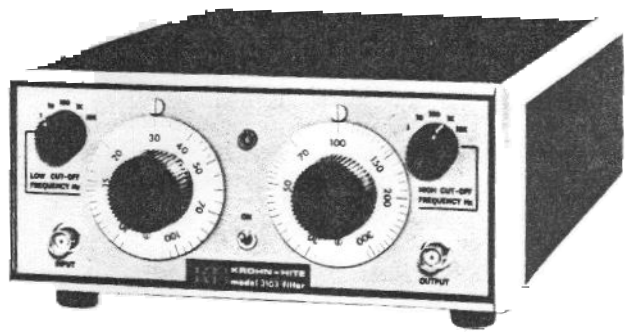
KROHN-HITE CORPORATION

FILTER

KH model 3103

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

model 3103



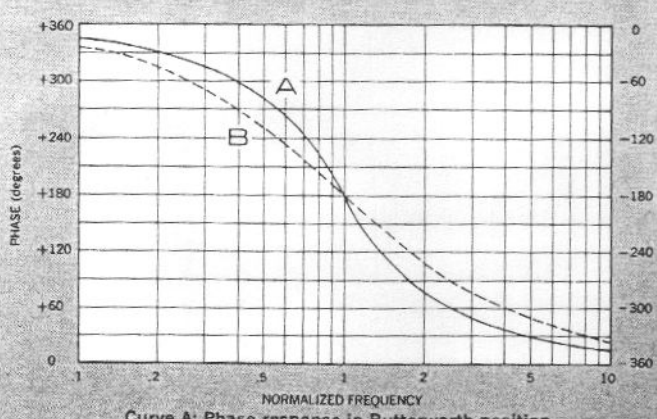
- ***Frequency range:*** 10 Hz to 3 MHz
- ***Frequency response:*** Butterworth or Simple R-C
- ***Calibration accuracy:*** ±5%
- ***Insertion loss:*** 0 db
- ***Attenuation slope:*** 24 db per octave
- ***Maximum attenuation:*** 80 db, minimum
- ***Hum and noise:*** 150μv rms
- ***Floating (ungrounded) operation***

The Krohn-Hite Model 3103 offers for the first time a variable electronic band-pass filter with cutoff frequencies continuously tunable from ten Hz to three Megahertz! The frequency response characteristic of this filter 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.

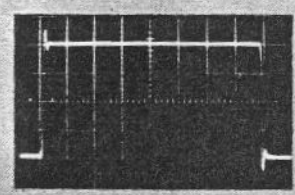
This variable electronic filter can be used in many applications where previously price, size, power consumption, limited high frequency operation, or poor transient performance have been serious limitations. Optimized frequency *or* time domain characteristics open up new vistas of applications where variable electronic filters were previously felt to be unusable.

This filter consists 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.

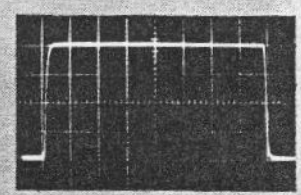
A sound basic design, together with careful attention to numerous circuit refinements, results in the optimum practical combination of excellent filter characteristics with dependable performance and versatility.



Curve A: Phase response in Butterworth position.
Curve B: Phase response in R-C position.



Response of Model 3103 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.

FILTER

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SPECIFICATIONS

Function: Band-pass

Frequency range:

Low-cutoff frequency adjustable from 10 Hz to 1 MHz in five bands. 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:

Separate low-cutoff and high-cutoff dials are individually calibrated with single logarithmic scales reading directly in Hz. Low-cutoff dial from 9.5 to 105. High-cutoff dial from 28 to 310. Total effective length for all bands is approximately 30 inches.

Cutoff frequency calibration accuracy: ±5% 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:

Continuously variable with the cutoff frequency limits of 10 Hz and 3 MHz. For minimum pass-band (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. 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 ±½ 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.
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:

150 Microvolts rms.

Front panel controls:

LOW CUTOFF FREQUENCY dial and multiplier switch
HIGH CUTOFF FREQUENCY dial and multiplier switch
POWER-ON switch

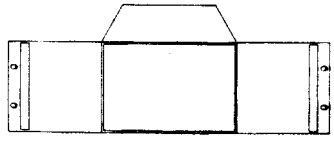
Terminals: Front panel and rear of chassis, one BNC connector for INPUT, one for OUTPUT.

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

Dimensions and weights:

Model 3103 — 8⅝" wide, 3½" high, 15" deep; 11 lbs. net, 13 lbs. shipping.

Optional Rack-Mounting Kit:
Part No. RK-38; permits installation of 3103 into a standard 19" rack spacing.



Specifications are subject to change without notice.