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ELECTRICAL MEASUREMENTS AND THEIR INDUSTRIAL APPLICATIONS®

A NEW UNIT OSCILLATOR—50 to 250 Mc (TYPE 1215-A)

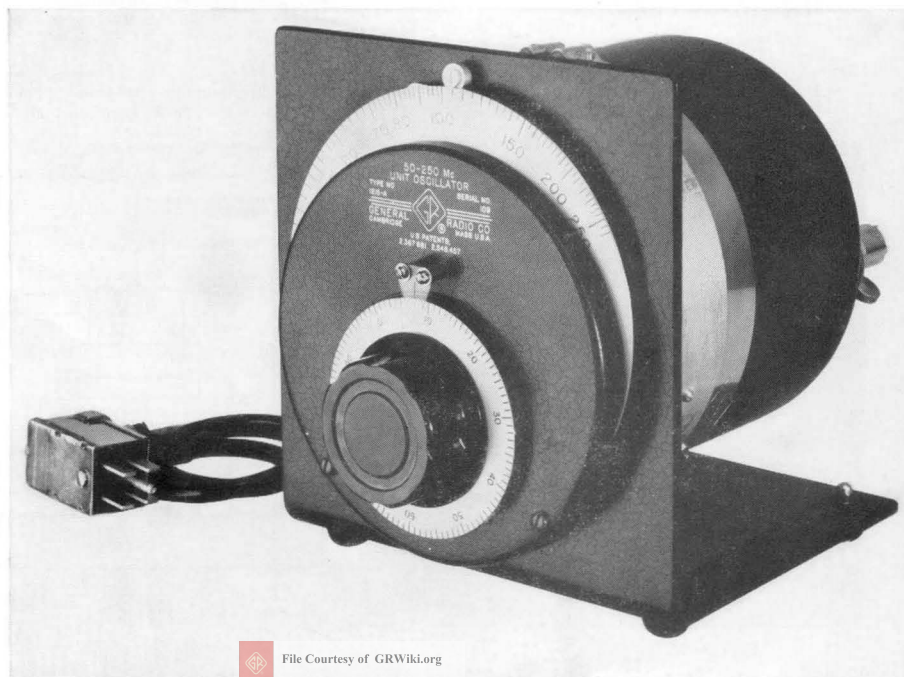
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● **GENERAL RADIO** Unit Oscillators,¹ particularly those covering the v-h-f and u-h-f ranges, have found a wide acceptance in the electronics industry as power sources for use in measurements and testing. These compact, low-priced units cover wide frequency ranges with single-dial control, furnish adequate power for measurement purposes, and are equipped with coaxial fittings at the output terminals to facilitate

connection to coaxial equipment.

¹Eduard Karplus, "V-H-F and U-H-F Unit Oscillators," *General Radio Experimenter*, Vol. XXIV, No. 12, page 7, May, 1950.

Figure 1. View of the Type 1215-A Unit Oscillator.



Two models have hitherto been available, the TYPE 1209-A, which has a frequency range of 250 to 920 megacycles, thus including all u-h-f television channels, and the TYPE 1208-A, 65 to 500 megacycles. A new model, TYPE 1215-A, which will be available for sale next month, covers a frequency range of 50 to 250 megacycles. Both the TYPE 1209-A and the TYPE 1215-A Unit Oscillators use butterfly²-type tuning units that are, essentially, the same as those used in the oscillator sections of the TYPE 1021-AU and 1021-AV Standard-Signal Generators.³ Their frequency stability and their precision of setting are very good. Hence they can be used with confidence for applications that involve heterodyning the operating frequency to produce low-frequency beats.

The TYPE 1208-A Unit Oscillator has the important advantage of a considerably wider frequency range, which is obtained at some sacrifice of stability and ease of setting. The tuned circuit in this unit is a sliding contact type, which is inherently less stable than the butterfly. There has, therefore, been a definite need for a more stable unit oscillator in the v-h-f range.

Like other General Radio Unit Oscillators, the TYPE 1215-A operates from the TYPE 1203-A Unit Power Supply,⁴ connection being made through a multi-point connector. The oscillator tube is a 12AT7-type twin-triode miniature, operating in a push-pull circuit. The oscillator unit with its cast aluminum support is mounted on an L-shaped bracket which serves as panel and base. A cylindrical shield is clamped over the oscillator to keep leakage to a minimum. As in the TYPE 1209-A, the output coupling system is a short length of 50-ohm coaxial line with a coupling coil at one end and a TYPE 874 Coaxial Connector at the other end. The assembly is mounted on the cylindrical shield, and the output level is set by rotating or retracting the output assembly. A large wing nut permits clamping the output coupling assembly firmly in any selected position.

Modulation terminals are provided in the cathode circuit for amplitude modulating the new oscillator over the

²Eduard Karplus, "The Butterfly Circuit," *General Radio Experimenter*, Vol. XIX, No. 5, October, 1944.

³Eduard Karplus and E. E. Gross, "A Standard-Signal Generator for Frequencies between 50 and 920 Mc.," *General Radio Experimenter*, Vol. XXIV, No. 10, March, 1950.

⁴"New Unit Instruments—Power Supplies—Modulator," *General Radio Experimenter*, Vol. XXVI, No. 2, July, 1951.

Figure 2. Interior view of the Type 1215-A Unit Oscillator with shield cover removed.

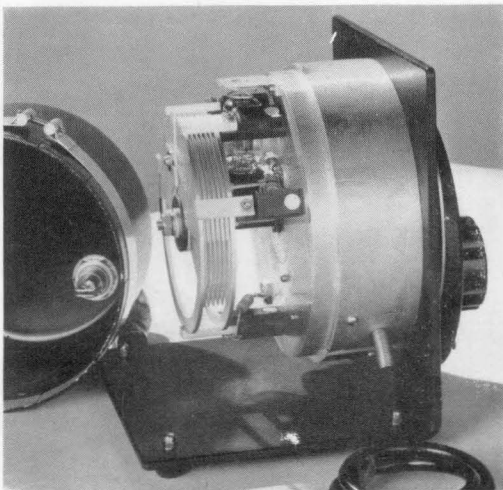
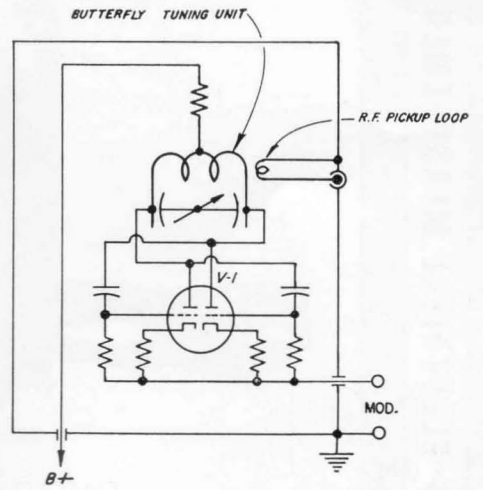


Figure 3. Elementary schematic circuit diagram of the oscillator.



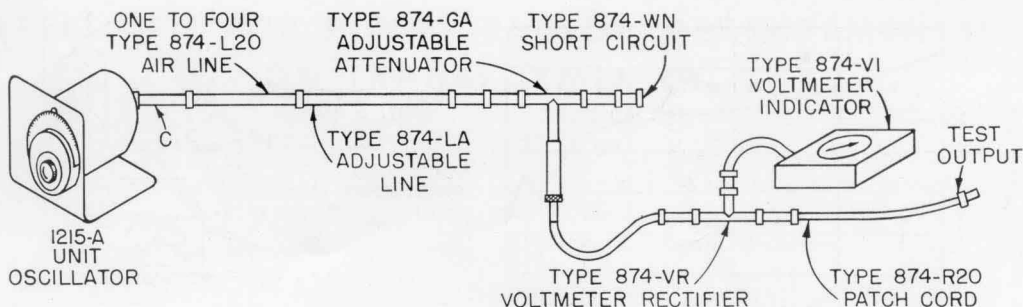


Figure 4. The Unit Oscillator can be assembled with simple auxiliary equipment to form a test-signal generator.

audio frequency range. The TYPE 1214-A Unit Oscillator⁴ (400 and 1000 cycles) is well suited for use as the modulating oscillator and provides about 25 per cent amplitude modulation. If amplitude modulation with no significant incidental f-m is desired, the output can be modulated with the TYPE 1023-A Modulator⁵ (up to 220 Mc) or with the TYPE 1000-P6 Crystal Modulator.⁶

USES

The usefulness of General Radio u-h-f and v-h-f unit oscillators is greatly enhanced by the availability of coaxial accessories, by means of which the oscillators can be conveniently adapted for specific purposes. Important among these are the TYPE 1000-P6 Crystal Diode Modulator⁶ and the TYPE 874-MR Mixer Rectifier.⁷ The crystal modulator permits the output to be picture modulated, thus converting the oscillator to a

test-signal generator for television frequencies. With the mixer rectifier, the unit oscillator is used as the local oscillator of a heterodyne converter system with a communications receiver as the i-f detector. This system is a universal null detector for high frequencies. It has the further advantage that much less shielding is required than is necessary when the detector and the generator operate at the same frequency.

The output connector is a General Radio TYPE 874 Coaxial Connector which allows connection to be made directly to the various coaxial elements of the TYPE 874 series, as well as the TYPE 874-LB Slotted Line and the TYPE 1602-A U-H-F Admittance Meter. Connection to other coaxial types can be made through TYPE 874-P⁸ Adaptors, which are available for both plug and jack types of N, BNC, C, and U-H-F connectors.

— A. G. BOUSQUET

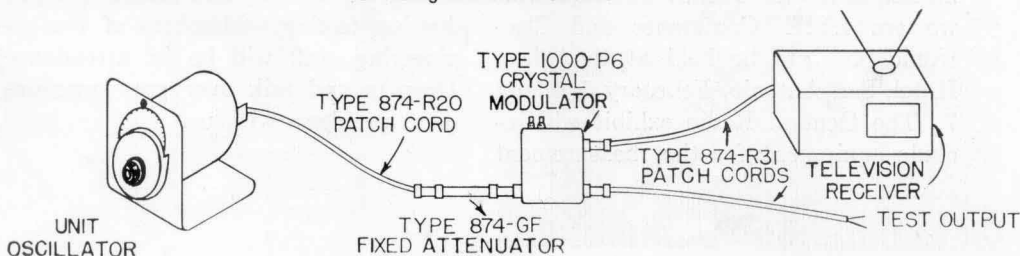
⁴D. B. Sinclair, "A Versatile Amplitude Modulator for V-H-F Standard Signal Generators," *General Radio Experimenter*, Vol. XXIV, No. 6, November, 1949.

⁶W. F. Byers, "An Amplitude Modulator for Video Frequencies," *General Radio Experimenter*, Vol. XXIV, No. 10, March, 1950.

⁷W. R. Thurston, "Simple, Complete Coaxial Measuring Equipment for the U-H-F Range," *General Radio Experimenter*, Vol. XXIV, No. 8, January, 1950.

⁸R. A. Soderman, "New Coaxial Accessories," *General Radio Experimenter*, Vol. XXVII, No. 5, October, 1952.

Figure 5. The Crystal Diode Modulator permits the oscillator to be modulated at video frequencies for testing television receivers.



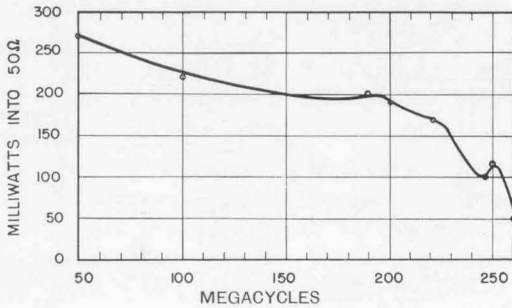


Figure 6. Typical curves of output vs. frequency for the Type 1215-A Unit Oscillator.

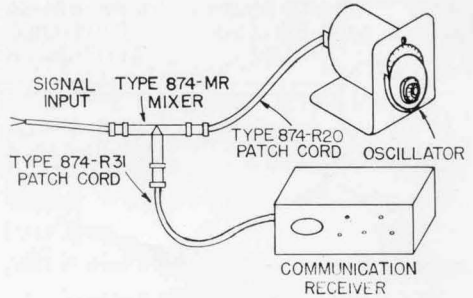


Figure 7. The Unit Oscillator and Mixer Rectifier used as a frequency converter.

SPECIFICATIONS

Frequency Range: 50-250 Mc.

Tuned Circuit: A semi-butterfly with no sliding contacts.

Frequency Control: A 6-inch dial with direct frequency calibration over 140 degrees. Slow motion drive, 4:1 ratio.

Frequency Calibration Accuracy: 1 per cent at no load.

Warm-up Frequency Drift: 0.4 per cent.

Output System: Short coaxial line with a coupling loop at one end and a TYPE 874 Coaxial Connector on the other end. Maximum power can be delivered to load impedances normally encountered in coaxial systems.

Output Power: At least 80 milliwatts into a 50-ohm load.

Power Supply Requirements: 370 volts d-c at 25 ma and 6.3 volts a-c or d-c at 0.3 ampere. The TYPE 1203-A Unit Power Supply is recommended.

Modulation: Direct amplitude modulation over the audio-frequency range can be obtained with an external audio oscillator. The impedance at the modulation terminals is about 15,000 ohms. A convenient audio source is the TYPE 1214-A Unit Oscillator which will deliver about

55 volts at 400 or 1000 cycles and will yield about 25 per cent modulation. The TYPE 1000-P6 Crystal Diode Modulator can be used for modulation at video frequencies essentially free of fm. TYPE 1023-A Amplitude Modulator can be used (up to 220 Mc) to obtain accurately calibrated amplitude modulation with no incidental fm.

Tube: TYPE 12AT7 miniature twin-triode which is supplied with the instrument.

Mounting: The oscillator is mounted in an aluminum casting and is shielded with a spun-aluminum cover. The assembly is mounted on an L-shaped panel and chassis.

Accessories Supplied: TYPE 874-R20 Patch Cord, TYPE 874-C Cable Connector, TYPE 874-P Panel Connector, and TYPE CDMS-466-4 Multipoint Connector.

Accessories Available: TYPE 1000-P6 Modulator, TYPE 1023-A Modulator, TYPE 1203-A Power Supply, TYPE 1204-B Power Supply, TYPE 1214-A Oscillator, and the TYPE 874 Coaxial Elements such as adaptors, attenuators, voltmeters, mixer, etc.

Dimensions: 7 x 8 x 9½ inches, over-all.

Net Weight: 7½ pounds.

Type		Code Word	Price
1215-A	Unit Oscillator, *50 to 250 Mc	ADOPT	\$190.00
1203-A	Unit Power Supply	ALIVE	47.50

*U. S. Patents Nos. 2,367,681; 2,548,457; 2,125,816.

SOUTHWESTERN I.R.E. CONFERENCE

General Radio products will be exhibited in Booths 6 and 7 at the Southwestern I.R.E. Conference and Electronic Show to be held at the Plaza Hotel, San Antonio, February 5, 6, and 7. The General Radio exhibit will include equipment for the measurement

of sound and noise, u-h-f impedance measuring devices, and bridges for production testing. Members of our engineering staff will be in attendance. Drop in and talk over your measurement problems with us.