



Marconi TF1152 RF Wattmeter

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In line with this month's focus on all things Wireless I am covering a vintage instrument that has given me many years of excellent service and peace of mind at a very small investment indeed. If you like to work with transmitters, large or small, the most important thing to have on the test equipment shelf is not a hefty power supply, not a spectrum analyser, not Teflon trimmer tools or any new-fangled bit of LCD multimeter. Forget about these — invest in a *proper dummy load* as it will give you a feeling of utter confidence that the [expensive] transmitter is [1] always properly loaded and [2] prevented from radiating away. Much to the amusement of some of my more DC-inclined friends, if unknown equipment lands on my benchtop I invariably hook up the wattmeter before anything else and then carefully inspect the coax lead and adapters if applicable. I bought my Marconi TF1152A/1 "Absorption

Wattmeter" about 10 years ago for just under 20 pounds from an electronics surplus store. I guess it was built in the early 1970's. From the available stock in the crammed store I was careful to pick a TF1152 with a not too clean face but clearly marked '50 Ω ' above the N-style input socket. These meters also come in 75 Ω guise which I believe is mostly for use in professional systems employing 75- Ω coax cables. Yes, N connectors also exist in a 75- Ω variety and only experts can see the difference with 50- Ω counterparts. For years I dreamt of owning a Bird 'Termaline' (no typo) wattmeter with a box of those beautiful plug-ins for various bands and power levels. To cut a long story short: too expensive for me.

The TF1152 combines the functions of wideband dummy load and accurate RF power meter in a single lightweight case painted a dull 'techno-grey'. Mine has a 13-digit number engraved in the front panel which I suspect is a NATO stock number (n.s.n.). The instrument has two switch-selectable power ranges with matching meter scales: 0-10 W and 0-25 W. Its frequency range is 0 to 500 MHz.

The size of the instrument and its sturdy carrying handle belies its weight — in a positive way because the TF1152 is very easy to carry around.

I have used my TF1152 to test and adjust more PMR equipment than I care to remember, also on windswept hills and towers and in radio amateur shacks covered in thick cigar smoke. The meter needle will faithfully indicate 200 mW or less of RF power even on 70 cms. The needle response enables you to do TX PA trimmer adjustments quickly and with confidence as you can observe the power output 'trend' — try that on a modern instrument with digital readout.

I must admit I never bothered to look inside the instrument until I started to write this article. The wattmeter being of the 'absorption' type, it contains a thermistor bolometer element in a glass encapsulation. This element is electrically incorporated in a bridge circuit together with several calibration and (thermal) compensation elements. A small bead inside the thermistor consists of a compound of metallic oxides possessing a negative temperature coefficient of resistance. Such a thermistor element is very hard if not impossible to

obtain as a one-off and certainly outside the reach of the average hobbyist.

The 50- Ω RF load inside the TF1152 looks like a tapered tube running almost the length of the meter's case (see photograph). Near the end, I was only able to see what looked like a ceramic insert. The VSWR of the mysterious load was found to be less than 1.10 across the band. The accuracy of an RF wattmeter is not terribly important, as on VHF and UHF it makes no difference at all whether you're feeding 15.0 watts or, say, 16.1 watts into your antenna system. Despite the presence of two hefty and clearly labelled pots inside the instruments I never felt the need to re-calibrate my TF1152 against, dare I mention it, a Bird. I'm sure the guys who designed and built the TF1152 knew what they were doing.

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Retronics is a monthly column covering vintage electronics including legendary Elektor designs. Contributions, suggestions and requests are welcomed; please send an email to editor@elektor-electronics.co.uk, subject: Retronics EE.