



instructions are included with each record for testing frequency range of the reproducing system, channel separation, pickup compliance and tracking, tone-arm resonance and stylus wear.

The STR 100 record is priced at \$8.50 and can be obtained from CBS Laboratories, Stamford, Connecticut, or from Columbia Records distributors and dealers.

MORE TALENTS, NEW DRESS, FOR THE OUTPUT POWER METER

In the nearly thirty years since its first announcement, the General Radio TYPE 583-A Output Power Meter has served as a work-horse of the audio-frequency industry. During this time, significant advances in material and techniques have made possible its replacement by a new instrument, based on the same general theory, but improved in all respects.

Both instruments are basically multi-tapped audio-frequency transformers that, by transformation ratio, reflect an essentially fixed secondary load as a variable primary impedance. They differ, however, in several respects, which make possible the new instrument's greater frequency, impedance, and power

ranges and its improved accuracy on complex waveforms.

The TYPE 583-A used a mu-metal core to secure high initial permeability (necessary for impedance accuracy at low power input), but was limited to a 5-watt maximum input by the low saturation level of mu-metal. The TYPE 1840-A secures high initial permeability through the use of grain-oriented silicon steel in a lamination specifically designed to take advantage of grain-orientation, and thereby increases its maximum input to 20 watts with but little increase in core size, since grain-oriented silicon steel is a true "power" material.

The TYPE 583-A had ten secondary taps to yield ten impedance values

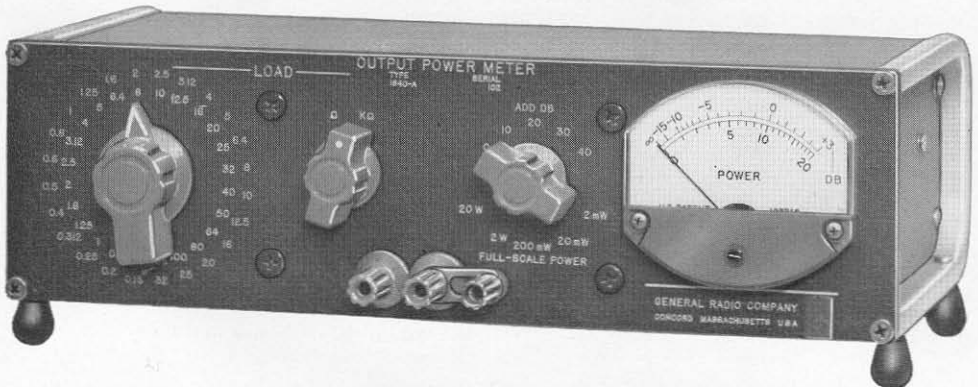


Figure 1. Panel view of the Output Power Meter.



spaced, approximately, at $\sqrt[10]{10}$ (tenth root of 10) intervals and four-primary taps to provide multiplication by powers of 10 (0.1, 1, 10, 100). This yielded forty impedance values between 2.5 and 20,000 ohms. The TYPE 1840-A has six secondary taps to yield six impedance values, spaced, approximately, at $\sqrt[6]{4}$ (sixth root of 4) intervals. Note that the two intervals are comparable

$$\sqrt[10]{10} \cong \sqrt[6]{4} \cong 1.26.$$

The TYPE 1840-A, however, has eight identical primaries, each tapped to provide a multiplier of 250/1, which primaries are switched from all parallel to all series in four configurations, each configuration introducing a multiplier of 4/1. The six secondary taps and four primary connections are all controlled by a single twenty-four position rotary switch yielding six times four, or twenty-four, discrete impedance values. The taps on all eight primaries are switched, simultaneously, by the ohms-kilohms switch. The ohms range lies between 0.6 and 128 ohms. The kilohms range multiplies these values by 250, to yield 0.15 to 32 kilohms. The net result of all these shennannigans is more efficient use of the transformer windings. While, in the

older instrument, up to forty percent of the input power was dissipated in the windings, in the new model it is reduced to less than eight percent. This fivefold decrease in winding dissipation so reduces the winding's contribution to input impedance that all TYPE 1840-A's use the same accurate resistors in contrast to the hand-tailored resistors required for each TYPE 583-A.

A further advantage of primary switching is apparent in the improved frequency response. Since all primaries are always active, and are interleaved with the secondary windings in two pi's, an octave improvement in both high and low frequency response has been achieved.

The quasi-rms meter in the TYPE 1840-A tolerates second and third harmonics up to 20% in the signal without departure from a true rms indication. The new General Radio rack-bench-instrument cabinet provides convenience, access and an adjustable tilt for easy reading.

A T-network attenuator, described in the instruction book, permits extension of the power level to 200 watts for any particular impedance setting.

— GILBERT SMILEY

SPECIFICATIONS

Power Range: 0.1 milliwatt to 20 watts. Auxiliary db scale reads from -15 to +43 db re 1 milliwatt.

Power Accuracy: Maximum error in full-scale power indication does not exceed 0.5 db from 50 to 10,000 cps; does not exceed 1.5 db from 20 to 20,000 cps.

Impedance Range: 0.6 ohm to 32 kilohms in two ranges; yielding 48 individual impedances spaced $\sqrt[6]{4}$ apart.

Impedance Accuracy: Maximum error does not exceed $\pm 5\%$ from 100 to 10,000 cps or $\pm 50\%$ from 20 to 30,000 cps.

Waveform Error: A quasi-rms meter is used which will indicate true rms with as much as 20% second and third harmonics.

Cabinet: Rack-bench instrument cabinet, aluminum panel. Cabinet has extension legs to permit instrument to be used in a tilted position. Panel extensions are available for relay-rack mounting.

Dimensions: Panel, width 12, height $3\frac{1}{2}$ inches (305 by 89 mm); depth behind panel, $6\frac{1}{2}$ inches (170 mm).

Net Weight: $10\frac{3}{4}$ pounds (4.9 kg).

Type	Code Word	Price
1840-A Output Power Meter.....	BELOW	\$210.00

