

# T41 IQ Calibration Directions

## Receive Calibration

Receive calibration is self-contained, requiring no external equipment. Calibration of each Band is necessary.

- Jumper J4 – Cal Isolation on RF board.
- Select the Band to calibrate.
- Select Menu item: Calibration/Rec Cal.
- When Rec Cal screen opens adjust Ref Level to line with “Out Atten.”

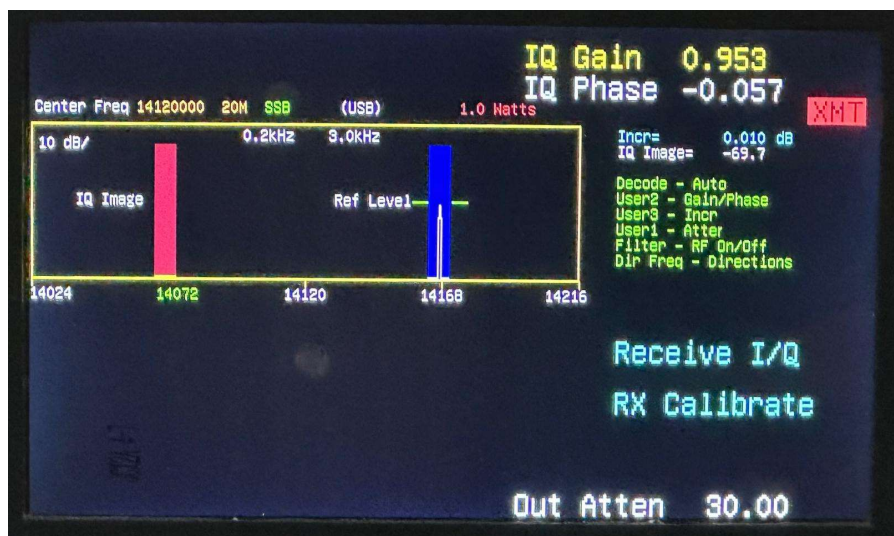


Figure 1 - T41 Receive Calibrate Screen

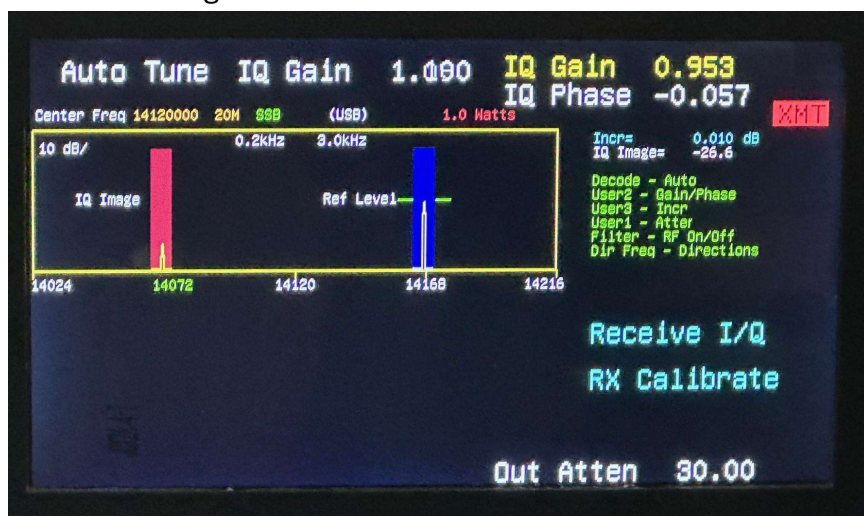


Figure 2 - T41 Receive Auto Calibrate

- Minimize IQ Image level in the Red block and IQ Image level readout:
  - Option 1 Manual adjustment
    - Alternately adjust IQ Gain and IQ Phase with Filter encoder. Use User2 to toggle between Gain and Phase adjustment.
    - Start with increment = 0.01, then refine with Incr = 0.001. Change Incr. with User3 button
    - Values better than -50dB should be attainable.
  - Option2 Auto adjustment
    - Set Ref Level
    - Press Decode Button to adjust
    - Repeat, if necessary
  - Press Select to Exit and save values.
  - Repeat for all Bands

## Transmit Calibration

Transmit IQ calibration requires external equipment to monitor the transmit IQ image. This can be either a Spectrum analyzer or a suitable HF receiver, either one should be connected to the T41 RF output through an attenuator/dummy load capable of at least 40dB of attenuation and power levels of 15W.

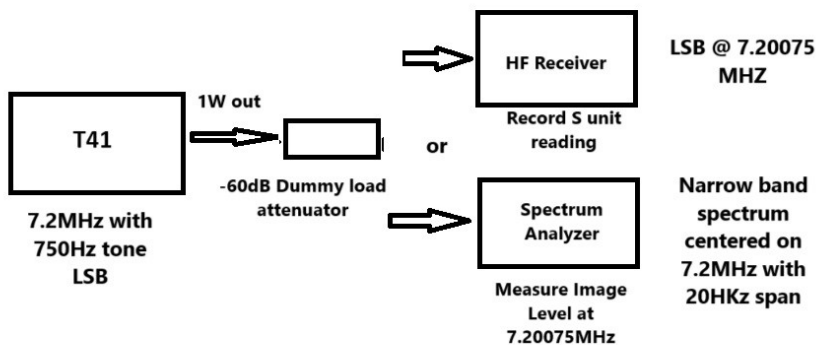


Figure 3 - Xmit Calibration Hardware Setup

See Figure 3 for 40M hookup details.

- Remove JP4 jumper on RF board.
- Set T41 to 7.2MHz
- Select Calibrate/Xmit Cal from the Menu
- Plug in a switch to the PTT jack

- Set the external receiver as follows:
- AGC to Normal.
- Frequency=7.2MHz and Sideband to USB or
- Frequency to 7.20075 and sideband to LSB
  - Either combination will tune the IQ Image.
  - If the Receiver has narrow band IF capabilities, tune for the narrowest BW that will give a good result when T41 is transmitting the 750Hz tone. The objective is to tune the IQ Image in the adjacent band, not the primary signal.
- Press the switch and set the IQ gain to 0.8.
- Change the IQ Gain to IQ Phase and tune for the lowest reading on the receiver S-meter. See Figure 4.
- Change back to IQ Gain and observe the S-meter reading.
- Use the Volume encoder to set the IQ Level value to the S-meter reading.



Figure 4 - S-meter at

- Press the Filter encoder switch to plot the point.
- Change the IQ Gain and repeat the process..



Figure 5 - S-meter at Minimum

- A clear minimum should appear around Gain =1.

- Change the increment to 0.001 and tune for the best minimum. See Figure 5.

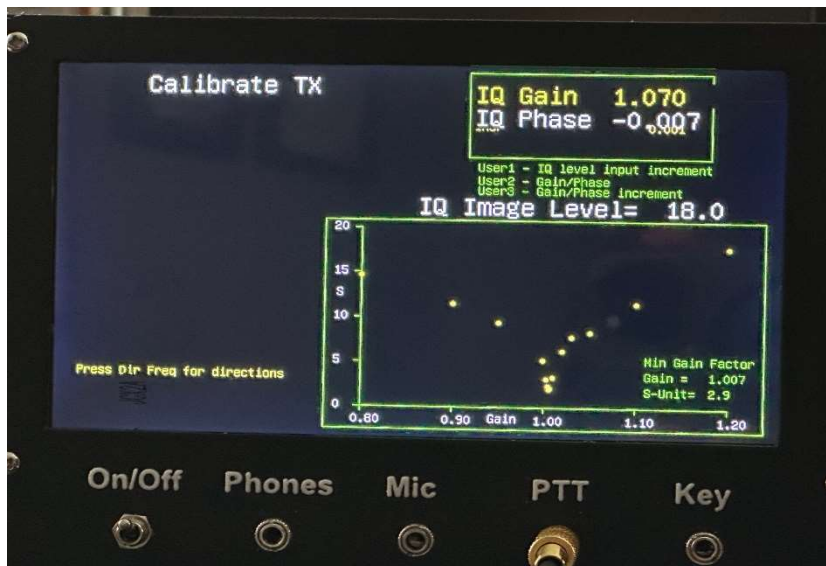


Figure 5 - S-Meter reading Plot

- Once the minimum reading has been obtained, **reset the IQ Gain to the value that gave the minimum and press Select** to exit and save the IQ Gain and IQ Phase values.
- Repeat for the other bands.
- Finally Press Dir Freq Button to display the on-screen Directions shown in Figure 6.

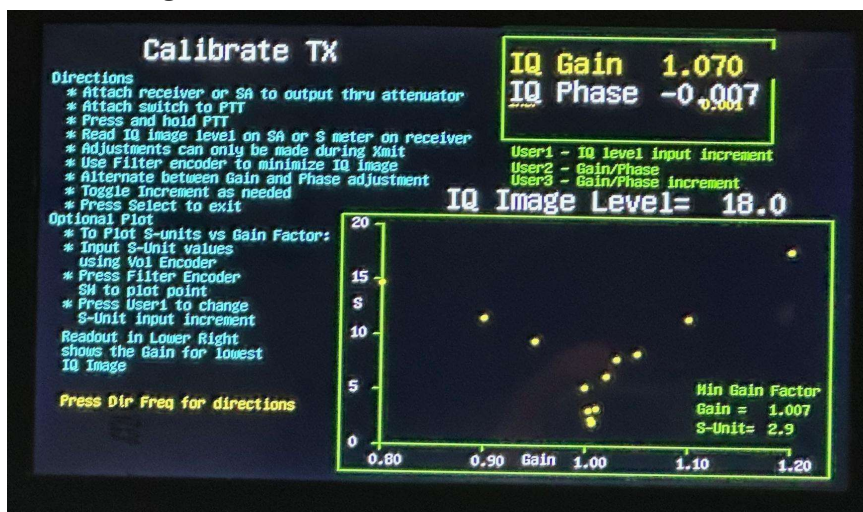


Figure 6 On-Screen instructions