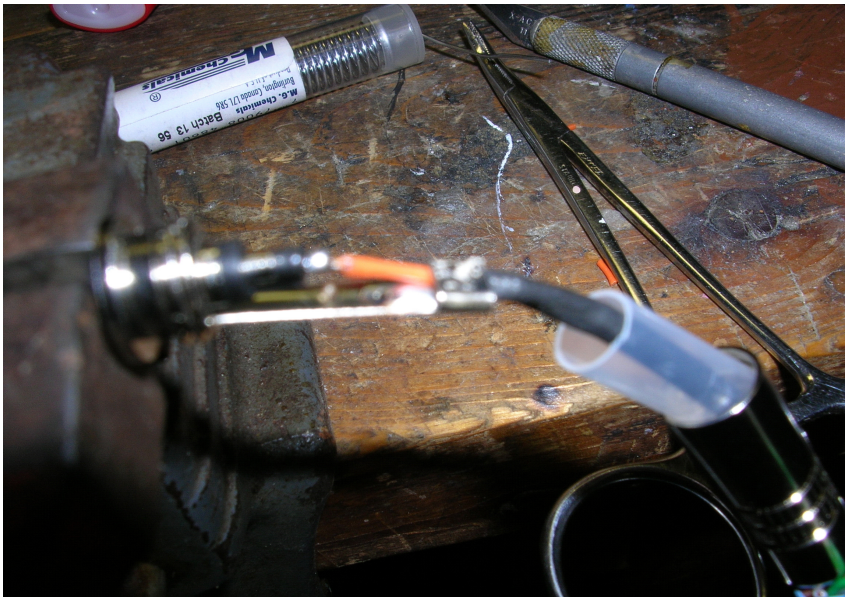
I slip a piece of heat shrink tubing, the strain relef, the outside shell of the jack, and the plastic insulator over the pair. Do not forget this step or you will be cursing later!

Shorten one conductor slightly the one you intend to connect to the barrel so that the conductor that connects to the tip will be long enough without having to scrunch things around. Strip some insulation and solder the shorter lead to the barrel. I usually do this lead first as it takes a good deal of heat to get it to solder to the connection. You can see the disfigured insulation.



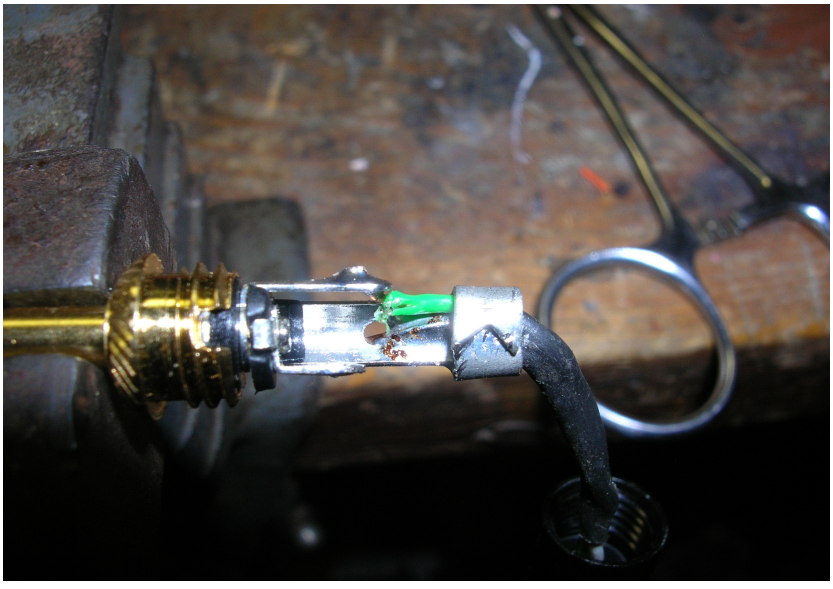
Strip a tiny bit of insulation off the orange conductor and pre tin it and the 'tip' connection of the plug. Tack solder them together.

Slip up the heat shrink tubing into place, shrink it then gently squeeze down the strain relief ears to hold the cables. I have found that this is the number one 'fail' spot of the assembly. Too much heat or pressure can cause the insulation on the conductors to fail resulting in a short or a broken / open conductor.



Screw it all together, one down three to go!

The 3.5mm go together in a similar manner, solder the 'ground' lead first, then the other lead. The 3.5 is easier because it has an actual solder tab and is not a tack weld. Again don't forget the heat shrink tubing, insulation piece, and outer shell over the conductors before you solder anything or you will end up fussing and fuming. I know from experience.



Note connection to 'ring' lug at xcvr end!

That is about it other than the other two3.5mm which go on the other end of the pairs in a similar manner. **Be sure to note that the connection to the 3.5mm at the radio end goes to the ring, the corresponding connection at the computer goes to the tip**. Seems like I get this wrong every time. The 'tip' of the plug at the computer end is the right channel audio which is what fldigi wants to use. Check your computer's pinout to determine which pin is the right channel. See the schematics at the beginning and you should be good to go. Check the assembly for continuity and for shorts with an ohm meter.

You may wish to add little tags on the computer ends as to which is for the mic and which is for the speaker. I just remember the orange goes to the mic. The radio end is no problem as they are different sizes. By the way, UV5R jacks are notoriously 'wimbly' and some reports of them failing after some use. Use care when plugging them in.

How to make it work:

Plug the respective plugs into the radio, plug the 'orange' lead into the microphone port of your computer and the 'green' lead into the speaker port. Turn the radio on and set the volume for about 10%. You will have to turn on the VOX on the UV5R (menu, 7, menu, up/down, menu, exit) I set mine at 10 (max). Oh yea don't forget to select the frequency so you don't sent a bunch of noise over your favorite repeater by mistake and get everyone mad at you!

Now fire up fldigi. Once fldigi is started open the configuration applet and choose 'sound card' you will see a tab marked "right channel" open that and select "mono audio output". You wont see anything on the waterfall at this point. Try turning on the FM feature of the UV5R to test (Press the orange 'call' button once briefly) and you should see 'noise' on the waterfall. If you don't see 'noise' try adjusting the volume pot till you do. If you still don't, scratch your head and try to figure out where you went wrong! You should be more or less set at this point. Turn off the FM feature of the radio (press the orange 'call' button once briefly) and the waterfall should go quiet.

I recommend doing the initial transmit testing on low power into a rubber ducky antenna or dummy load to avoid any un-intentional RFI. Press one of the TR buttons in fldigi CQ works good and watch the radio to shift into transmit (red led indicator). Note that there is a short delay until the vox opens up. You may have to fuss with your computers 'headphone level' output some to get things in the Goldilocks zone. Mine ends up around 50% or so but even 10% should break open the vox. If the xmit does not fire up, well scratch your head and figure out where you went wrong. Now find a buddy to hook up with and check things out!

I cannot of course be held responsible for any burnt or cut fingers, strained relationships, or fried radios etc. This all works for me and it should work for you too!

I wish you great success and good digital qso's!!

73 de AK4HN