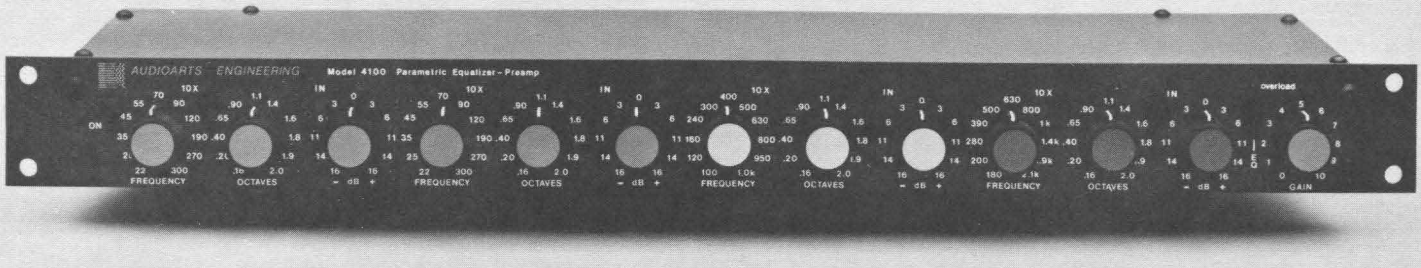
AUDIOARTS ENGINEERING

Model 4100 Parametric Equalizer – Preamp



CONSIDER THIS – A parametric equalizer without low, mid and high band restrictions. The Audioarts Engineering Model 4100 is a four section mono parametric equalizer; each section is a dual range filter. CONSIDER an equalizer that can handle full +20 dBm studio levels, regardless of equalization setting, but which also has a low-noise preamp input to allow musical instruments to plug directly into those same studio effects. The Audioarts Engineering Model 4100 is a professional no compromise parametric equalization system intended for recording, reinforcement and musical preamp applications.

CONTROL – Control, after all, is what equalizers are all about. That is why the Model 4100 is designed for maximum control, by means of dual range equalization sections. Sections 1 and 2 both cover 22 Hz to 300 Hz and 220 Hz to 3 KHz; Section 3 covers 100 Hz to 1,000 Hz and 1 KHz to 10 KHz; and Section 4 covers 180 Hz to 2,100 Hz and 1.8 KHz to 21 KHz! Additionally, this same dual ranging permits tighter resolution for fine tuning, since each setting must span only an approximate 10:1 frequency range. Each section has 32 dB of boost/cut range, and, of course, more boost or cut is available, since equalization sections are cascaded and they all overlap in frequency range. Reciprocal curves for boost and cut permit removal of previous equalization settings (i.e., mixdown operations). The octave bandwidth controls can vary each filter anywhere from 1/6 to 2 octaves, permitting synthesis of practically any imaginable response curve.

THE PREAMP – The Model 4100 is designed for recording and sound reinforcement work in mind; however, it is also equipped with a high gain, low-noise preamp that is activated when the preamp input jack is used. This preamp is well-suited for musical instrument pick-up and contact mics. Instruments may then be equalized by any combination of the four overlapping filter sections, with their volume controlled by the front panel master gain control. The output of the equalizer would generally be patched to a power amp or to an electronic crossover for two or three-way systems. Additionally, two units may be patched in tandem to allow eight bands of EQ.

- Four dual range filter sections
- EQ bypass switch for each section
- Master bypass switch
- LED overload indicator
- Input gain control
- Balanced input
- Balanced transformer output option
- Instrument preamp input jack
- .002% THD typical
- 110 dB S/N ratio
- 20 Hz to 100 KHz ± .5 dB
- Reciprocal equalization
- 1¾ inch rack mount
- Two year warranty

Designed and Constructed in U.S.A.

PARAMETRIC EQUALIZATION — The Audioarts Engineering Model 4100 is the most powerful processing tool available. Dual range equalizer sections make possible a 100:1 tuning range, meaning even the high band, which has a maximum frequency of 21 KHz, can go all the way down to 180 Hz! The usual low, mid and high band restrictions found on other conventional equalizers are avoided. Additionally, each section has a separate equalization bypass switch, allowing it to be preset for punch-in purposes, and of course a master equalization bypass switch is provided. Further, all bandwidth controls are calibrated in octaves, not "Q", so you don't need a calculator to relate bandwidth to music. A gain control and an overload LED are also included to eliminate overload problems common to other equalizers.

GAIN CONTROL AND OVERLOAD — Equalizers are generally subject to severe clipping conditions, since equalization causes increased gain around the desired center frequencies when boosted. The Model 4100 is equipped with both front panel input gain control and LED overload monitoring circuitry. The overload monitor will indicate when clipping conditions exist; these may then be corrected by adjusting the master gain control. The obtained result is simple, absolutely clean and quiet signal processing.

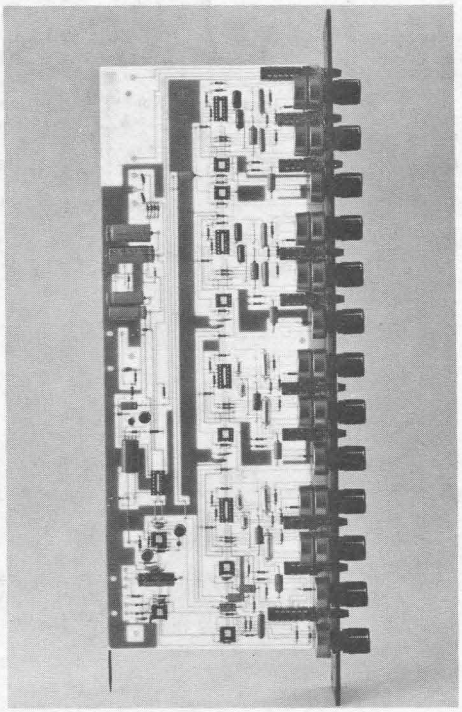
INPUTS AND OUTPUTS — The Model 4100 has two input jacks: one a balanced line level input allowing full +20 dBm inputs, regardless of equalization setting (it will also operate with unbalanced sources); the other input feeds a high impedance low-noise preamp, designed for low level sources (such as guitar pickups, acoustic instrument contact pickups, etc.). The output stage of the Model 4100 is designed to drive a full +20 dBm (+22 dBm typical) into a 600 ohm load, thus assuring compatibility with other professional studio equipment. Both input and output stages have been designed to reject RF interference. A transformer balanced output is available optionally.

APPLICATIONS

- Recording mixdown
- Room equalization
- Hum and noise reduction
- Instrument preamp
- Stage monitor EQ
- Reinforcement EQ
- Feedback control
- Discotheque systems
- Real-time room EQ

CONSTRUCTION — Like all Audioarts Engineering products, the Model 4100 has been designed for continuous professional applications where there can be no compromise in signal quality or function. Emphasis has been placed on quiet, high performance circuitry designed around socket-mounted integrated circuits, with special attention paid to rugged construction and easy serviceability.

- Brushed aluminum faceplate
- Rugged anodized aluminum chassis
- Glass epoxy circuit board
- Socket-mounted ICs
- Heavy duty controls
- Color-coded knobs



SPECIFICATIONS

Frequency Response	20 Hz to 100 KHz, ± .5 dB
THD 20 Hz to 20 KHz @ +18 dBm	.005% (.002% typical @ 1 KHz)
IM Distortion SMPTE @ +18 dBm	.002% (.001% typical)
Noise, 20 KHz BW	-92 dBm, 0 dBm reference
Signal-to-Noise Ratio	110 dB (113 dB typical)
Slew Rate	12 volts/microsecond
Output Level	+21 dBm into 600 ohms
Output Impedance	6 ohms
Input Level	+22 dB (+26 dB available)
Input Impedance	100K ohm
Gain	0 dB line in +27 dB preamp in
Functions:	
Center Frequency Range	Section 1: 22 Hz to 300 Hz 220 Hz to 3 KHz Section 2: 22 Hz to 300 Hz 220 Hz to 3 KHz Section 3: 100 Hz to 1 KHz 1 KHz to 10 KHz Section 4: 180 Hz to 2.1 KHz 1.8 KHz to 21 KHz
Octaves Bandwidth Range	2 octaves to 1/6 octave
Boost/Cut Range	±16 dB (reciprocal curves)
General:	
Terminations	1/4" RTS
Dimensions	19" W x 1.75" H x 8.5" D
Power — 110-125 VAC, 50-60 Hz	10 watts

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OPERATION

Model 4200A - Stereo/Two Channels
Model 4100 - Mono/One Channel

(1) CONNECTION - The first step is to connect inputs and outputs as previously described.* Then connect to properly grounded AC main. (*see next page)

(2) SET-UP - Start with the master GAIN control turned up to "full" setting ("10"); all EQ switches out; all BOOST/CUT ("-dB+") controls set to 0dB (12 o'clock); all FREQUENCY and OCTAVE controls set to 12 o'clock; and all 10X switches out. In other words, all knobs set to 12 o'clock except GAIN (set to full), and all switches out except power. With this setting the equalizer will pass the input signal unaltered.

(3) EQUALIZATION - The Model 4200A has four independent equalizer sections per channel (Model 4100 one channel only), each with its own EQ IN switch. Additionally, there is a MASTER EQ IN switch for each channel. Each equalizer section has a FREQUENCY control, an OCTAVES control, a BOOST/CUT control, a 10X frequency range extender switch, and the previously mentioned EQ IN switch.

To begin equalization, first activate the MASTER EQ IN switch and the desired equalizer section EQ IN switch. Rotate the BOOST/CUT control to the desired dB setting. The affected center frequency is determined by the FREQUENCY control setting, as indicated on the front panel calibration legends.

The 10X switch when engaged will cause the center frequency of the filter section to be ten times the frequency indicated by the control pointer. Each filter's bandwidth is controlled by means of the OCTAVE control; an octave setting of "1.1" is a good practical starting point to use.

You will note there are four filter sections per channel; each requiring its own frequency, octaves, and boost/cut setting. It is good practice to adjust one filter section at a time. Since the filter sections are cascaded, their effects are cumulative. That is, two filters set to +10dB boost at 1KHz would produce a result of +20dB boost at 1KHz.

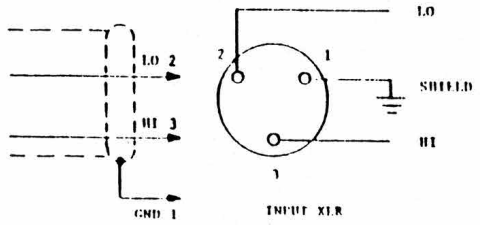
If boosting certain frequencies causes overload conditions anywhere in the circuit, the OVERLOAD LED will light. If this happens, reduce the master GAIN setting until the LED goes out.

CONNECTING INPUTS

This Audioarts Engineering Model 4200A is provided with an electronically balanced input section. It may be driven by balanced or unbalanced sources by means of the 3-pin XLR input jacks on the rear of the chassis. The pin code is as follows:

Pin 1 is SHIELD
Pin 2 is LOW
Pin 3 is HIGH

It is desirable to use two-conductor shielded cable only, even if the system is run unbalanced. Terminate the shield at either sending or receiving end of cable, but not at both. That is, do not run current through the cable shield. If you do choose to use single-conductor shielded cable, then it is necessary to connect the shield at both ends of the cable.

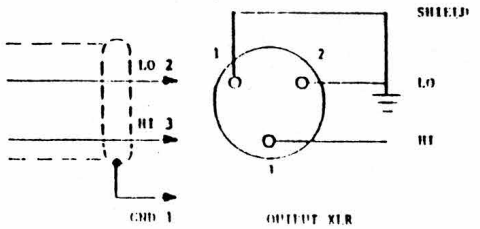


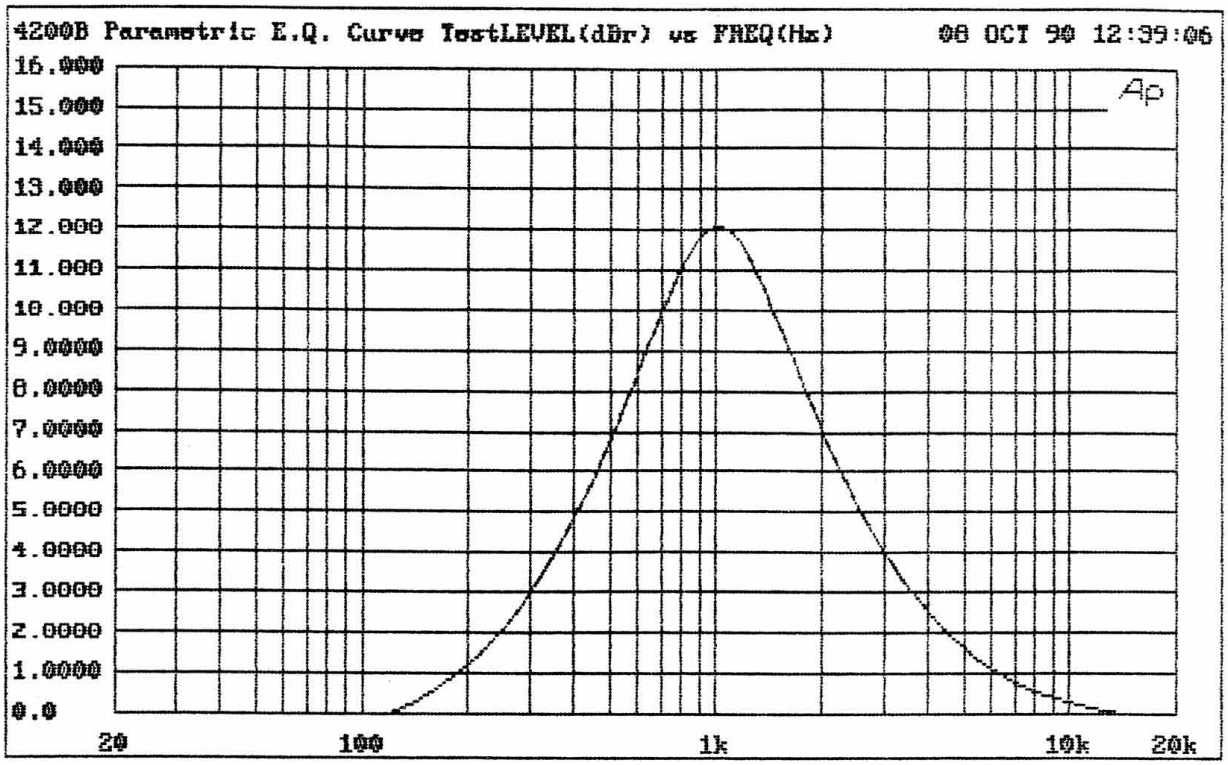
OUTPUT CONNECTIONS

All Audioarts Engineering audio processing equipment is designed with high current, high voltage output stages, assuring compatibility with virtually any other equipment.

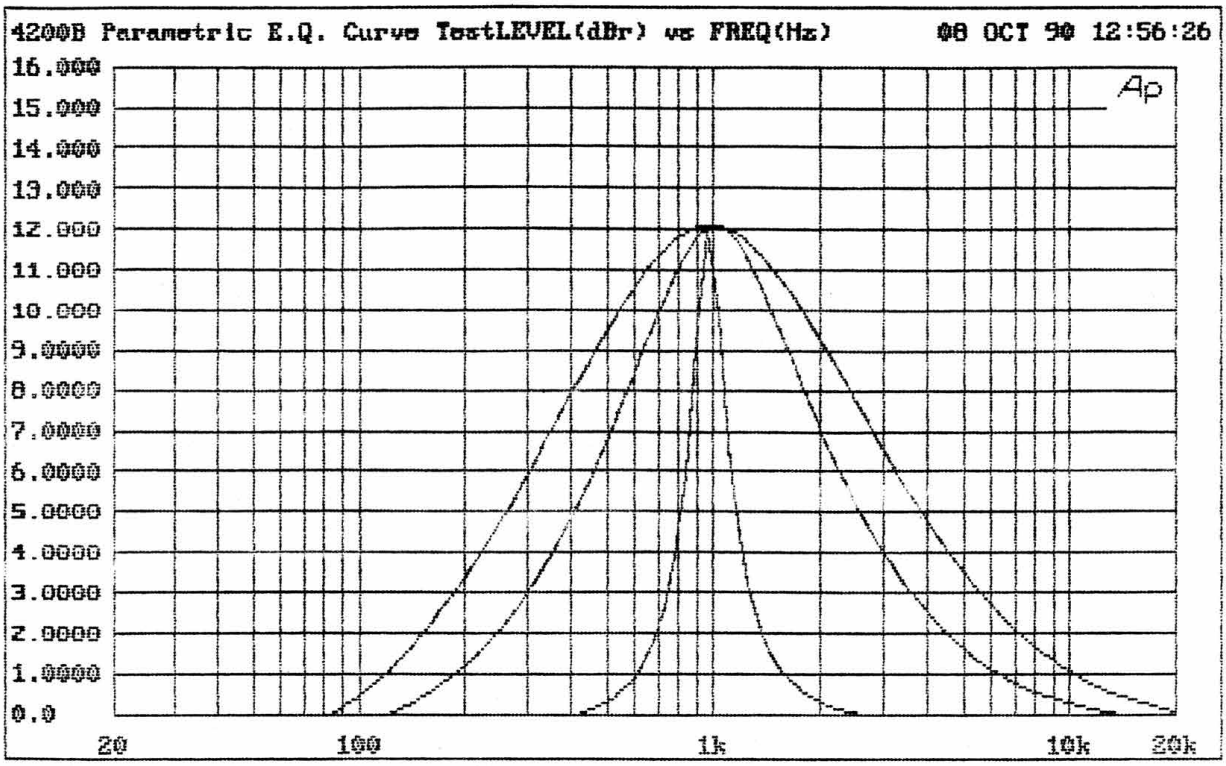
LOAD IMPEDANCE - It is possible to drive any load from 600 ohms to millions of ohms with no adverse effects. With the above loads a maximum level of +20dB can be expected. Loads less than about 500 ohms will not cause damage, but a reduction in maximum output level may result. A short across the output lines will cause the output stage to self-protect, and will of course result in reduced output and increased distortion.

WIRING - For reasons of superior hum and noise rejection, it is always best to use two-conductor shielded cables, even if unbalanced lines are run. One wire should be designated as "hot" or "high"; another as "low", and the shield should be terminated at one end of the cable only. Single conductor shielded cable will work, but it is subject to induced interference into the shield conductor. If single conductor shielded cable is used, the shield must be used as ground at both ends.





Test Conditions: OdBu input level
+12dB gain
1kHz center frequency
Bandwidth = 1.1 octaves



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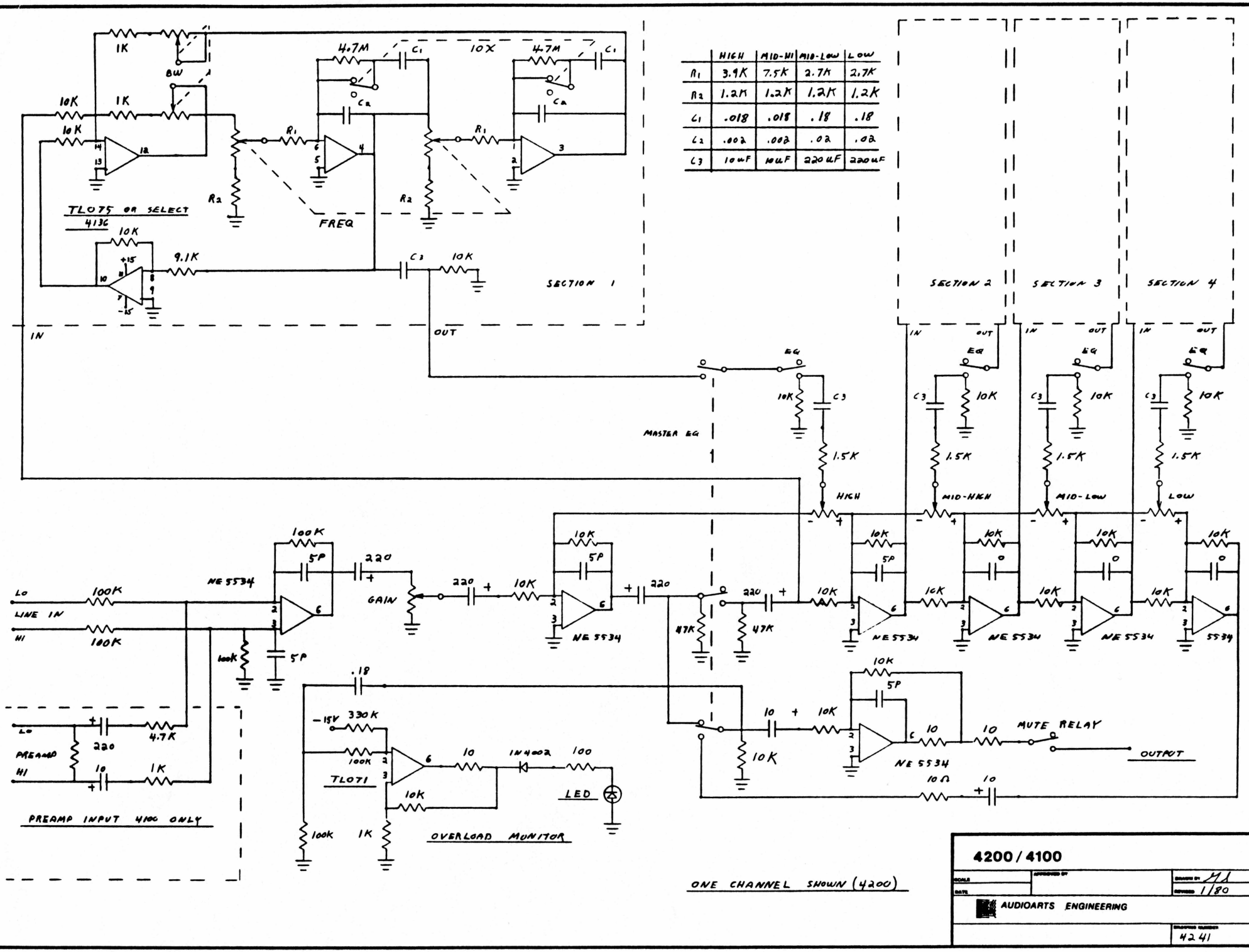

	HIGH	MID-HI	MID-LOW	LOW
R1	3.9K	7.5K	2.7K	2.7K
R2	1.2K	1.2K	1.2K	1.2K
C1	.018	.018	.18	.18
C2	.002	.002	.02	.02
C3	10uF	10uF	220uF	220uF

4200 / 4100

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