

MFJ-249 to MFJ-259 Upgrade Kit

This MFJ-249 to MFJ-259 upgrade kit carries the MFJ guarantee which states that the owner of this kit may return the **unassembled** kit for either credit or refund. However, once soldering of parts has begun neither MFJ nor any dealer can accept the return of this kit for any reason whatsoever. MFJ's technicians will complete this upgrade and calibration of the unit, please call the factory for a quote.

We advise reading this procedure first, so you get a better understanding of what you are about to do. If you have a question about any steps in the procedure please contact *MFJ Technical Service* at 601-323-0549 or the *MFJ Factory* at 601-323-5869.

CAUTION: If you feel you cannot complete this kit you should let MFJ's technicians upgrade the MFJ-249 for you. Only *unassembled* kits may be returned for credit or refund.

To complete this upgrade you will need the following tools:

- ✓ A Phillips screwdriver
- ✓ A small crescent wrench
- ✓ Wire Snips (diagonal wire cutters)
- ✓ A 1/16" Allen wrench
- ✓ A low wattage soldering iron (15 or 20 watt) and electronics grade, rosin core solder
- ✓ A flat-tipped tuning tool or small flat-tipped screwdriver for calibration.

Parts in this kit:

- | | |
|-----------------------------------|--------------------------------------|
| (1) MFJ-259 chassis | (1) Diode, Germanium, 1N34A |
| (1) Resistance Meter | (2) Capacitors, .01 μ F |
| (2) Meter hold down straps | (1) Resistor, 1/4 watt, 51 Ω |
| (1) Horiz. Trimpot, 100K Ω | (1) Resistor, 1/4 watt, 10K Ω |
| (1) Wire, Black, 3" | (1) 3 Wire-Plug Assembly |
| | Pin 1--4" Red Wire |
| | Pin 2--4" Black Wire |
| | Pin 3--5" Blue Wire |

Overview

You will start this upgrade by removing all of the parts from the old chassis. Then you will add a few components to the PC board. The meters are then connected to the pc board. The meters, pc board and display are then installed into the 259 chassis. Finally, the unit is calibrated and the cover is replaced.

Chassis Disassembly

[✓] each step as you finish it. If there are any questions about a step, **STOP** and give us a call.

- [] 1. Remove the back cover from your MFJ-249. Save the screws.
- [] 2. Unsolder the wire from the BNC jack and remove the nut holding it to the chassis. Remove the BNC jack from the chassis.
- [] 3. Remove the panel nuts on the "INPUT" and "GATE" switches. Remove the switches from the chassis **leaving them soldered to the pc board.**
- [] 4. Remove the "TUNE" and "FREQUENCY" knobs with a 1/16" Allen wrench.
- [] 5. Remove the keycap from the "POWER" switch.
- [] 6. Remove all the black screws on the front holding the PCB and display to the chassis.
- [] 7. Remove the screws from the SO-239 coax connector.
- [] 8. Remove the strap(s) holding the meter into the chassis.
- [] 9. Carefully slide the PC board, LCD counter module display, and meter, backward and up, out of chassis.
- [] 10. Carefully unplug the LCD counter module display from the pc board.

Upgrading the PC Board

A component is installed by first inserting the leads into the proper holes on the pc board. Each lead should be bent in the direction of the traces leading to that hole. Heat the junction of the pad and lead with the soldering iron tip and apply a small amount of solder. Once the solder flows into the hole, remove the soldering iron. Check all soldered components for shorts and solder bridges. Clip the component leads and remove all loose wire from the pc board.

Please refer to **Figure 1** for placement of the new components.

- [] 1. Install R23, a 10K Ω 1/4watt Resistor; Color-coded brown, black, orange.
- [] 2. Install R31, a 100K Ω , Sub-Horiz. Trimpot.
- [] 3. Install C34 and C35, two .01 μ F capacitors marked "103".
- [] 4. Install D1, a 1N34A diode.

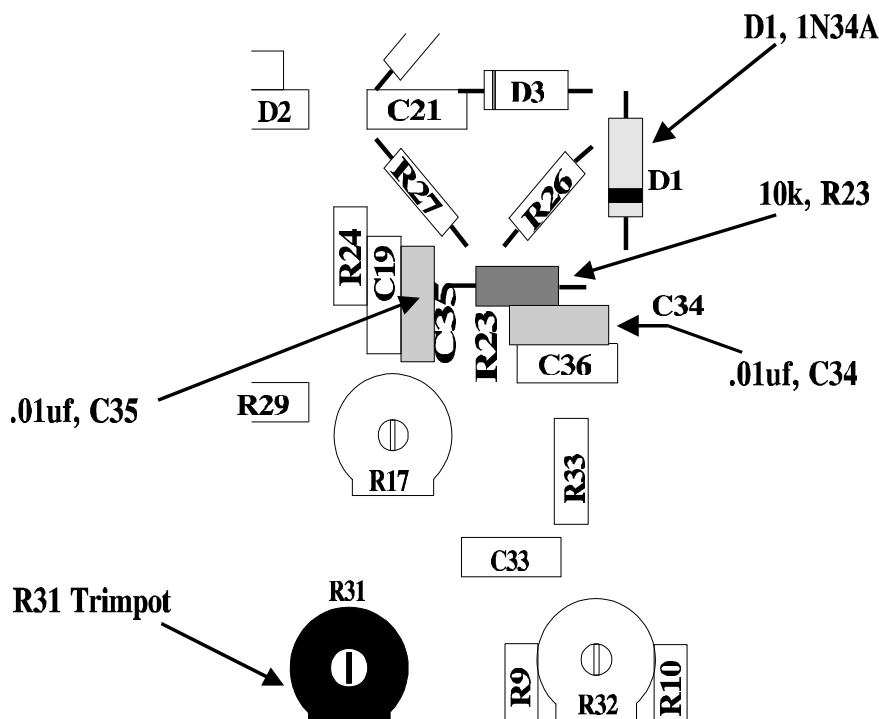


Figure 1
Partial View of PC board

Connecting the Meters

There are **two** different meter connection configurations in the MFJ-249. The SWR meter is either connected with a plug or hard wired to the pc board. Follow the steps below accordingly.

Installation: Case 1; SWR meter with a plug Assembly to PC board

Please refer to **Figures 2A and 2B** for the following steps.

- [] 1. Desolder the wires from the **SWR** meter.
- [] 2. Unplug the **3-pin wiring harness** for the SWR meter from the pc board.
- [] 3. Remove the **SWR** meter from the old MFJ-249 chassis.
- [] 4. Install each meter in the correct location in the new MFJ-259 chassis and secure each with a meter strap. Install the **SWR** meter on the left side, and the **RESISTANCE** meter on the right side.
- [] 5. Solder the **4" BLACK wire** attached to the plug to the **negative post** of the **SWR** meter.

- [] 6. Solder the 3" **BLACK wire** supplied with the kit, from the **SWR meter's negative post**, to the **RESISTANCE meter's negative post**.
- [] 7. Solder the 5" **BLUE wire** attached to the plug, to the **positive post** of the **RESISTANCE meter**.
- [] 8. Solder the 4" **RED wire** of the plug to the **positive post** of the **SWR meter**.
- [] 9. Plug the new meter wiring harness onto the pc board. The 3-pin plug inserts easily into J2 only one way. The wires should be coming out of the bottom of the plug. If the 3-pin plug is difficult to insert, then you are inserting it upside down.....turn it over, and re-insert it properly.

At this point we advise you to go back and double-check all previous steps. If there are any mistakes in the previous installation steps, you must correct them before moving on to the next part.

Installation: Case 2; SWR meter is HARD WIRED to PC board

Please refer to **Figures 2A and 2B** for the following steps.

Wire Preparation

Being as this section has to do with Installation, without a 3-pin wiring harness, you must prepare the individual wires. In this section you will remove the individual wires from the 3-pin harness supplied with the upgrade kit, and prepare them for the installation process.

- [] 1. Clip all three (3) wires as close to the 3-pin plug as possible.
- [] 2. Strip about 3/16" of the insulation from the ends of each wire.

This completes the **Wire Preparation** section the **HARD WIRED** installation. Set the prepared wires aside for use in the later installation steps.

Installation Process

- [] 1. Desolder the wires from the **SWR meter**.
- [] 2. Desolder the old wiring harness at **J2** on the PC board. Discard the old wiring harness.
- [] 3. Using a good desoldering tool, clear all solder from the holes of J2
- [] 4. Remove the **SWR meter** from the old MFJ-249 chassis.
- [] 5. Install each meter in the correct location in the new MFJ-259 chassis and secure each with a meter strap. Install the **SWR meter** on the left side, and the **RESISTANCE meter** on the right side.
- [] 6. Solder the 3" **BLACK wire** from the **negative post** of the **SWR meter**, to the **negative post** of the **RESISTANCE meter**.
- [] 7. Solder the 4" **BLACK wire** prepared earlier, to the **negative post** of the **SWR meter**.
- [] 8. Solder the 5" **BLUE wire** prepared earlier, to the **positive post** of the **RESISTANCE meter**.
- [] 9. Solder the 4" **RED wire** prepared earlier, to the **positive post** of the **SWR meter**.
- [] 10. Referring to **Figure 2A**, solder the **BLUE wire** to **Pin 1 of J2** on the MFJ-259 PC board.
- [] 11. Referring to **Figure 2A**, solder the **BLACK wire** to **Pin 2 of J2** on the MFJ-259 PC board.
- [] 12. Referring to **Figure 2A**, solder the **RED wire** to **Pin 3 of J2** on the MFJ-259 PC board.

Please double-check all previous installation steps in this section before moving on to the next section.

MFJ-259 Chassis Assembly

- [] 1. After the PC board is reinstalled, the bottom nut on the SO-239 connector is impossible to reach. Stick the nut in place with tape or a dab of hot glue before installing the PC board..
- [] 2. Plug the LCD display onto the pc board header. Be sure to insert all of the pins of the LCD display into the pc board header.
- [] 3. Carefully slide the pc board into the chassis. Ensure that the pc board is completely in the MFJ-259 chassis.
- [] 4. Replace the black pc board hold-down screws in the front of the chassis.
- [] 5. Tighten the black pc board hold-down screws to the MFJ-259 chassis. **DO NOT OVERTIGHTEN** these screws, because the stand-offs you are screwing into are made of aluminum. **OVERTIGHTENING** the screws will strip the screw and stand-off threads.

- [] 6. Install the push-button switches, BNC jack and POWER switch keycap. **DO NOT** forget the grounding lug on the BNC jack.
- [] 7. Secure the SO-239 jack and grounding lugs.
- [] 8. Finally, solder the BNC connector to the free wire.

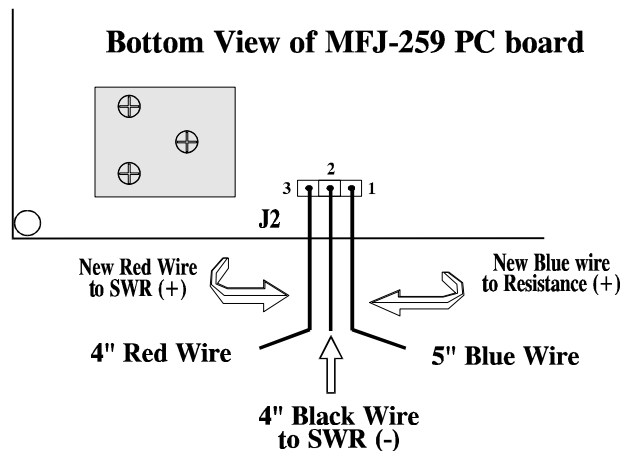
Resistance Meter Calibration

CAUTION: If you turn any potentiometers other than R31 the unit will have to be re-calibrated by MFJ technicians.

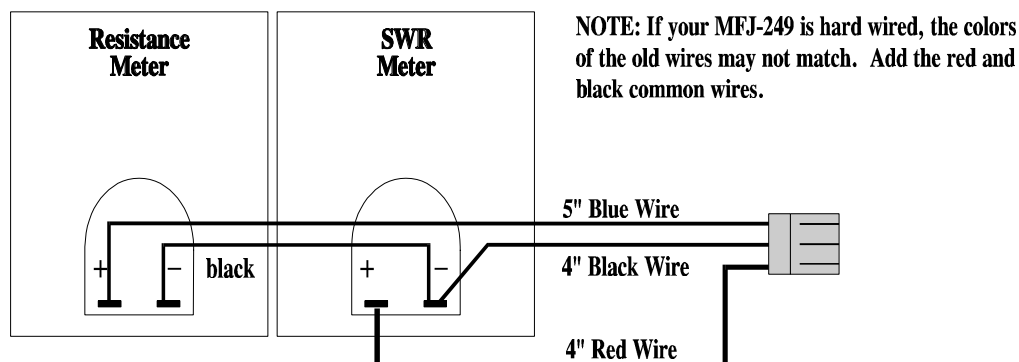
- [] 1. Connect the 51 ohm resistor from the center conductor to the shield of the SO-239. If you have a 50 Ohm HF dummy load connect it instead.
- [] 2. Turn power "on". Set the **TUNE** frequency to 4.0 MHz. Turn **R31** until the resistance meter reads 50 ohms.
- [] 3. Install the back cover to your new MFJ-259.
- [] 4. Remove the 51 ohm resistor or dummy load.

As mentioned earlier, **DO NOT** adjust any other controls except the ones specified. If other controls are adjusted, then the MFJ-259 will require calibration by our Technicians.

Congratulations, you have completed the MFJ-249 to MFJ-259 upgrade. Your new MFJ-259 is now ready to use.



**Figure 2A J2 Layout
Meter Wiring w/o
3-Pin Wiring Harness**



**Figure 2B
Meter Wiring with
3-Pin Wiring Harness**