

Improving the MFJ-267 Dummy Load/Wattmeter (Improve Power Handling & Extend the Dummy Load to 2-meters) - Phil Salas – AD5X

Introduction

The MFJ-267 Dummy Load/Wattmeter provides in-line SWR, and average and peak power readings up to 3000 watts in two ranges from 1.8-54 MHz – PLUS it includes a legal limit dummy load that can be switched in-line. Now while the dummy load is rated at 100 watts for 30 minutes and 1500 watts for 10 seconds, it can take a long time for the dummy load to cool off – especially when used at high power levels. For example, when using my ALS-600 amplifier at 600 watts output into the dummy load, the MFJ-267 gets very hot after just a few repetitive 10-15 second tests. Then I must wait a good five minutes for the unit to cool down enough for me to feel comfortable applying full power again. Also, the internal dummy load is good to 6-meters, but I also wanted to extend this to 2-meters as I use this as a piece of test equipment in my lab.

Improving Power Handling

I solved the heat problem by simply adding an inexpensive surplus fan to the dummy load. I chose an All Electronics (www.allelectronics.com) CF-252 40mm fan, but any similar small computer fan will work well. I removed one of the #6 sheet metal screws from the dummy load shield and tapped this hole for a #6 machine screw. I used a single 1.25" long #6 screw, two nuts and two lockwashers to mount the fan to the dummy load shield as you can see in Photo A. Orient the fan so that it blows air across the dummy load.

The MFJ-267 SWR/Wattmeter is active whenever 12VDC is applied. The on/off switch just turns the meter lamps on and off. So you can meter SWR and peak and average power regardless of the on/off switch position. Therefore, I wired the fan's DC input to the on/off switch such that the fan comes on only when the switch is turned on. This eliminates the fan noise during normal use of the metering functions, but lets you turn on the fan if desired when using the dummy load. The correct place to connect the fan's plus (+) wire is to the lower center terminal on the power switch as seen in Photo B.

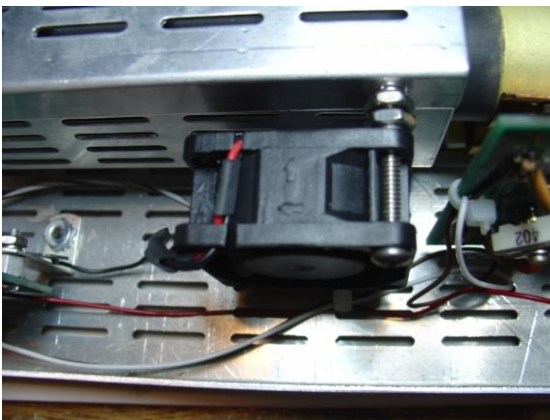


Photo A: Fan mounting details



Photo B: Fan +12V striped wire (bottom) soldered to bottom center switch terminal

The impact of this fan is dramatic! With the fan running, I have no problem running my ALS-600 at full output for testing (usually 10-20 seconds at a time), and I no longer have to wait at all between transmissions for the dummy load to cool off.

Extending the Dummy Load to 2-Meters

I swept the dummy load up to 148 MHz (Photo C). As you can see, the SWR degrades to about 1.6:1 on 2-meters. I found that by adding 5pf across the dummy load I could flatten the SWR curve and drop the 2-meter SWR to about 1.2:1. Photo D shows the new SWR curve with the added capacitance, and Photo E shows the capacitors in place. The 5pf capacitor consists of two 10pf ceramic or silver-mica capacitors in series. Use 500V or higher voltage-rated capacitors if you want the dummy load to continue to handle high power. Note: The SWR/Power meter will still NOT be accurate on 2-meters.

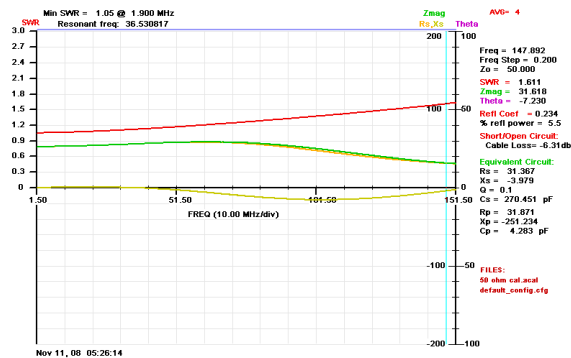


Photo C – Untuned SWR Plot

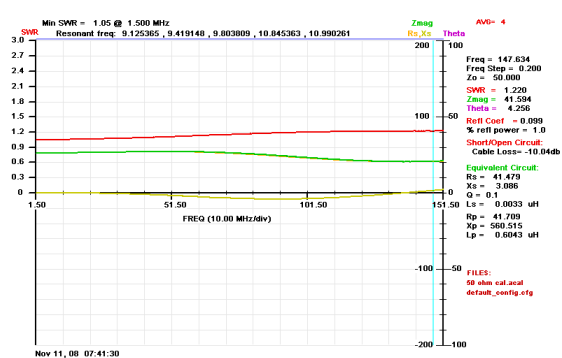


Photo D – Tuned SWR Plot

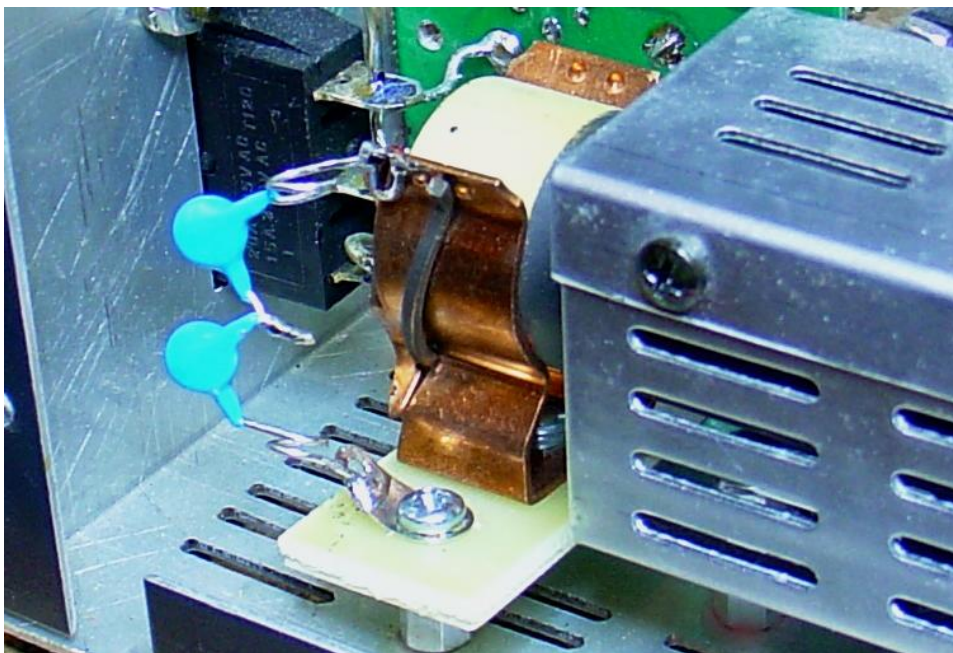


Photo E – 5pf capacitor across the dummy load (2x10pf capacitors in series)

Conclusion

A bit of time and a few dollars will result in a much-improved MFJ-267!