

Calibrating Your MFJ-259

KT4QW Sam Kennedy . . . xsamo@widomaker.com
(Procedure developed by Dino Papas KL0S)

Some folks say the MFJ-259 HF/VHF SWR Analyzer is the greatest thing since sliced bread! You get even better results by performing periodic calibration...

Overview

The MFJ-259 Antenna analyzer is the greatest thing since sliced bread! I don't know how any serious ham shack can operate without one of these devices. A signal generator, a digital counter, an swr bridge and an impedance meter all rolled into one package. There has been many articles written about the MFJ-259 and people have come up with applications that you could never imagine.

To be of maximum value, any instrument like the MFJ-259 should be calibrated periodically...and some time realigned. This article covers the calibration procedure as well as the alignment procedure, should it be necessary. It's not complicated.

To prepare for calibration, you need to locate two quarter watt resistors, one at 50 ohms and the other at 100 ohms. Metal film resistors are preferred. Check the actual value of the resistors using a known accurate digital multimeter. The accuracy of your calibration process will depend on the accuracy of these resistors. While the resistors may be used in their raw form, I recommend mounting them individually in a PL-259 connector as shown in Figure 1. The light weight "crimp" type connector is suitable. Mounting and color coding these terminator plugs will allow easy repeated use. There are other applications for terminator plugs around the ham shack as well.

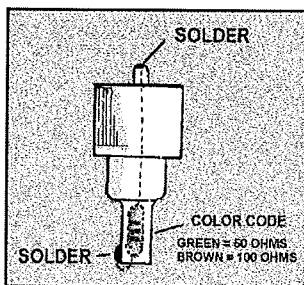


Figure 1 Terminator Plug

Note that this procedure applies only to the basic MFJ-259 Analyzer. Later models require a somewhat more complex procedure.

NOTE

Check calibration before removing the analyzer cover... your instrument may yield acceptable results without alignment.

Concept

This procedure allows you to set up two accurate load values on the analyzer: one at 50 ohms and one at 100 ohms. This will produce a predictable swr and resistance indication. If the desired values are not indicated this procedure allows you to adjust the internal circuits to correct the error.

Detail Procedure

Note

A small uninsulated screwdriver or alignment tool may be used for adjustments in the following procedures.

Step 1. Check Battery Voltage

Remove cover from analyzer and check battery voltage with the power switch in the "on" position. See Figure 2 for location of measurement points. The battery voltage should be 11 vdc. minimum. It's probably time to install new batteries any how.

Step 2. Set AGC Levels

With no load connected to analyzer set frequency to approximately 10 MHz. Measure dc voltage at pins 2 to ground and 3 to ground, on the 14 pin IC. Using the right hand potentiometer, set voltage if necessary to 0.4 vdc. (acceptable range is 0.3 to 0.5 vdc.).

Step 3. Adjust 2:1 SWR Setting

Connect the 100 ohm terminator plug on the output connector. Set top potentiometer so that the analyzer indicates 2:1 swr.

Step 4. Adjust 50 Ohm Setting

Connect the 50 ohm terminator plug to the analyzer. Set middle potentiometer so that the analyzer indicates 50 Ohms on the

resistance meter. This should correspond with an indication of 1:1 swr. This adjustment can be touchy.

Step 5. Check Top Frequency

With the 50 ohm terminator still connected, set the frequency to 170 MHz and check the swr indication; it should be close to 1:1 but the resistance indication may be somewhat inaccurate.

Step 6. Check All Frequency Bands

With the 50 ohm terminator still in place, sweep frequency over entire frequency range of all bands and observe the swr and resistance indications. The swr indication should be very near 1:1 and the resistance

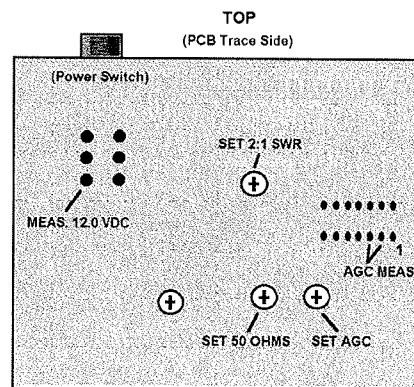


Figure 2. PCB Locator

indication should be very near 50 ohms.

Summary

This procedure works well assuming that the analyzer is in otherwise good condition. If after carefully performing the preceding procedures, your unit is still not operating properly, consider sending the unit back to MFJ for repairs. It has been my experience that they give good service at reasonable prices.