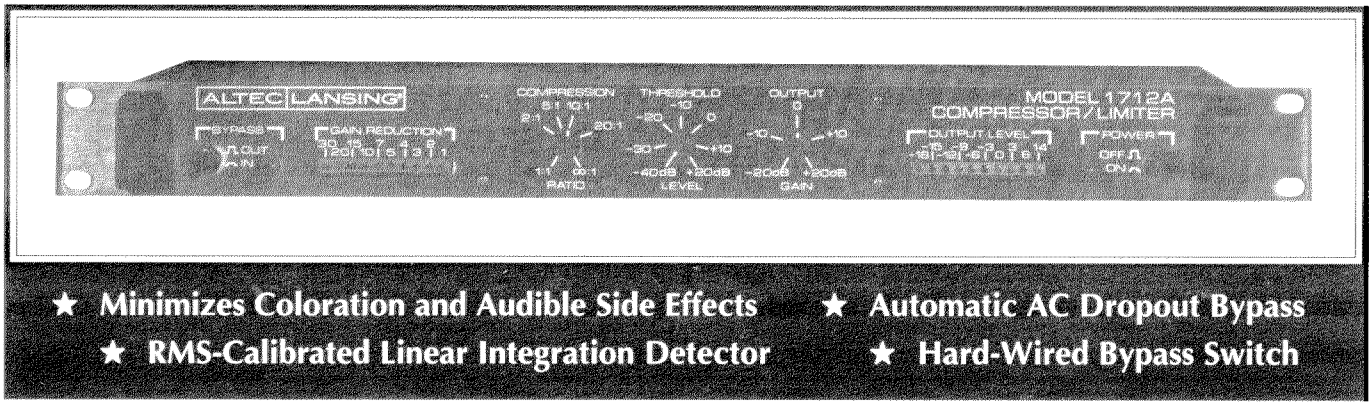
ALTEC LANSING®

a MARK IV company

1712A Compressor/Limiter



★ Minimizes Coloration and Audible Side Effects ★ Automatic AC Dropout Bypass

★ RMS-Calibrated Linear Integration Detector ★ Hard-Wired Bypass Switch

KEY SPECIFICATIONS

Frequency Response: (reference 1 kHz) — 20 Hz to 20 kHz, +0/-1 dB.

Threshold Range: — Continuously variable from -45 to +20 dB.

Compression Ratio: — Continuously variable from 1:1 to ∞:1.

Maximum Compression: — 60 dB.

Attack Time: — Program dependent; 12 ms for 10 dB input level above threshold, 8 ms for 20 dB, 4 ms for 30 dB.

Release Time: — Program dependent; automatically variable from 0 to 750 ms; affected by front panel control settings.

Output Gain: — Continuously variable from -20 to +20dB.

THD:
(0 dBv input, unity gain, no compression, 30 kHz low pass filter) — <0.03%.

(0 dBv input, unity gain, reference 1 kHz, up to 20 dB compression) — <0.05% .

IMD (SMPTE):
(0 dBv input, unity gain, no compression) — <0.03%.

Noise:
(below maximum output, output gain control at +20 dB, 30 kHz low pass filter) — <-86 dB.

DESCRIPTION

The **1712A Compressor/Limiter** addresses the minimization of level differences between paging system announcers and transient protection for loudspeaker systems. Its feed-forward design permits compression ratios up to ∞:1 with complete stability to automatically restrict the system output to a predetermined level. Special compensation circuitry minimizes coloration and audible side-effects for virtually unmatched sonic qualities.

The single channel unit features an rms-calibrated linear integration detector. Its logarithmic output (linear in decibels) closely matches the characteristics of the human ear for a more natural sounding response when undergoing gain changes. The detector is also compensated to prevent "peak reversion" - a condition that occurs when low frequency signals are below the period chosen for the integration time. Without correction, an rms or averaging detector would revert to peak detection resulting in an overmeasurement of the low frequency energy. This causes over-compression, increased distortion, and audible pumping. The **1712A** is free from these side effects.

The input level for a 0 dB reference is determined by an internal jumper which may select -10, 0, +4, or +8 dBv. This permits interfacing with virtually any industry standard line level. Two LED arrays simultaneously display gain reduction and output level for effective monitoring of system operation. The continuously variable Threshold, Compression Ratio, and Output Gain controls are recessed in screwdriver slotted adjustments to minimize inadvertent changes to the control settings. Program-dependent attack and release times assure natural sounding compression without the need for continuous manual adjustment. The Altec Lansing model **1712A** compressor/limiter is the choice among professionals where serious level control and transient protection is demanded.

SPECIFICATIONS

Input:
(reference 0 dBv = 0.775 V rms)

Impedance	20 kohms balanced 10 kohms unbalanced
Nominal Level	Selectable by internal jumper for −10, 0, +4, +8 dBv
Maximum Level	+20 dBv (7.75 V rms)

Output:
(reference 0 dBm = 0.755 V rms across 600 ohms)

Impedance	44 ohms balanced 22 ohms unbalanced
Maximum Level	+20 dBm (7.75 V rms)

Frequency Response: (reference 1 kHz)	20 Hz-20 kHz, +0/−1 dB
Threshold Range:	Continuously variable from −45 to +20 dB
Compression Ratio:	Continuously variable from 1:1 to ∞:1
Maximum Compression:	60 dB
Attack Time:	Program dependent; 12 ms for 10 dB input level above threshold, 8 ms for 20 dB, 4 ms for 30 dB
Release Time:	Program dependent; automatically variable from 0 to 750 ms; affected by front panel control settings
Output Gain:	Continuously variable from −20 to +20 dB
THD: (0 dBv input, unity gain, no compression, 30 kHz low pass filter)	<0.03%
(0 dBv input, unity gain, reference 1 kHz, up to 20 dB compression)	<0.05%
IMD (SMPTE): (0 dBv input, unity gain, no compression)	<0.03%
Noise: (below maximum output, output gain control at +20 dB, 30 kHz low pass filter)	< −86 dB
Controls and Switches:	Threshold control Compression ratio control Output gain control Bypass switch Power switch
Front Panel Indicators:	Power LED Bypass LED Output level display indicating −18 to +14 dB Gain reduction display indicating −1 to −30 dB
Connections:	
Input	Female XLR 3 terminal barrier strip
Output	3 terminal barrier strip
AC	IEC power cord receptacle
Power Requirements:	100, 120, 200, 220, 240 VAC, 50/60 Hz, 12 Watts
Operating Temperature Range:	up to 60°C (140°F) ambient
Dimensions:	1¾" H x 19" W x 9" D (4.45 cm H x 48.26 cm W x 22.86 cm D)
Shipping Weight:	10 lbs (4.55 kg)
Net Weight:	6.3 lbs (2.86 kg)
Color:	Black
Enclosure:	Rack mount chassis Heavy duty front handles 18 GA steel main chassis 18 GA steel top/rear cover 1/16 inch thick black anodized aluminum alloy front panel
Accessories:	**15560** 600 ohm output transformer

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The compressor/limiter shall be a single channel unit of solid state design that is capable of detecting input levels above the threshold control setting and automatically reducing the gain of the signal level in accordance with the compression ratio control setting. The 0 dB reference level of the detector circuitry shall be selectable to be −10, 0, +4, or +8 dBv. The amount of gain reduction introduced by the system and the output level of the compressor/limiter shall be presented on their respective LED displays. The gain reduction display shall have a range from −1 dB to −30 dB of attenuation and the output level display shall show levels from −18 dB to +14 dB with a variable sensitivity for 0 VU equals −10 dBm to +8 dBm. Automatic bypass and manual hardwire bypass of the compressor/limiter shall be provided, along with a turn-on delay to eliminate startup/shutdown transients. The compressor/limiter shall be capable of operating from a 120/240 VAC, 50/60 Hz line.

The compressor/limiter shall meet the following performance criteria. Maximum input level: +20 dBv (7.75 V rms). Input impedance: 20 kohms balanced, 10 kohms unbalanced. Maximum output level: +20 dBm (7.75 V rms). Output impedance: 44 ohms balanced, 22 ohms unbalanced. Frequency response: 20 Hz to 20 kHz, +0,−1 dB. Threshold range: continuously variable from −45 to +20 dB. Compression ratio: continuously variable from 1:1 to ∞:1. Attack time: program dependent; 12 msec for 10 dB input level above threshold, 8 msec for 20 dB above threshold level, 4 msec for 30 dB above threshold level. Release time: program dependent; automatically variable from 0 to 750 msec. Outut gain: continuously variable from −20 to +20 dB. THD: less than 0.03% from 20 Hz to 20 kHz with no compression, less than 0.05% at 1 kHz with up to 20 dB of compression. IMD (SMPTE): less than 0.03% with no compression. Noise: less than −86 dB below maximum output with the threshold control, compression ratio control, and output gain control fully clockwise.

The compressor/limiter shall be 1¾" H x 19" W x 9" D, and shall have a net weight of 6.3 lbs.

The compressor/limiter shall be the ALTEC LANSING Model **1712A.**

ALTEC LANSING®

P.O. BOX 26105, OKLAHOMA CITY, OKLAHOMA 73126-0105, U.S.A.

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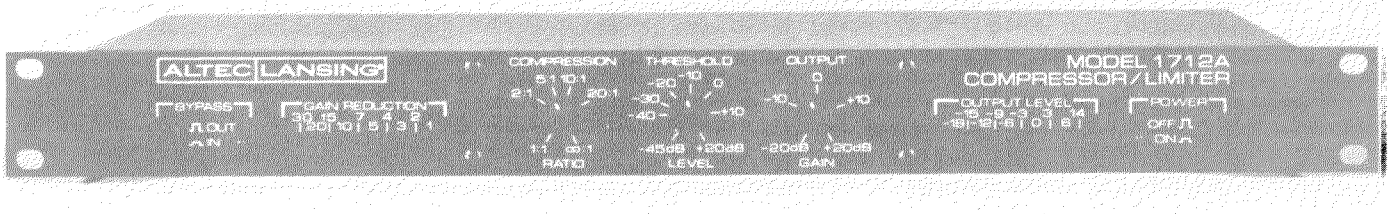
ALTEC LANSING®

1712 A
COMPRESSOR/LIMITER
OPERATING INSTRUCTIONS

ALTEC LANSING CORPORATION
P.O. BOX 26105 OKLAHOMA CITY, OK 73126-0105 U.S.A.
(405) 324-5311

ALTEC LANSING®

1712A
COMPRESSOR/LIMITER



DESCRIPTION

As the quality of sound systems improves in airports, civic centers, and arenas, two problems typically result which need to be addressed; the minimization of level differences between various paging system announcers, and transient protection for loudspeaker systems. The ALTEC LANSING Model **1712A** Compressor/Limiter addresses both. Its feed-forward design permits compression ratios up to ∞:1 with complete stability to automatically restrict the system output to a predetermined level. Special compensation circuitry minimizes coloration and audible side-effects for virtually unmatched sonic qualities. These features coupled with its low cost make the **1712A** a real value.

The single channel unit features an rms-calibrated linear integration detector. Its logarithmic output (linear in decibels) closely matches the characteristics of the human ear for a more natural sounding response when undergoing gain changes. The detector is also compensated to prevent "peak reversion"—a condition that occurs when low frequency signals are below the period chosen for the integration time. Without correction, an rms or averaging detector would revert to peak detection resulting in an overmeasurement of the low frequency energy. This causes over-compression, increased distortion, and audible pumping. The **1712A** is free from these side effects.

The input level for a 0 dB reference is determined by an internal jumper which may select −10, 0, +4, or +8 dBv. This permits interfacing with virtually any industry standard line level. Two LED arrays simultaneously display gain reduction and output level for effective monitoring of system operation. The continuously variable Threshold, Compression Ratio, and Output Gain controls are recessed screwdriver-slotted adjustments to minimize inadvertent changes to the control settings. Program-dependent attack and release times assure natural sounding compression without the need for continuous manual adjustment.

Other features include a true hard-wired bypass switch, an automatic AC dropout bypass, XLR and barrier strip input connectors, barrier strip output connections, and electronically balanced input and output circuitry. The universal power transformer permits 100, 120, 200, 220, and 240 VAC 50/60 Hz operation. An optional plug-in line output transformer, Model **15560,** is also available.

The ALTEC LANSING Model **1712A** Compressor/Limiter is the choice among professionals where serious level control and transient protection is demanded.

SPECIFICATIONS (continued)

Input:
(reference 0 dBv = 0.775 V rms)

Impedance:	20K ohms balanced. 10K ohms unbalanced.
Nominal Level:	Selectable by internal jumper for -10, 0, +4, +8 dBv.
Maximum Level:	+20 dBv (7.75 V rms).

Output:
(reference 0 dBm = 0.755 V rms across 600 ohms)

Impedance:	44 ohms balanced. 22 ohms unbalanced.
Maximum Level:	+20 dBm (7.75 V rms).

Controls and Switches: Threshold control,
Compression ratio control,
Output gain control,
Bypass switch,
Power switch.

Front Panel Indicators: Power LED,
Bypass LED,
Output level display indicating -18 to + 14 dB,
Gain reduction display indicating -1 to -30 dB.

Connections:

Input:	Female XLR. 3 terminal barrier strip.
Output:	3 terminal barrier strip.
AC:	IEC power cord receptacle.

Power Requirements: 100, 120, 200, 220, 240 Vac, 50/60 Hz, 12 Watts.

Operating Temperature Range: up to 60° C (140° F) ambient .

Dimensions:

Height:	1.75 inches (4.45 cm).
Width:	19.0 inches (48.26 cm).
Depth:	9.0 inches (22.86 cm).

Weight:

Shipping:	10 lbs (4.55 kg).
Net:	6.3 lbs (2.86 kg).

Color: Black.

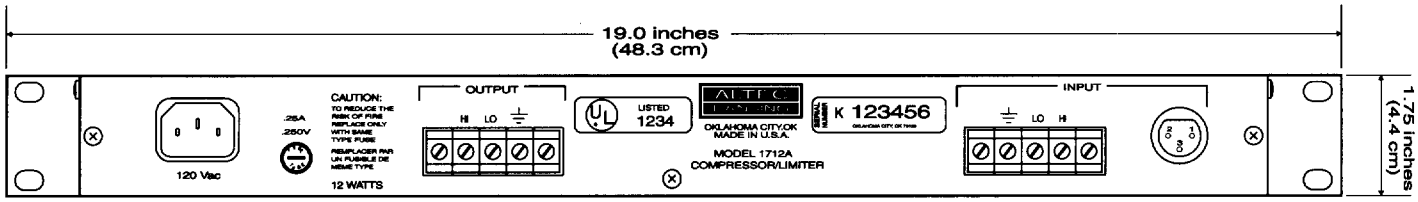
Enclosure: Rack mount chassis,
18 GA steel main chassis,
18 GA steel top/rear cover,
1/16 inch thick black anodized aluminum alloy front panel.

Accessories: **15560** 600 ohm line transformer.
15550A 15K ohm input transformer.

Design and Performance Approvals:
Meets the requirements of UL Standard 813.

Altec Lansing continually strives to improve products and performance. Therefore, specifications are subject to change without notice.

Back Panel of 1712A



ARCHITECT'S and ENGINEER'S SPECIFICATIONS

The compressor/limiter shall be a single channel unit of solid state design that is capable of detecting input levels above the threshold control setting and automatically reducing the gain of the signal level in accordance with the compression ratio control setting. The 0 dB reference level of the detector circuitry shall be selectable to be -10, 0, +4, or +8 dBv. The amount of gain reduction introduced by the system and the output level of the compressor/limiter shall be presented on their respective LED displays. The gain reduction display shall have a range from -1 dB to -30 dB of attenuation and the output level display shall show levels from -18 dB to +14 dB with a variable sensitivity for 0 VU equals -10 dBm to +8 dBm. Automatic bypass and manual hard-wire bypass of the compressor/limiter shall be provided, along with a turn-on delay to eliminate start-up/shutdown transients. The compressor/limiter shall be capable of operating from a 120/240 VAC, 50/60 Hz line.

The compressor/limiter shall meet the following performance criteria. Maximum input level: +20 dBv (7.75 V rms). Input impedance: 20K ohms balanced, 10K ohms unbalanced. Maximum output level: +20 dBm (7.75 V rms). Output impedance: 44 ohms balanced, 22 ohms unbalanced. Frequency response: 20 Hz to 20 kHz, +0,-1 dB. Threshold range: continuously variable from -45 to +20 dB. Compression ratio: continuously variable from 1:1 to -:1. Attack time: program dependent; 12 msec for 10 dB input level above threshold, 8 msec for 20 dB above threshold level, 4 msec for 30 dB above threshold level. Release time: program dependent; automatically variable from 0 to 750 msec. Output gain: continuously variable from - 20 to + 20 dB. THD: less than 0.03% from 20 Hz to 20 kHz with no compression, less than 0.05% at I kHz with up to 20 dB of compression. IMD (SMPTE): less than 0.03% with no compression. Noise: less than -86 dB below maximum output with the threshold control, compression ratio control, and output gain control fully clockwise.

The compressor/limiter shall be 1.75 inches (4.4 cm) high by 19.0 inches (48.3 cm) wide by 9.0 inches (22.9 cm) deep, and shall have a net weight of 6.3 lbs (2.86 kg).

The compressor/limiter shall be the ALTEC LANSING Model **1712A.**

OPERATING INSTRUCTIONS

ELECTRICAL

120 VAC, 50/60 Hz Power Connections

The compresor/limiter is provided with the primary of the power transformer strapped for 120 Volts from the factory. Refer to Table I for exact strapping details and other voltage options.

NOTE

Verify that the line voltage is in accordance with the selected voltage rating BEFORE connecting the compressor/limiter to the AC line.

Table I. Primary Power Conversion Chart

PRIMARY CONFIGURATION	
VOLTAGE	CONNECT PINS
100V	1-5,2-4
120V	1-6,3-4
200V	2-5
220V	2-6
240V	3-6

100, 200, 220, 240 VAC, 50/60 Hz Power Connections

The compressor/limiter may be powered from line voltages other than 120 Volts by re-strapping the primary of the power transformer. Use the following procedures to change the factory strapping to the desired line voltage.

1. Disconnect the compressor/limiter from the AC power source.
2. Remove the seven screws securing the top/back cover.
3. Locate the six voltage selection solder cups on the right side of the circuit board in front of the power transformer. See Figure 1 for location. Referring to Table I, unsolder the jumper wires from the solder cups and resolder them in accordance with the pin designations that correspond to the desired operating voltage.
4. Install the top/back cover with the seven screws previously removed.

INSTALLATION

Rack Mounting

The **1712A** may be installed in a standard 19-inch equipment rack. The compressor/limiter requires 1¾ inches of vertical space and mounting is accomplished by using the appropriate four mounting screws supplied.

Ventilation

The compressor/limiter should not be used in areas where the ambient temperature exceeds 60°C (140°F).

ADJUSTMENTS

Detector Reference Level Selection

A Detector Reference Level Selector is provided to determine the nominal level of the detector circuitry. Selections include −10, 0, +4, and +8 dBv for interfacing with virtually any industry standard line level. For example if the **1712A** is used in a broadcast application where the line level is +8 dBv, the Detector Reference Level should be selected accordingly. The Detector Reference Level Selector is factory set at a nominal level of 0 dBv. Use the following procedures to select another reference level, if needed.

1. Disconnect the **1712A** from the AC power source.
2. Remove the seven screws securing the top/back cover.
3. Select the desired nominal level by placing the jumper on two pins of the six-pin male connector (J4) located near the upper left edge of the circuit board as shown in Figure 1. Table II shows the pin numbers to be connected for each available reference level.

Table II. Detector Reference Level Selection Chart

REFERENCE (dBv)	PIN NUMBER CONNECTION
−10	1-2
0	2-3
+4	4-5
+8	5-6

4. After making any necessary adjustments, install the top/back cover with the seven screws previously removed.

Output Meter Calibration

An Output Meter Calibration trimmer is provided to vary the 0 VU reference level of the Output Meter from −10 to +8 dBm. The Output Meter is calibrated by the factory to indicate "0 dB" when the output level is 0 dBm (0.775 Vrms). To make an adjustment in the reference level of the Output Meter, use the following procedures.

1. Disconnect the **1712A** from the AC power source.
2. Remove the seven screws securing the top/back cover.
3. Verify that the Compression Ratio and Threshold Level controls on the front panel are fully clockwise and that the Output Gain control is set on "0".
4. Feed a 1 kHz signal at the selected nominal level (the level desired for a "0 dB" meter indication) to the signal input. Then adjust the meter calibration trimmer (R78) located near the center of the circuit board until the meter indicates "0 dB". See Figure 1 for location of calibration trimmer.
5. After making any necessary adjustments, install the top/back cover with the seven screws previously removed.

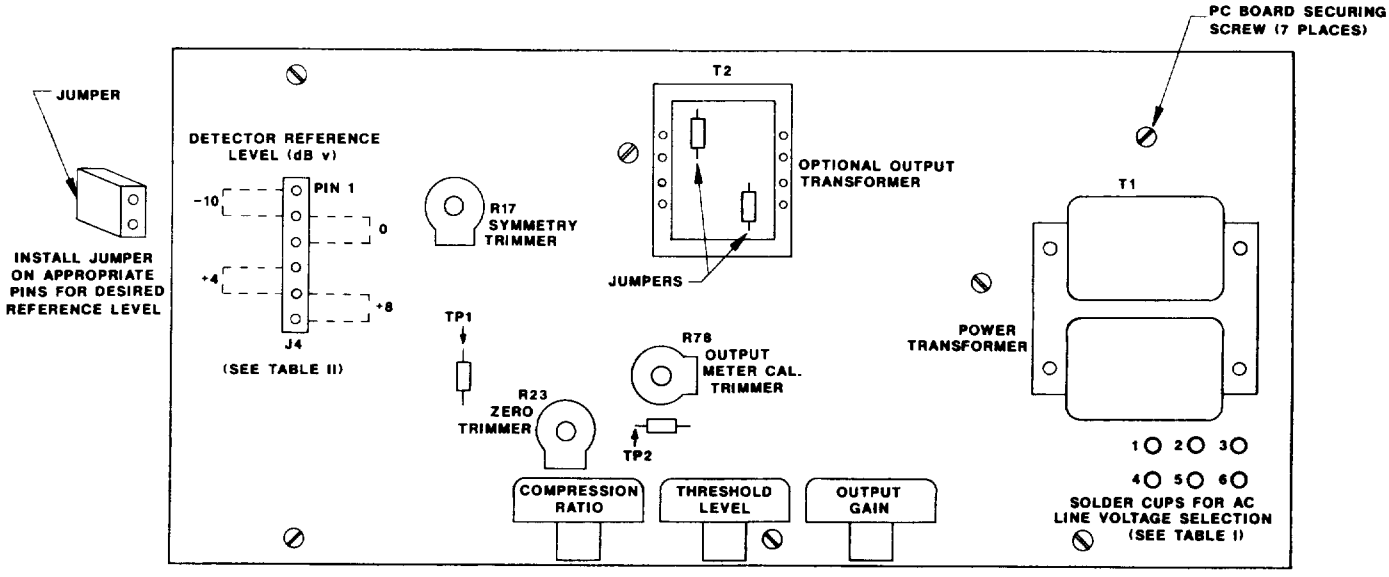


Figure 1. Location of Pertinent Components on Circuit Board

SIGNAL CONNECTIONS

Input Connections

Balanced input connections may be made either to the barrier strip or to the 3-pin XLR connector. For single-ended inputs, strap the low (−) input to ground. Otherwise, the compressor/limiter will see 6 dB less input signal than with a balanced input. Refer to Figure 2 for typical input connection details.

Output Connections

Balanced output connections are made to the output barrier strip connector.

CAUTION

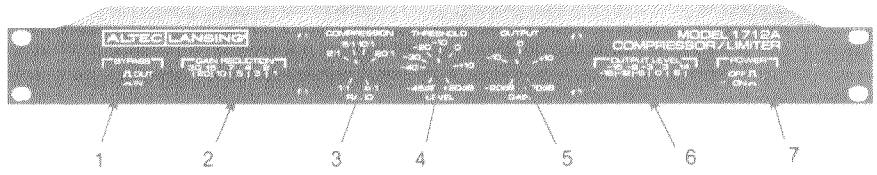
The 1712A's active balanced output is ground referenced. DO NOT OPERATE WITH THE HIGH (+) OR LOW (−) SIGNAL OUTPUT CONNECTED TO GROUND.

Single-ended outputs may be connected between either the high (+) or low (−) signal output and ground. If a single-ended load is connected as described above, a 6 dB loss in output will occur. Refer to Figure 3 for typical output connection details.

INSTALLING OUTPUT ISOLATION TRANSFORMER

The Model **15560** output isolation transformer is available to provide an isolated output, if necessary. The circuit board is drilled to accept the **15560**. It is recommended that the **15560** transformer be added ONLY when an isolated output is needed. Use the following procedures to install the **15560** transformer.

Table III. Controls and Indicators



ITEM	NAME	FUNCTION/DESCRIPTION
1	**BYPASS** Switch and indicator	Depressing this switch provides a hard-wire bypass of the **1712A**'s circuitry by connecting the input directly to the output. The LED beside this switch illuminates when in Bypass mode.
2	**GAIN REDUCTION** Display	This row of 10 LEDs displays up to 30 dB of gain reduction being caused by the **1712A**. (Fixed gain changes by the OUTPUT GAIN control are not displayed by the GAIN REDUCTION LEDs but are reflected on the OUTPUT LEVEL display.)
3	**COMPRESSION RATIO** Control	This control provides the amount of compression desired from 1:1 (no compression) to ∞:1 (no increase in RMS output regardless of input level increases above threshold).
4	**THRESHOLD LEVEL** Control	Adjusting this control varies the threshold of compression from −45 dB to +20 dB.
5	**OUTPUT GAIN** Control	Adjusting this control varies the amount of fixed gain from −20 dB to +20 dB in the output amplifier stage. The OUTPUT GAIN control does NOT interact with the threshold of compression.
6	**OUTPUT LEVEL** Display	This row of 10 LEDs displays the output level from −18 dB to +14 dB. This display is factory-set to indicate "0 dB" when the output level is 0 dBm (0.775 Vrms).
7	**POWER** Switch and indicator	Depressing this switch applies primary AC power. The LED beside this switch illuminates when power is turned on.

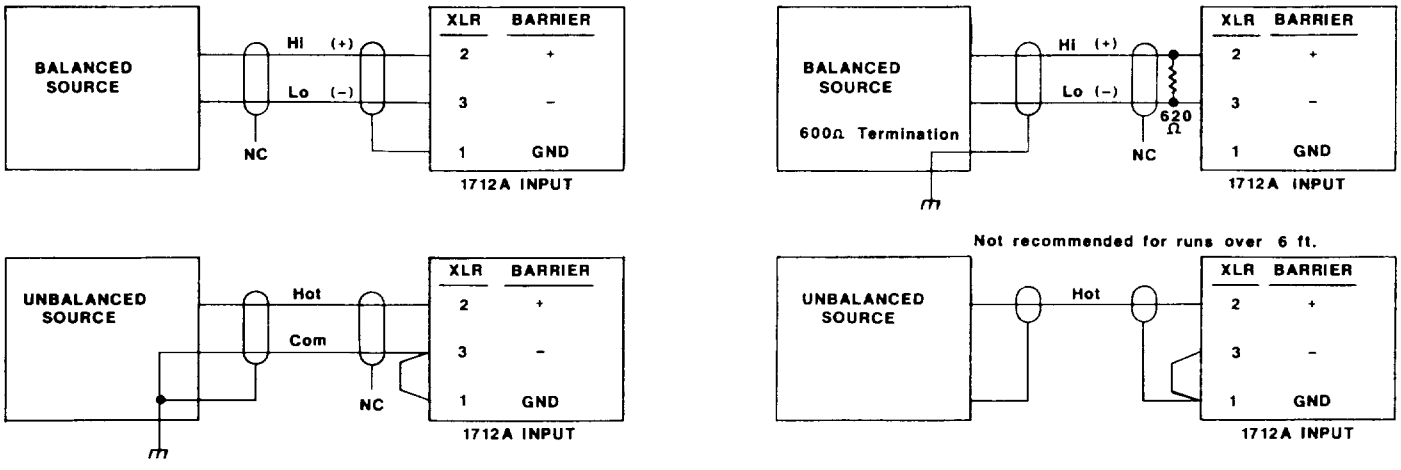


Figure 2. Typical Input Connections

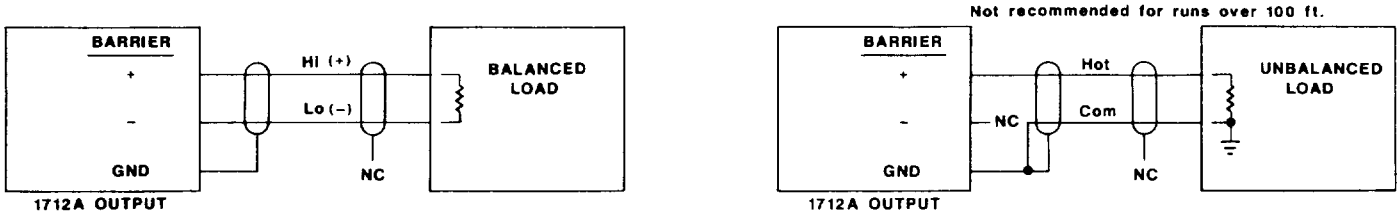
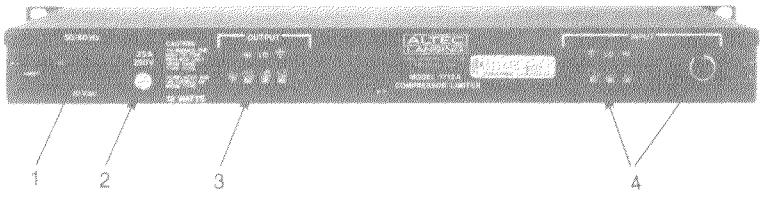


Figure 3. Typical Output Connections

Table IV. Rear Panel Controls and Features



ITEM	NAME	FUNCTION/DESCRIPTON
1	Primary Power Connector	AC line voltage is applied through this connector.
2	Fuse	Protects against excessive current drain from AC source. Replace only with same type 0.25A fuse.
3	**OUTPUT** Connector	Barrier strip; drives a balanced or unbalanced 600-ohm load.
4	**INPUT** Connectors	Barrier strip or 3-pin XLR (female) connector; balanced or unbalanced.

1. Disconnect the **1712A** from the AC power source.
2. Remove the seven screws securing the top/back cover.
3. Remove the seven screws securing the printed circuit board. Locate the mounting holes near the top of the circuit board. See Figure 1 for these locations.
4. Cut or unsolder the two jumpers inside the transformer-mounting area.
5. Insert transformer in the drilled holes and solder each pin in place.
6. Install the printed circuit board with its respective seven screws and the top/back cover with its seven screws previously removed.

OPERATION

Compression Ratio Control

This control sets the ratio of the input level to the output level when the input level is above the threshold reference level. In the case of a compression ratio setting of 2:1, a 2 dB increase in input signal would result in a 1 dB increase in output signal. A compression ratio setting of ∞:1 indicates that an infinite increase in input level would be required for a 1 dB increase in output level; otherwise any finite increase in input level would result in no change in output level. See Figure 4 for various compression ratio curves.

Threshold Level Control

This control sets a reference level above which the input signal will be compressed according to the setting of the Compression Ratio control. Input signals that fall below this level will pass through to the output uncompressed, but will still be affected by the Output Gain control.

Output Gain Control

This control provides a fixed gain in the output stage from −20 dB to +20 dB. The fixed gain that is added or subtracted by the Output Gain control is not affected by the Threshold Level control setting. However, the gain changes brought about when the input signal exceeds the Threshold Level setting are in addition to those caused by the Output Gain control.

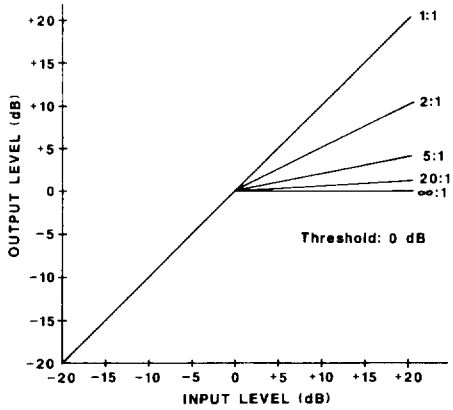


Figure 4. Compression Ratio Transfer Curves

APPLICATIONS

Restrict Dynamic Range

The **1712A** Compressor/Limiter may be used to restrict the dynamic range of a sound system for clarity by raising the average level. Fixed installation sound systems are used by many different people with various vocal levels. The gain of the system may be set up for a loud-spoken person and a soft-spoken person may not be heard above the ambient noise level. On the other hand, the gain may be set for a soft-spoken person and a loud-spoken person may overload the system and make the listeners feel uncomfortable. To solve this problem, the following steps may be used.

1. Set up the system gain to accommodate the soft-spoken person.
2. Set the **1712A** Compressor/Limiter for low compression (about 2:1). Adjust the Threshold Level control to the desired maximum input level.
3. If the output level of the system is still too high for the loud-spoken person, increase the Compression Ratio control until the desired level is attained.

Loudspeaker Protection

The **1712A** Compressor/Limiter may also be used to protect compression drivers and loudspeakers from excessive levels and transients. Limiting the signal allows high levels to be maintained without damaging the loudspeaker. Speaker damage would normally occur due to excessive heat build-up and over-excursion. In this application, the **1712A** may be set up in the following manner.

1. Set the Compression Ratio control for a ratio of 20:1 to ∞:1.
2. Set the Treshold Level control to the highest permissible level. This will limit the signal at the level just below the maximum power handling of the loudspeaker.

Figure 5 shows the limiting effect of the **1712A** on an excessive input signal.

NOTE

The overall best way to set the controls on the **1712A** in any application is to follow the above procedures and listen for the desired effects. Then change the settings again, if necessary.

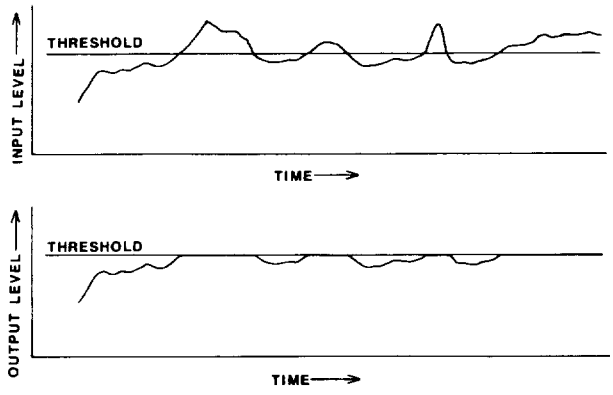


Figure 5. An Input Level and Its Corresponding Output Level at ∞:1 Compression Ratio

1712A COMPRESSOR/LIMITER

SERVICE INSTRUCTIONS

* * * CAUTION * * *

No user serviceable parts inside. Hazardous voltage and currents may be encountered within the chassis. The servicing information contained within this document is for use only by ALTEC LANSING Corp. authorized warranty stations and qualified service personnel. To avoid electric shock, DO NOT perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

SERVICE INSTRUCTIONS

CAUTION

These service instructions are for use by qualified personnel only. To avoid electrical shock do not perform any servicing other than that outlined in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Alignment Procedure

The following alignment procedure requires the following equipment:
Digital Voltmeter (DC)
Signal Generator
Oscilloscope

1. Disconnect the **1712A** from the AC power source.
2. Remove the seven screws securing the top/back cover.
3. Set the Compression Ratio control to ∞:1 setting; the Threshold Level control to −10 dB setting; and the Output Gain control to 0 dB setting.
4. Apply an input signal of 100 Hz sine wave at 0 dB (0.775 Vrms) to the input connector. Connect oscilloscope probe to TP1 (see Figure 1 for location) and observe a mildly distorted 200 Hz sine waveform. Adjust the symmetry trim (R17) for equal peak amplitude of the waveform.
5. Connect the DC digital voltmeter to TP2 and adjust the zero trim (R23) for 0.5 VDC on the DC digital voltmeter.
6. Install the top/back cover with the seven screws previously removed.

SERVICE INFORMATION

Service must be performed by an ALTEC LANSING CORP. Qualified Service Representative. For Factory Service:

1. Ship the unit prepaid to:
   ALTEC LANSING Customer Service/ Repair
   10500 West Reno Avenue
   Oklahoma City, OK 73128 U.S.A.
2. Include with the unit a written description of the problem, along with any other helpful information such as where used, how used, etc.

For applications assistance or other technical information, call (405) 324-5311, Telex 160369, or write:

ALTEC LANSING Technical Assistance
P.O. Box 26105
Oklahoma City, OK 73126-0105 U.S.A.

CAUTION

No user serviceable parts inside. Hazardous voltages and currents may be encountered within the chassis. Installation and service information within this document is for use only by ALTEC LANSING Corp. approved sound contractors, factory authorized warranty stations, and qualified service personnel.

Customer modifications to ALTEC LANSING products are not recommended. Such modifications shall be at the customer's sole expense, and any damage or injury to persons or property resulting therefrom shall not be covered under warranty or otherwise.

NOTICE

REPAIR PERFORMED BY OTHER THAN AUTHORIZED WARRANTY STATIONS (DEALERS) OR QUALIFIED PERSONNEL SHALL VOID THE WARRANTY PERIOD OF THIS UNIT. TO AVOID LOSS OF WARRANTY, SEE YOUR NEAREST ALTEC LANSING AUTHORIZED DEALER, OR CALL ALTEC LANSING CUSTOMER SERVICE DIRECTLY AT (405) 324-5311, TELEX 160369, OR WRITE:

ALTEC LANSING CUSTOMER SERVICE/REPAIR
P.O. BOX 26105
OKLAHOMA CITY, OK 73126-0105 U.S.A.

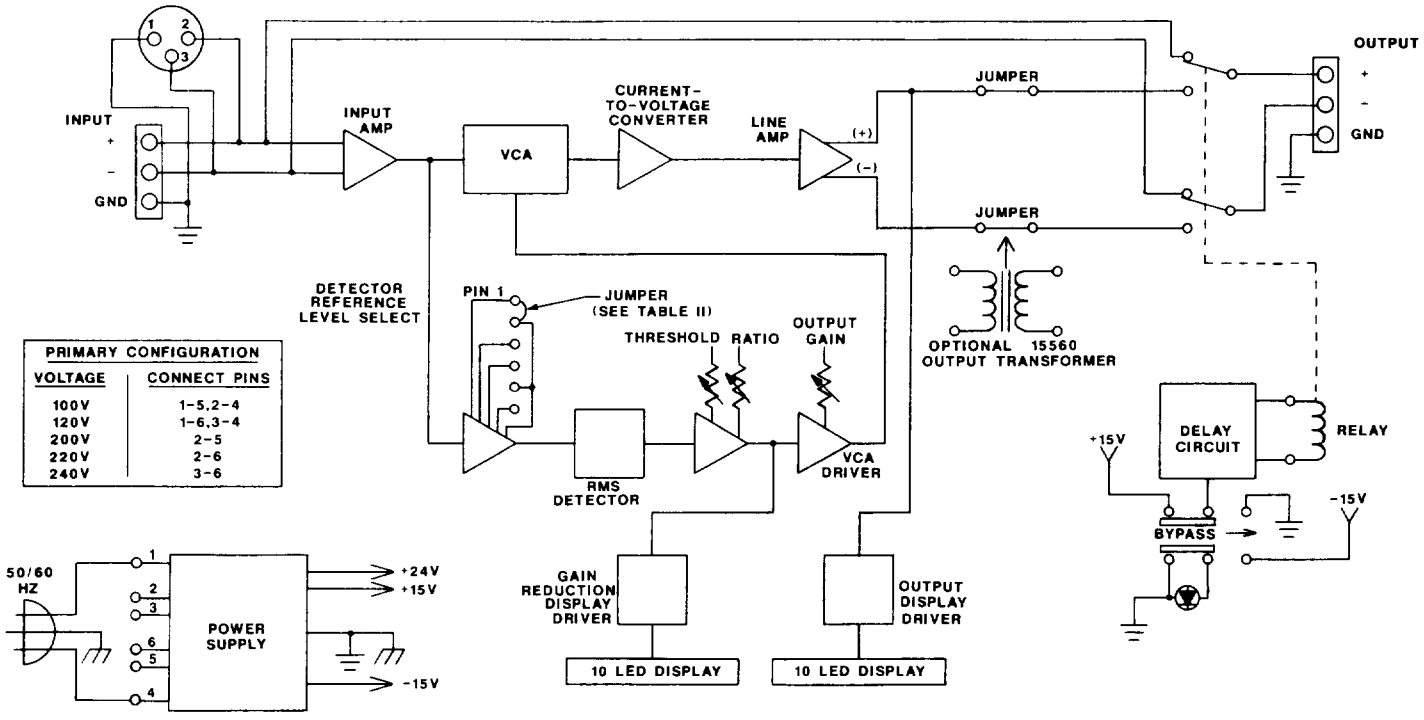


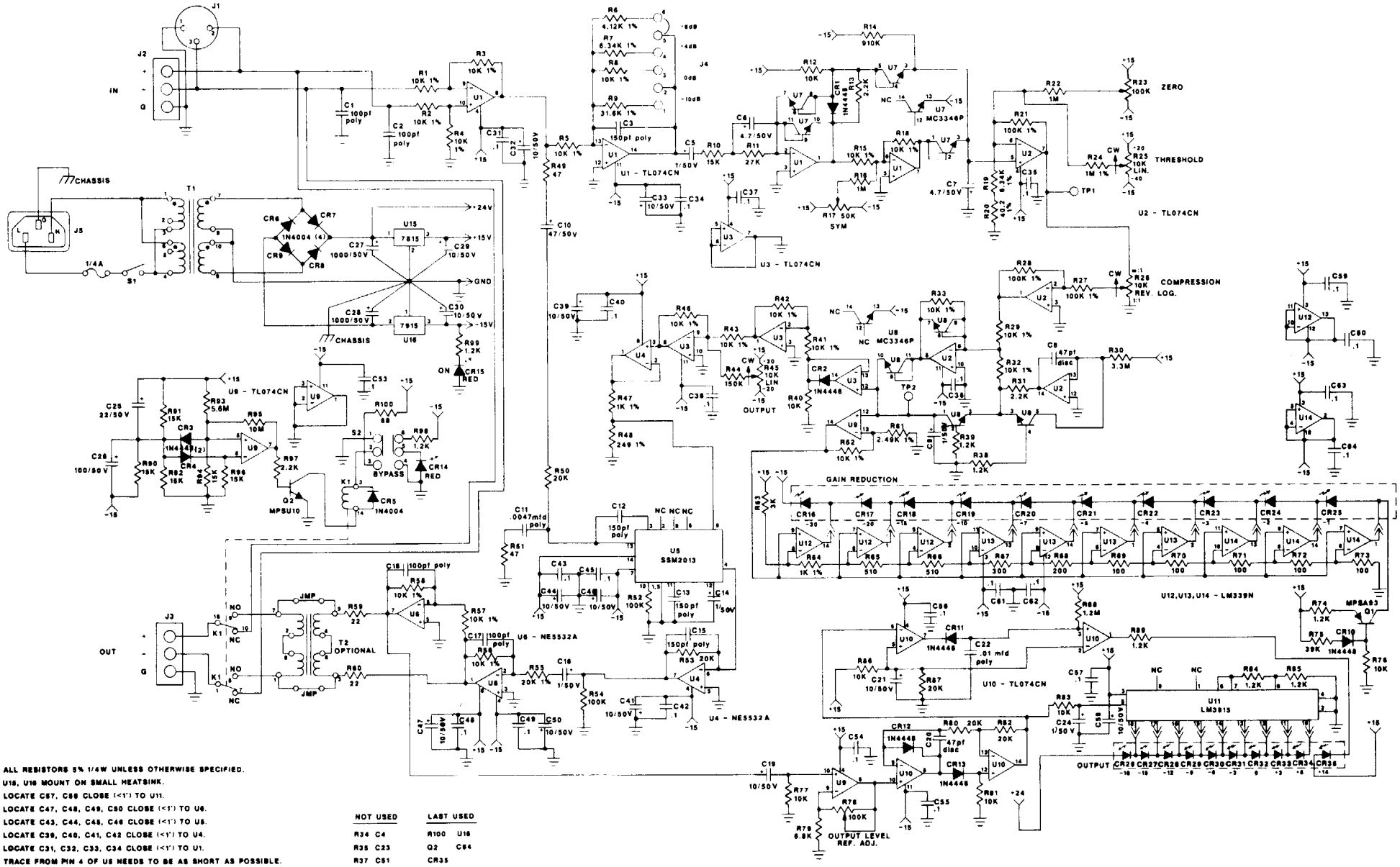
Figure 6. Block Diagram of the 1712A

PARTS LIST

CIRCUIT BOARD ASSEMBLY (27-01-025894)

Reference Designator	Ordering Number	Name and Description
C1,2,17,18	15-06-124440	Cap., 100 pF, 630V
C3,12,13,15	15-06-124499	Cap., 150 pF, 630V
C5,9,14,16,24	15-01-124507	Cap., 1 μF, 50V
C6,7	15-01-124506	Cap., 4.7 μF, 50V
C8,20	15-02-124498	Cap., 47 pF, 1000V
C10	15-01-124508	Cap., 47 μF, 50V
C11	15-06-124517	Cap., .0047 μF, poly
C19,21,29,30,32, 33,39,41,44,46, 47,50,58	15-01-124502	Cap., 10 μF, 50V
C22	15-06-124518	Cap., .01 μF, poly
C25	15-01-124504	Cap., 22 μF, 50V
C26	15-01-124503	Cap., 100 μF, 50V
C27,28	15-01-124505	Cap., 1000 μF, 50V
C31,34,35,36,37, 38,40,42,43,45, 48,49,53,54,55, 56,57,59,60,61, 62,63,64	15-02-124437	Cap., .1 μF, 50V, disk
CR1-4,10-13	48-01-122601	Diode, signal, 1N4448
CR5-9	48-02-042787	Rect., 1N4004
CR14,15	39-01-124532	LED, red, 1.7V
CR16-25	39-01-124519	10 LED Array, green
CR26-35	39-01-124520	10 LED Array
F1	51-04-100462	Fuse, 0.25A, 250V
K1	45-01-123000	Relay, 12V, 1A, DPDT
Q1	48-03-120234	Transistor, MPSA93, PNP, 200V
Q2	48-03-120159	Transistor, MPSU10, NPN, 300V
R1-5,8,15,18,29, 32,33,41,42,43, 46,56,57,58,62	47-03-109437	Res., 10 kΩ, ±1%, ¼W
R6	47-03-108444	Res., 4.12 kΩ, ±1%, ¼W
R7,19	47-03-124490	Res., 6.34 kΩ, ±1%, ¼W
R9	47-03-124489	Res., 31.6 kΩ, ±1%, ¼W
R10,90,91,92,94, 96	47-01-102106	Res., 15 kΩ, ±5%, ¼W
R11	47-01-102112	Res., 27 kΩ, ±5%, ¼W
R12,40,76,77,81, 83,86	47-01-102102	Res., 10 kΩ, ±5%, ¼W
R13,31,97	47-01-102086	Res., 2.2 kΩ, ±5%, ¼W
R14	47-01-121767	Res., 910 kΩ, ±5%, ¼W
R16,22	47-01-108491	Res., 1 MΩ, ±5%, ¼W

Reference Designator	Ordering Number	Name and Description
R17	47-06-122135	Pot., 50 kΩ, ±30%, trim
R20	47-03-124487	Res., 40.2Ω, ±1%, ¼W
R21,27,28	47-03-119305	Res., 100 kΩ, ±1%, ¼W
R23,78	47-06-122136	Pot., 100 kΩ, ±30%, trim
R24	47-03-124488	Res., 1 MΩ, ±1%, ¼W
R25,45	47-06-124523	Pot., 10 kΩ, linear taper
R26	47-06-124524	Pot., 10 kΩ, rev. audio taper
R30	47-03-124491	Res., 3.3 MΩ, ±5%, ¼W
R38,39,74,84,85, 89,98,99	47-01-102080	Res., 1.2 kΩ, ±5%, ¼W
R44	47-01-102131	Res., 150 kΩ, ±5%, ¼W
R47,64	47-03-121532	Res., 1 kΩ, ±1%, ¼W
R48	47-03-124486	Res., 249Ω, ±1%, ¼W
R49,51	47-01-102046	Res., 47Ω, ±5%, ¼W
R50,53,80,82,87	47-01-102109	Res., 20 kΩ, ±5%, ¼W
R52,54	47-01-102127	Res., 100 kΩ, ±5%, ¼W
R55	47-03-109434	Res., 20 kΩ, ±1%, ¼W
R59,60	47-01-102038	Res., 22Ω, ±5%, ¼W
R61	47-03-124485	Res., 2.49 kΩ, ±1%, ¼W
R63	47-01-102089	Res., 3 kΩ, ±5%, ¼W
R65,66	47-01-102071	Res., 510 kΩ, ±5%, ¼W
R67	47-01-102065	Res., 300Ω, ±5%, ¼W
R68	47-01-102061	Res., 200Ω, ±5%, ¼W
R69-73	47-01-102054	Res., 100Ω, ±5%, ¼W
R75	47-01-102116	Res., 39 kΩ, ±5%, ¼W
R79	47-01-102098	Res., 6.8 kΩ, ±5%, ¼W
R88	47-01-108933	Res., 1.2 MΩ, ±5%, ¼W
R93	47-01-113206	Res., 5.6 MΩ, ±5%, ¼W
R95	47-01-107373	Res., 10 MΩ, ±5%, ¼W
R100	47-01-102050	Res., 68Ω, ±5%, ¼W
S1	51-02-124478	Switch, PB, power, DPDT
S2	51-02-124479	Switch, PB, DPDT
T1	56-08-025906	Transformer, power
U1,2,3,9,10	17-01-124461	IC, TL074CN quad op-amp
U4,6	17-01-122832	IC, 5532A dual op-amp
U5	17-01-124482	IC, SSM2013 VCA
U7,8	17-01-124460	IC, 3346P transistor array
U11	17-01-122347	IC, LM3915 LED driver
U12,13,14	17-01-124463	IC, LM339N quad comparator
U15	17-01-121660	IC, regulator, +15V, MC7815CT
U16	17-01-121659	IC, regulator, −15V, MC7915CT



9. ALL RESISTORS 5% 1/4W UNLESS OTHERWISE SPECIFIED.
8. U15, U16 MOUNT ON SMALL HEATSINK.
7. LOCATE C57, C58 CLOSE (<1") TO U11.
6. LOCATE C47, C48, C49, C50 CLOSE (<1") TO U6.
5. LOCATE C43, C44, C45, C46 CLOSE (<1") TO U8.
4. LOCATE C39, C40, C41, C42 CLOSE (<1") TO U4.
3. LOCATE C31, C32, C33, C34 CLOSE (<1") TO U1.
2. TRACE FROM PIN 4 OF U5 NEEDS TO BE AS SHORT AS POSSIBLE.
1. R86 NEEDS TO BE AS CLOSE AS POSSIBLE TO U5.

NOTES: UNLESS OTHERWISE SPECIFIED

NOT USED		LAST USED	
R34	C4	R100	U16
R35	C23	Q2	C64
R37	C51	CR35	
	C52		

Figure 7. Schematic Drawing of Compressor/Limiter (11D097-01)