

Dual Compressor-Limiter



Based on a proprietary hybrid design, the DCL-200 two channel compressor-limiter combines the most desirable sonic characteristics of vacuum tubes with the increased reliability of solid-state devices. DCL-200 circuitry incorporates selected 12AX7A vacuum tubes with high reliability 990 op-amps in a transformerless signal path. Suggested applications for the DCL-200 include recording studios, MIDI project studios, broadcast facilities, touring sound reinforcement systems and mastering facilities.

Features Include:

- CONTINUOUSLY VARIABLE ATTACK AND RELEASE TIMES
- ADJUSTABLE A.C. THRESHOLD
- VARIABLE SLOPE
- OUTPUT GAIN CONTROL
- SOFT-KNEE TRANSITION CHARACTERISTIC
- STEREO LINK SWITCH
- DUAL METERS, SWITCHABLE TO OUTPUT OR GAIN REDUCTION MODE
- PEAK OVERLOAD INDICATORS
- 990 OUTPUT STAGE, BALANCED OR UNBALANCED
- BALANCED OR UNBALANCED INPUTS
- SIDE CHAIN INSERT
- BYPASS SWITCH
- HAND CRAFTED IN THE USA

Specifications:

OUTPUT: Maximum output level is +25 dbm. Output level of +4 dbm corresponds to 0 VU. Output impedance is 75 Ω . Recommended output load is 600 Ω .

INPUT: Electronically balanced XLR. Input impedance of 40 k Ω .

FREQUENCY RESPONSE: 5 Hz to 70 kHz.

NOISE: Less than -80 dbm at unity gain.

DISTORTION: Less than .05% at +4 dbm.

ATTACK TIME: .1 mS to 40 mS.

RELEASE TIME: 45 mS to 10 S. *Note: Attack and release times vary with the amount of gain reduction and are program dependent.*

SLOPE: Adjustable from 1.1:1 to 7:1.

GAIN CONTROL DEVICE: Proprietary design.

PANEL SIZE: 19" x 3.5" (Standard 2U rack space).

DEPTH: 10.5" plus user I/O cabling.

POWER: 40 watts, 115 or 230 V, 50 or 60 Hz.

COMPONENTS: (3) selected 12AX7A vacuum tubes, (4) high reliability 990 operational amplifiers, (24) integrated circuits, (12) transistors.

SHIPPING WEIGHT: 20 lbs. (9.07 kg).



Summit Audio, Inc.

P.O. Box 1678, Los Gatos
California 95031 U.S.A.
TEL: 408-395-2448
FAX: 408-395-1403

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INTRODUCTION

The Summit Audio DUAL COMPRESSOR LIMITER is a hybrid of technologies. It contains both vacuum tube and solid state components. This combination of old and new technologies produces an incredibly warm and smooth sounding compression device without the inherent disadvantages of the older designs. In the stereo mode the attack, release, slope, and A.C. threshold controls operate both channels.

FEATURES:

- . STEREO OR DUAL MONO OPERATION
- . "SOFT KNEE" CHARACTERISTIC
- . CONTINUALLY VARIABLE ATTACK AND RELEASE TIMES
- . CONTINUALLY VARIABLE A.C. THRESHOLD
- . CONTINUALLY VARIABLE SLOPE
- . CONTINUALLY VARIABLE OUTPUT GAIN
- . SWITCH SELECTABLE STEREO LINKING
- . CH 1 ATTACK, RELEASE, SLOPE, A.C. THRESHOLD, OPERATES BOTH CHANNELS IN LINK MODE
- . METERS FOR MONITORING OUTPUT LEVEL OR GAIN REDUCTION ON EACH CHANNEL
- . PEAK OVERLOAD INDICATORS
- . 990 OUTPUT STAGE BALANCED OR UNBALANCED
- . BALANCED OR UNBALANCED INPUT STAGE
- . SIDE CHAIN INSERT
- . STEREO LINK OR DUAL MONO OPERATION
- . HAND CRAFTED IN THE U.S.A.

Having found this manual, carefully unpack the DCL-200 and its power cord. Save the carton and packing material should it be needed for future shipping. Before powering the unit, read this manual, observing the cautions for HIGH VOLTAGE. Proceed by doing the following:

- .Set the line voltage switch to the proper position.
- .Determine the proper fuse size by referring to the specifications.
- .Check for pilot lamp illumination when powered up.
- .Check for meter illumination when powered up.

THE CONTROLS

- BYPASS:** Removes the compressor-limiter from the signal path. The tube circuit is left in the signal path with the unit bypassed. The meter will show gain reduction and output level as if the compressor-limiter circuit is in the signal path.
- GAIN:** Sets the gain of the DCL-200 when the unit is switched in.
- A.C. THRESHOLD:** This control controls the amount of gain reduction that will take place. This is accomplished by changing the gain of the side chain. A low setting will require a large signal to create a large amount of gain reduction and a higher setting will require less signal to get the same amount of gain reduction. The DCL-200 has no fixed threshold point which causes a change in action depending upon the signal being above or below this point. This control works like the gain reduction control on the TLA-100A.
- SLOPE:** The slope control sets the ratio for the DCL-200. The higher the setting the higher the ratio and the lower the setting the lower the ratio. The high settings will result in limiter action and the low settings in compressor action. The ratio of the unit will change depending on the signal level and the setting of the A.C. threshold control. The ratio of the DCL-200 can vary from less than 1.1 to 1 to as high as 7 to 1.
- ATTACK:** The time it takes the DCL-200 to respond to the incoming signal is determined by this control. The shortest time is .1mS and the longest is 100mS. A setting of 0 on the control is the fastest time and a setting of 10 is the slowest time.

RELEASE: The release control sets the time it takes the DCL-200 to go back to no gain reduction. With a 0 setting being the fastest and a setting of 10 being the slowest. The fastest release time is 35mS and the slowest is 10S, but as the release time is increased the DCL-200 becomes more and more program dependent, because of a built in memory effect.

NOTE: The attack and release values are not on the dial because they interact with each other and change with different amounts of gain reduction taking place and the settings of the A.C. threshold and slope controls. The given values for attack and release times are measured with 12 db of gain reduction and full signal change.

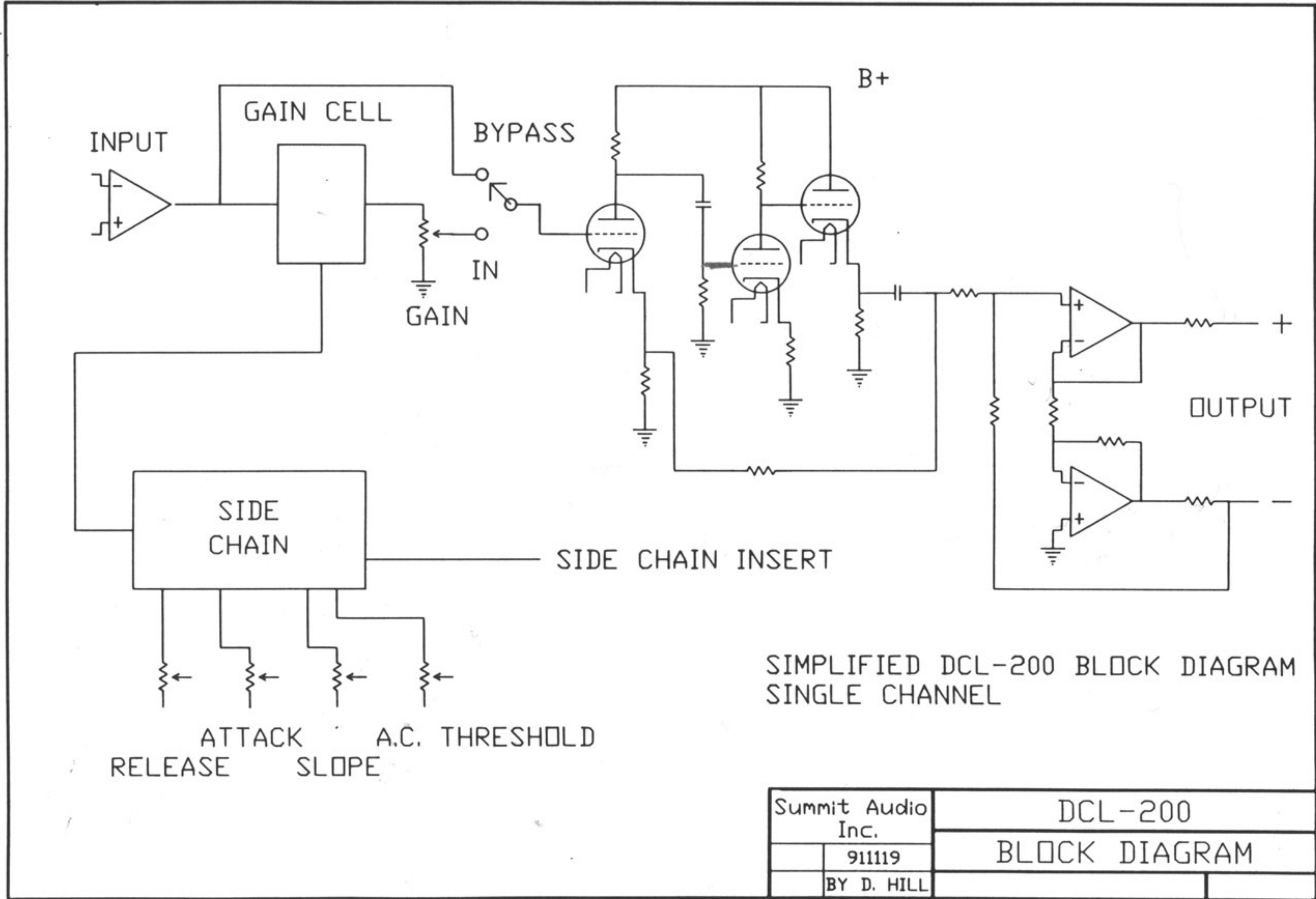
METER SWITCH: This switch allows the operator to monitor the output level or the gain reduction taking place.

LINK: Links the two channels for stereo operation. When in the stereo mode the A.C. threshold, slope, attack, and release controls on the top channel (channel 1) will operate both channels. The bypass switch, meter switches, and the gain controls will need to be set individually.

POWER: Power switch turns the unit on or off.

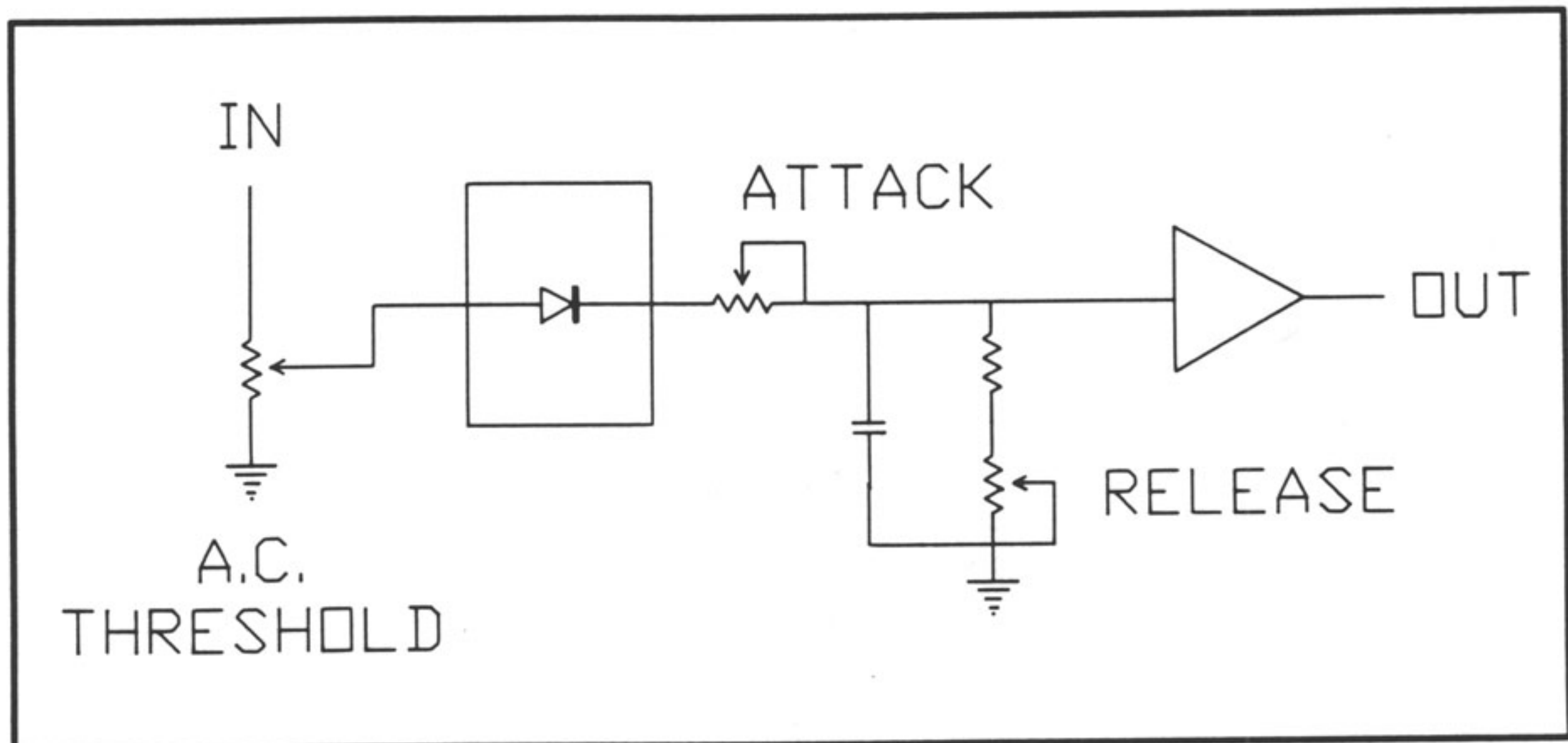
OL: The over load or clip lamp is an LED to the right of the meter. It will light between .25 and .5 db below clipping. The lamp has a pulse stretcher circuit to make it easier to see on quick peaks. The OL lamp is always in the main signal path.

METER: The meter will show gain reduction or output level, and will act as if the compressor-limiter is in the signal path whether the compressor-limiter is in the signal path or not.



CIRCUIT EXPLANATION

The DCL-200 is organized so that in stereo link mode the A.C. threshold, slope, attack, and release controls on the top channel operate both channels. The channel 1 side chain is fed with the sum of channel 1 and channel 2 (combined to a mono signal). The side chain then generates the control for both channel 1 and channel 2. The only problem with this method occurs if the stereo signal has a large out-of-phase component (180 Degrees). This out of phase signal will sum to zero and not generate any gain reduction. Mono compatability is necessary for any sound that has the potential for radio or TV play. The DCL-200's method of stereo linking will work very well when your source is mono compatible.



SIMPLIFIED ATTACK AND RELEASE CIRCUIT

The attack and release settings will change the gain of the side chain. With the attack set at 10 and release set at 0, a voltage divider circuit is formed creating a low output voltage to the control circuit. In this case you will need to increase the the setting of the A.C. threshold control. By setting the attack at 0 and the release at 10, there is no voltage loss in the circuit. The A.C. threshold control will need a much lower setting to achieve the same amount of gain reduction as in the previous example. By allowing this interaction, you can adjust the circuit for peak or average responding operation. This allows you to adjust the DCL-200 to meet your needs better and get a larger variety of smooth sounds.

The audio path has a balanced input followed by the gain cell, a tube amplifier, and a balanced discrete output stage using Dean Jensen designed 990 Op Amps. The 990's are arranged so that operation in either balanced or unbalanced mode will result in the proper gain structure. The tubes are 12AX7A's. They have well regulated power supplies and DC on the heaters. All amplification is done with the tubes. The input stage is operated at a loss to provide the input clipping Level of +24 dbm.

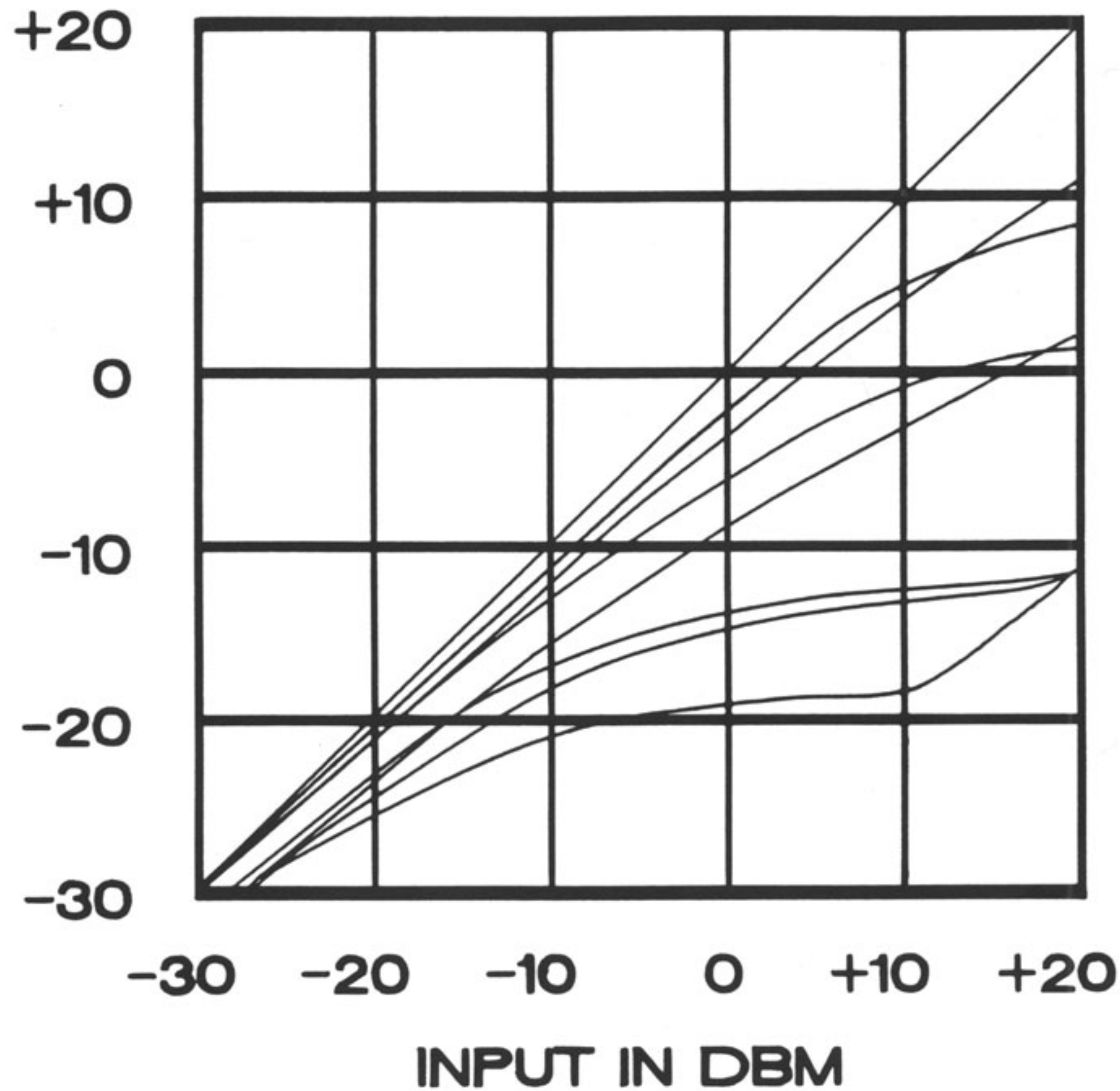
The gain control device is a proprietary design that synthesizes what the old photo resistor, light source compressor-limitors did. Our approach allows a much faster response time, wider bandwidth, and lower distortion. The frequency response -3 db point is 70 KHz and increases as you go into gain reduction. The meter displays the output level that the DCL-200 will have when it is in the circuit., i.e. not bypassed. When bypassed, the tubes are in the signal path.

SIDE CHAIN INSERTION

This connection allows for the insertion of an equalizer in the side chain. By doing this, the DCL-200 becomes frequency selective. Program material with large amounts of low frequency may have the low frequencies attenuated in the side chain, causing the low frequency content to not affect the gain reduction. High frequency response of the side chain may be boosted to help prevent high frequency overload; the DCL-200 can become a "de-esser" in this mode. When stereo linked, the insert point for the top channel (channel 1) controls both channel 1 and channel 2.

GAIN CURVES

OUTPUT IN DBM



DCL-200 GAIN CURVES

The DCL-200 gain curves were made with the unit set at unity gain. This occurs when the gain control is set to approximately 5.5. The gain curves converge around -60 dbm. The different curves are a result of various A.C. threshold and slope settings. The bottom curve that turns up at +10 dbm input was made with the A.C. threshold and slope both equal to 10. The upward change is the result of the 28 db maximum gain reduction in the unit.

SPECIFICATIONS

OUTPUT: +4 dbm corresponds to 0 VU. The output is unbalanced using 990 operational amplifiers. Output impedance is 75 ohms. The recommended output load is 600 ohms more. Maximum output is +25 dbm.

INPUT: The input is electronically balanced with an input impedance of 40K ohms. With input clipping at +24 dbm.

FREQUENCY RESPONSE: 5 Hz to 70 KHz

NOISE: Less than -80 dbm at unity gain

DISTORTION: Less than .05% at +4 dbm

ATTACK TIME: .1 mS to 100 mS

RELEASE TIME: 35 mS to 10 S

SLOPE: Adjustable from 1.1 to 1 to 7 to 1

PANEL SIZE: Standard 19" by 3.5" (two units of rack space)

DEPTH BEHIND PANEL: 10.5" in addition to users I/O cabling

POWER: 40 watts, 115-230 Volt, 50 or 60 Hz
FUSE SIZE MDL .5A FOR 115V OR
MDL .25A FOR 230V

METER LAMP: CM7373, Pilot Lamp 120MB

COMPONENTS: (3) Selected 12AX7A vacuum tubes,
(4) high reliability 990 operational amplifiers, (24) integrated circuits,
(12) transistors,
Proprietary Gain Control Device

SHIPPING WEIGHT: 20 Lbs.

Specifications subject to change without notice.
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INTERFACING

INPUT CONNECTIONS:

UNBALANCED: 3 PIN XLR CONNECTOR
PIN 1 - GROUND
PIN 2 - CONNECT TO PIN 1
PIN 3 - (+) SIGNAL

BALANCED: 3 PIN XLR CONNECTOR
PIN 1 - GROUND
PIN 2 - (-) SIGNAL
PIN 3 - (+) SIGNAL

OUTPUT CONNECTIONS:

UNBALANCED: 3 PIN XLR CONNECTOR
PIN 1 - GROUND
PIN 2 - CONNECT TO PIN 1
PIN 3 - (+) SIGNAL

BALANCED: 3 PIN XLR CONNECTOR
PIN 1 - GROUND
PIN 2 - (-) SIGNAL
PIN 3 - (+) SIGNAL

NOTE: WHEN RUNNING AN UNBALANCED OUTPUT IT IS BEST TO CONNECT PIN 2 TO PIN 1 IN THE CONNECTOR THAT PLUGS IN TO THE DCL-200. USE HIGH QUALITY CONNECTORS FOR RELIABILITY.

SIDE CHAIN: TIP - SIGNAL TO EQUALIZER
RING - SIGNAL FROM EQUALIZER
SLEEVE - GROUND

Because the DCL-200 contains heat generating devices, it needs plenty of ventilation. Good ventilation will give long, trouble free operation.

Think Tubes!