

359K EQUALIZER DESCRIPTION

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1. GENERAL

1.01 This section describes the 359K equalizer, which is a plug-in apparatus unit designed for use in V4 telephone repeater applications.

1.02 The 359K equalizer is an adjustable low-frequency loss equalizer intended for use in applications where circuit gain and loss equalization are required for H44-loaded exchange cable. The 359K equalizer is used in conjunction with a 227-type amplifier to provide adjustable loss equalization, when needed, to flatten the frequency attenuation characteristic of H44-loaded exchange cable over the frequency range of 200 to 3000 Hz.

1.03 The 359K equalizer contains the same circuit components as the low-frequency section of the 359A equalizer, but contains no high-frequency section since H44 facilities do not ordinarily need high-frequency equalization in the 200- to 3000-Hz range. Unlike the 359A, however, it selects the 600-ohm ports of both amplifiers toward the cable facilities.

2. EQUIPMENT DESCRIPTION

2.01 The 359K equalizer (see Fig. 1) is a plug-in unit equipped with a 20-pin connector plug and is designed to be plugged directly into the equalizer connector socket of the repeater mounting shelf.

2.02 The 359K equalizer consists of seven resistors and four capacitors mounted on a printed wiring board and housed in a metal can approximately 1-3/4 inches wide by 1-3/4 inches high by 7 inches long. Tabs are provided on the front of the can

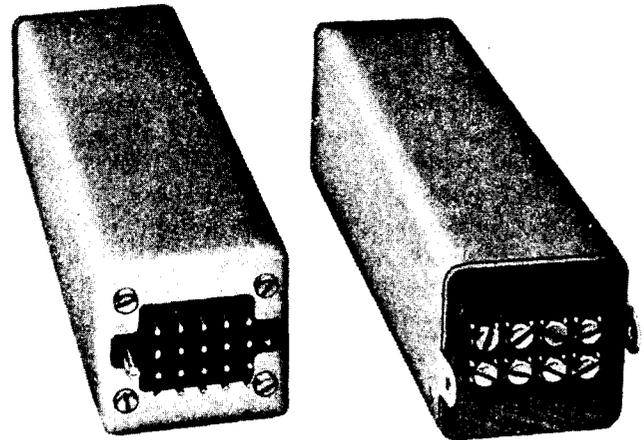


Fig. 1—359K Equalizer

to facilitate removal of the equalizer from the repeater mounting shelf with the use of a 602C or 602D tool.

2.03 Eight screw-type switches mounted in the faceplate permit selection of the indicated component values, as required, when adjusting equalization.

3. CIRCUIT DESCRIPTION

3.01 The general circuit configuration of the 359K equalizer is illustrated in Fig. 2. Resistor R and capacitor C are the low-frequency equalizer; resistors R5, R6, and R7 make up a 600-ohm, 6.2-dB pad.

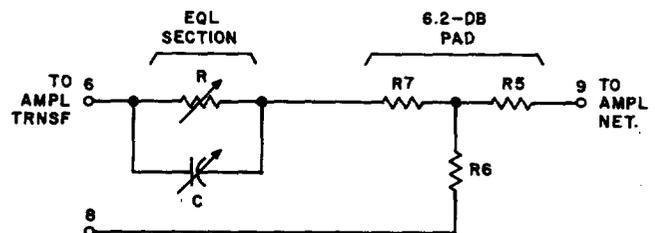


Fig. 2—359K Equalizer—General Circuit Configuration

3.02 Figure 3 is a schematic of the 359K equalizer illustrating typical circuit connections when plugged into the equalizer socket of a 24V4 or 44V4 repeater. The transmitting side is strapped to provide connections to the AMPL OUT and MON jacks and also connects the 600-ohm transmitting amplifier output to the 4-wire line (H44-loaded cable).

3.03 The receiving side of the 359K equalizer contains the equalizing components for equalizing the H44-loaded cable. Received transmission signals from the 4-wire line (H44-loaded cable) at terminals 2 and 4 are connected to the 600-ohm receiving amplifier input through terminals 1 and 3. Terminals 6, 8, and 9 connect the equalizing section into the receiving amplifier circuit and select the proper transformer secondary tap to make the input impedance 600 ohms.

3.04 The equalization circuit consists of a resistor section R made up of R1, R2, R3, and R4 in parallel with a capacitor section C made up of C1, C2, C3, and C4. All are controlled by associated faceplate screw-type switches. Resistors R5, R6, and R7 form a 6.2-dB fixed pad which prevents interaction between the equalizer and amplifier. Resistor R is adjustable from 0 to 3750 ohms in 250-ohm steps, and capacitor C is adjustable from 0 to 3.75 μF in 0.25- μF steps. The resistors are

bypassed when their associated screw-type switches are closed (turned in) and are included in the circuit when the switches are opened (turned out). The capacitors are added to the circuit when their associated screw-type switches are closed (turned in) and are removed when the screw-type switches are opened (turned out).

3.05 The 359K equalizer provides compensation for loss distortion in the 4-wire line facilities at frequencies up to approximately 1000 Hz. Figures 4 and 5 illustrate typical equalization losses which may be obtained by various combinations of C and R. Figure 4 shows the results of keeping C constant and varying R; Fig. 5 shows the results of keeping R constant and varying C. Adjustment settings of the equalizer normally used have little effect on either the transmission loss or the transmission frequency characteristics above 1000 Hz.

3.06 While the equalizer components provide compensation for amplitude distortion, they introduce delay distortion at the same time. Figures 6 and 7 illustrate typical delay-frequency characteristics obtained from various combinations of R and C. Figure 6 shows the results of keeping C constant at 0.25 μF and varying R; Fig. 7 shows the results of keeping R constant at 1500 ohms and varying C.

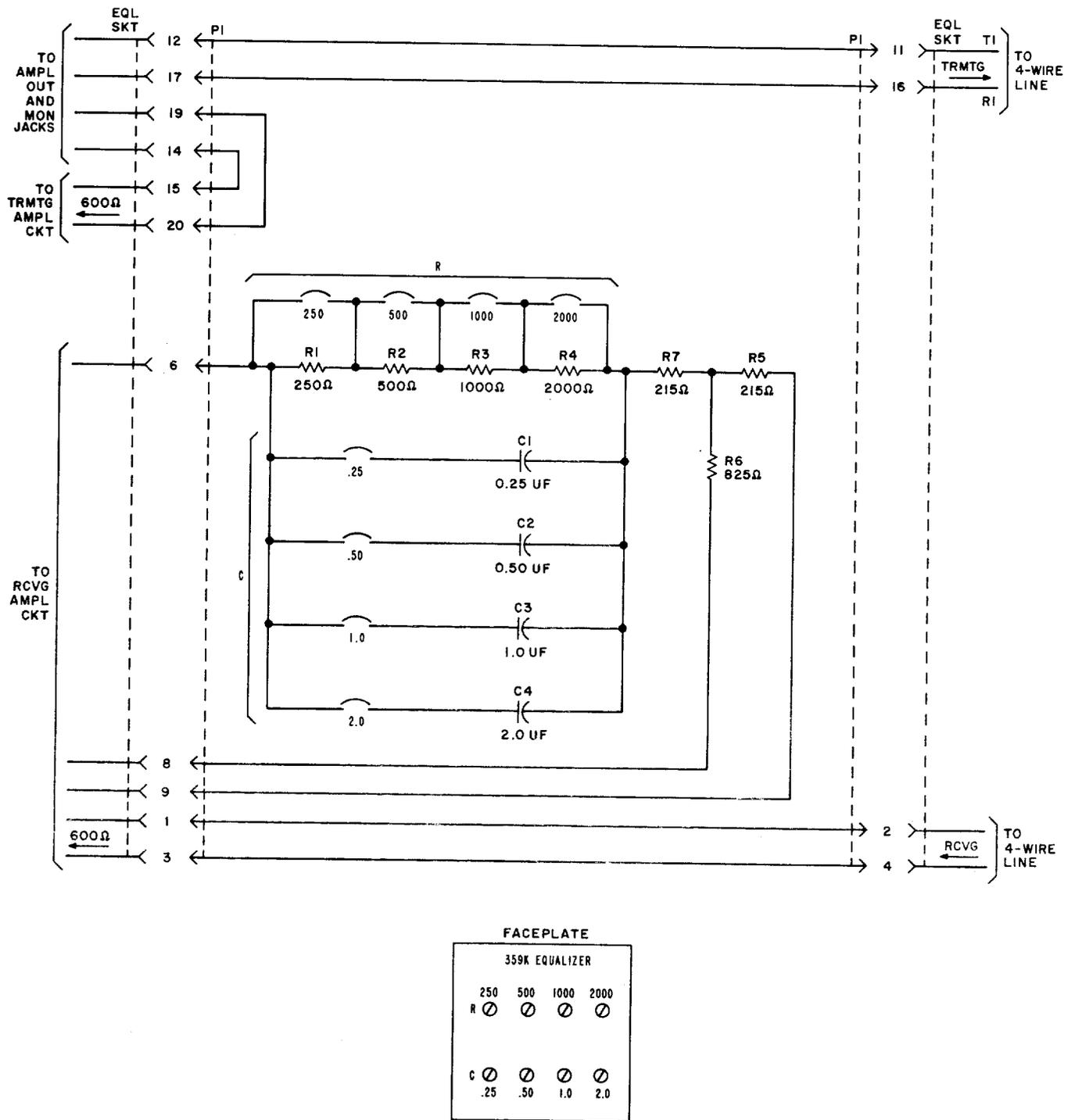


Fig. 3—359K Equalizer—Schematic and Typical Circuit Connections

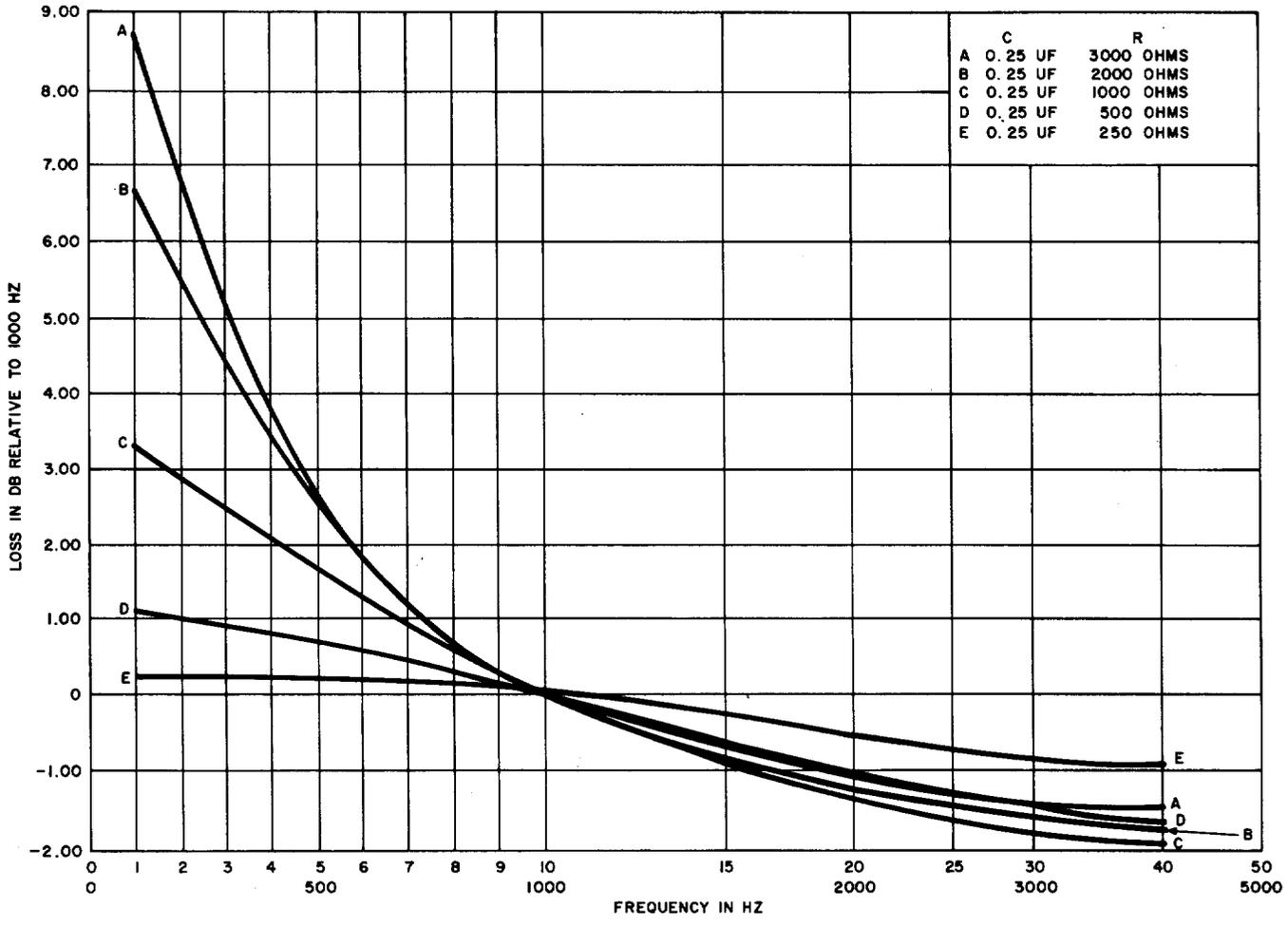


Fig. 4—359K Equalizer—Loss-Frequency Characteristics—Between 600 Ohms—
Keeping C Constant and Varying R

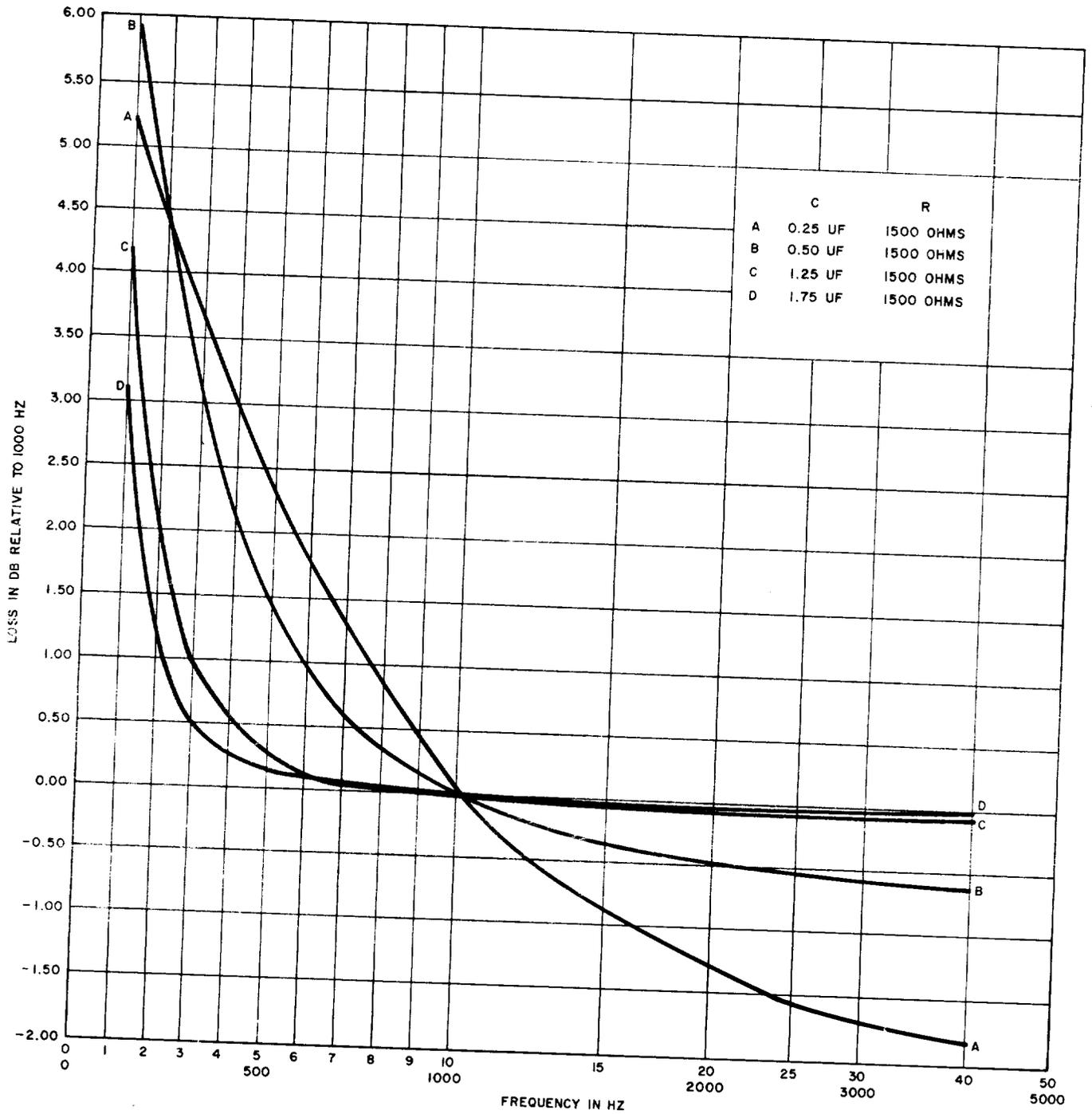


Fig. 5—359K Equalizer—Loss-Frequency Characteristics—Between 600 Ohms—
Keeping R Constant and Varying C

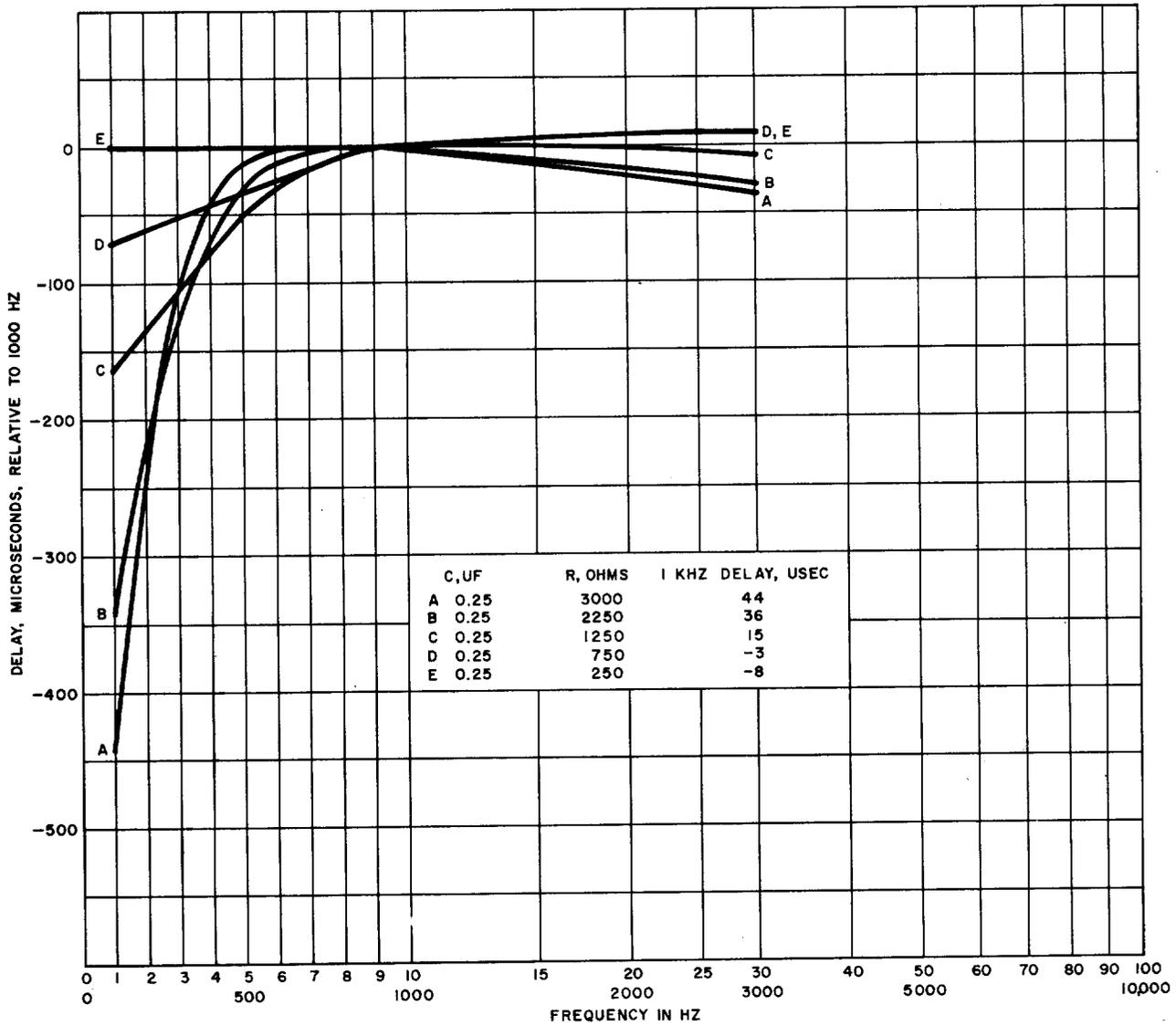


Fig. 6—359K Equalizer—Delay-Frequency Characteristics—Between 600 Ohms—
Varying R for C=0.25 μF

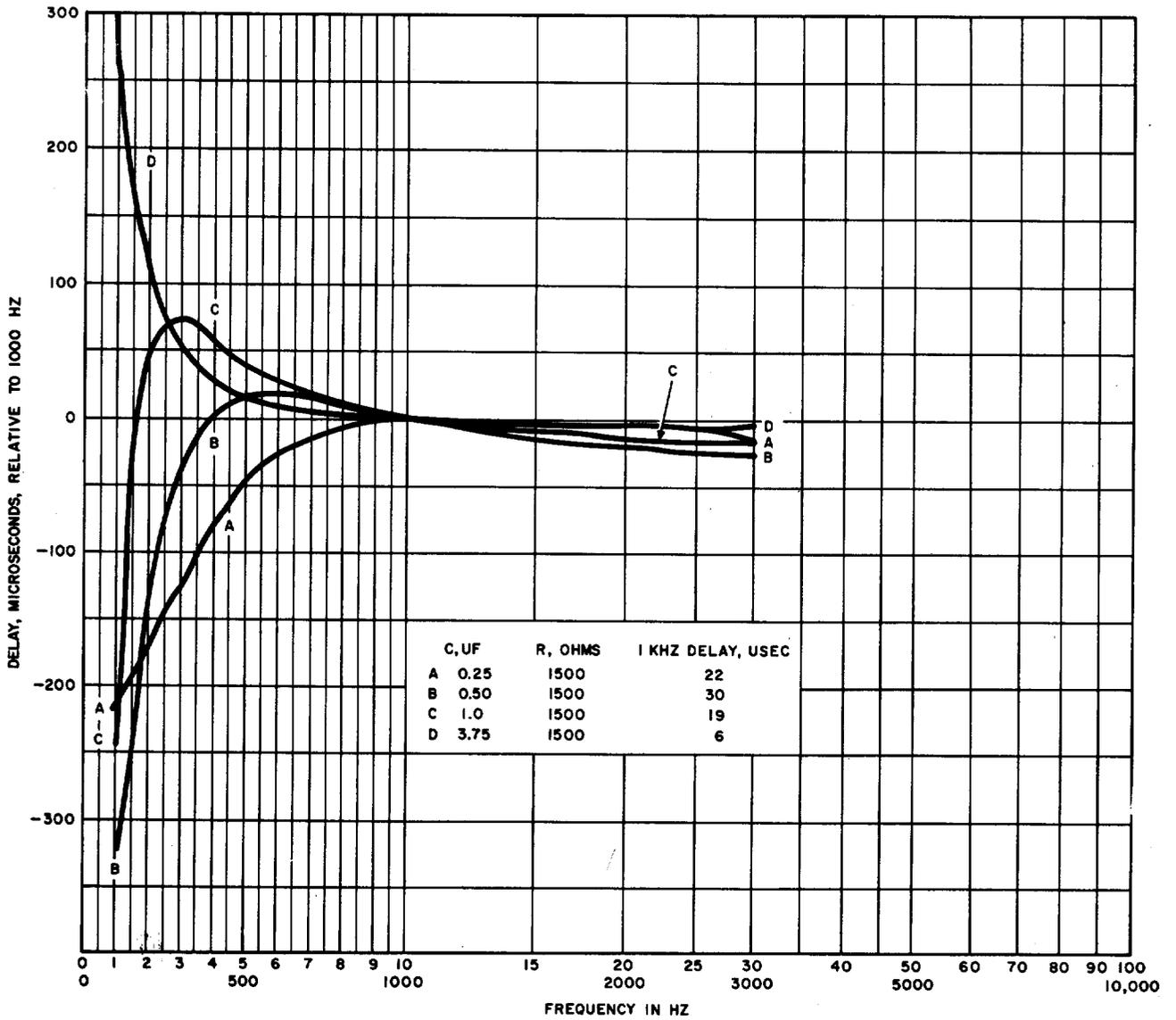


Fig. 7—359K Equalizer—Delay-Frequency Characteristics—Between 600 Ohms—
Varying C for R=1500 Ohms