

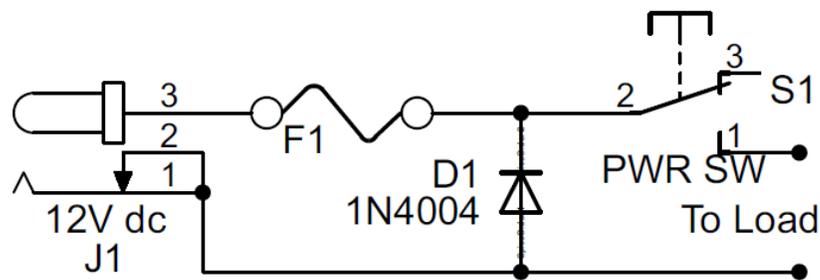
BASIC uBITX CONSTRUCTION IMPROVEMENTS

NOT ALL OF THESE NINE BUILDING STEPS APPLY TO ALL VERSIONS OF THE MICROBITX --- DO THE ONES THAT APPLY TO YOUR MODEL.

Gordon Gibby KX4Z

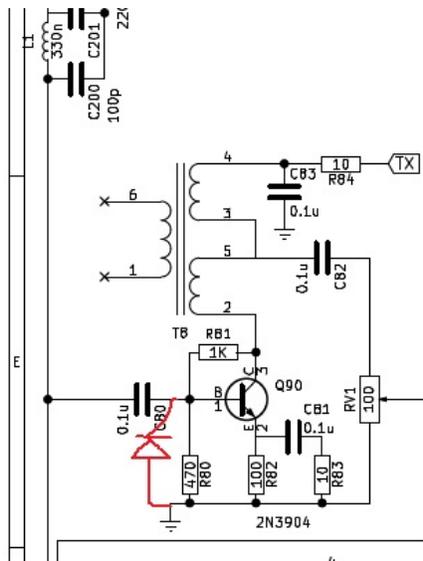
1. Polarity Protection – ALL MODELS

We install a Fuse and cross-diode right from the beginning so you won'tFRY your wonderful radio!

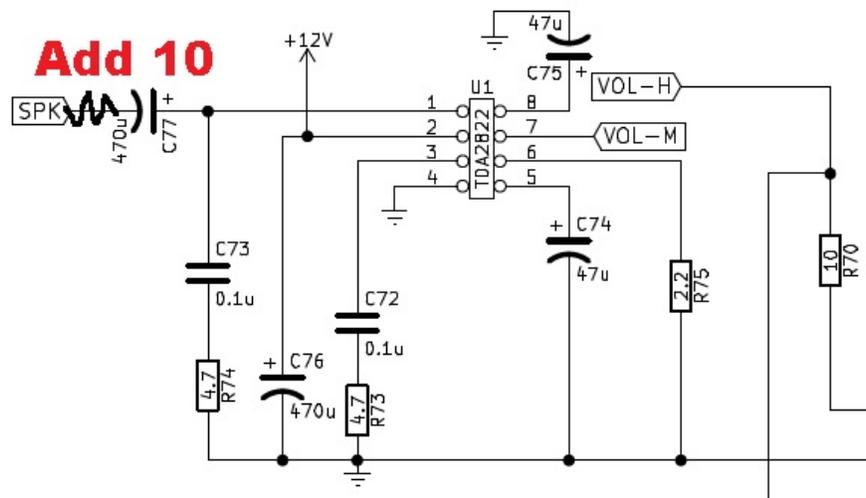


2. BE CERTAIN to Add the 4.7K pull up resistor on the CW key input or equivalent. If you forget this the rig will go into CW transmit!

3. Receiver input diode protection This will keep your rig protected from being damaged by a nearby powerful transmitter, which can destroy Q90 if you don't put a reverse diode between base and emitter so both sides of the powerful AC waveform get conducted. We use a small signal diode like a 1N4148. I also have some surface mount ones on order that will sit right on top of a resistor and just solder to it.



4. TDA chip output protection (version 3) – 10 ohm resistor in series with output This protects against accidental short circuits as you insert or remove connectors, which have been known to blow this chip.



5. version 4 audio amplifier bias adjustment – 500 ohm trimmer with 100 ohm parallel to add voltage drop between biasing diodes but avoid over temperature. See: <http://ubitx.net/2018/06/16/distorted-audio-v4-main-board/>



6. Digital connections (ALL VERSIONS UNLESS YOU DON'T WANT TO DO DIGITAL)

- Add a RJ45 plug with digital output so you're ready for digital immediately – we just go ahead and wire up your digital connections, mic, PTT, speaker output, using shielded cable.

7. Aligning calibrations (ALL VERSIONS)

To set the correction for the 25MHz crystal, we'll use my routine and actually MEASURE it.

- Use my 25MHz calibration routine, then adjust the “crystal” number to get correct frequencies.
- Recompile and reload the sketch into the Raduino.
- Write down the correct crystal frequency on your Rig so it won't get lost.

3. Setting the BFO

- Click on the encoder button to display the menu, rotate it to the “Setup On?” and click on to confirm it
- Tune to a clean and preferably weak SSB signal to its loudest (not the clearest)
- Click on the encoder button again to display menu and choose Theoption 'Set the BFO'. Click to enter this option
- Now tune with the encoder for the best sounding audio
- Press PTT to save the calibration.

Done.

This can easily be done at any time. And if your SSB crystal set is too “tight” we have an improvement for THAT also, by changing the inter-crystal capacitors to 82 pf slightly lower values.

8. Installing v. 4 software (IF YOU HAVE VERSION 3 YOU CAN USE VERSION 4 SOFTWARE WHICH IS MUCH IMPROVED ON YOUR VERSION 3 HARDWARE)

if your rig has v3 software we upgrade it to v4 which has much smoother tuning.

9. TDA chip voltage protection (ONLY CERTAIN INSTANCES OF THE VERSION 3 HARDWARE)

If your rig has the troublesome WX chip – we add a voltage regulator to keep the voltage to that chip down to about 9 V

With these simple steps, you’ll have a fairly safe rig right from the start. It still isn’t any \$800 radio, but it will be a lot easier to use and HARDIER than otherwise.

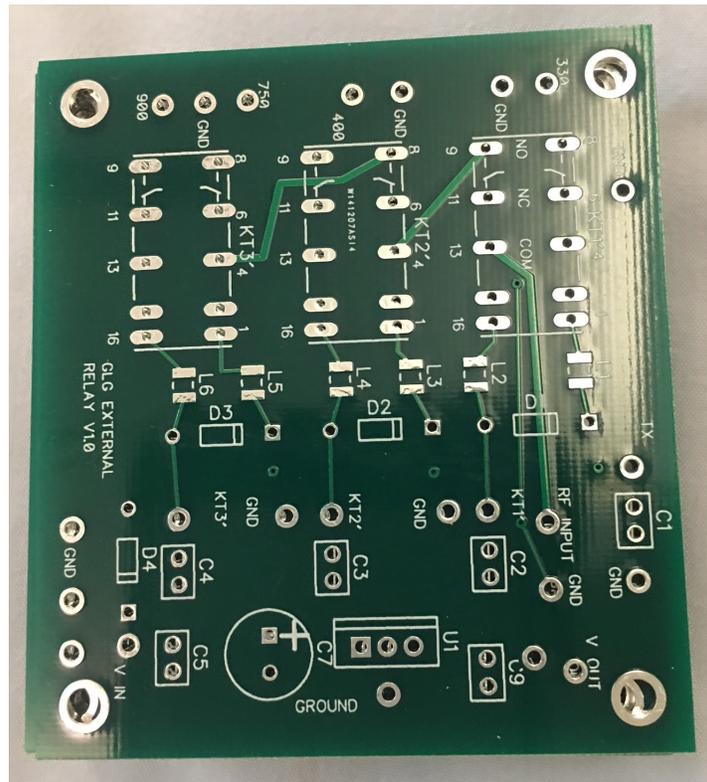
ONCE YOU HAVE IT BUILT AND WORKING....then at a later month we can offer some significant improvements as shown on the following pages:

Significant Improvements TO THE DESIGN OF THE UBITX DON'T DO THESE UNTIL YOU HAVE IT WORKING AS ORIGINALLY DESIGNED

1. Fixing Harmonics

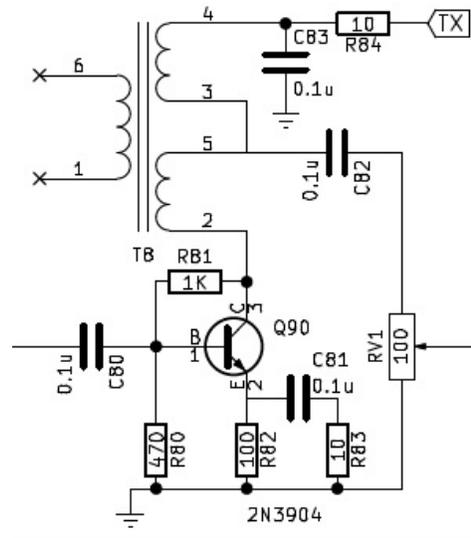
See my separate document. <http://qsl.net/nf4rc/2018/OutboardRelaysDesignDocumentTry3.pdf>

We're going to have a simple small daughterboard so we can stop having to use the SAME relay to both input and output switching of the same filter --- that allows undesired signals to jump (by capacitive coupling) from one set of relay contacts to another set, bypassing the filter entirely! One relay's isolation has been measured by members of the bitx20 forum at only -20dB....when the filter needs to be as good as -50db several octave higher.



Blank circuit board...also includes optional power polarity protection circuitry and a voltage regulator if desired.

2. Improving output Power --- As each one of these changes is employed, the output power will improve.

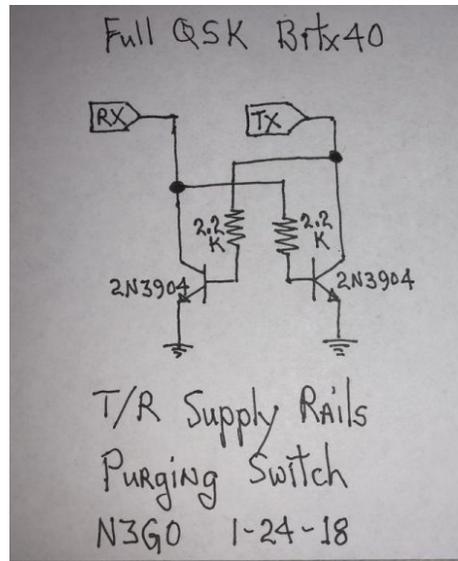


- Change C81(originally 0.1 uF) to 470 pf, This flattens the 80 and 40M runaway power and helps the higher bands. (see above Q90 circuit)

Parts needed:

22 ohm resistors
 BFR106
 R81 2-2.7K
 C81 goes to 470 pf

3. Pop fix for version 3 units



See: Option 2, in <http://ubitx.net/fix-audio-pop/>

4. Crystal Filter adjustment

82 pf NPO capacitors (5 of them)

