

OPERATING INSTRUCTIONS
FOR
TYPE 619-E
HETERODYNE DETECTOR
FORM 377-C



GENERAL RADIO COMPANY
CAMBRIDGE A, MASSACHUSETTS

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OPERATING INSTRUCTIONS

FOR

TYPE 619-E

HETERODYNE DETECTOR

PART 1 DESCRIPTION

The Type 619-E Heterodyne Detector is a tuned, regenerative detector and audio-frequency amplifier. It is designed primarily for use with a harmonic frequency standard such as the Class C-21-HLD Primary Frequency Standard or Class C-10-H Secondary Frequency Standard.

POWER SUPPLY The Type 619-E Heterodyne Detector is a-c operated (105-125 or 210-250 volts, 50-60 cycles).

FREQUENCY RANGE Plug-in coils are used to cover a frequency range of from 25 kc to 25 Mc.

CIRCUIT Figure 1 is a complete circuit diagram. The regenerative detector is of the magnetic feedback type with potentiometer screen-voltage control of regeneration. Tuning of the detector circuit is accomplished by means of plug-in coils in conjunction with two variable condensers controlled from a single dial. The coil mounting is so arranged that the proper condenser is connected automatically when the coil is plugged in. By this arrangement a more open scale is obtained on the high frequency ranges. A vernier condenser is also provided for fine adjustment of the tuning.

INPUT COUPLING A low-impedance input circuit is provided, suitable for use with 65-ohm shielded cable, such as that supplied with Class C-21-HLD and C-10-H Frequency Standards and Measuring Equipment. A coupling coil is provided in each tuning coil, designed for optimum coupling throughout the frequency range covered by the coil.

REGENERATION A regeneration control is provided so that the detector may be used either in a non-oscillating state where the difference in frequency of the known and unknown signals is an audio frequency, or in an oscillating state where the difference is very small and the three-oscillator method of matching two frequencies, by means of the waxing and waning of a beat note between the frequencies being matched and a third frequency, is used. The third frequency is then supplied by the oscillating detector.

A chart is supplied, mounted on the coil compartment door, which gives the range in kilocycles of the individual coils. Calibration data is supplied in the form of a table. The calibration is good only when the door to the coil compartment is closed and the FINE tuning dial is set at 50 divisions.

PART 2 INSTALLATION

(1) Install vacuum tubes as follows:

1 - RCA 6K7G 1 - RCA 6X5G
2 - RCA 6J5G 1 - RCA VR-105-30

(2) Connect power supply:

Connect to 105-125 volt, 50-to-60 cycle ac line, by means of cord-and-plug assembly provided. If 210-250 volt supply

is used, change transformer connections as shown on wiring diagram.

(3) Input and telephone connections are made through multipoint connector; see diagram. Numbers of terminals are visible on plug when cover is removed. Telephones may also be connected by binding posts or jack on panel.

PART 3 OPERATION

REGENERATION The regeneration is increased when the control is rotated in a clockwise direction. Oscillation is indicated by a thump heard in the head telephones. If regeneration is increased too far, blocking may occur.

TUNING The tuning condensers are so arranged that an increase in dial reading corresponds to an increase in frequency.

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PARTS LIST

Resistors

R-1 = 100 Ω
R-2 = 5 M Ω
R-3 = 250 k Ω
R-4 = 100 k Ω
R-5 = 500 k Ω
R-6 = 50 k Ω
R-7 = 500 Ω
R-8 = 50 k Ω
R-9 = 10 k Ω
R-10 = 500 k Ω
R-11 = 50 k Ω
R-12 = 1 k Ω
R-13 = 100 k Ω
R-14 = 50 k Ω
R-15 = 5 k Ω \pm 2%

Fuses

F-1 = 1.0 amp. Buss. Type 7AG
F-2 = 1.0 amp. Buss. Type 7AG
F-3 = 0.1 amp. Buss. Type 7AG

Condensers

C-1 = 0.001 μ f
C-2 = 0.0001 μ f
C-3 = 0.01 μ f
C-4 = 1.0 μ f
C-5 = 1.0 μ f
C-6 = 0.01 μ f
C-7 = 1.0 μ f
C-8 = 1.0 μ f
C-9 = 0.01 μ f
C-10 = 1.0 μ f
C-11 = 1.0 μ f
C-12 = 15 μ f
C-13 = 100 μ f
C-14 = }
C-15 = } 619-350
C-16 = }
C-17 = 0.01 μ f
C-18 = 0.01 μ f
C-19 = 0.01 μ f
C-20 = 0.01 μ f
C-21 = 0.01 μ f
C-22 = 16 μ f
C-23 = 16 μ f
C-24 = 0.001 μ f

Tubes

V-1 = RCA Type 6J7G
V-2 = RCA Type 6J5G
V-3 = RCA Type 6J5G
V-4 = RCA Type 6X5G
V-5 = RCA Type VR-105-30
(or Sylvania Type VR-90)

SHIPPING LIST

2 - Pilot Lamps (6.0-volt)
1 - Box of 5 Fuses (0.1 amp)
1 - Box of 5 Fuses (1 amp)
1 - RCA Type 6J7G
2 - RCA Type 6J5G
1 - RCA Type 6X5G
1 - RCA Type VR-105-30
(or Sylvania VR-90)
3 - Calibration Charts
21 - Plug-in Coils
1 - Coil Mounting Drawer (619-P1)
1 - Type 274-M Plug
1 - Line cord and plug
*1 - Multipoint Connector

*When a connecting cable for an assembly of instruments is supplied, plugs are attached to the cable.

PATENT NOTICE

This instrument is manufactured under the following U. S. Patents and license agreements:

Patents of the American Telephone and Telegraph Company, solely for utilization in research, investigation, measurement, testing, instruction and development work in pure and applied science.

Patents 1,713,146 and 1,744,675

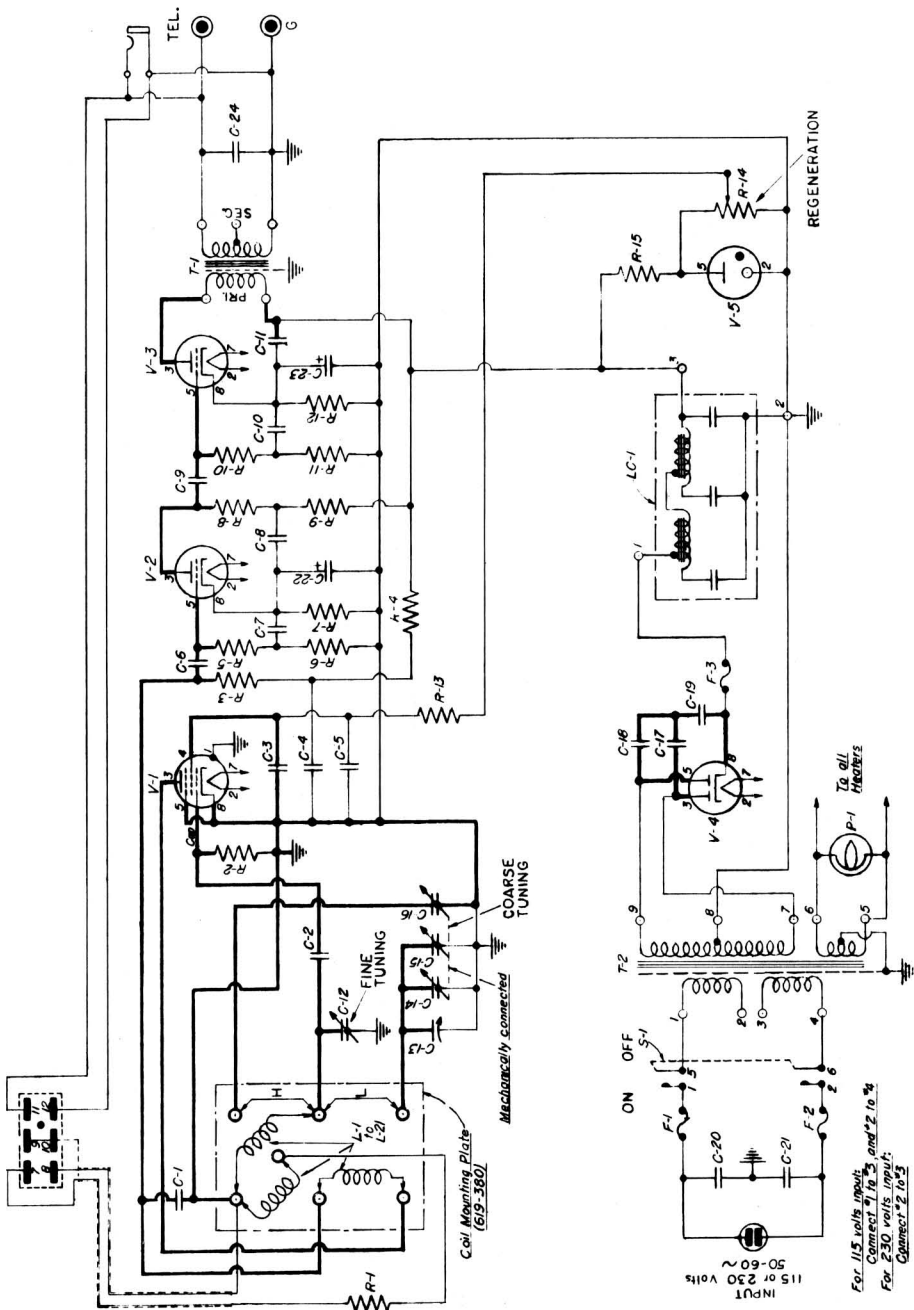


FIGURE 1. Circuit Diagram for Type 619-E Heterodyne Detector