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Waters' Dummy Load and Wattmeter

The new dummy loads from Waters Manufacturing down in Wayland, Massachusetts, nicely fill the amateur need for a dummy load and/or wattmeter that he can depend upon. The two models are basically the same load, but the Model 374 has a built in wattmeter while the Model 384 does not. These loads consists of a structured monolithic 52 ohm non-inductive resistance unit designed to present a constant impedance of 52 ohms over the frequency range from dc to 230 MHz. To provide adequate cooling when large amounts of power are dissipated by the resistor, it is sealed into a steel container filled with oil; a thermostat is also sealed into the container as an indicator of maximum safe operating temperature.

Since the impedance of a load of this type is dictated solely by the physical geometry of the load resistor, once it is sealed into the can, it cannot be adjusted. However, the manufacturer states that the maximum SWR is less than 1.3:1 from dc to 230 MHz,

and tests with a commercial SWR bridge bear this out. The load is somewhat flatter (closer to 52 ohms resistive) on the high frequency bands up to 30 MHz than on the VHF bands, but even at 230 MHz the measured SWR was less than 1.3:1.

The two loads appear to be identical except that the 374 Dummy Load-Wattmeter has a built in rf wattmeter. This wattmeter consists of a semiconductor rectifier and filter network which furnishes a dc voltage to the meter movement from the rf voltage across the load. The dc voltage is connected to the meter through four resistive attenuators to provide full scale readings of 15, 50, 300 and 1500 watts. This instrument is calibrated at the factory with a precision low frequency wattmeter and the guaranteed accuracy from 2 to 30 MHz is $\pm 5\%$ of the full scale reading on each range. This means that on the 1500 watt range the reading is $\pm 5\%$ of 1500 or ± 75 watts. The accuracy from 30 MHz to 230



MHz is not stated by the manufacturer because the power readings above 30 MHz will be somewhat higher than predicted. However, the 374 may be used as a *relative* power indicator up to 450 MHz; above 230 MHz the power input should not exceed 250 watts.

One very nice feature of the wattmeter is that it is possible to run a quick check on the calibration with normal 120 Vac, 60 Hz, line voltage. Immediately after calibration, the technicians down at Waters make a note of the reading obtained on the 50 watt scale when 120 Vac is applied to the input terminals of the model 374 and record it on the rear panel of the instrument. No attempt should be made to correlate actual power levels at 60 Hz with the wattmeter readings, because the circuit is not compensated for this frequency, but it does give the ham out in the field an opportunity to check the calibration.

These loads are very useful for loading your transmitter without radiating a signal and for measuring the power output of your transmitter. The Model 384 does not have a built in wattmeter, but it may be used with the Waters 369 Reflectometer to provide accurate, direct measurements of rf power. If your antenna is very closely matched to 52 ohms, your transmitter may be loaded into the dummy load and then switched to the antenna with no changes in final amplifier tuning. If a coaxial switch is used to switch the transmission line from load to antenna, make sure you turn off the transmitter when switching.

The wattmeter is also useful to checking the loss of coaxial transmission lines and

Waters' Model 384 Dummy Load Specifications

Frequency range:	DC to 230 MHz.
Load impedance:	52 ohms nominal.
Power rating:	1500 watts (intermittent). (Maximum inner case temperature of 220° is reached in 4 to 6 minutes at 1500 watts input).
Input connector:	Hermetically sealed SO-239 UHF mates with standard UHF PL-259 plug.
Power Requirements:	120 Vac, 60 Hz (for over temperature warning light).
Size:	4¾"x9"x10¼".
Weight:	12 pounds.
Price:	\$65.00

Model 374 Dummy Load - Wattmeter Specifications

Same as for the Model 384 above except as follows:	
Wattmeter ranges:	0-15, 0-50, 0-300, 0-1500 watts.
Accuracy:	± 5% of full scale value from 2 to 30 MHz. May be used as a power indicator from 30 MHz to 230 MHz without statement of accuracy.
Price:	\$135.00

for checking and adjusting SWR bridges. If you suspect that old World War II coax you're using is lossy, a quick check on the Waters 374 will confirm (or deny) it.

Once you have one of these units in your shack, whether it's the 374 Dummy Load-Wattmeter or the 384 Dummy Load, you'll wonder what you did before you got it. Besides, all your ham buddies in town will be over to borrow it! . . . W1DTY

WTW News

We've printed up a small WTW countries list which you can use to check off each WTW country as you work it. It has a place for the date of each QSO and a place to check when you receive the QSL. Please send a self-addressed business envelope for your copy.

WTW Awards Issued

SSB WTW-200	1. Bob Wagner W5KUC
SSB WTW-100	1. Gay Milius W4NJF
	2. Bob Wagner W5KUC
	3. A. A. Hopple W3DJZ
	4. Bob Gilson W4CCB

	5. Jim Lawson WA2SFP
	6. Joe Butler K6CAZ
	7. Warren Johnson WØNGF
	8. Ted Marks WA2FQG
	9. Lew Papp W3MAC
	10. George Banta K1SHN
	11. Don Redman K8IKB
	12. Paul Friebertshauser W6YMV
	13. Jay Chesler W1SEB
CW WTW-100	1. Vic Ulrich WA2DIG
	2. James Resler W8EVZ
	3. Dan Redman K8IKB