

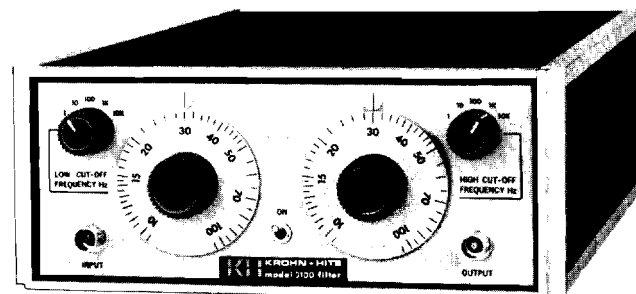


model 3100/3103

10 Hz to 3 MHz SOLID-STATE, BAND-PASS VARIABLE FILTER models 3100, 3103

- **All silicon solid-state**
- **Frequency range:** 10 Hz to 3 MHz
Model 3100 — 10 Hz to 1 MHz
Model 3103 — 10 Hz to 3 MHz
- **Frequency response:**
Maximally flat (Butterworth)
or transient-free (Simple R-C)
- **Calibration accuracy:** $\pm 10\%$
- **Insertion loss:** 0 db
- **Attenuation slope:** 24 db per octave
- **Maximum attenuation:** 80 db, minimum
- **Hum and noise:** 100 μ v
- **Floating (ungrounded) operation**

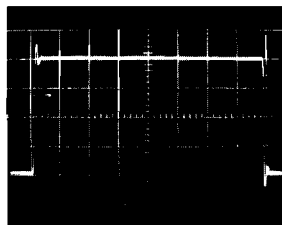
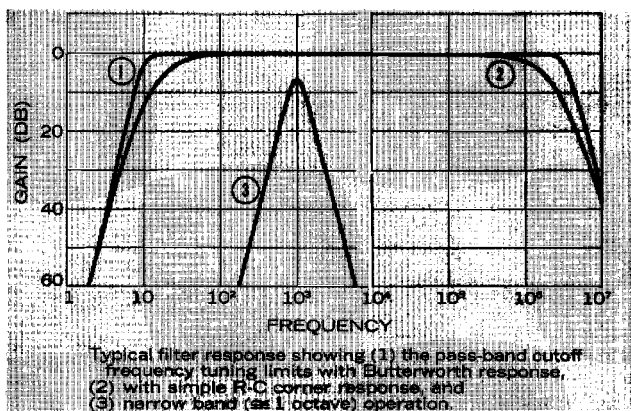
THE KROHN-HITE MODELS 3100 and 3103 offer for the first time variable electronic band-pass filters with both cutoff frequencies continuously tunable from ten Hz to three Megahertz! The frequency response characteristic of these filters very closely approximates a fourth-order Butterworth with maximal flatness for cleanest filtering in the frequency domain. For pulse or transient signal filtering, a switch is provided to change the frequency response to



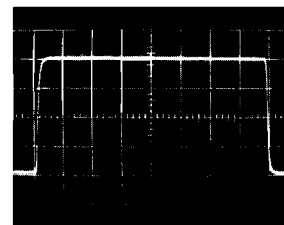
simple R-C, optimum for transient-free filtering. Pass-band gain is unity, standard in all Krohn-Hite filters, and the attenuation slope is 24 db per octave.

These variable electronic filters can be used in many applications where previously price, size, power consumption, limited high frequency operation, or poor transient performance have been serious limitations. Their rugged solid-state construction and low power consumption make them ideally suited for portable and field use, as well as for plant and laboratory applications. Optimized frequency or time domain characteristics open up new vistas of applications where variable electronic filters were previously felt to be unusable.

These filters consist of independent variable high-pass and low-pass sections, each containing four cascaded R-C elements coupled by isolating stages. The two filter sections are, in turn, cascaded in this band-pass filter. A sound basic design, together with careful attention to numerous circuit refinements, result in the optimum practical combination of excellent filter characteristics with dependable performance and versatility.



Response of Model 3100 to 1-kHz squarewave, with cut-offs at 10 Hz and 1 MHz. Overshoot at leading edge is approximately 1 db with "Response" switch in "max. flat" position.



Response to same square-wave with "Response" switch in "R-C" position. Note very slight rounding of leading edge, but the complete removal of overshoot.

model 3100/3103

FILTER

SPECIFICATIONS

Function: Band-pass

Frequency range:

Model 3100 — Both low-cutoff and high-cutoff frequencies are independently adjusted from 10 Hz to 1 MHz in five bands.

BAND	MULTIPLIER	FREQUENCY RANGE (Hz) (Low and High Cutoff)
1	1	10 - 100
2	10	100 - 1,000
3	100	1,000 - 10,000
4	1,000	10,000 - 100,000
5	10,000	100,000 - 1,000,000

Model 3103 — Low-cutoff frequency adjustable from 10 Hz to 1 MHz in five bands, same as Model 3100. High-cutoff frequency adjustable from 30 Hz to 3 MHz in five bands.

BAND	MULTIPLIER	FREQUENCY RANGE (Hz) Low Cutoff High Cutoff
1	1	10-100 30-300
2	10	100-1,000 300-3,000
3	100	1,000-10,000 3,000-30,000
4	1,000	10,000-100,000 30,000-300,000
5	10,000	100,000-1,000,000 300,000-3,000,000

Frequency dials:

Model 3100 — Separate low-cutoff and high-cutoff dials are individually calibrated with single logarithmic scales reading directly in Hz from 9.5 to 105. Total effective length for all bands is approximately 30 inches.

Model 3103 — Low-cutoff dial same as Model 3100. High-cutoff dial reads directly in Hz from 28 to 310.

Cutoff frequency calibration accuracy: $\pm 10\%$ with "Response" switch in "max-flat" (Butterworth) position; less accurate in "R-C" position. Relative to mid-band level, the filter output is down 3 db at cutoff in "max-flat" position, and approximately 13 db in "R-C" position.

Bandwidth:

Model 3100 — Continuously variable with the cutoff frequency limits of 10 Hz and 1 MHz. For minimum passband curve 3, page 1 (Butterworth response), the two cutoffs are set to the same frequency, resulting in an insertion loss of 6 db at that frequency, with 3 db points at factors of 0.8 and 1.25.

Model 3103 — Continuously variable within the limits of 10 Hz and 3 MHz. Minimum passband, equivalent to curve 3, page 1, can only be achieved between 30 Hz and 1 MHz.

Attenuation Slope: Nominal 24 db per octave

Maximum attenuation: Greater than 80 db.

Insertion loss: Zero db $\pm \frac{1}{2}$ db

Frequency Responses: Standard response is 4th order Butterworth, maximally flat. A switch on rear of chassis converts to simple R-C response for optimum transient performance with no overshoot on fast-rise pulses.

Input characteristics:

MAXIMUM INPUT AMPLITUDE: 3 volts rms to 1 MHz, decreasing to 2.5 volts at 3 MHz for Model 3103.

IMPEDANCE: 100 k ohms in parallel with 50 pf.

MAXIMUM DC COMPONENT: 200 volts

Output characteristics:

MAXIMUM VOLTAGE: 3 volts rms.

MAXIMUM CURRENT: 10 milliamperes rms.

INTERNAL IMPEDANCE: Approximately 50 ohms.

Floating (ungrounded) Operation: A switch is provided on rear of chassis to disconnect signal ground from chassis ground.

Hum and noise:

Model 3100 — 100 Microvolts

Model 3103 — 150 Microvolts

Front panel controls:

LOW CUTOFF FREQUENCY dial and multiplier switch

HIGH CUTOFF FREQUENCY dial and multiplier switch

Power-ON switch

Terminals: Front panel and rear of chassis, one BNC connector for INPUT, one for OUTPUT.

Power requirements: 105-125 or 210-250 volts, single phase, 50-400 Hz, 15 watts.

Dimensions and weights:

Standard bench Models 3100 and 3103 — 8 $\frac{3}{8}$ " wide, 3 $\frac{1}{2}$ " high, 15" deep; 11 lbs. net, 22 lbs. shipping.

Rack-mounting Models 3100R and 3103R — 19" wide, 3 $\frac{1}{2}$ " high, 15" deep; 13 lbs. net, 24 lbs. shipping.

Specifications are subject to change without notice.

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