

μBITX Tuneup Instructions

IMPORTANT: The μBITX board comes pre-adjusted. You do not need to make any adjustments unless you think the MBITX requires them. If so, follow the steps below.

You must tuneup three parts of the μBITX: The Power-Amplifier (PA) Bias, the Master Clock, and the Beat-Frequency Oscillator (BFO). For these steps, you will need:

- A 50-ohm dummy load.
- An ammeter with a setting for currents of at least 2 amperes.
- A small flat-blade screwdriver.
- A 12V power supply with at least a 2A current output.
- The MBITX microphone with push-to-talk (PTT) switch. Construct the microphone as you see fit. Ensure you have connected the PTT switch as shown in the circuit diagram.

Adjustments

1. Adjust the Power-Amplifier Bias

- Connect your μBITX to a +12-volt power supply that can provide three amperes (3A) of current. **DO NOT TURN ON POWER.**
- Insert an ammeter in the positive 12V power supply line so you can monitor current drawn by the μBITX. Set your ammeter for a range of 2 amperes (2A) or greater.
- Connect a 50-ohm dummy load to the μBITX antenna BNC connector.
- Connect the ammeter's positive lead to the power supply's positive output and then connect the ammeter's negative lead to the positive input to your μBITX.
- Turn on power. The LCD should display information. And the ammeter should show a current of about 0.160 A or 160 mA.
- Locate the two PA-bias trimmer resistors. These are small square variable resistors that have a flat-blade screwdriver slot in the middle.
- Gently turn both trimmers to their fully clockwise position.

- Press the PTT switch but do NOT speak into the microphone. You should see the current increase to between 0.470 and 0.500 amperes or between 470 and 500 mA. Note your FIRST current measurement here: _____.
- Use the small screwdriver to slowly rotate one of the trimmers in the counterclockwise (anti-clockwise) direction. The current will increase slowly and as you continue to rotate it, current will rise quickly. Be careful. Stop adjusting the trimmer when the current reaches your reading above plus 100 mA. If the current exceeds your initial reading plus 100 mA, slowly rotate the trimmer in the clockwise direction to reduce the current as needed. Note the new current measurement, or SECOND measurement, here: _____. (Get as close as you can. A slight difference will not harm your MBITX.)
- Move the screwdriver to the other trimmer and adjust it as described in the previous step. You want the current to increase so the ammeter reads a value equal to your second measurement plus 100 mA. The total current should now amount to four FIRST measurement plus 200 mA.
- Now, speak a loud "HALLLOWWW" into the mic. Does the current increase? If so, you have completed the PA Bias adjustments.

2. Align the Master Clock

All the frequencies used by the μ BITX transceiver come from multiplying and dividing the signal from a 25-MHz crystal oscillator. This crystal rarely has a frequency of exactly 25.000000 MHz. So you must "adjust" this clock to the exact 25-MHz frequency via a setup menu.

- If not already on, apply power to your μ BITX. It can help to have an antenna connected to your μ BITX so it can receive a strong radio signal from a local station or WWV. You can receive the WWV signals at 2.5, 5, 10, 15, and 20 MHz.
- Lightly push the rotary encoder knob to display a menu. Then rotate the knob until you see "Setup On?" on the LCD. Again, press the encoder knob to confirm you want to go through the setup steps.
- Use the encoder knob to turn the μ BITX to a nearby AM broadcast station, or to WWV. You might need to look on the Internet for station information and frequency.
- Set the μ BITX to the exact carrier frequency of the station you can hear and want to use for the clock setup. If you have not used the correct frequency, the setup will not save the proper zero-beat frequency.

- Push the encoder knob again. You will see a new option, 'Set Calibration?'. Push the knob again to enter the zero-beat frequency information. The μ BITX frequency display does not change.
- Finally, press the PTT button to save the master-clock calibration information..

3. Set the Beat-Frequency Oscillator (BFO)

- Gently press the μ BITX encoder knob and then rotate it until you see the "Setup On?" option. Press the encoder knob again.
- Adjust the frequency so you can hear a clean, but preferably weak, SSB signal. Then adjust the volume control so the signal sounds loud.
- Press the encoder knob again and rotate it until you see the 'Set the BFO' option. Press the encoder knob again.
- Adjust the frequency for the best sounding audio from the station you selected in this section, and press the PTT switch to save the BFO calibration information.

Congratulations. You have "tuned up," and calibrated your μ BITX. Now you're ready to attach your antenna and get on the air.

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Revision History:

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