Mods for the TJ DC RX

For the case and the power supply:

* Make the case, the front panel, and the back connectors ANY WAY YOU WANT TO. You can 3D print it. Or use wood. Paint it. Add stickers. Or whatever you want. Have it your way!
* Get an AC powers supply (maybe from an old computer).
* Get a 12 Volt rechargeable battery (Maybe a LiPo).
* Run your receiver from solar panels. With or without a battery.

For the Bandpass Filter:

* Experiment with a narrower Bandpass filter to eliminate interference from Radio Marti!
* Try adding an RF gain control (10k potentiometer) at the antenna port.
* Experiment with a simpler 2 diode, single transformer mixer.

For the Audio Amplifier:

* Try connecting other speakers (including amplified computer speakers) to the output
* Put a Bluetooth transmitter on the audio output and listen with Bluetooth devices.
* Experiment with different AF amplifiers. Try feedback amplifiers or even (GASP!) integrated circuits like the LM 386.

For the mixer:

* Experiment with an RF amplifier between the Bandpass Filter and the mixer. Does it help?
* Experiment with the diplexer at the audio output of the mixer. Can this be improved?

For the Variable Frequency Oscillator:

* Make a simple, ruler type frequency readout…. Or
* Put a San Jian Frequency Counter on it. Or
* Get a Digital Multimeter with a Frequency Counter inside. AstroAI DM600AR. $35
* Experiment with the tuning mechanism to get better coverage and frequency spread. Install the tuning mod (extra coil) to increase number of turns to tune 40 meter band.
* Try using a steel screw instead of the brass. You should have a frequency counter for this.
* Get a bigger tuning knob.
* Get a variable capacitor for easier tuning.
* Build a varactor tuning circuit for easier tuning.
* Experiment with the VFO. Replace the screw and coil with a glue stick.
* Maybe change the varactor to 7 volts so that a weak 9 volt battery does not cause trouble.

For the Antenna:

* Better antenna (look at the books, and experiment – but be careful with power lines!)

For the entire receiver:

* Connect receiver to computer sound input – decode digital signals with FLDIGI (free download)
* Decode CW Morse code signals.
* Install the tuning mod (extra coil) to increase number of turns to tune 40 meter band.
* Put the receiver on other frequencies: Just change the Bandpass filter and the VFO.
* Try to digitize or use integrated circuits in the Receiver: Si5351 for the Oscillator, LM386 for the AF amp, An SBL-1 or ADE-1 or an NE602 for the mixer. Or build an entirely new receiver using ICs, microcontrollers, and Si5351 boards.
* Look at the receiver in a simulator (see the resource page of the shared drive).
* Connect a Software Defined Receiver to the output of the receiver. Look at the output on the screen
* Build two DC receivers like this and create a single signal phasing receiver.

After you get your General Class license:

* Build a mic amp and an RF amplifier and put the rig on Double Sideband.