[ ] Calibrate the Micro908 reflectometer channels for gain

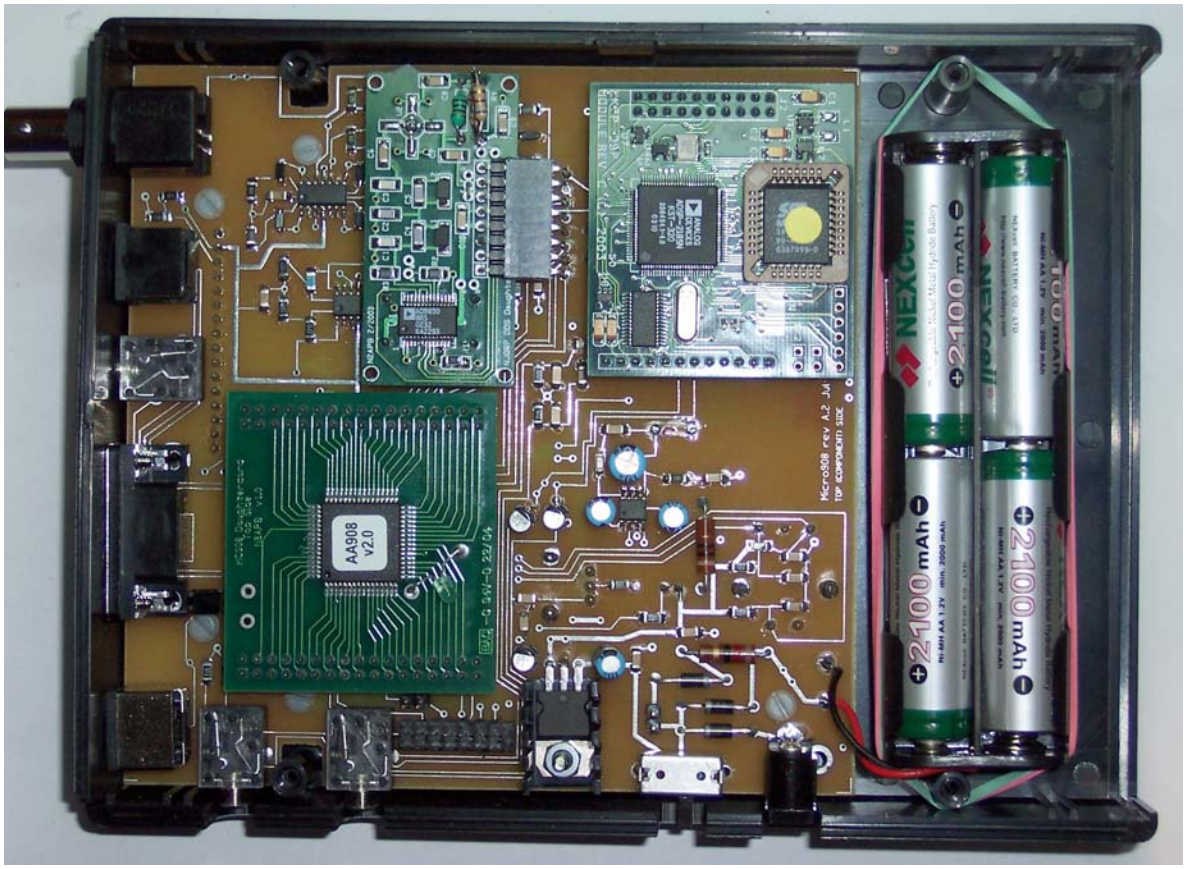
The "calibrate" function is only available starting with version 3.0, so if you don't yet have this latest software, please download and install it per the instructions given in Appendix G. Once this is done, you can select the Calibrate function from the Config menus and just follo the directions given inn the LCD. The calibration steps include:

1) Ensuring that no channel exceeds the range of the A/D converter for an open circuit (i.e., no load on J1). You will be instructed to adjust the trim pot on the DDS card such that none of the open circuit voltages displayed on the LCD are approaching FF.
2) You will place a 50-ohm load on J1 and press the Dial to continue.
3) You will place a 100-ohm load on J1 and press the Dial to continue.
4) You will place a 270-ohm load on J1 and press the Dial to continue.

Section 7: Installing the PCB in the Enclosure

Now that the functional tests are complete, you can finish the final assembly of the Micro908 by installing it into the enclosure. (NOTE: The enclosure is an optional item and may not have been purchased. If this is the case, you are done!) Refer to the Mechanical Assembly diagram in Appendix E for a detailed "exploded view" described in this section.

When this section is complete, your Micro908 will look something like the photo below.



Fully-Assembled Micro908 PCB mounted in the Top Shell of the Enclosure

[ ] Apply Overlay Label to Drilled End Panel

Locate the black overlay with white labels and carefully apply it to the drilled end panel. Carefully peel back the protective paper from the sticky side off the overlay and lay it down on the side of the end panel that is "raised" around the edges – that is, the fully-flat side of the end panel will end up being on the inside of the Micro908, so you want to apply the overlay label to the outside surface. Be careful not to misalign the label, as it is very difficult to remove.

Pre-Drilled End Panel with Overlay Label attached

[ ] Install spacers on inside of top shell

Locate four of the longer nylon spacers and the four flathead nylon screws. (Flathead screws have an angled head that allows them to be countersunk in the plastic to lie flat with the surface of the enclosure and thus provide a smooth overall finish.) Connect the four nylon spacers to the inside of the top shell using the flathead nylon screws at the countersunk positions in the enclosure shell.

[ ] Apply front Panel Overlay Label to the Top Shell

Once again, peel back the protective paper from the large yellow front panel overlay label and carefully align it over the holes and to the edges of the enclosure shell. Once in place, the overlay label will cover the nylon spacers just installed, so ensure they are snug before covering over the flathead screws.

[ ] Apply Side Panel Overlay Label to the Side of the Top Shell

Locate and peel back the protective paper from the long, black (with white letters 'ON', 'OFF', etc.) side panel overlay label and carefully align it over the holes and to the edge of the side of the enclosure shell.

[ ] Place Drilled End Panel on Connector End of the PC Board

Place the end panel on the connectors at the edge of the Micro908 pc board, with the label side facing out/away from the board. The end panel will only go on one way and it can remain loosely in place.

[ ] Install the PCB Assembly into the Top Shell

Carefully slide the pc board into the top shell, making sure to guide the loose end panel into the slots at the top end of the enclosure shell while also guiding the edge connectors and front panel controls through the appropriate holes. Although it may seem like a tight fit, it should drop into position real nice once everything is aligned. If you have problems with a fit being too tight, you might not have filed the side post holes in the pc board large enough, or you might not have filed the top and side edges of the pc board enough to allow the fit. Once the PCB assembly is in place, use the four remaining nylon screws to connect the pc board to the nylon spacers previously installed on the inside of the enclosure top shell. The holes for these screws are located near J6, J4, U3 and D11.

[ ] Install the Battery Holder

If not already done, solder the wires from the battery holder to the pc board at the points marked 'BATT'. The red wire goes to the '+' pad and the black wire goes to the '-' pad. The battery holder (and heavy batteries) can effectively be held in place with some rubber bands holding the assembly to the two molded enclosure posts, as shown in the photo at the top of this section. Additionally, a strip of the small bubble wrap supplied in the Kit may be cut off and affixed to the inside of the enclosure above/below the battery holder to further act as a cushion for the battery assembly.

[ ] Install the other End Panel

Slide the uncut plastic end panel into position at the bottom end of the enclosure shell. Be sure that it is contained in the small slot at the end of the shell.

[ ] Install the Bottom Shell of the Enclosure

Place the bottom black plastic shell of the enclosure in place and use the four ¾" self-tapping screws to secure it to the top shell.

[ ] Install Rubber Feet

Peel off the four rubber feet and apply them to the corners of the enclosure's bottom shell.

[ ] It's "Miller Time"!

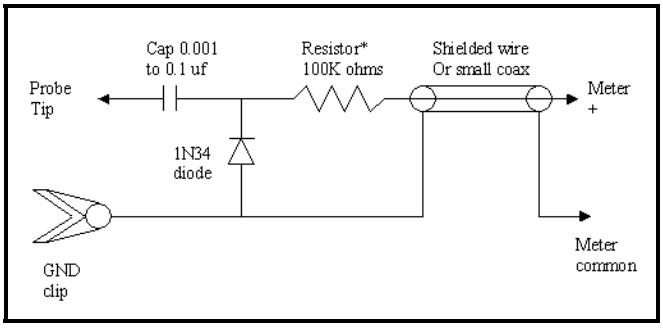
Assembly of the Micro908 is complete.

Section 8: Troubleshooting

In this section we'll help you get your Micro908 instrument working if it doesn't behave as described when power is first applied. You'll need some basic equipment, the schematic from Section B and the pc board layouts from Section C.

Equipment Needed

If you have an oscilloscope that's good to 100 MHz, you'll be all set to probe at all the signals inside the Micro908. But at a minimum, you'll need a volt-ohmmeter (DVM) for DC voltage and resistance measurements. You'll also need an RF probe in order to see the RF voltages that we're dealing with in this instrument. If you don't have an RF probe, like the AccuProbe from the NorTex QRP Club, it's pretty easy to make a simple one. The one shown below can be made up in less than an hour from common junk box parts. If you want to get fancy you could install the components on a narrow piece of perf board and slide it into an old metal cigar tube for shielding. Otherwise just have the probe made from stiff wire affixed to the end of that narrow perf board and an alligator clip for ground. Then with your DVM probe connected to the back end, you can hold the perf board with the "probe tip" at the front end and use it to probe around the circuit.



Simple RF Probe (by Phil DeCaire, WB7AEI, described in QRP Homebrewer #9)

Basic Tests

We'll assume you haven't seen any smoke coming from the circuit board or components. That's always a good starting point for a successful repair of a unit. Otherwise, you'll obviously need to look in the area when the smoke came from, or where the board and components look charred – for that is the place where a component was mis-installed or the place where the problem surfaced from something else (e.g., reversed power supply, etc.)

Power Supply

If you are operating from batteries, be sure the terminal voltage on the battery holder is at least 8.5V. If the level is below that, the RF signal will not be generated properly, or at all, and you will not get expected readings displayed on the LCD.

If operating from an external source, make sure the voltage level does not exceed 16V DC. Beyond this maximum specification, the regulators will be required to dissipate too much power and they'll get too hot for normal operation. Further, the "battery monitor" voltage divider R28 and R41 will present more than 5V to the A/D on the MPU , which would not be too nice.

Make sure you have your battery polarity proper with the wires going to the circuit board, and be sure the connector supplying external power is wired with positive-to-center on the mating plug to J4. If either connection is reversed, your board will not be damaged, but it won't receive the necessary voltage to make it work. In that case … fix it!