BitX 40

A Single band, 5 Watt, LSB single side band transceiver

Ashhar Farhan, VU2ESE designed it several years ago, but has recently started to produce a kit.

The original article is at http://www.phonestack.com/farhan/bitx.html

It is available from his company at http://www.hfsigs.com/ using Paypal. The design is open source, so some other versions are available as kits or finished products.

www.hfsignals.com is the web site for purchasing

http://bitxhacks.blogspot.com/ has modifications and upgrades listed

https://groups.io/g/bitx20 has the community forum - lots of opinions

Eric O / KE6MLF

What I got..

The BitX arrives with the **PCB, connectors with wire pigtails, microphone element, and a PTT switch**. You will have to add your own enclosure and speaker (or headphones). I purchased mine in in the middle of 2016, and got the **analog VFO** version.

The VFO drifted quite a bit, but I want the lower current requirements of the analog VFO to increase battery life. I spent a bit of time at the active message board at https://groups.io/g/bitx20 and got a few solutions.

I put mine in a light weight tin box. Several enclosure designs are available in metal and 3D print. Many people use off the shelf boxes.

Costs

Costs are as follows:

- $60 - BitX40
- $5 - 10 turn pot
- $5 - Tin enclosure
- $5 - Headphones
- $20 – Battery
- $25 - Dipole Balun, Coax, wire

I ordered mine via India Post, **2-1/2 weeks** of nothing, then it shows up in the mailbox. I ordered one for my brother with DHL tracking, 1 week of nothing, then the status is updated after it shows up in the mailbox

Warning, DHL is charging Value Added Taxes or Import Duty to some countries, India Post has no such extra charges.

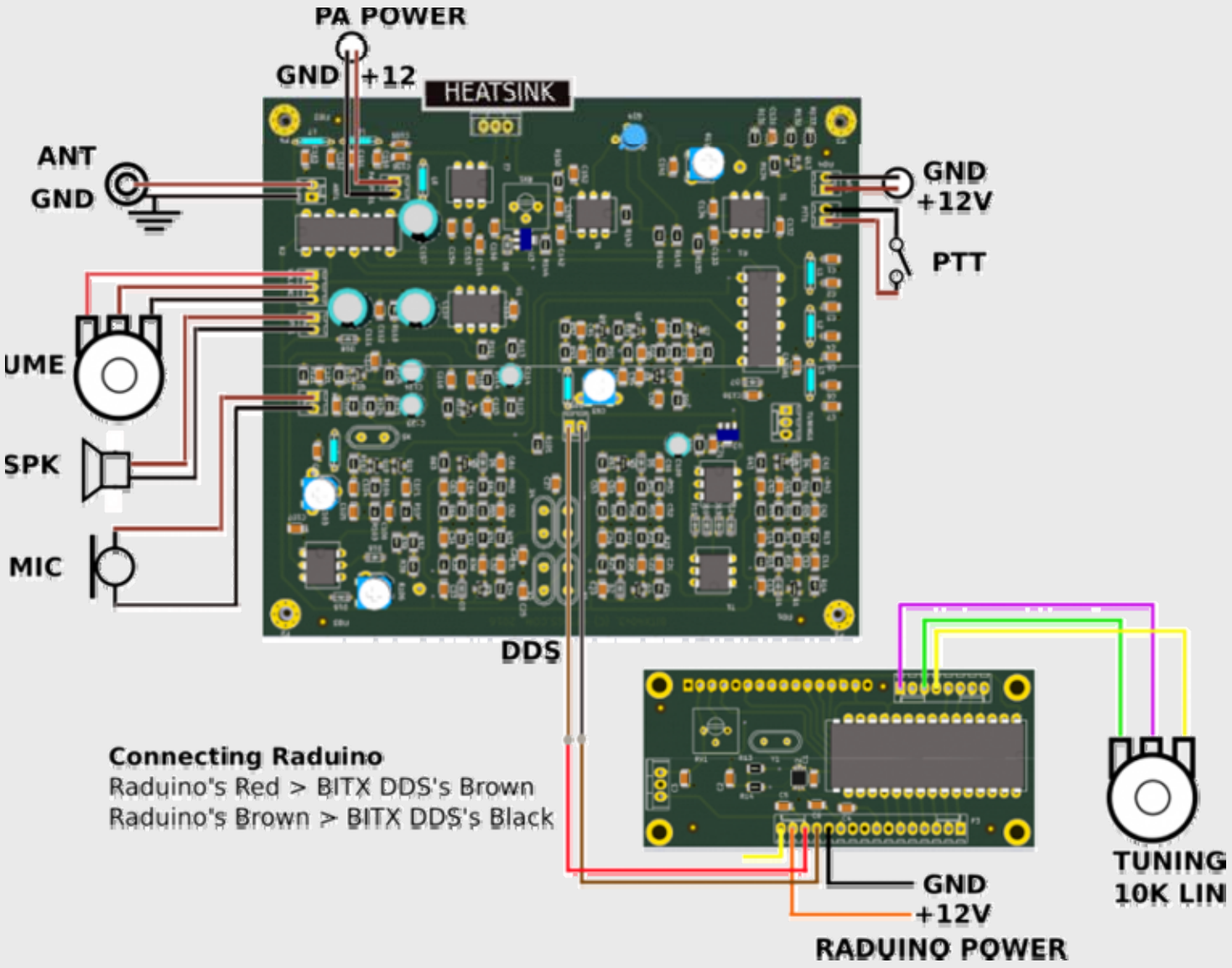
What you can get..

It now comes with a **Raduino** that has a frequency synthesizer IC and LCD display. The current shipments add a plastic box to better protect the parts, better than the early cardboard boxes.

The Raduino comes pre-programmed, but there is **lots of activity** to change the functionality. It has to be re-programmed to get other bands, digital modes, or change from LSB to USB.

Ashhar has been working on a multi-band version. The **uBitX** is a bit more ~ $125.

Easy to Wire Up



My setup

I got mine to take it portable, as in backpacking, so weight is an issue.

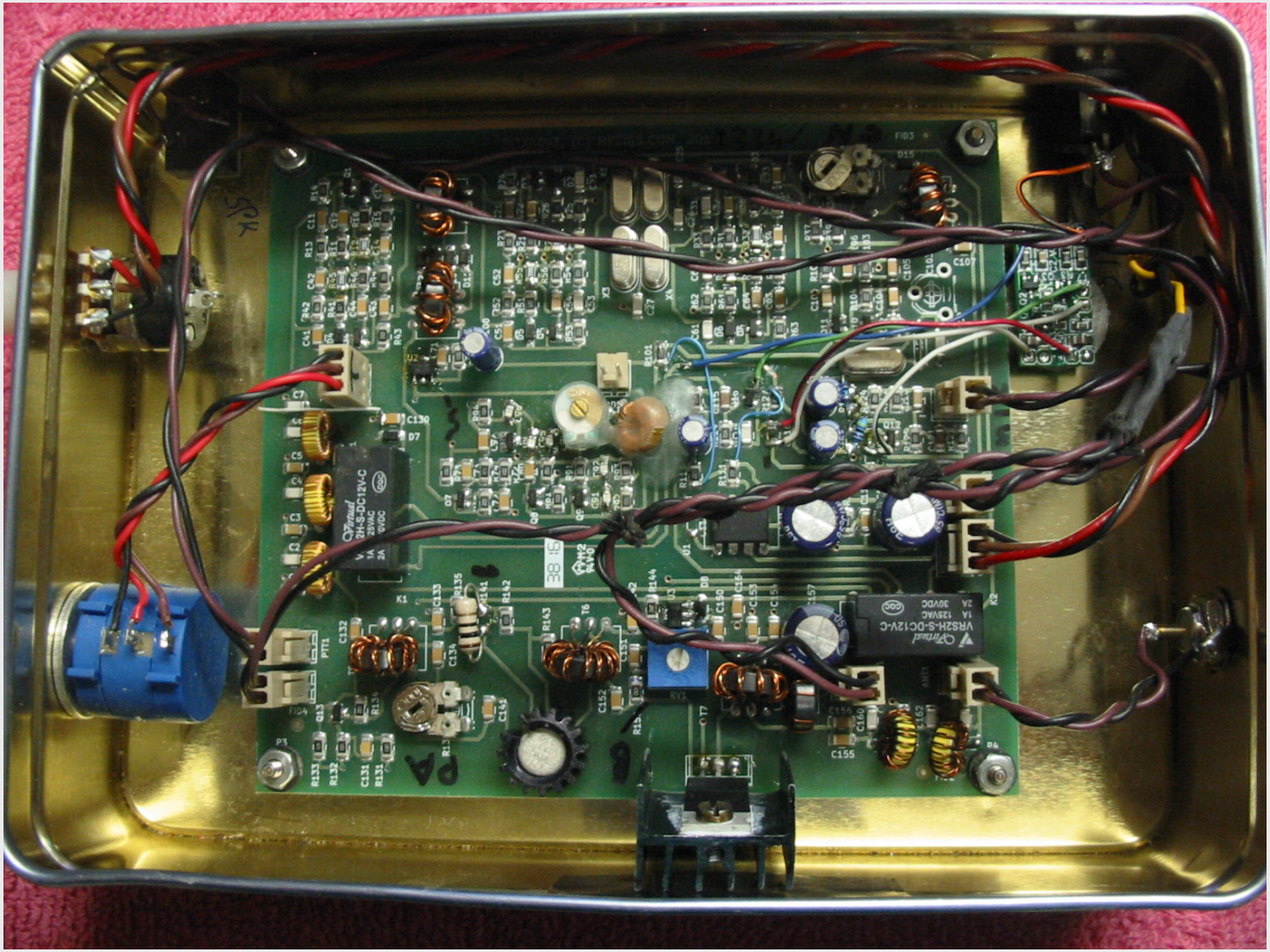
I take 50 feet of nylon line and some fishing weights to throw up in trees for the wire ends support.

I use a 2.2 Amp hour lead acid battery. Should give 2 hours talk time.

I use headphones, but have a small speaker for demonstrations.

PCB Installation

Tuning knob, volume knob, PTT plug, headphones plug, antenna BNC, power wires.



Radio and accessories

Green box is the push to talk button and microphone.

Antenna

This is a **SotaBeams dipole**.with 4:1 Balun, 22 AWG wire poles, RG-174 coax.

I take nylon line and fishing weights to get it suspended up in the trees.

Easy to Modify

Here are some of the modifications I did, all from the **user groups**:

Installed back to back diodes across the front end input for overload protection.

Changed to low temperature coefficient capacitors in the VFO section to **reduce drift**.

Glued down the VFO coil for stability.

Changed the **tuning** potentiometer to a 10-turn.

Added a capacitor across output inductor to reduce off frequency harmonics.

Reduced audio output gain for headphones.

Transmit pop elimination.

Spare output and pre-driver transistors.

Future Modifications

Modifications I will do:

Audio AGC.

End fed antenna – only one leg to put up in a tree!

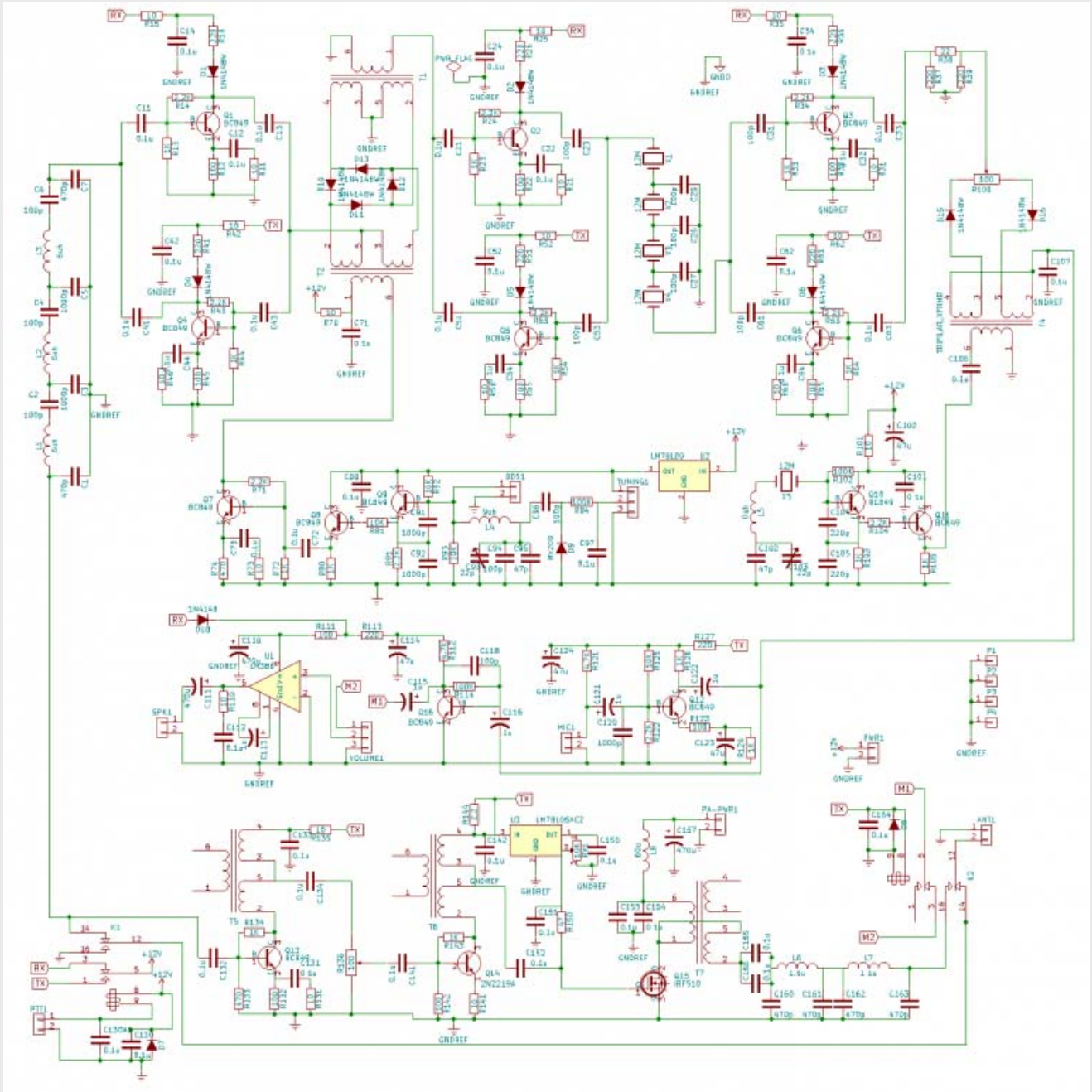
Reverse power polarity protection?

SSB Radio Blocks

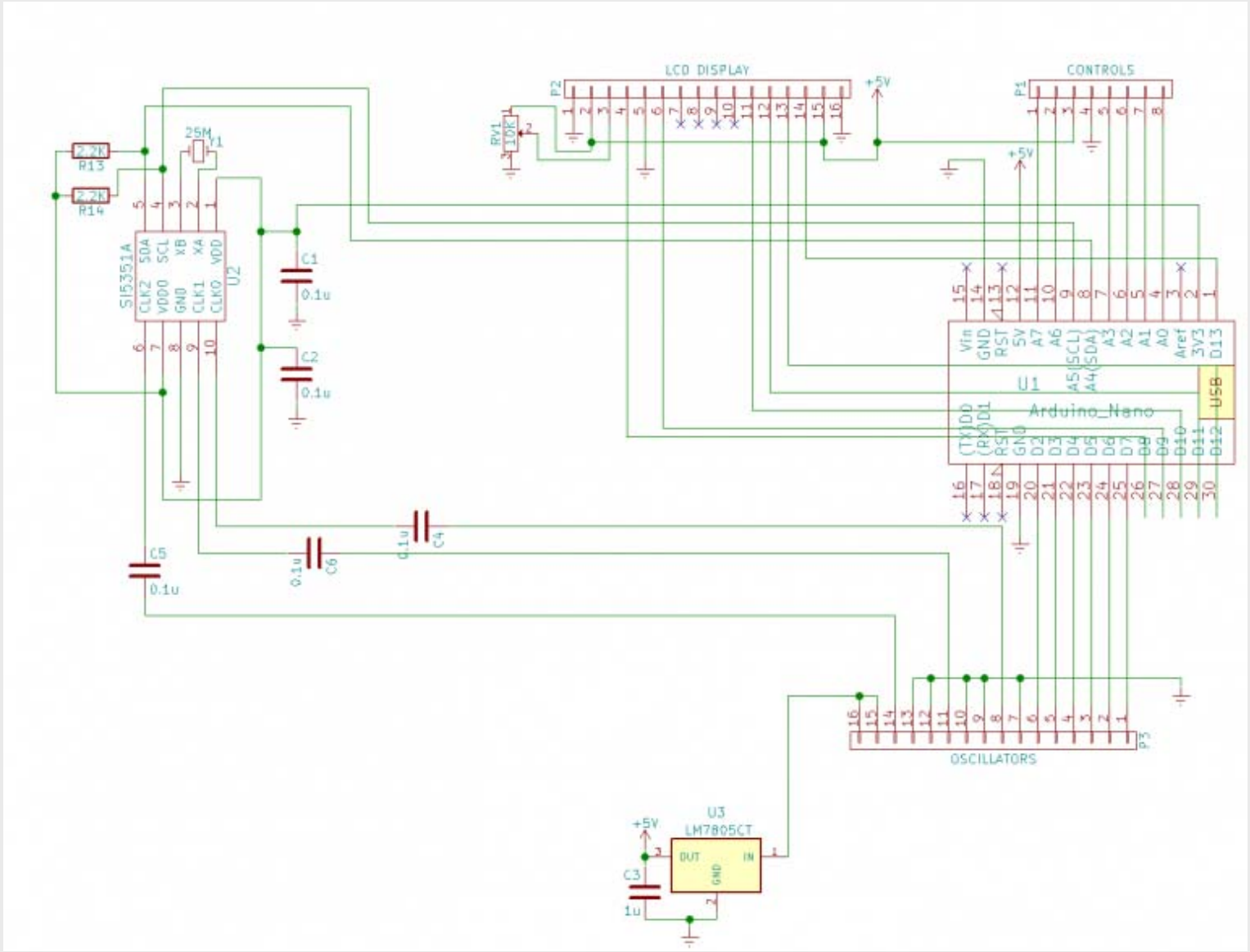
Teaches the very basics of transceiver design

- Local oscillator
- VFO
- Mixers
- Amplifiers (bi-directional, just switch power on and off between RX and TX
- Filters
- SSB

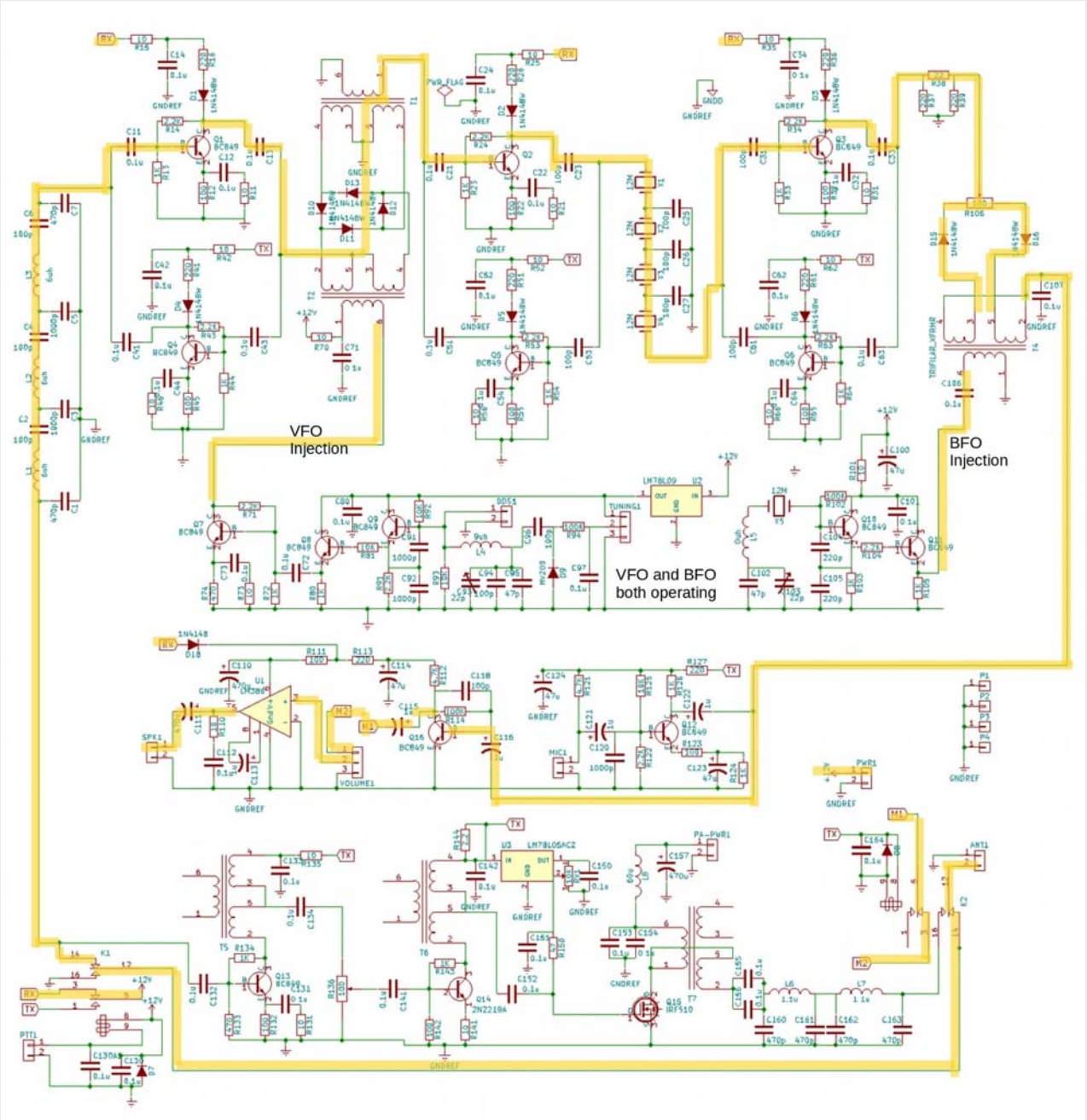
Schematic



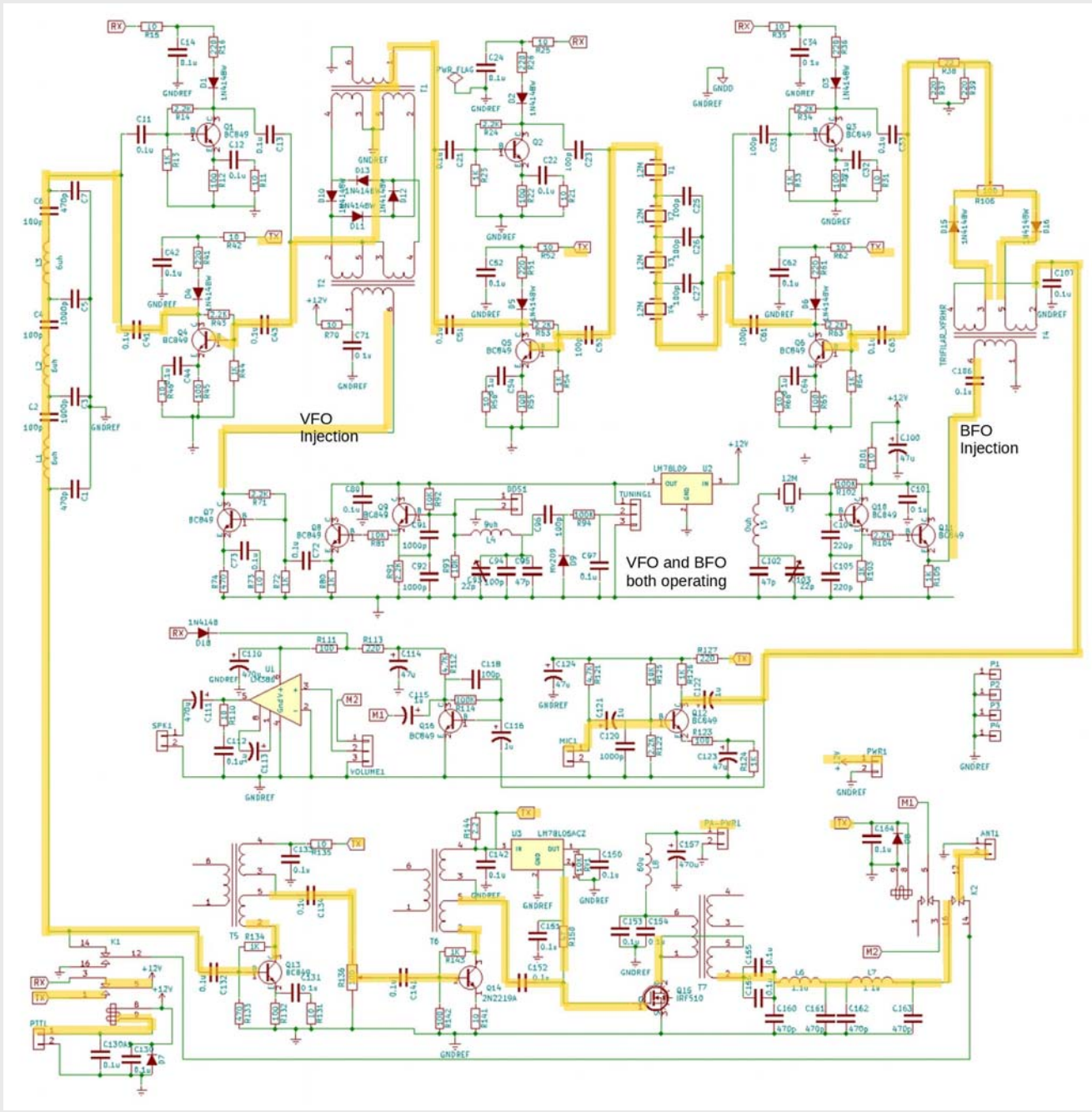
Raduino and Display Schematic



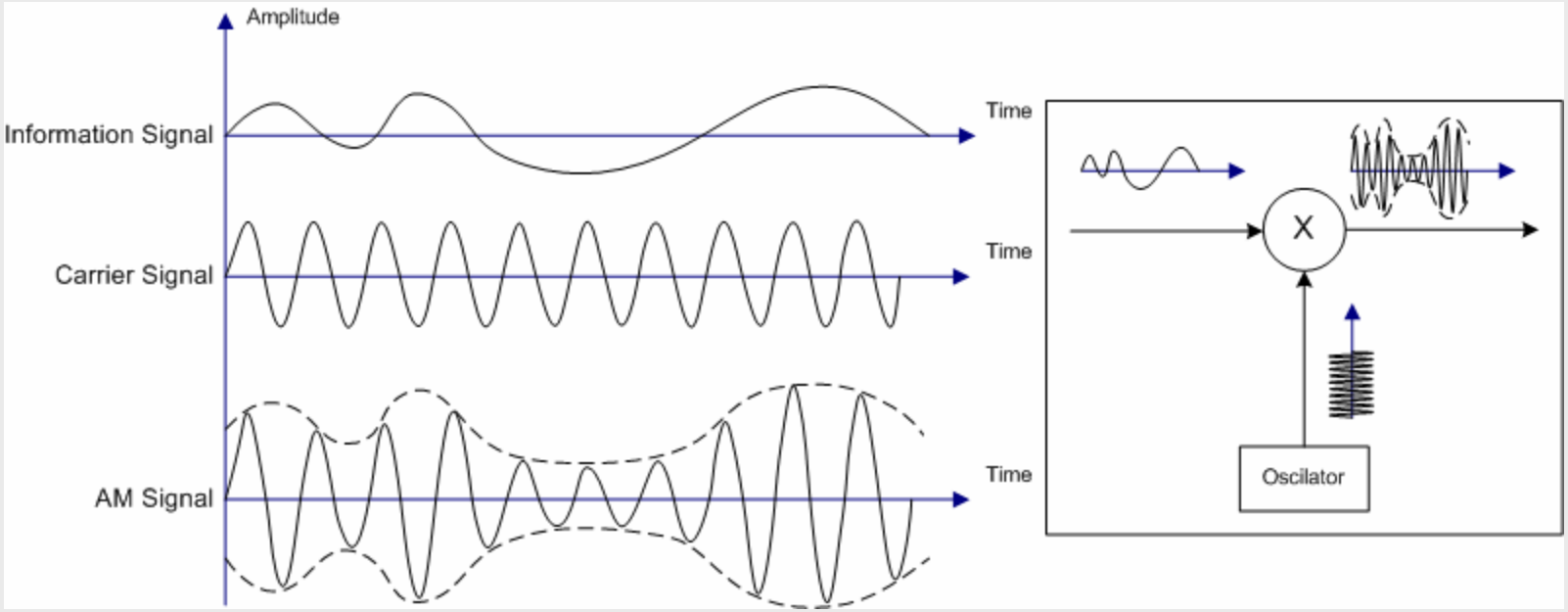
Receive Path

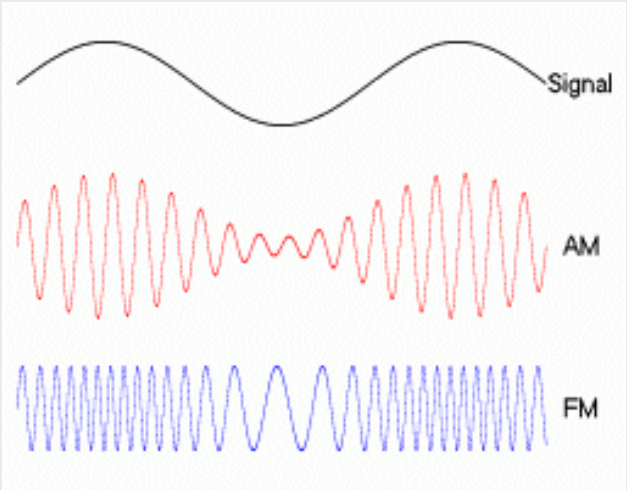


Transmit Path



Waveforms - AM





Waveforms - SSB