

# INKITS

Easy Bitx Boxing

Mono Band 20mt 40mt 80mt

Power Output 3 Watts on 20mt

Power Output 5 Watts on 40mt

Power Supply 12V 2 Amps

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VU3SUA

Our sincere condolence to the people who passed away due to Covid19-  
Prayers for the departed souls

Website: <https://amateurradiokits.in>



2020

# EASY BITX BOXING

## FOR 20MT



Front Controls:

1. Volume Control
2. MIC PTT Two Optional Connectors
3. Phones Optional Use
4. VU Meter
5. Tuning Dial
6. 1602 Display

## Rear Faceplate Construction



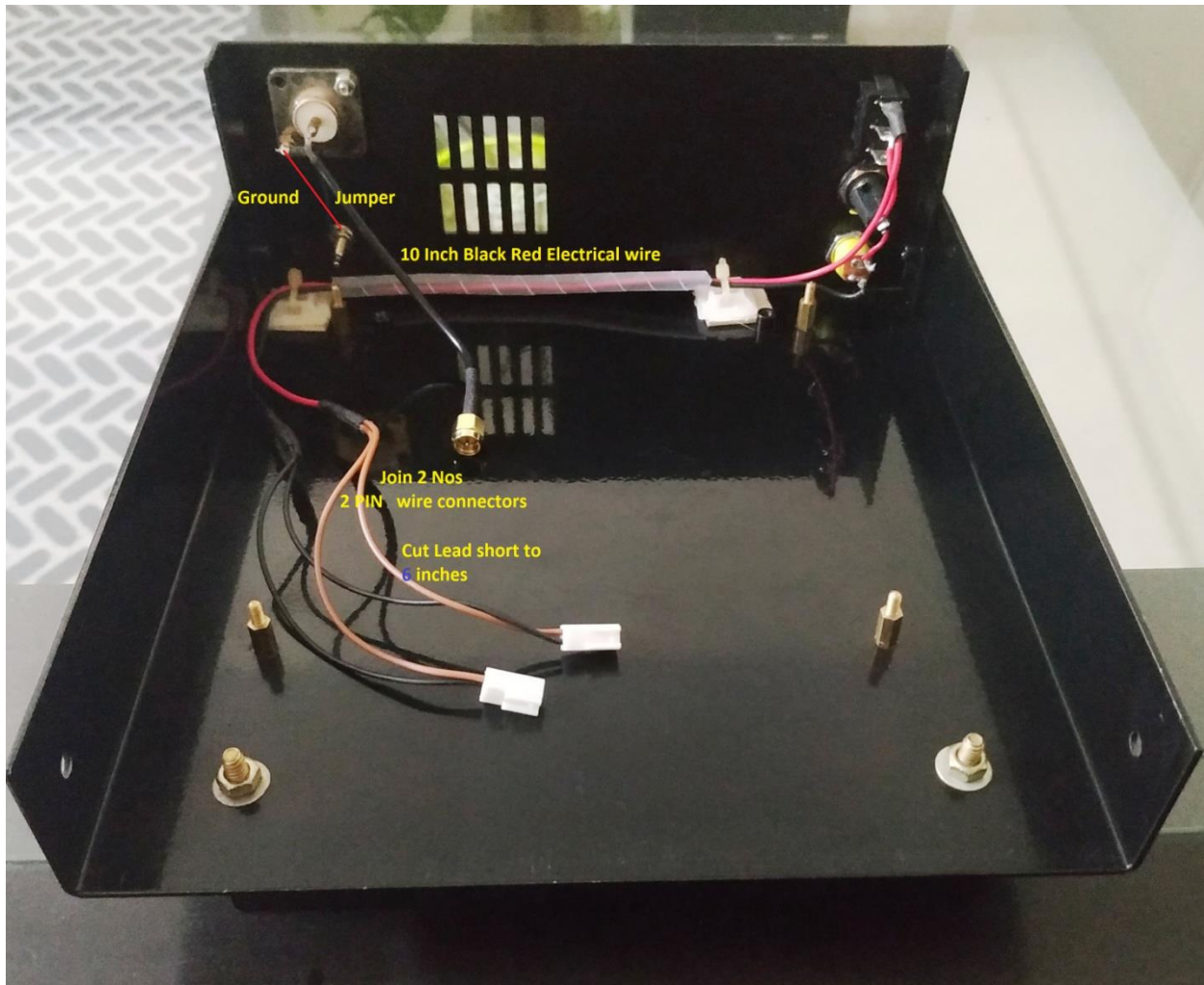
1. On/off Switch.
2. Fuse Holder with 2 Amp Fuse.
3. Dc Input Socket.
4. SO239 Ant.
5. Banana Plug for ground / Wing nut.

We will start constructing the case with taking some paint off from the rear faceplate antenna and ground section. This could be done with with your own method. But since I had some files it was found convenient taking some paint off with them.



Use the file in circular motion and try to peel the paint within holes and on the outer corners too, this way when the connectors are placed they will be grounded to the case.

Mount the on off switch fuse holder and DC connector. Now wire in series all three of them for supply of +12 Volts with a red wire. The pin on the yellow DC connector lying vacant is for the negative supply line. The top end of On OFF switch is for the +12 V to the tcvr that will be shown in the next picture as below.

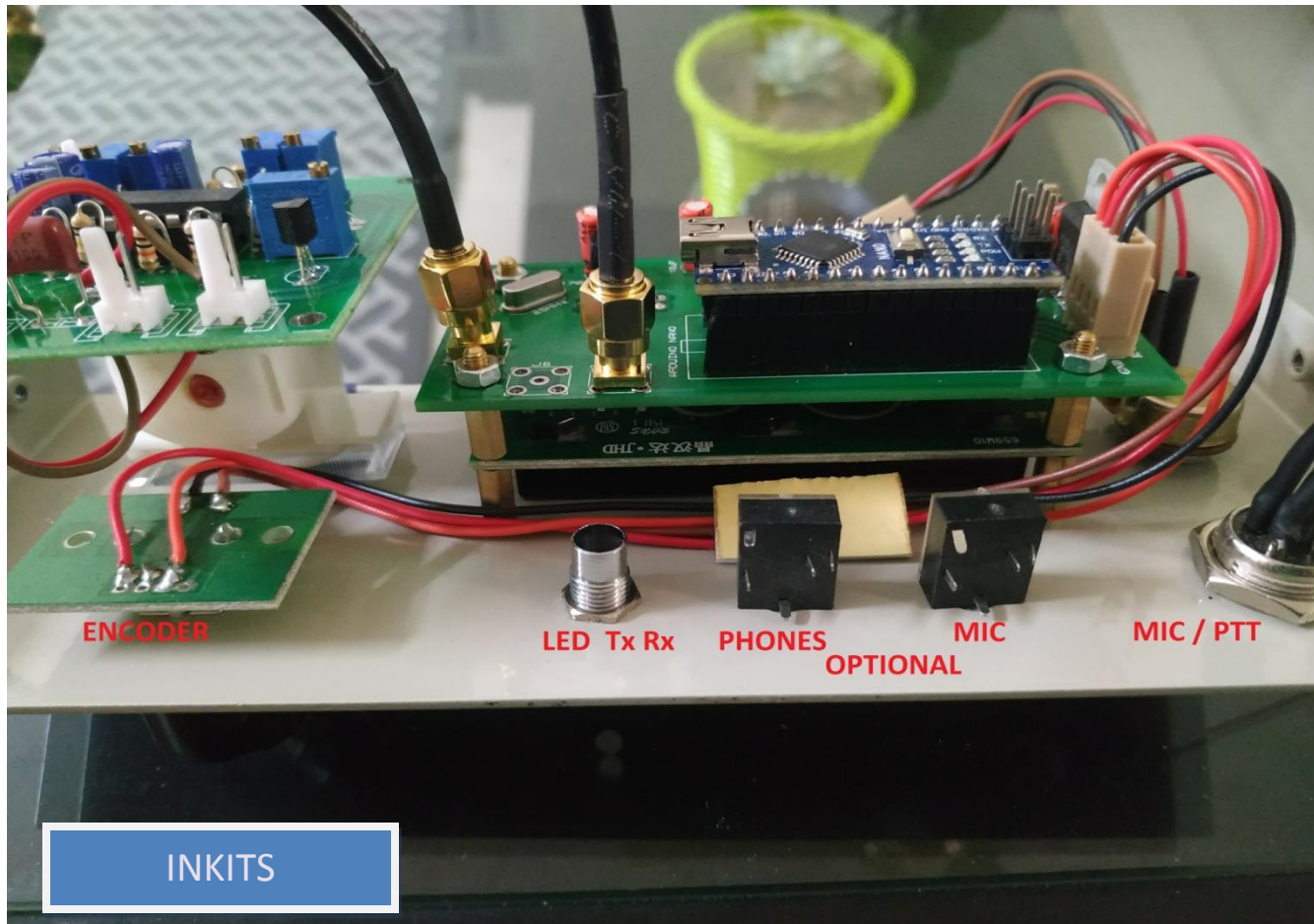


1. Electrical wire **Red** Black to be cut to **10 inches** and joined with 2 number of relimate connectors two pin having length of 5 to 6 inches.
2. Use heat shrink tube to cover the joints, now the harness is ready to provide +12 V to the main tcvr and +12V to the PA amp section.
3. Strip one side of RG17U RF cable and shorten the cable so that length is about 4 inches and solder on the S0239 Antenna socket and ground banana plug.  
The SMA connector will mate with the SMA onboard the easy bitx.
4. Mount 4 number brass stands provided with screws for mounting the easy bitx tcvr board.
5. The stand on front and rear can be mounted after the construction of the case.



## Front Face Plate Construction

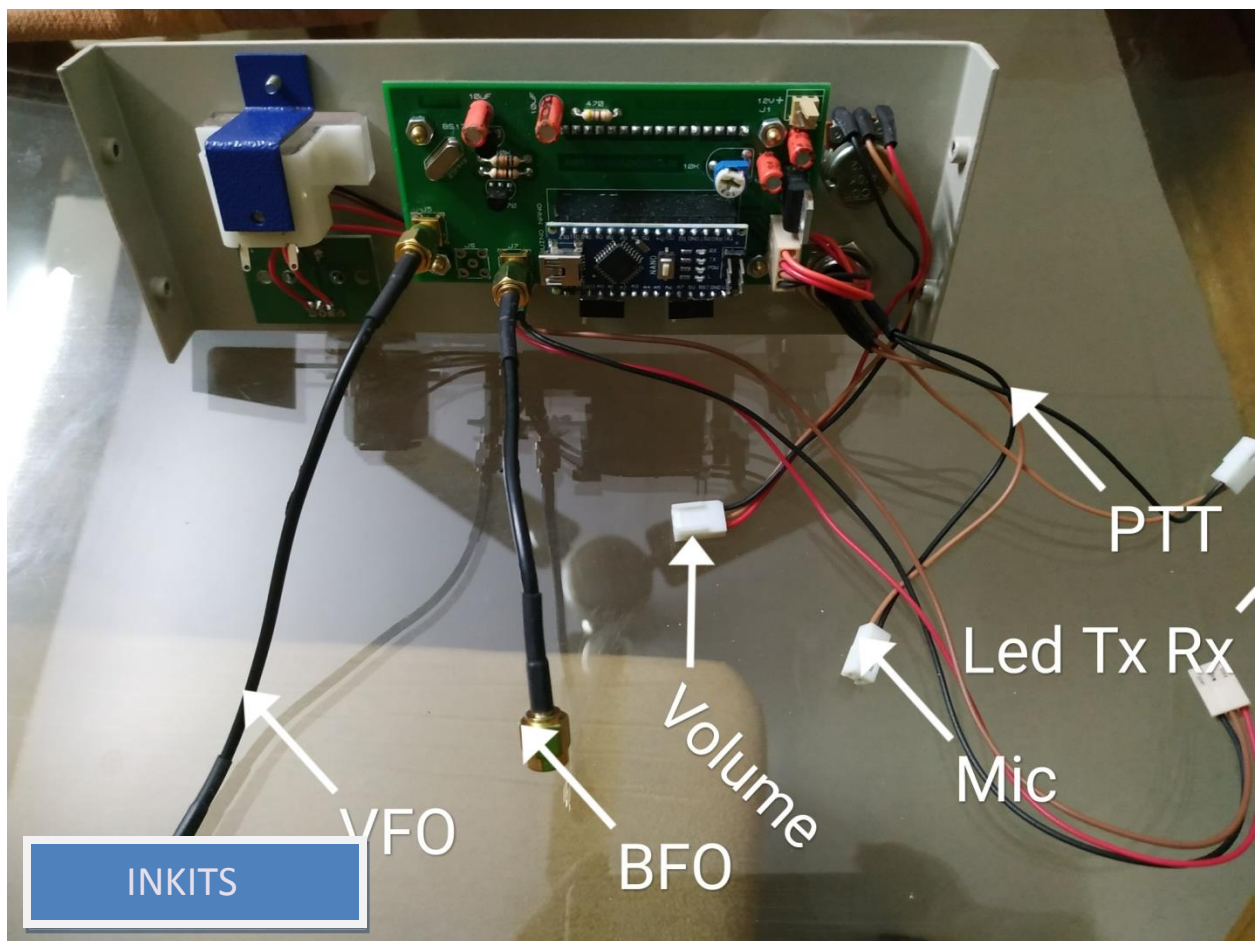
So now we move over to the mounting the modules meter and 10K pot and encoder on the front faceplate as below.



Items to be mounted on the front faceplate:

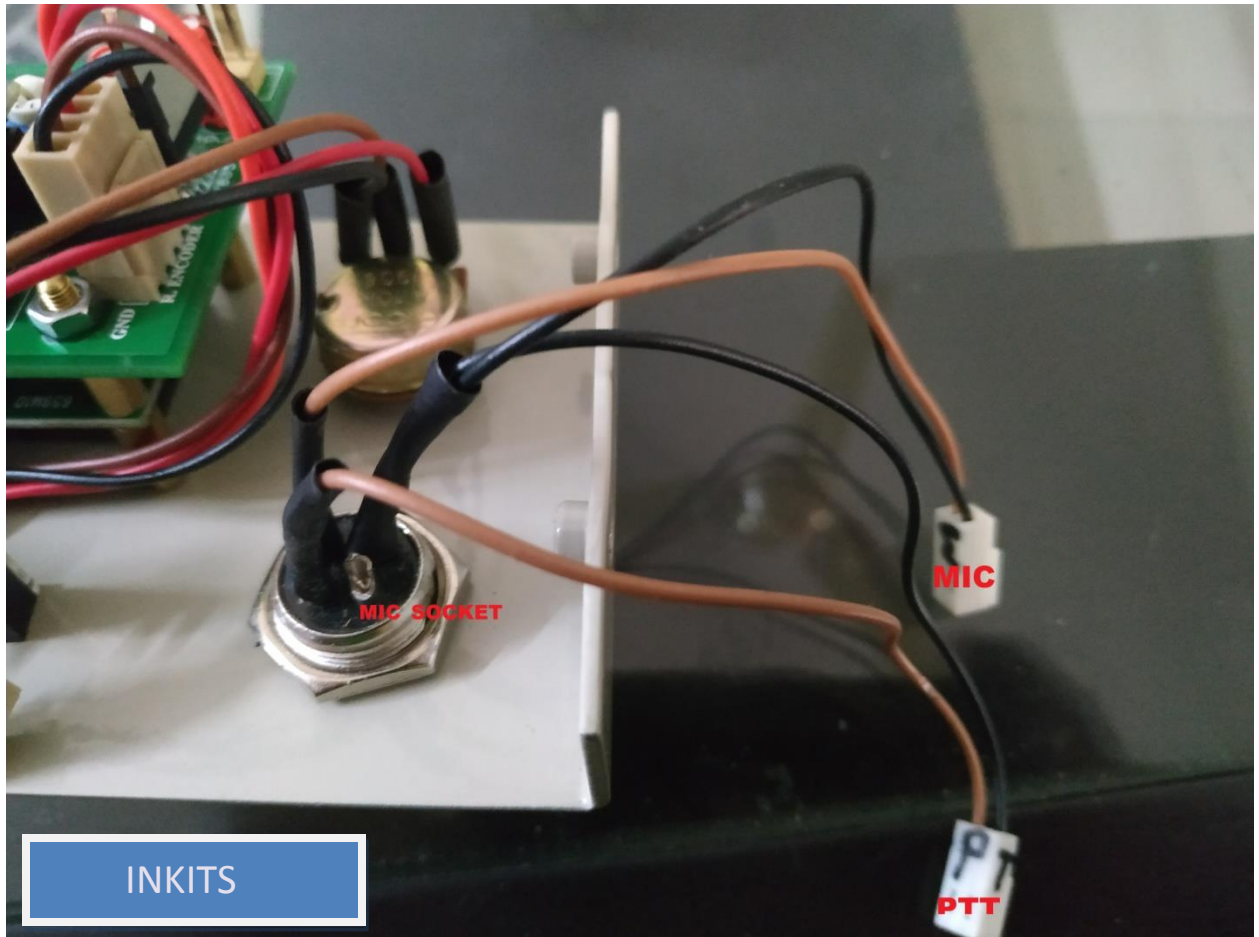
1. 10K Volume Control.
2. Microphone socket Circular 4 PIN for professional microphone.
3. Stereo socket for Jack type Pin for microphone use. This is for optional use.

4. Stereo socket for Jack type Pin for headphone use. This is for optional use.
5. Led for TX RX, the supplied faceplate want have a holder, the led will have to be pushed into the led placement.
6. Encoder. The length of the wire can be cut short accordingly.
7. VFO BFO. Si5351. The Board has facility of SMA connectors and two RF cables provided with both ends with SMA. One end plugs to the VFO output on VFO other to the Input VFO of easy bitx board. Same to be done with the BFO.



Wires and RF cables to be cut short as per requirement

Advantage of shorter cables that they won't cramp the available place and make fitting a bit neat and clean. Nylon ties are provided for securing the cables and wires.



Cut strip and solder the PTT and Mic relimate wires to the mic socket as given in picture below. Then these are to be plugged into the bitx easy main board PTT Mic on the easy bitx board.





Microphone 4 Pin Jack

If your microphone is with 8 pin, you need to change the mic adapter.

The microphones have generally connections for,

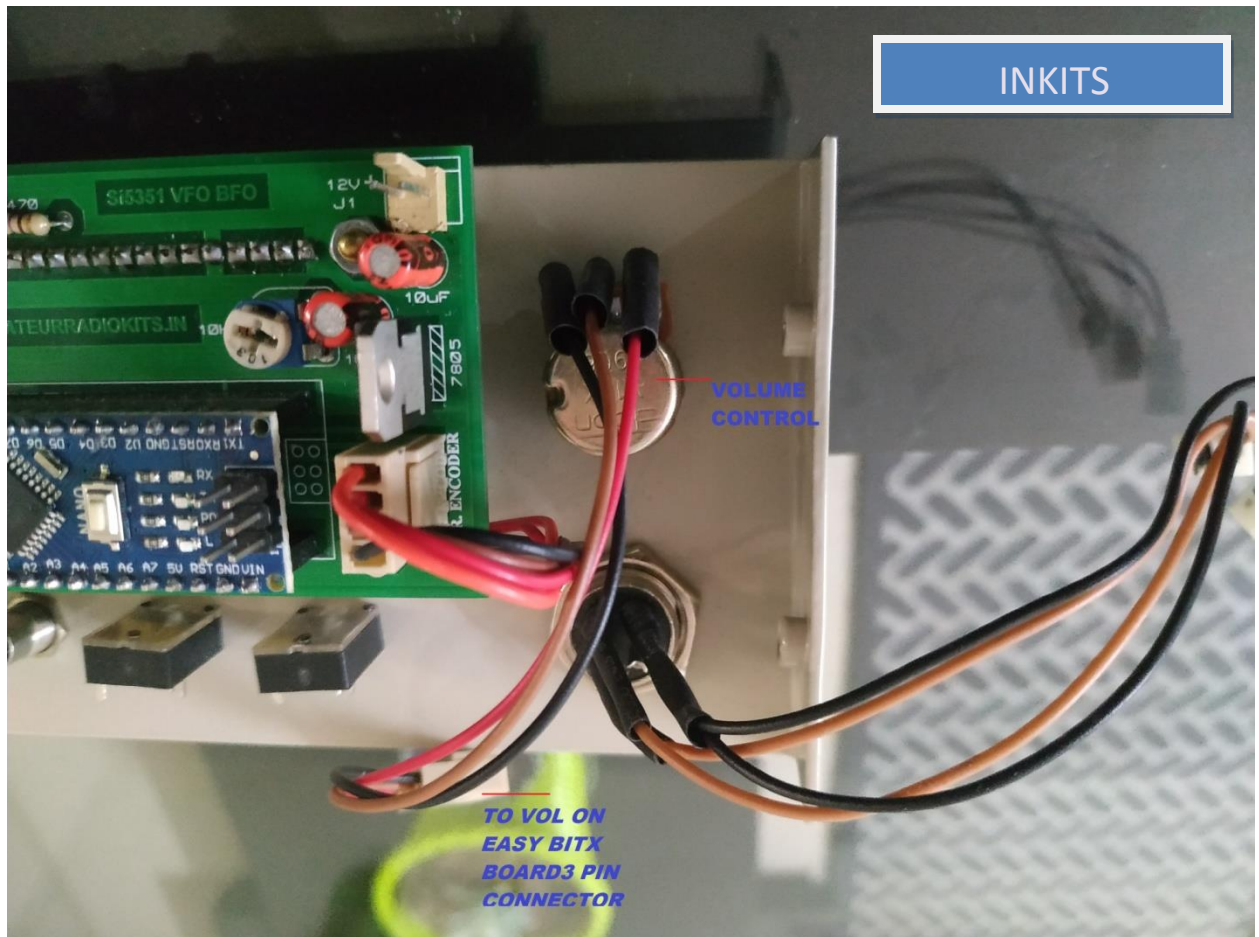
Illustration for Baofeng mic connections

1. Ground
2. Microphone
3. PTT
4. Speaker

Some microphones have speaker and some do not. Check connections your microphone. If you 3d print a mic case then use the electric mic sent in kit.

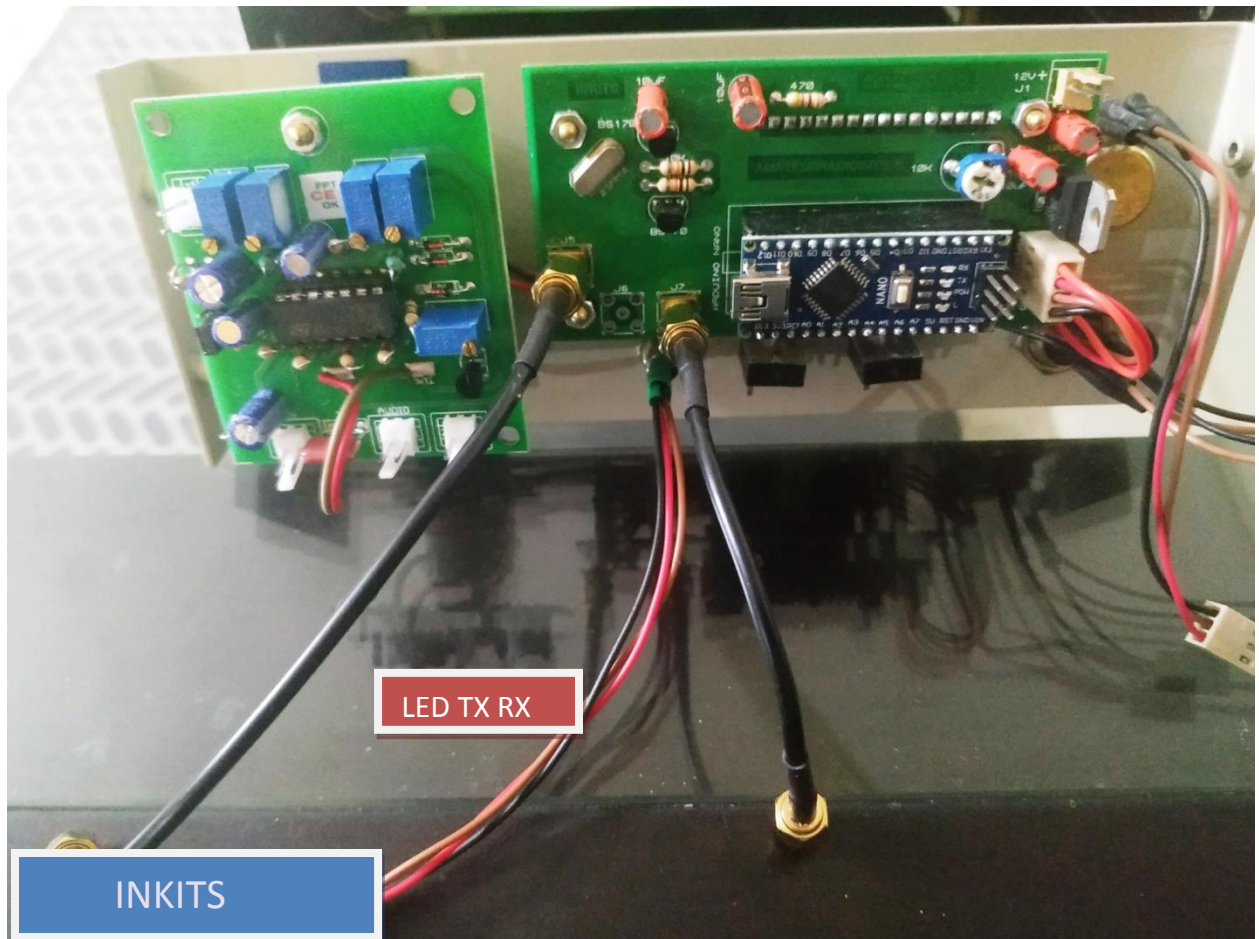
With an electric microphone you need to figure out the connections, which can be done with a multi meter. With a dynamic microphone you would need to install in series a tantalum capacitor about 4.7uf 16v so that the mic does not get +12 Volts. The connections will also depend on your mic. Your microphone may have

different connections, so please check with multi meter, before connecting to the transceiver to the respective pins.



### Mounting 10K Volume Control

Prepare a 3 pin relimate wire cut strip and solder on the 10K pot, cut small pieces of heat shrink tube and slide them over the 3 wires. Once the wire has been soldered and checked then the heat shrink tubes could be placed over the 10K pot pins and heat applied with a soldering iron or blow gun to shrink them.



Prepare a three pin relimate wire now cut wires short so that it is not too long. Strip the wires and solder to the LED. The left and right pins of led are anodes and the center pin is the cathode, solder wire accordingly. Use heat shrink tube on the led leads and wire, plug the 3 pin female side to the male 3 pin connector marked LED TX Rx on easy bitx board. You could select Red for TX and Green for RX.

The green led will remain always on in Rx mode and with pressing PTT the led would change to red.

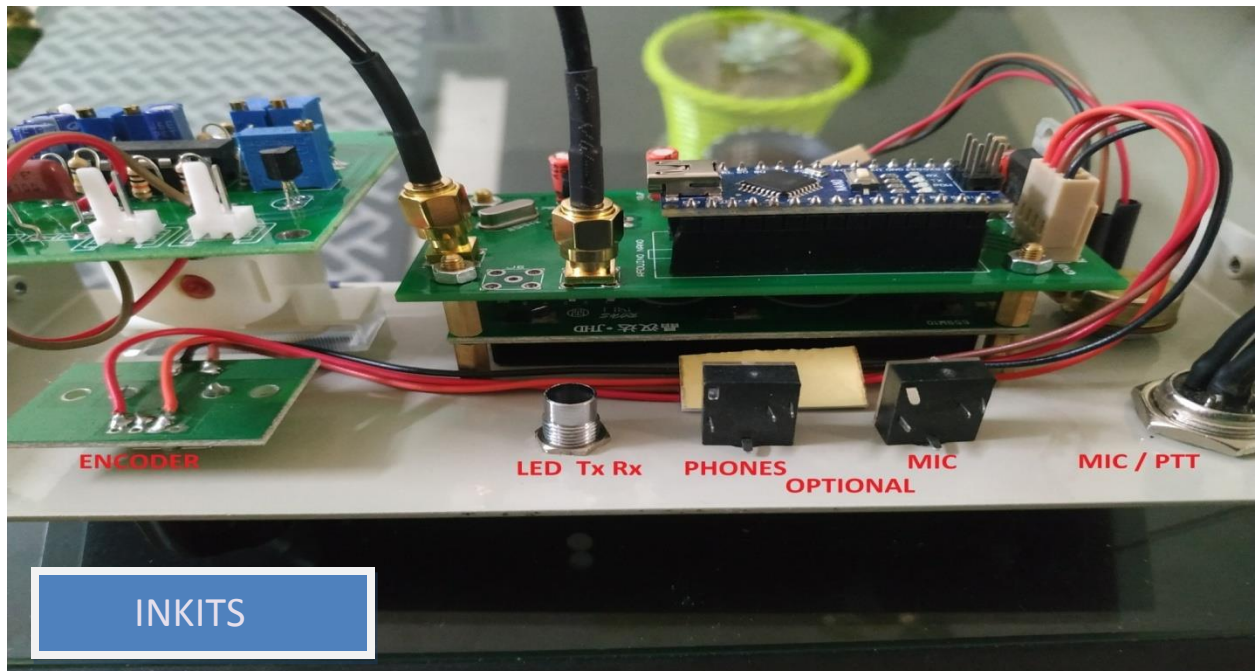
Rx Tx Led Left Pin Anode: Middle Pin Cathode: Right Pin Anode



**NOTE:** Check led red green position with millimeter in continuity mode and mark it so to solder correctly on the three pin relimate connectors going to the bitx easy board led connector.

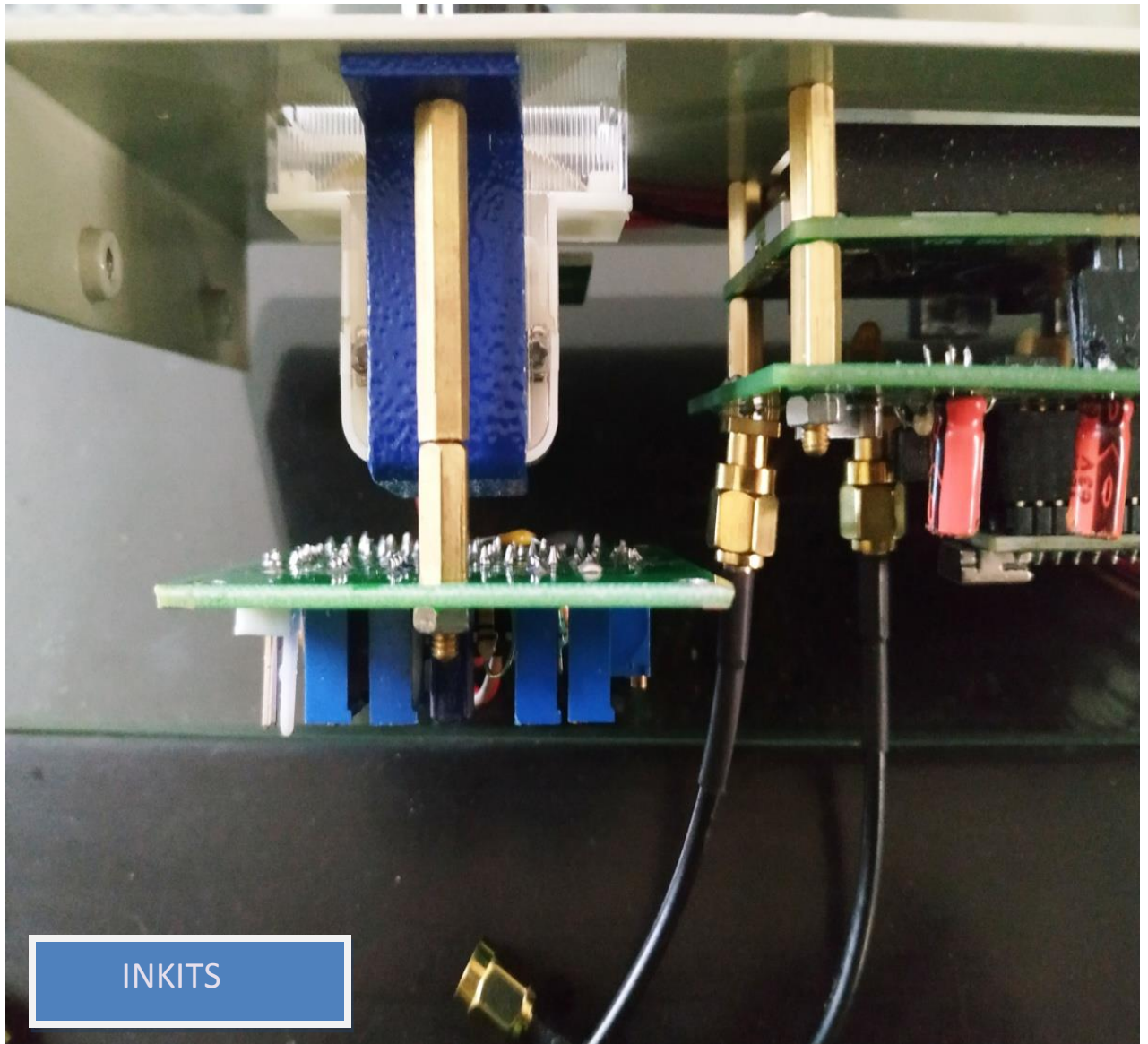
Mounting AGC on Front Faceplate.

Make sure the AGC is well checked before mounting on the faceplate so that constantly it does not need to be taken off the faceplate.

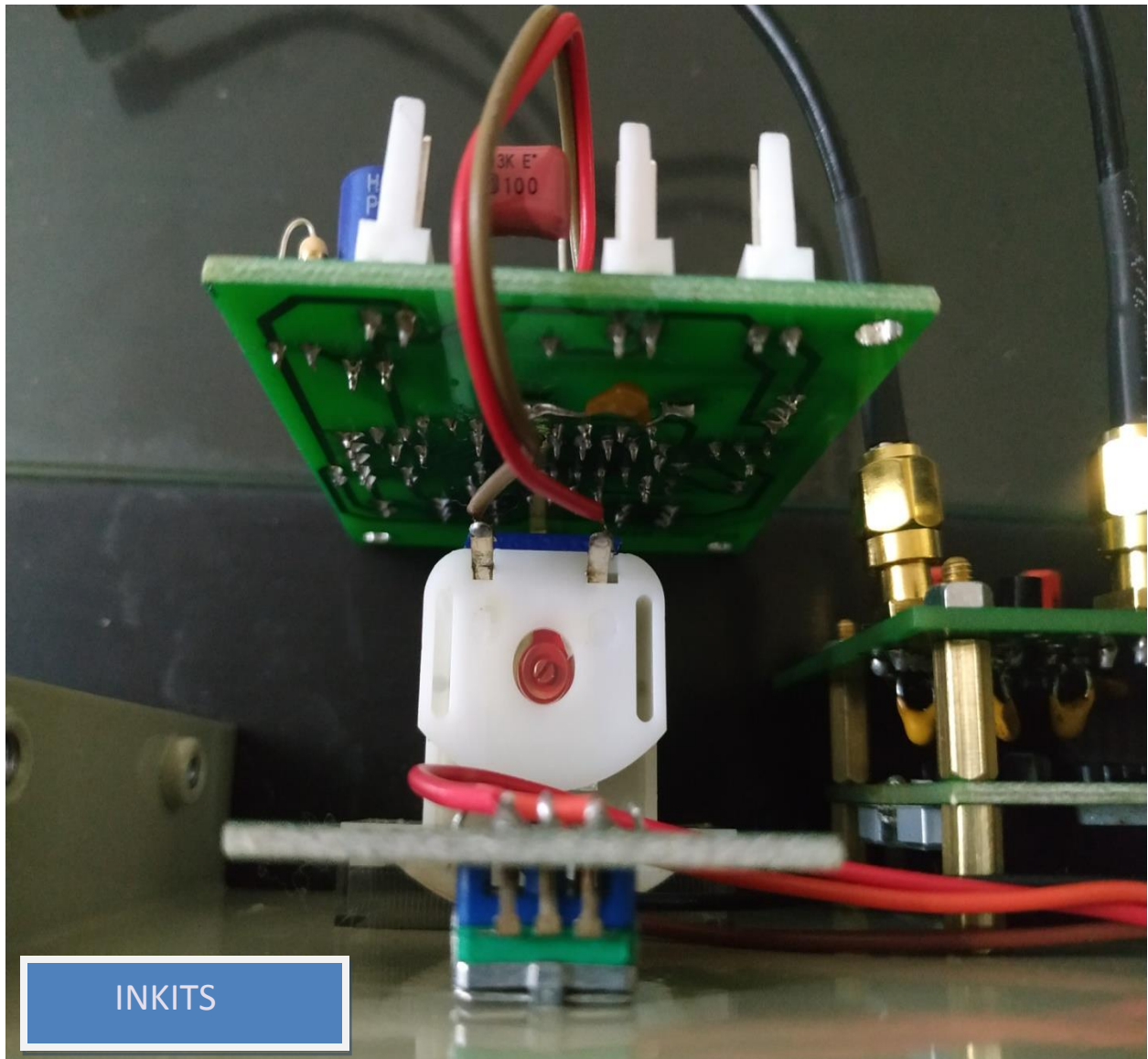


Mounting AGC on Front Faceplate





Clamp and brass stands used to attach the meter to the faceplate



VU Meter Connected to AGC SM1 SM2, below encoder as in picture

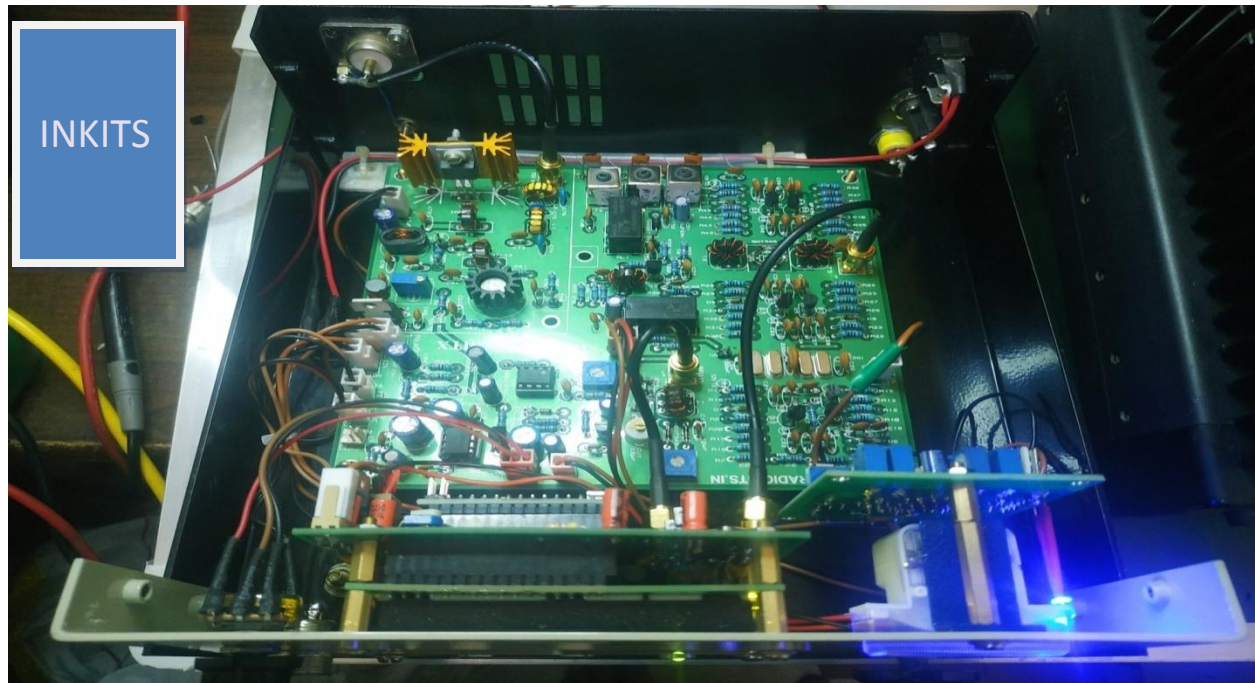
For connecting wire from AGC to VU Meter use the wiring connections as below Picture.



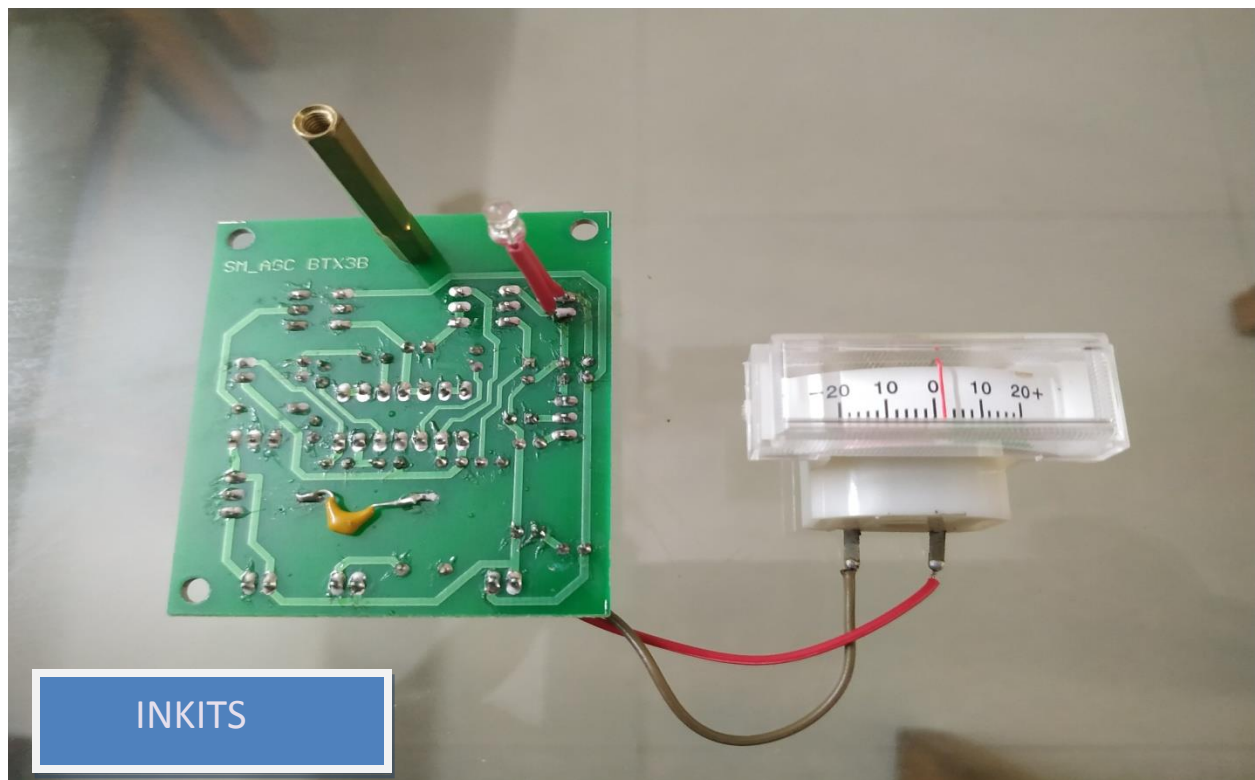
Use these wire connections for VU Meter and Agc connect

AGC Led





AGC led mounted



Led mounted on agc. 0.1uf added across meter to suppress RF in VU Meter





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VU Meter Installed with a top screw to the clamp

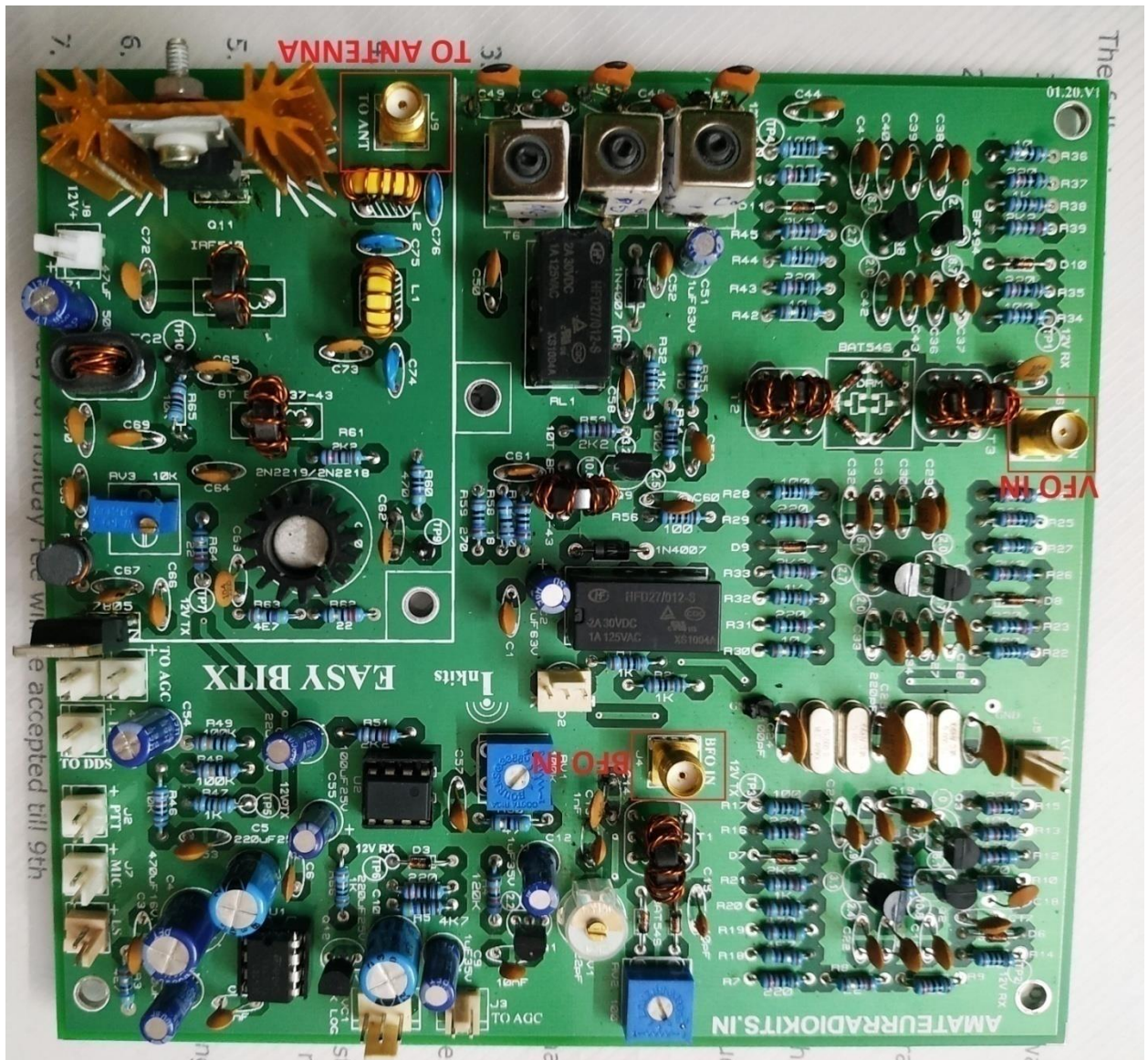


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This is how the front panel would look when completed. An acrylic cover is fit on top of the LCD with 4 screws on brass stands.

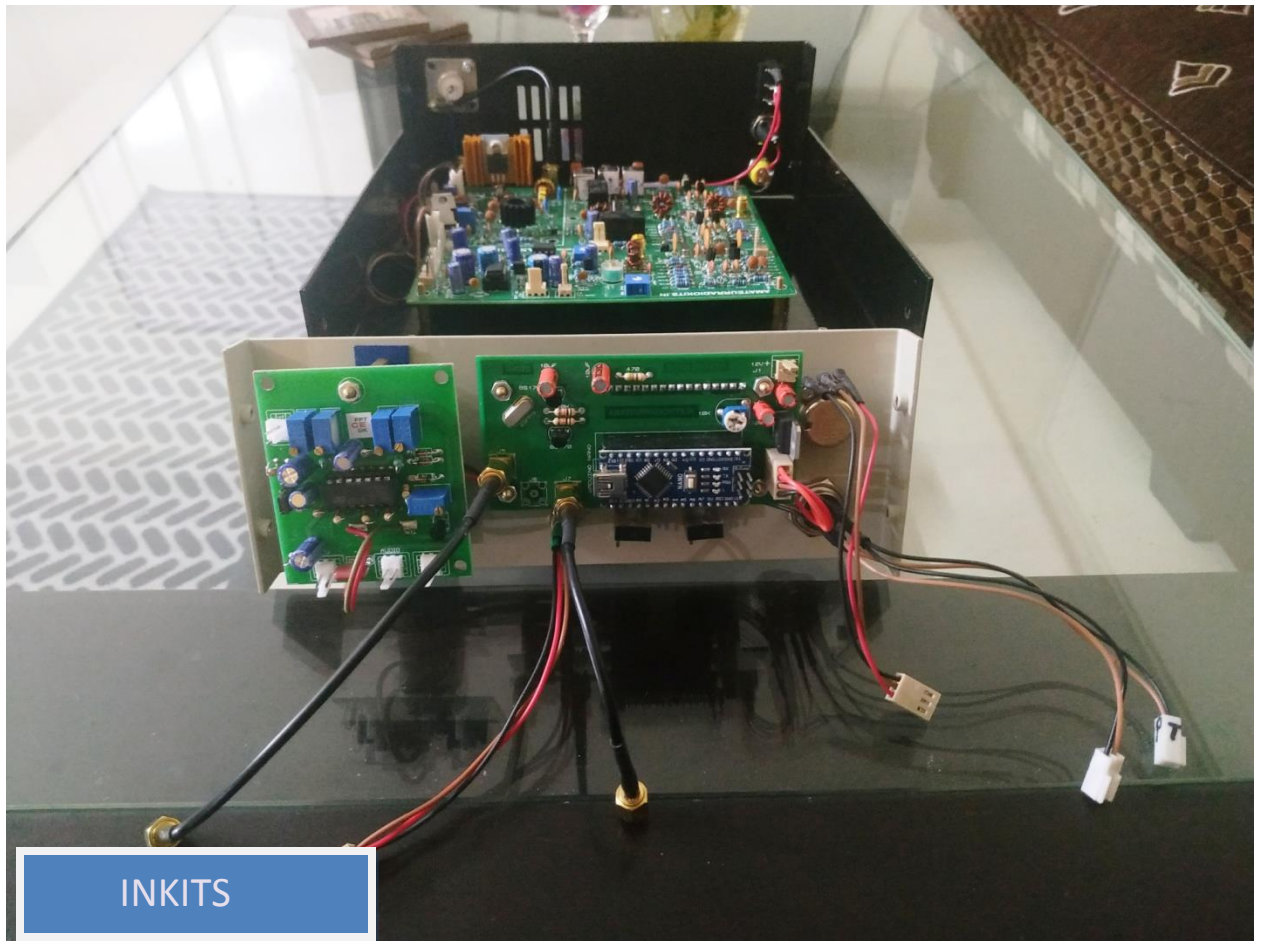
Now we have the front, rear and base plate ready, next step is to mount the bitx easy board on the base cover in this direction as in picture.

## Towards rear side of case



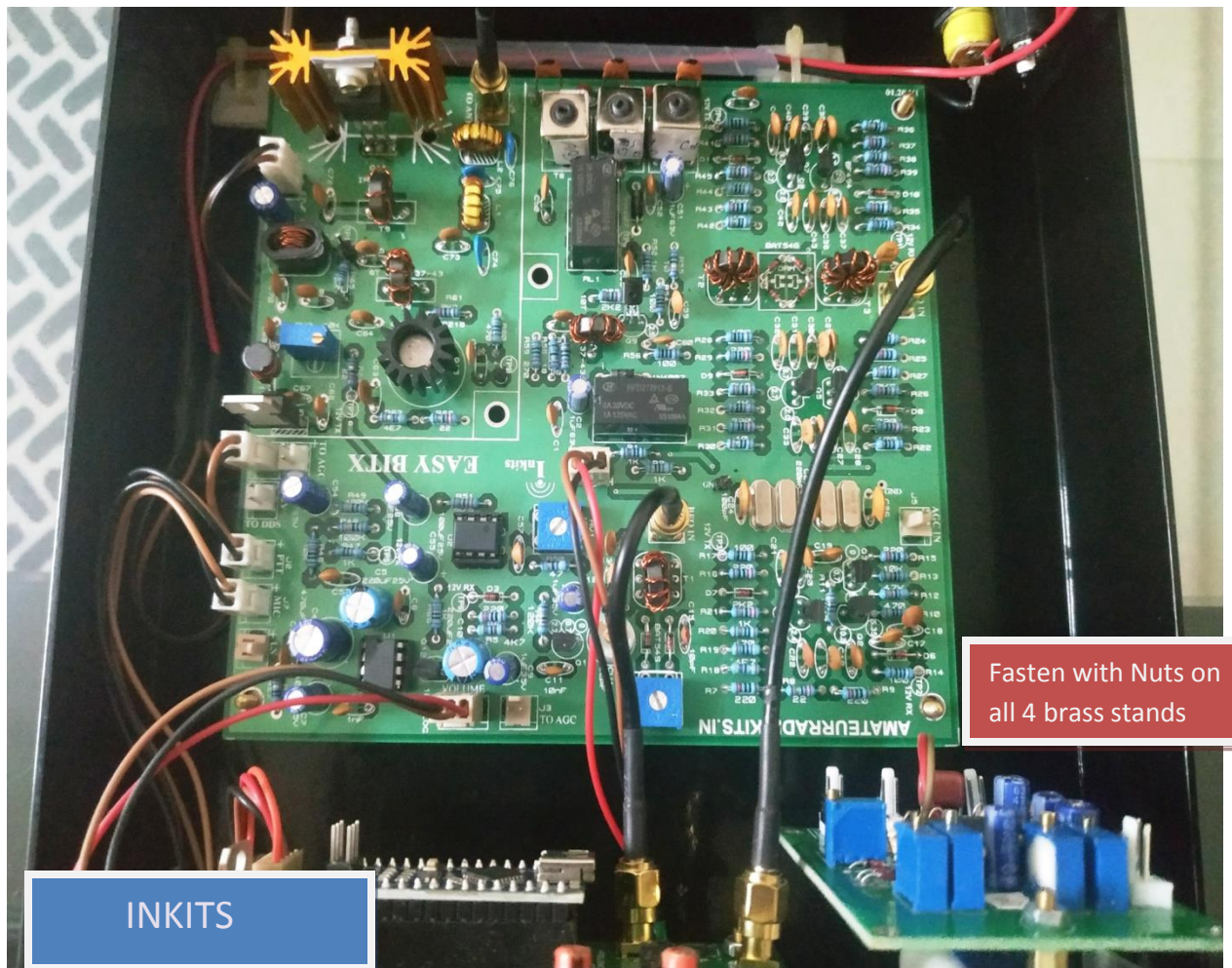






View of the built front and rear faceplate and the bottom cover

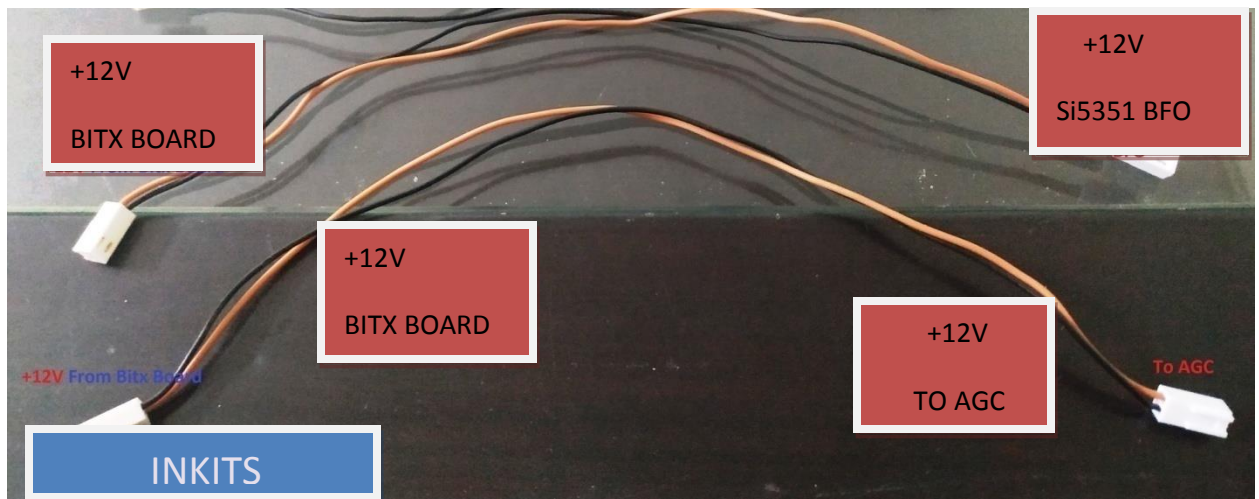




So now we have placed the front faceplate and attached the wires connectors for the following. +12V to TCVR, PA, PTT, MIC, LED. S0239.

Near the Power Input there are two extra 2 pin connectors which are for +12 AGC and +12V For VFO BFO marked as to DDS.

And 2 other connector for AGC in and audio out between agc board and easy bitx board required to be plugged in.



First set of connector wires

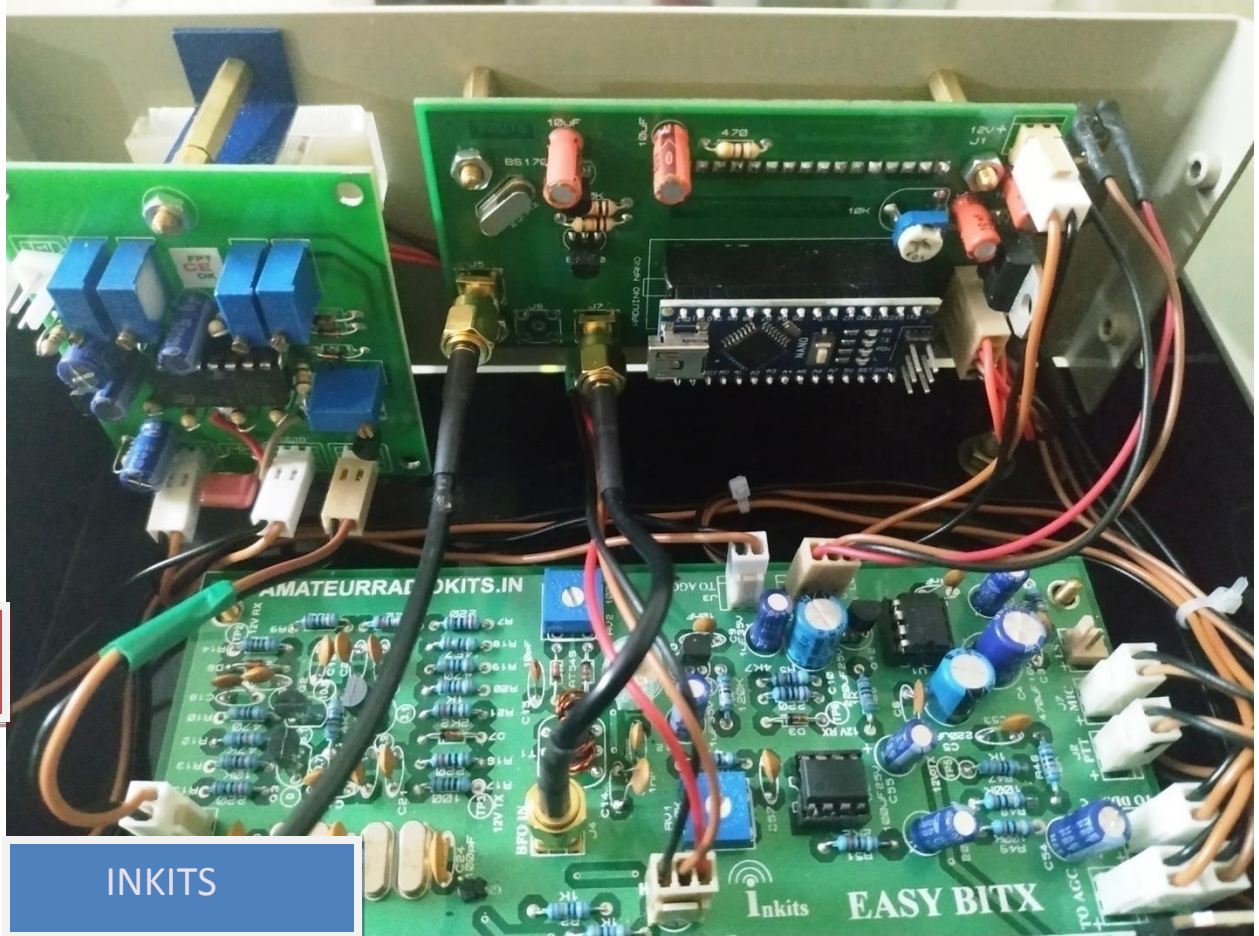
Plug the wire connectors between +12 V on board to AGC and VFO BFO



Second set of connector wires

Make the AGC wire a bit short 4 inches as both the input and output connectors are quite near, you could do that only after mounting the AGC and meter on the front faceplate and determining the suitable length.





Inner view of the bitx board and front faceplate with all module and parts fitted

The wire connectors could be neatly tied using nylon ties, but does the cosmetic stuff only when you have tested the tcvr in TX and RX mode and think that the project is complete, if you want to repair or modify then keep a few nylon ties to redo the finishing work.

So what we see in picture is that the relimate wires, RF cables are plugged into their respective places and secured with nylon ties.

Now use the 3M8 screw provided to fit the front faceplate and also the rear faceplate.



Front Faceplate View





### Rear Faceplate View

The faceplates have been secured in place with 3M8 screws.

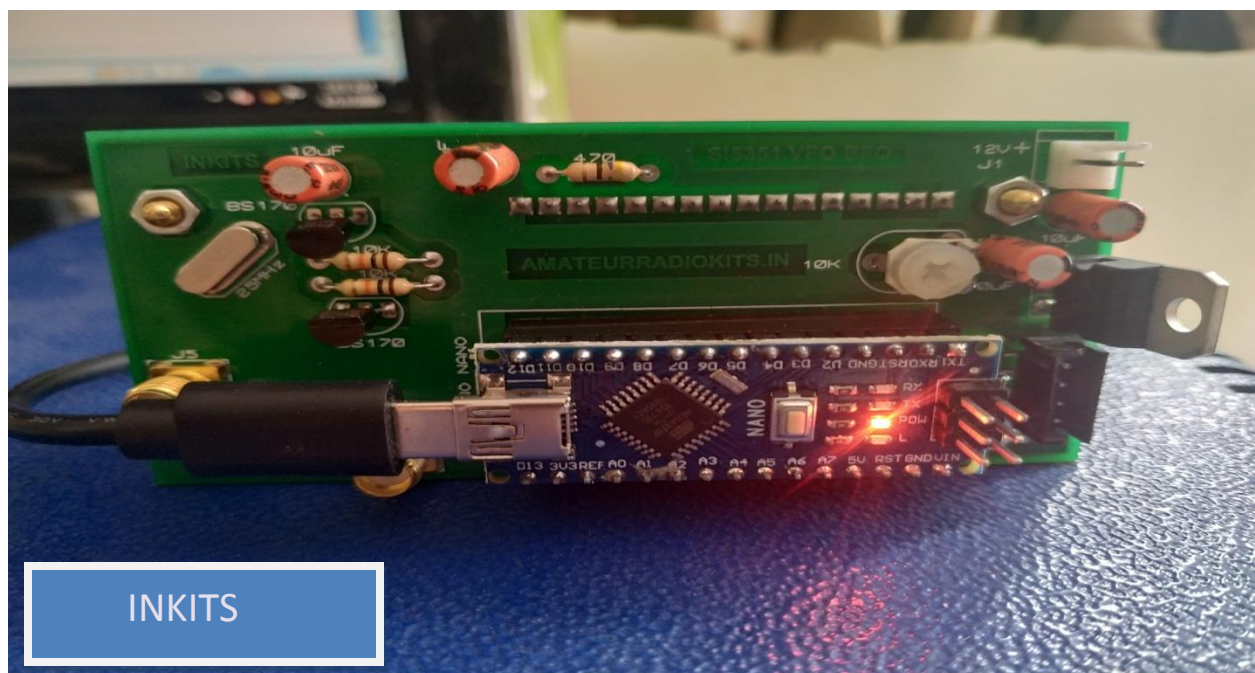
Now we need to fit the speaker on the top cover as in picture, the clips and screws have been provided in the Kit.

Now we need to power the TCVR and check the RX working OK with antenna connected.

Arrange a suitable power supply +12V with at least 2 amps current or higher. Connect the power supply with a power cord to the input DC socket.

As the power is switched on the first step would be to tune the VFO and BFO by pressing the encoder which has a switch to activate the menu.

### Tuning the VFO BFO Si5351 Easy Bitx



The BFO VFO used is with Si5351 the sketch used is open source.

The PCB is in house design by INKITS

Any design sketch could be used with Easy Bitx, only IF Freq needs to be set at 10MHZ. If you wish to use 12 MHZ Filter then set the IF to 12MHZ.

For complete details of the design, operation and sketch we are giving the link below.

Link <https://sites.google.com/site/vk3bhr/home/index2-html>

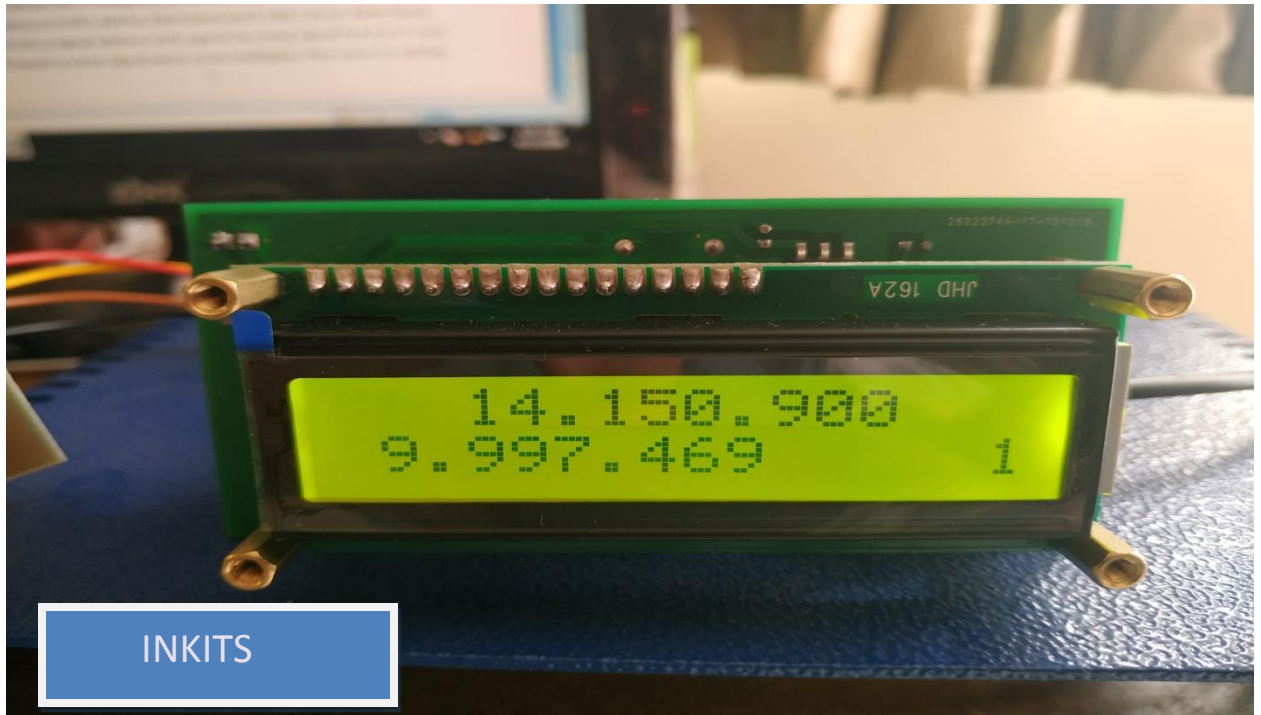
## Setting Up the VFO BFO

It is presumed you have already set up the VFO BFO before fitting in the case. Still some steps are being mentioned.

The ready build VFO BFO will have the IF set for 9.997.469

1. First set the Frequency to 14MHZ by pressing encoder and setting the tuning range to 100 KHZ tuning range for encoder.
2. Second press now again two times the menu switch steps to the second line which shows the IF frequency, press the different range steps and fix the frequency to 9.997.469 for 20mt Band and 9.998.216 for 40mt band, now tune into a signal which is with a good incoming signal first try to tune on the frequency when signal seems to be intelligible then move to setting the IF frequency and tune it till the signal received sounds very natural, this sets up your IF frequency.





You do not need to select LSB or USB as that is done by the sketch when you change the bands.

The VFO BFO is done.

The Tx is now to be checked if all relevant connector's wires are at right places.

If you have not set the bias then set the bias for IRF 510 as mentioned in the bias setting notes.

Once you are satisfied with the entire test including the AGC test and TX test you could close the top cover.

This completes the boxing of the easy bitx for 20mt.



Easy Bitx









Easy Bitx In receive mode 20mt band.

Do not forget to mount the front and rear stands.

The L Type plate is the front stand and you shape is the rear stand.

Since its homebrew equipment you would be constantly doing experiments so cover want be closed permanently, hi hi .....

Final Look of Easy Bitx boxed Up !