SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

The Model 3500 Filter, shown in Figure 1, is a variable, electronic band-pass filter that operates at frequencies from 20Hz to 200kHz. The filter consists basically of an input amplifier, a variable high-pass section, a variable low-pass section, and an output amplifier. The high-pass and low-pass sections are connected in series. The overall gain of the Filter is unity(0db). The cutoff frequencies of both the high-pass and low-pass sections can be adjusted independently over the full frequency range of 20Hz to 200kHz.

An optional rack-mounting kit, (Part No. RK-38) is available from Krohn-Hite, for installing the unit in a standard 19" rack spacing.

1.2 GENERAL SPECIFICATIONS

Frequency Range

Continuous coverage from 20Hz to 200kHz for both high cut-off and low cut-off frequencies independently. Frequency range is covered by separate calibrated dials and four-decade band switches. Center frequency and width of pass band in band-pass mode are continuously adjustable over the entire frequency range.

BAND	MULTIPLIER	FREQUENCY (Hz)
1	1	20 - 200
2	10	200 - 2,000
3	100	2,000 - 20,000
4	1K	20,000 - 200,000

Frequency Dials

Each dial is engraved and individually hand-calibrated with a single logarithmic scale reading directly in cycles per second, from 19 to 210. Dials are 2 inches in diameter with an effective scale length of 6 inches per band, giving a total effective scale length of 24 inches for the range of 20Hz to 200kHz.

Accuracy of Cut-off Frequency Calibration

±10% with "Response" switch in "max-flat" (Butterworth) position; less accurate in "Low Q" position. Relative to mid-band level, the filter output is down 3db at cut-off in "max-flat" position, and approximately 12db in "Low Q" position.

Bandwidth

Continuously variable within the cutoff frequency limits of 20Hz and 200kHz. For minimum pass-band (Butterworth response) the two cutoffs are set to the same frequency, resulting in an insertion loss of 6db at that frequency, with 3db points at factors of .8 below it and 1.25 above it.

Response Characteristics

Choice of 4 pole Butterworth (maximally flat response) for frequency domain operation and Low Q (damped response) for transient-free time domain operation, selected by means of a switch on rear of chassis.

Pass-Band Gain

Zero db ±1 db in pass band.

Input Characteristics, Impedance

Approximately 10 megohms in parallel with 50 pf. Maximum input amplitude: 5 volts rms up to 2MHz. Maximum dc component: 100 volts.

Output Characteristics, Impedance

Approximately 50 ohms. Maximum Voltage +7 volts peak. Maximum Current +5 ma peak. Internally generated hum and noise: Less than 200 microvolts. (Slightly higher for 400 Hz operation.)

Attenuation Slope

Nominal 24db per octave each side of pass-band.

Maximum Attenuation

Greater than 60 db.

Controls

Front panel; LOW CUT-OFF FREQUENCY dial and multiplier switch. HIGH CUT-OFF FREQUENCY dial and multiplier switch. POWER OFF-ON switch. Rear panel; RESPONSE switch, GROUND switch, 115/230V LINE switch.

Terminals

Front panel, two BNC connectors, one for INPUT and one for OUTPUT. Rear of chassis, two BNC connectors, one for input and one for output. An additional multi-purpose binding post for CHASSIS GROUND is provided on the rear panel. An AC power receptacle with detachable line cord is also provided.

Power Requirements

105-125 or 210-250 volts, single phase; 50-400 Hz, 10 watts. Hum and noise are increased by a factor of approximately two for 400Hz operation.