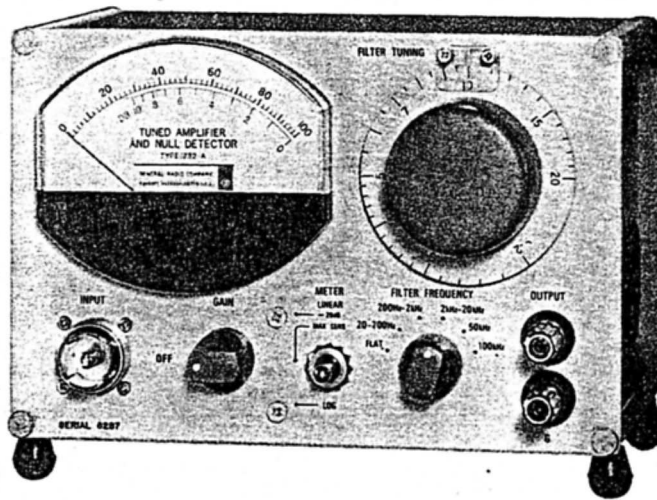


# Type 1232-A TUNED AMPLIFIER AND NULL DETECTOR

- 20 Hz to 20 kHz, 50 and 100 kHz
- 0.1- $\mu$ V sensitivity
- bandwidth approx 5%
- 120-dB gain

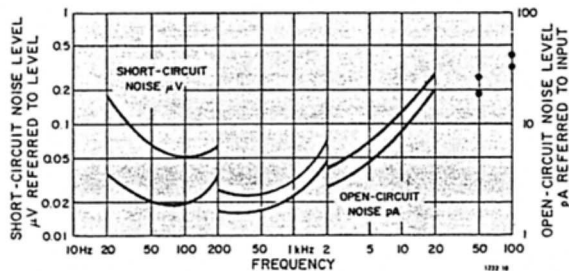


This battery-operated, solid-state amplifier will excel in common applications and fit many unusual requirements with its combined high sensitivity, low noise, choice of narrow or broad bandwidth, high gain, portability, and accessories for added versatility. Use it as a

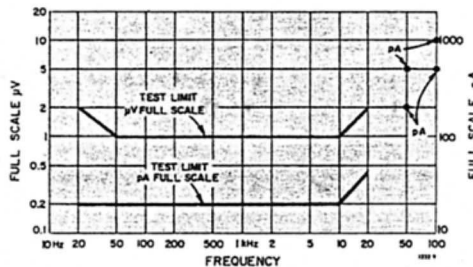
- bridge detector at audio frequencies; with the 1232-P2 Preamplifier it is equally sensitive for extremely high-impedance, low-frequency balances. With the 1232-P1 RF Mixer it is a sensitive, heterodyne, rf

- detector to 10 MHz with excellent harmonic rejection.
- audio preamplifier and general-purpose, tunable or broadband audio amplifier
- a-m detector for 0.5- to 500-MHz carrier frequencies
- when used with an 874-VQ Voltmeter Detector; sensitive audio wave analyzer for approximate measurements.

— See GR Experimenter for July 1961.



(Left) Typical noise levels as a function of frequency. (Right) Minimum input for full-scale meter deflection as a function of frequency, when amplifier is tuned to peak response.



## specifications

### Frequency Response:

**Tunable Filters** — 20 Hz to 20 kHz in 3 ranges; between 2% and 6% bandwidth to 15 kHz; 2nd harmonic at least 34 dB down from peak, 3rd at least 40 dB down; rejection filter on two highest ranges reduces 60-Hz level to at least 60 dB below peak (50 dB at 50 Hz). Dial accuracy is  $\pm 3\%$ .

**50- and 100-kHz Filters** — 2nd harmonic 44 and 53 dB down, respectively.

**Flat Response** —  $\pm 3$  dB 20 Hz to 100 kHz.

**Sensitivity:** See plot. Typically better than 0.1  $\mu$ V over most of the frequency range.

**Noise Level Referred to Input:** See plot. Noise figure at 1 kHz is less than 2 dB at an optimum source impedance of 27 k $\Omega$ .

**Noise Level Referred to Output:** Less than 5 mV on FLAT filter-frequency position, min gain setting, and -20-dB switch position; less than 50 mV in MAX SENS position.

**Input Impedance:** Approx 50 k $\Omega$  at max gain; varies inversely with gain to 1 M $\Omega$  at min gain.

**Max Safe Input Voltage:** 200 V ac or 400 V dc.

**Voltage Gain:** Approx 120 dB on the tunable ranges; 100 dB, flat range; 106 dB at 50 kHz; 100 dB at 100-kHz position.

**Output:** 1 V into 10,000  $\Omega$ . Internal impedance is 3000  $\Omega$ .

**Meter Linearity:** dB differences are accurate to  $\pm 5\%$   $\pm 0.1$  division for input of less than 0.3 V.

**Compression (on LOG position):** Reduces full-scale sensitivity by 40 dB. Does not affect bottom 20% of scale.

**20-dB Position:** Reduces gain by 20 dB in linear mode.

**Distortion (in FLAT position):** Less than 5% (from meter rectifiers).

**Power Supply:** 12 V dc, from 9 mercury (M72) cells in series.

Est battery life 1500 hours. Optionally, a rechargeable battery (non-mercury) can be supplied on special order.

**Accessories Available:** 1232-P1 RF Mixer for heterodyne operation to 10 MHz; 1232-P2 Preamplifier to maintain sensitivity of 1232-A at low frequencies when operating from a source impedance above 100 k $\Omega$ ; rack-adaptor sets (see below) convert 1232 and companion instruments to 19-in. rack-mount width.

**Terminals:** Input, GR874 coaxial connector; output, binding posts.

**Mounting:** Convertible-Bench Cabinet.

**Dimensions (width x height x depth):** 8 x 6 x 7 $\frac{1}{2}$  in. (205 x 155 x 190 mm).

**Weight:** Net, 5 $\frac{3}{4}$  lb (2.7 kg); shipping, 8 lb (3.7 kg).

Catalog Number	Description
1232-9701	1232-A Tuned Amplifier and Null Detector
1232-9829	1232-AP Tuned Amplifier and Null Detector, with preamplifier
<b>Rack-Adaptor Sets</b>	
0480-9838	480-P308, for 1232-A alone
0480-9836	480-P316, for 1232-A with 1310 or 1311 oscillator or similar 8-in. wide instrument with convertible-bench cabinet
0480-9837	480-P317, for 1232-AP (with pre-amp) and companion 8-in. instrument
8410-1372	Replacement Battery, 9 req'd

PATENT NOTICE. See Note 15.