

The Alignment Procedures for AN-50 System

The AN-50 system includes two main units, which require alignments. These units are: **AN-50 Terminal**, also called **AN50** and **Transceiver**, also called **T58**. We will refer to these units as they appear in the production test procedure: **AN50** for Terminal and **T58** for Transceiver.

AN50 and T58 do not require tuning, but only level adjustments and frequency alignment. Each AN50 and T58 is checked and adjusted separately in production. The units sent at Ultratech for FCC testing have been adjusted using the same procedure, reference levels and traces.

The following two items are part of the test procedure applied to each AN50:

1. TX-IF Test and Gain Adjustment

We connect the AN50 through a reference (measured) cable to a spectrum analyzer as shown in figure 1. We load, into the spectrum analyzer, the reference trace and settings used to test and adjust the 815 MHz IF transmitter chain in AN50.

We configure the AN50 to continuous transmission and we adjust potentiometer P1 until the transmit level measured by the spectrum analyzer matches a reference power level. This ensures that all AN50 units will have the same gain in the transmit chain. We also verify that the displayed spectrum matches the reference trace. This ensures that all AN50 units will have the same spectral output.

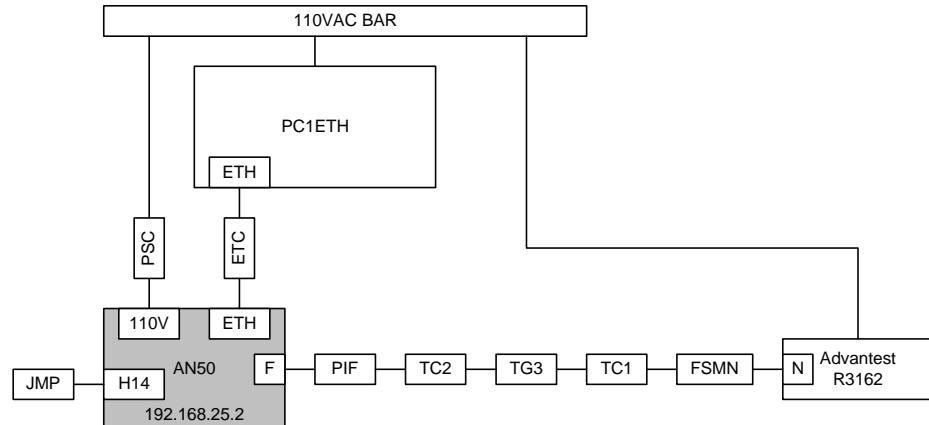


Figure1. Test Set-up for TX-IF Gain and Low IF-LO Frequency Adjustment

2. Low IF-LO Test and Frequency Adjustment

With the same test set-up as in figure 1, we load, into the spectrum analyzer, the reference trace and settings used to verify the level and adjust the frequency offset for

the Low IF-LO local oscillator. We adjust potentiometer P5 until the frequency offset of the system (measured at the 2.5GHz local oscillator frequency) matches the offset of the spectrum analyzer. This ensures an excellent frequency precision of the system. We also check that the LO has no spurs and the level matches the reference trace.

The following item is part of the test procedure applied to each T58 (Transceiver):

1. TX-RF Test and Gain Adjustment

We connect the T58 with a reference cable to a reference AN50 and with another reference cable to a spectrum analyzer as shown in figure 2. We load, into the spectrum analyzer, the reference trace and settings to test and adjust the TX-RF transmitter chain in T58 (Transceiver unit). We configure the AN50 to continuous transmission, on the channel 4 (one of the central channels) and we adjust potentiometer P4 until the transmit level measured by the spectrum analyzer matches a reference power level. This ensures that all units will have the same gain in the transmit chain. We also verify that the displayed spectrum matches the reference trace. This ensures that units will have similar spectral output. Note that we have different maximum power limits for different channels, and these limits are ensured automatically by the software via a digital control. Therefore, the linearity and the precision of the gain control are guaranteed by design. **The maximum transmitted power is limited for each channel by software / firmware, according to the rating shows in the User's Manual. The operator cannot change or exceed the minimum or maximum power limits.**

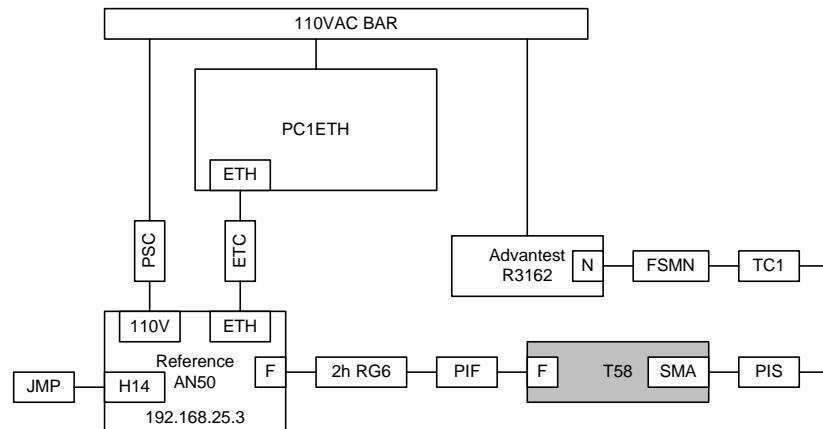


Figure 2. Test Set-up for TX-RF Gain Adjustment