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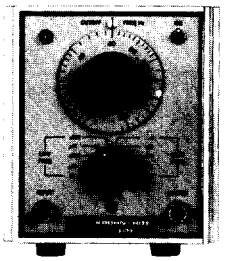
KROHN-HITE CORPORATION

model 3200/3202

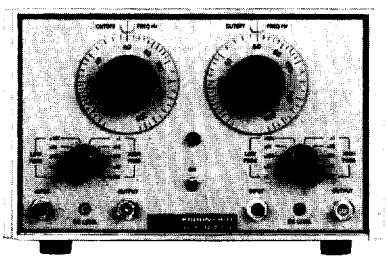
20 Hz to 2 MHz SOLID-STATE VARIABLE HIGH-PASS, LOW-PASS, BAND-PASS, BAND-REJECT

models 3200 and 3202

- ***All silicon solid-state***
- ***Frequency range:*** 20 Hz to 2 MHz
- ***Frequency response:*** Maximally flat (Butterworth) Transient-free (simple R-C)
- ***Calibration accuracy:*** ±10%
- ***Insertion loss:*** 0 db
- ***Attenuation slope:*** 24 db/octave (each channel)
- ***Maximum attenuation:*** 80 db
- ***Hum and noise:*** 100 μv
- ***Floating (ungrounded) operation***
- ***DC coupled in low-pass mode***



MODEL 3200



MODEL 3202

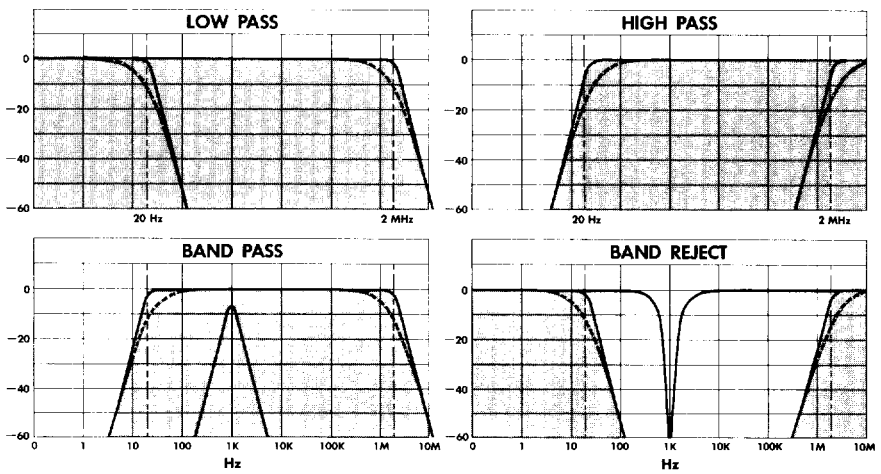
THE KROHN-HITE MODEL 3200 Series offers, for the first time, an all solid-state variable electronic filter with High-Pass, Low-Pass, Band-Pass and Band-Reject filtering capabilities plus continuous tuning over the range of 20 Hz to 2 Megahertz! The basic frequency response characteristic of this filter very closely approximates a *fourth-order Butterworth* with maximal flatness for cleanest filtering in the Frequency Domain. To meet the requirements of Time Domain, a switch changes the basic response to *simple R-C* to provide superior pulse or complex (transient) signal filtering.

Pass band gain is unity (standard on all Krohn-Hite Filters) and the single-channel attenuation slope is 24 db per octave. The individual channels of the Model 3202 (or two separate Model 3200 units) may be interconnected to obtain band-pass and band-reject modes or to achieve 48-db-per-octave high-pass or low-pass attenuation slopes. See Specifications.

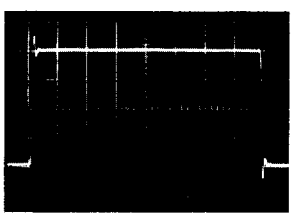
This filter consists of four cascaded R-C elements coupled by isolating stages into a single channel. A front panel switch selects high-pass or low-pass filter functions. The Model 3200 is a single-channel (High-Pass or Low-Pass) unit; the Model 3202 has two identical channels.

Four package configurations are available: Two Bench Units (illustrated) and two corresponding Rack Mounted Units (Models 3200R and 3202R, respectively). Corresponding Bench and Rack Units are electrically identical; they differ only in package formats.

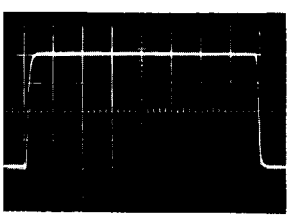
The Model 3200 Series marks the *first time* that such operational flexibility has been available in Krohn-Hite Filters. When considered with all the other features, instruments of really outstanding value are now available for the engineer or scientist who requires quality variable filter performance.



MULTIFUNCTION RESPONSES of Butterworth (solid curves) and Simple R-C (dashed curves) show basic 24-db-per-octave attenuation slopes. Interconnection of Low-Pass and High-Pass channels provides tunable Band-Pass or Band-Reject functions and, also, 48-db-per-octave slopes High-Pass or Low-Pass modes. Minimum bandwidth in Band-Pass mode is approximately one octave with the center frequency located at any point between 20 Hz and 2 Mhz. Model 3202 (and 3202R), with two channels, provides all four functions. Single-channel units, Models 3200 and 3200R provide High- and Low-Pass functions. Two of them may be cascaded for performance identical to Model 3202.



Response (in low-pass mode) to 1-kHz square wave, with cut-off at 1 MHz. Overshoot is approximately 1 db with Response Switch in "Max. Flat" position.



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

model 3200/3202 FILTER

SPECIFICATIONS

Functions:

Single-Channel
- High-Pass — 24 db/octave attenuation slope
- Low-Pass — 24 db/octave attenuation slope

Two-Channels
- Connected in Series
  - High-Pass — 48 db/octave attenuation slope
  - Low-Pass — 48 db/octave attenuation slope
  - Band-Pass — 24 db/ocatve attenuation slopes
- Connected in parallel
  - Band-Reject — 24 db/octave attenuation slopes

Frequency Range:

BAND	MULTIPLIER	FREQUENCY (Hz)
1	1	20 to 200
2	10	200 to 2,000
3	100	2,000 to 20,000
4	1,000	20,000 to 200,000
5	10,000	200,000 to 2,000,000

Frequency Dials: Each channel has a one decade frequency dial (calibrated from 19 to 210) and an associated high-pass/low-pass band switch providing 5 multiplier ranges for each function.

Cutoff Frequency Calibration Accuracy: ±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 (See "Input Characteristics"):
- Low-Pass Mode — Frequency response from dc to the cutoff frequency set within the range from 20 Hz to 2 MHz.
- High-Pass Mode — Continuously-adjustable between 20 Hz and 2 MHz with upper 3 db point at approximately 10 MHz.
- Band-Pass Operation — Continuously variable within the cutoff frequency limits of 20 Hz to 20 MHz. For minimum bandwidth the high-pass and low-pass cutoff frequencies are set equal. This produces an insertion loss of 6 db, with the −3 db points at 0.8 and 1.25 times the midband frequency.
- Band-Reject Operation — Continuously variable within the cutoff frequency limits of 20 Hz and 2 MHz or sharp null at any frequency between 40 Hz and 1 MHz. The low-pass band extends to dc. The high-pass band has its upper 3 db point at approximately 10 MHz. The null is sharper than that of a balanced "parallel T" filter, and is obtained by setting the high-pass cutoff at approximately twice the desired null frequency, and the low-pass cutoff at approximately one-half the desired null frequency.

Response Characteristics (selected by rear panel switch):
- Butterworth — Each channel exhibits maximally flat fourth order Butterworth response for optimum performance in frequency domain.
- Simple R-C — Fourth order R-C response for transient-free time-domain performance.

Note: Higher order characteristics may be obtained by cascading individual channels.

Attenuation Slope: Nominal 24 db per octave per channel in high-pass or low-pass modes. (see "Functions".)

Maximum Attenuation: Greater than 80 db.

Insertion Loss: Zero ±½ db to 2 MHz; 3 db at approximately 10 MHz. 6 db in Band-Reject operation.

Input characteristics:
- Maximum Input Amplitude — 3 v rms up to 2 MHz, decreasing to 1 v rms at 10 MHz.
- Maximum DC Component —
  - Low-Pass Mode: Combined ac plus dc should *not* exceed 4.2 v, peak.
  - High-Pass Mode: 100 v.
- Impedance — 100 k ohms in parallel with 50 pf.

Output Characteristics:
- Maximum Voltage — 3 v, rms, to 2 MHz (1.5 v, rms, in Band-Reject operation).
- Maximum Current — 10 ma (less in Band-Reject operation).
- Internal Impedance — 50 ohms, approx. (higher in Band-Reject operation).

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

Hum and Noise: Less than 100 microvolts,rms.

Output DC Level Stability: ±1 millivolt per degree C.

Front Panel Controls:
- CUTOFF FREQUENCY Hz Dial and Multiplier/Function 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.

Operating Temperature Range: 0°C to 50°C.

Dimensions and Weights:

Model	Height	Width	Depth	Ship Wgt.	Op. Wgt.
(Bench Models)					
3200	5¼″	4¾″	15¼″	21 Lb.	9 Lb.
3202	5¼″	8⅝″	15¼″	22 Lb.	14 Lb.
(Rack Units)					
3200R	3½″	19″	15¼″	21 Lb.	11 Lb.
3202R	3½″	19″	15¼″	22 Lb.	18 Lb.

Prices and Specifications are subject to change without notice.

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