



# THE NEW LOOK IN HIGH-FREQUENCY OSCILLATORS

The General Radio high-frequency oscillators have found widespread use as simple signal sources. They cover a very wide frequency range, and, with accessory equipment, which includes modulators, mechanical sweeps, attenuators, coaxial fittings, and a variety of power supplies, they can be assembled into more sophisticated systems to meet specific needs. Some of these possibilities are indicated in Figure 2.

To enhance further the adaptability and convenience of these oscillators, a redesign of panel arrangements has been carried out. The "new look" provides a simple uniform package which is readily attached to any one of an expanded line of companion power supplies or mounted in a standard relay rack. While the economical L-bracket construction that has become a virtual trademark of these

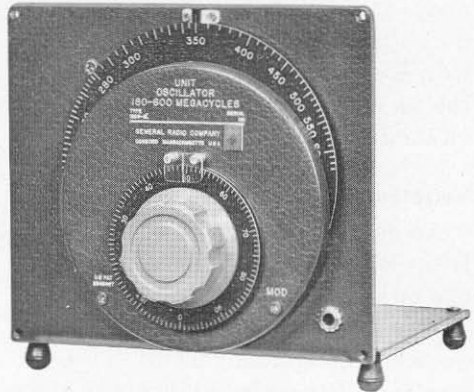


Figure 1. Panel view of the Type 1209-CL Unit Oscillator.

oscillators has been retained, the panels are now 7" high and 8" wide, the same size as the previously announced TYPE 1361-A UHF Oscillator (450 to 1050 Mc)<sup>1</sup> and the TYPE 1211-C Unit Oscillator (0.5 to 50 Mc)<sup>2</sup>. Figure 1 shows the TYPE 1209-CL Unit Oscillator. The new models with their frequency ranges are tabulated on page 12.

<sup>1</sup> G. P. McCouch, "A New UHF Signal Source," *General Radio Experimenter*, 35, 3, March, 1961.

<sup>2</sup> E. Karplus, "The TYPE 1211-C, An Improved Unit Oscillator," *General Radio Experimenter* 36, 10, October, 1962.

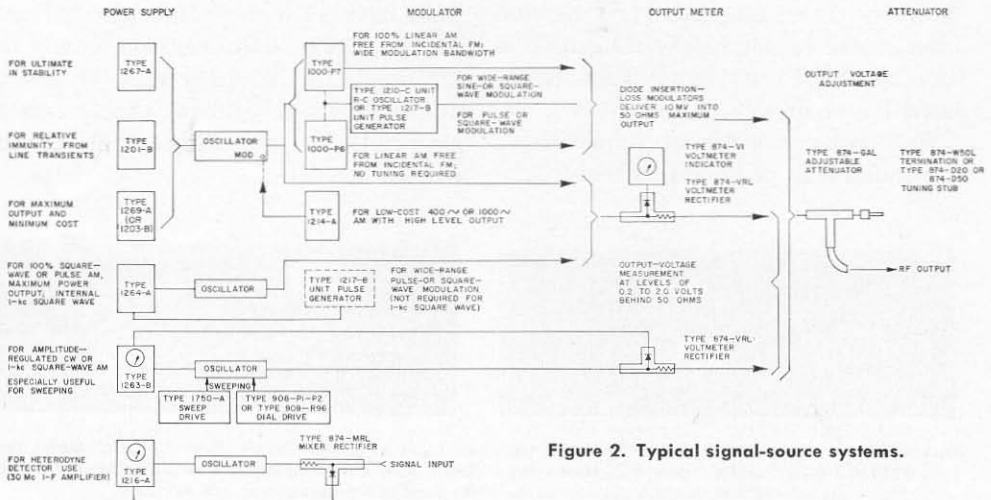


Figure 2. Typical signal-source systems.

Tapped holes near the four corners of the front panel permit rigid attachment to an associated power supply or, by means of low-cost adaptor plates, to a relay rack. The oscillators all have 6-inch precision dials and are equipped with TYPE 874 Locking Connectors for the RF output. The modulation jack is on the front panel.

**Versatile Power Supplies**

An outstanding feature of these oscillators is the provision for use with any one of several different power supplies.

Power-supply characteristics are frequently a determining factor in the performance of an oscillator. For such applications as parametric-amplifier pumps, oscillators must be stable against all power-line variations and free of modulation from power-supply ripple. For these extreme requirements, both plate and heater supplies should be regulated, well filtered dc, as in the TYPE 1267-A Regulated Power Supply.

Where relative freedom from line transients is required without ultimate reduction in long-term drifts and hum modulation, regulated plate supply is desirable, but unregulated ac may be used for the heater supply. This need is met by the TYPE 1201-B Unit Regulated Power Supply.

For many noncritical applications, unregulated dc plate and ac heater sup-

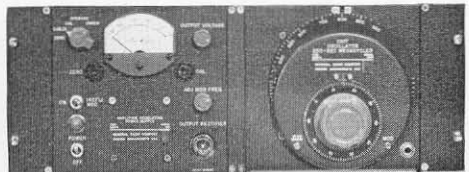
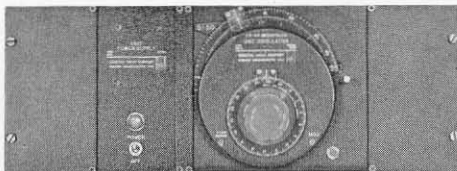
plies are entirely adequate and represent considerable economy. The TYPE 1269-A Power Supply is of this type.

Typical power-output curves for the several oscillators, when operated from these power supplies, are shown in the specifications.

Other applications require power supplies in which the plate-supply voltage is controllable to modulate or to regulate the oscillator output. The TYPE 1264-A Modulating Power Supply provides 100% amplitude modulation at high level by square waves or pulses as well as cw operation. The TYPE 1263-B Amplitude-Regulating Power Supply includes a feedback loop to maintain constant oscillator output as the oscillator frequency is varied. Constant output not only speeds and simplifies measurements where the oscillator is tuned manually, but is essential when making sweep measurements. The TYPE 1263-B Amplitude-Regulating Power Supply has an internal 1-kc oscillator for square-wave modulation.

The TYPES 1267-A and 1269-A power supplies† are new items, designed specifically for use with these oscillators. They have a 7-inch panel height, matching the oscillators and attach readily to the oscillator for either rack or bench use, as shown in Figure 3. The necessary hardware for attaching oscillator to

† See page 13.



Rack-mount arrangements of a Unit Oscillator with two types of power supply. Figure 3 (left) shows the Type 1269-A Power Supply; Figure 4 (right) the Type 1263-B Amplitude-Regulating Power Supply. For bench mount, the rack-adaptor plates, shown at the ends of the assemblies, are not used.





power supply is furnished with the power supply. Rack adaptor panels are listed on page 13.

Figure 4 shows how the TYPES 1263-B and 1264-A power supplies attach to the oscillator for rack mount. The older Unit power supplies, TYPES 1203-B and 1201-B, are still available and connect to the oscillator through a plug-in cable, as shown in Figure 5.

— G. P. McCouch

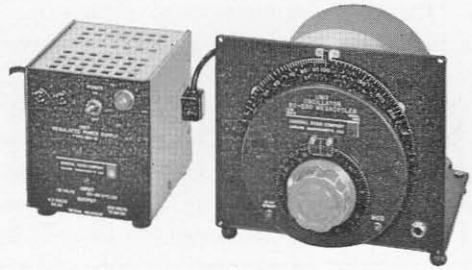


Figure 5. Oscillator with older type of Unit Power Supply, Type 1201-B.

## SPECIFICATIONS

**Frequency Control:** TYPE 908 Gear-Drive Precision Dials are used on all models. Vernier drive ratio is 15:1.

**Output Power:** Output power is shown in tabulated specifications. With the TYPE 1263-B Amplitude-Regulating Power Supply, the maximum useful power output is 20 milliwatts. The available power is adequate for practically all laboratory measurements with bridges, slotted lines, admittance and transfer-function meters, tuned circuits, etc.

**Output System:** A short coaxial line brings the output from an adjustable coupling loop to a locking TYPE 874 Coaxial Connector. The output connector is located at the rear of the oscillator. Maximum power can be delivered to load impedances normally encountered in coaxial systems. Adaptors are available to convert the TYPE 874 Connector to any other common type. These adaptors lock securely in place, yet are easily removed.

**Power Supply:** The external power supply should be chosen from the group listed in the *Summary of Oscillator Power-Supply Characteristics* on page 13. Operation from 400-cycle lines is permissible with many of these power supplies.

**Modulation:** Amplitude modulation over the audio range can be obtained by superimposing a modulating voltage on the plate supply. A jack is provided on all GR oscillators for this purpose. The audio source must be capable of carrying the dc plate current of the oscillator. The inexpensive TYPE 1214 fixed-frequency oscillators are recommended as modulators, and are usually used in conjunction with the TYPE 1269-A, 1201-B, or 1267-A power supplies. For 30% a-m, incidental fm in this system is of the order of 0.01% at the lower part of the tuning range, and increases to about 0.05% at the high-frequency end. Approximately 40 volts across 8000 ohms is adequate to produce 30% modulation.

Square-wave or pulse modulation can be obtained on all oscillators, except the TYPE 1208-C, by use of the TYPE 1264-A Modulating Power Supply.\* All oscillators, except the TYPE 1208-C, can be square-wave modulated at 1 kc by the TYPE 1263-B Amplitude-Regulating Power Supply.\*

For video modulation up to 30% with 5-Mc bandwidth, the TYPE 1000-P6 Crystal-Diode Modulator\* can be used at carrier frequencies from 20 to 1000 Mc. No tuning adjustments are required. This low-level absorption modulator introduces negligible incidental fm, but the output capability is limited to approximately 10 millivolts, peak, into 50 ohms.

**Sweep Application:** Mechanical sweep at speeds suitable for oscilloscopic display can be obtained by use of the TYPE 1750-A Sweep Drive.\* The TYPE 1208-C is not recommended for this service because of the sliding contacts in its tuned circuit.

Slower mechanical sweep for use with xy recorders is possible with the TYPE 908-R96 Dial Drive.\*

The TYPE 1263-B Amplitude-Regulating Power Supply is recommended to hold the oscillator output constant as the frequency is varied, particularly when mechanical sweep is employed. It can be used with all these oscillators except the TYPE 1208-C.

### Mounting:

**Bench Use** — Any of the oscillators can be used on the bench with any of the recommended power supplies; interconnecting cables are supplied. All oscillators and all power supplies, except the TYPES 1201-B and 1203-B, are 7" high and can be attached to each other with the hardware supplied to form a rigid assembly.

**Relay-Rack Use** — Any oscillator can be relay-rack mounted together with a TYPE 1263-B, 1264-A, 1267-A, or 1269-A power supply in a space 7" high. When the TYPE 1201-B Power Supply is used, separate rack-adaptor panels are necessary.

\*Consult the latest General Radio catalog for details.

(Continued on page 12)



## SPECIFICATIONS (Continued)



Type Number	1215-C	1208-C	1209-CL	1209-C
Frequency	50 to 250 Mc	65 to 500 Mc	180 to 600 Mc	250 to 960 Mc
Tuned Circuit	Semi-Butterfly	Variable L and C	Butterfly	Butterfly
Calibration Accuracy	$\pm 1\%$	$\pm 2\%$	$\pm 1\%$	$\pm 1\%$
Warmup Frequency Drift (typical)	0.4%	0.5%	0.2%	0.2%
Output into 50 ohms with Type 1269-A or 1203-B supply	120 mw from 50 - 215 Mc 70 mw from 215 - 250 Mc	240 mw from 65 - 250 Mc 80 mw from 250 - 500 Mc	320 mw from 180 - 500 Mc 240 mw from 500 - 600 Mc	150 mw
Output into 50 ohms with Type 1267-A, 1201-B, or 1264-A supply	90 mw from 50 - 215 Mc 50 mw from 215 - 250 Mc	170 mw from 65 - 250 Mc 60 mw from 250 - 500 Mc	270 mw from 180 - 500 Mc 200 mw from 500 - 600 Mc	120 mw
<p>Typical and Guaranteed Output Power into 50 ohms</p> <p>Upper curves are typical Lower curves are guaranteed</p> <p>— with Type 1269-A (or 1203-B) Supply</p> <p>- - - with Type 1267-A, 1201-B, or 1264-A* Supply</p> <p>*Not for use with Type 1208-C.</p>				
Panel Dimensions	8 × 7 in. (180 × 205 mm)	8 × 7 in. (180 × 205 mm)	8 × 7 in. (180 × 205 mm)	8 × 7 in. (180 × 205 mm)
Depth Behind Panel	7½ in. (190 mm)	7¾ in. (190 mm)	7¾ in. (190 mm)	7¾ in. (190 mm)
Net Weight	7¼ pounds (3.3 kg)	6 pounds (2.8 kg)	6 pounds (2.8 kg)	6 pounds (2.8 kg)
Shipping Weight	15 pounds (7 kg)	12 pounds (5.5 kg)	13 pounds (6 kg)	13 pounds (6 kg)
Code Number	1215-9703	1208-9703	1209-9933	1209-9703
Price	\$210.00	\$250.00	\$285.00	\$285.00







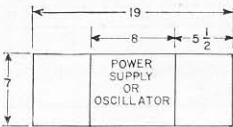
**SUMMARY OF OSCILLATOR POWER-SUPPLY CHARACTERISTICS**

Type	Applications	DC Plate Supply	Heater Supply	Panel Width
1267-A <sup>1</sup>	Ultimate stability for cw	300 v @ 70 ma, regulated	6.3 v dc @ 1 amp, reg	4"
1201-B <sup>1</sup>	Relative freedom from line transients	300 v @ 70 ma, regulated	6.3 v ac @ 4 amp	*
1269-A <sup>1</sup> 1203-B <sup>1</sup>	Maximum output and minimum cost	380 v open circuit; 300 v @ 50 ma	6.3 v ac @ 3 amp	4" *
1264-A <sup>1,2,3</sup>	100% square wave and pulse a-m	200-300 v @ 50 ma, reg.	6.3 v ac @ 2.1 amp	8"
1263-B <sup>2</sup>	Amplitude-regulated cw or 1-kc square-wave output	0-300 v @ 30 ma	6.3 v dc @ 0.5 amp	8"
1216-A <sup>1</sup>	Hetrodyne detector	300 v @ 30 ma	6.3 v ac @ 1 amp	*

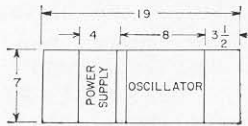
<sup>1</sup>Unit Instrument Cabinet.  
<sup>2</sup>May be operated from 400-cycle supply. <sup>3</sup>Not for use with TYPE 1208-C Unit Oscillator.  
<sup>4</sup>Requires adaptor cable when used with TYPES 1215-C, 1209-CL, and 1209-C Unit Oscillators (see latest General Radio catalog).

**Accessories for Relay-Rack Mount**

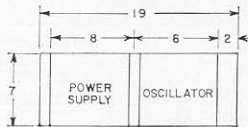
The panel extensions listed below can be readily attached to any of the 7"-high oscillators, power supplies, or oscillator-power supply assemblies to permit mounting in a standard 19" relay rack.



**Adaptor Plate Set Type 480-P408** used to rack-mount a single 8"-wide power supply (Type 1263-B or 1264-A) or oscillator.



**Adaptor Plate Set Type 480-P412** used to rack-mount an assembly of a 4"-wide power supply (Type 1267-A or 1269-A) and oscillator.



**Adaptor Plate Set Type 480-P416** used to rack-mount an assembly of an 8"-wide power supply (Type 1263-B or 1264-A) and oscillator.

Type	Description	Code Number	Price
480-P408	Adaptor Plate Set, for one 8"-wide instrument (7" high) . . . . .	0480-9648	\$ 8.00
480-P412	Adaptor Plate Set, for assembly of one 8"- and one 4"-wide instrument (7" high) . . . . .	0480-9642	7.00
480-P416	Adaptor Plate Set, for assembly of two 8"-wide instruments (7" high) . . . . .	0480-9646	6.00
480-P4U1	Relay-Rack Adaptor Panel, for Type 1201-B or Type 1203-B Power Supply only (7" high) . . . . .	0480-9984	11.00

**THE NEW POWER SUPPLIES**

To obtain the ultimate performance from our line of Unit Oscillators, the TYPE 1267-A Regulated Power Supply provides both regulated plate and heater voltages. Regulation is such that effects of line voltage on the oscillator performance are essentially eliminated. As a result, the residual fm of the oscillators

is approximately the same as that obtained with battery operation.

A vacuum-tube series regulator is used for the 300-volt, 70-ma, dc output and a transistor regulator for the 6.3-volt, 1-a, dc output. The vacuum-tube regulator shown in Figure 2 uses a differential-input amplifier to compare the