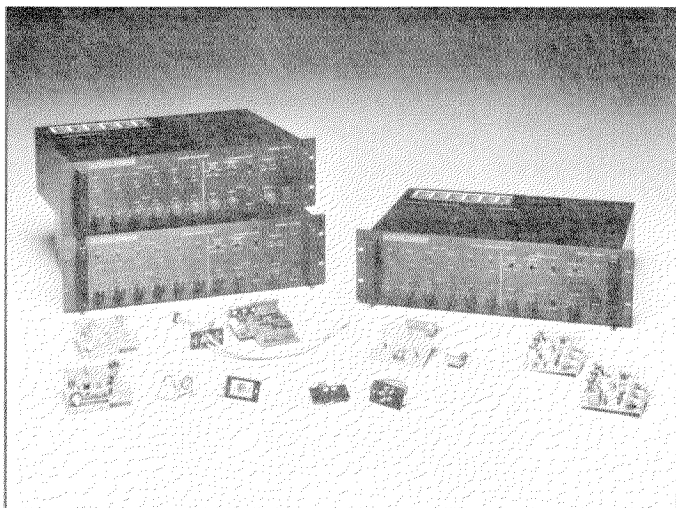




1707C/1715C Six Channel Mainframe Mixer/Power Amplifier



KEY FEATURES

- ★ Six ports for inputs or outputs
- ★ Offers systemwide remote muting
- ★ Built-in compressor/limiter

The **Altec Lansing 1707C/1715C** Mixer/Power Amplifier is a six channel user-configurable mainframe amplifier. By selecting from the large array of system component options, the **1707C/1715C** can become a six-in/one-out microphone mixer/amplifier or a one-in/six-out distribution preamplifier.

The basic mainframe combines a fully protected 75-watt (for the **1707C**) or 150-watt (for the **1715C**) power amplifier with six ports which can be input or output. Multiple **1707C/1715C** mainframes can be linked together for situations where more than six input/output ports are required.

Built-in features include a trap-door on the top panel for easy access into the unit, compressor/limiter, low and high frequency shelving equalizers, muting, remote volume control capability, and a

KEY SYSTEM SPECIFICATIONS

Frequency Response:	(Ref. 1 kHz)
Direct Output:	±1 dB, 20 Hz - 20 kHz (1 watt output)
Preamp Output:	±1 dB, 20 Hz - 20 kHz (0.775 Vrms output, 600 Ω load)
Total Harmonic Distortion (THD):	(Ref 1 kHz)
Direct Output:	<0.05%, 20 Hz - 20 kHz (rated output power, 30 kHz low-pass filter)
Preamp Output:	<0.05%, 20 Hz - 20 kHz (0.775 Vrms output, 600 Ω load, EQ flat, compressor/limiter off, 30 kHz low-pass filter)
Signal-to-Noise Ratio:	
Direct Output:	>80 dB below rated output power, A-weighted (master at maximum)
Preamp Output:	>75 dB below 0.775 Vrms output, A-weighted, EQ off, compressor/limiter off

DESCRIPTION

tone generator which produces four different sounds.

Input Modules: The **Altec Lansing 1780A/1780AT** Input module and the **1781A/1781AT** Programmable Input module accept either mic or line level signals through a wide variety of connector interfaces.

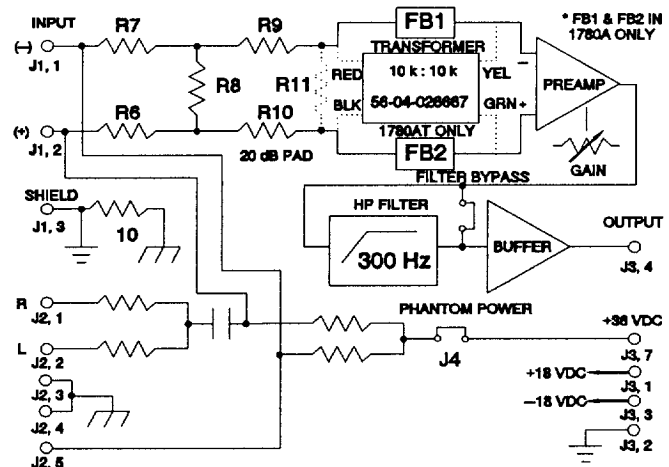
Output Modules: The **Altec Lansing 1783** Line Output module allows the user to interface with other professional equipment.

The **Altec Lansing** model **1707C/1715C** mixer/power amplifier systems respond to most design tasks with the ease and versatility of systems costing much more. As a result, it is *the choice* for use in professional installations requiring high quality, flexibility in design, and low cost.

1780A/1780AT

Description

The Altec Lansing 1780A/1780AT Mic/Line Input modules combine basic microphone preamplification with true line level input capability. The module has a built-in resistive pad to permit levels in excess of 0 dBu and its high input impedance easily allows sixteen modules to be driven from a single low impedance source. Also, the module offers a 300 Hz high-pass filter, phantom power capability, L + R stereo summing, and 0 to 50 dB of continuously variable gain. Included in the 1780AT version is a 10 k Ω input bridging transformer for those who prefer transformer isolation.



Block Diagram of the 1780A/1780AT Input Module

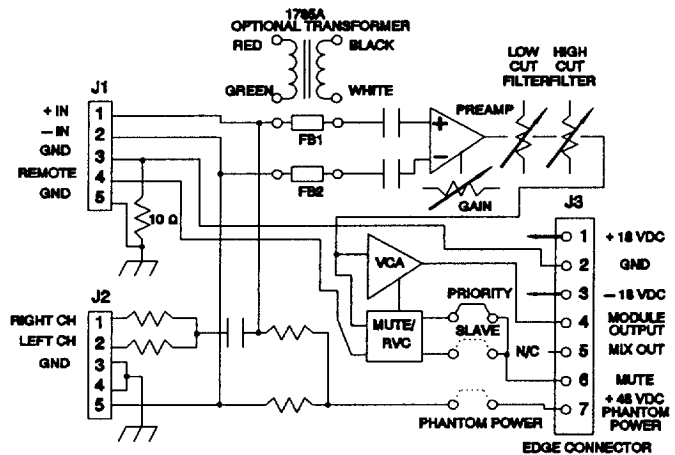
1780A/1780AT Specifications

Gain:	0 - 50 dB, continuously variable	High Pass Filter:	
		Corner Frequency:	300 Hz
		Slope:	12 dB/octave
Input Sensitivity:		Controls:	1 - Gain, continuously variable
Without Pad:	-68 dBu to -18 dBu (.3 mVrms to 100 mVrms)		
With Pad:	-48 dBu to +2 dBu (3 mVrms to 1 Vrms)		
Input Impedance:		Weight (Net):	
1780A:	10 k Ω	1780A:	2.5 oz. (70 g)
1780AT:	10 k Ω	1780AT:	3.0 oz. (85 g)
With 1793 Dual Phono:	40 k Ω	Power Supply Requirements:	± 18 VDC at 15 ma DC (supplied by mainframe)
Frequency Response:	50 Hz - 20 kHz, ± 1 dB	Included Accessories:	1 - 2-pin female jumper (for phantom power) 2 - mounting screws (for potentiometer bracket) 1 - Operating Instructions
Total Harmonic Distortion:	(Ref. minimum gain, 50 Hz - 20 kHz measurement bandwidth, 30 kHz low-pass filter)		
1780A:	<0.01%		
1780AT:	<0.025%		
Equivalent Input Noise:	<-120 dBr (Ref. 0 dBr = 100 mVrms out- put, 10 k Ω load, 200 Ω input termination, maximum gain, A-weighted)		

1781A/1781AT

Description

The Altec Lansing 1781A/1781AT Programmable Input modules accept either mic or line level signals through a wide variety of connector interfaces. Standard features include an electronically balanced input stage with adjustable gain, continuously variable high and low pass filters, RFI protection, 48 volt phantom powering two levels of muting, and remote volume control capability. Programming with plug-in jumpers which may select phantom power (on or off), mute priority or slave, or remote volume control. The 1781AT module also comes equipped with a 1785A Input Isolation Transformer which provides an additional 10 dB of gain for improved sensitivity.



Block Diagram of the 1781A/1781AT Input Module

1781A/1781AT Specifications

Gain:		Total Harmonic Distortion (THD):	(Ref. 1 kHz, 100 mVrms output, minimum gain, 10 k Ω load, 30 kHz low pass filter)
1781A:	0 dB - 50 dB, continuously variable	20 Hz - 20 kHz:	<0.03%
1781AT:	10 dB - 60 dB, continuously variable		
Input Sensitivity:	(Ref. 1 kHz, 10 k Ω load)	Equivalent Input Noise:	(Ref. 0 dB = 100 mVrms output, 10 k Ω load, 200 Ω input termination maximum gain, A-weighted)
1781A:	-68 dBu to -18 dBu (0.3 mVrms - 100 mVrms)		<-120 dB
1781AT:	-78 dBu to -28 dBu (0.1 mVrms - 30 mVrms)		
Input Impedance:	(Ref. 1 kHz)	High Pass Filter (Low Cut):	(Ref. 100 mVrms output, minimum gain, 10 k Ω load)
Electronically balanced:	>8 k Ω	Corner Frequency:	320 Hz
Transformer balanced:	200 Ω - 600 Ω	Slope:	>10 dB at 100 Hz 6 dB/oct (20 dB/dec)
With 1793 Dual Phono Connector Installed:	>39 k Ω		
Frequency Response:	(Ref. 1 kHz, 100 mVrms output, 10 k Ω load)	Low Pass Filter (High Cut):	(Ref. 100 mVrms output, minimum gain, 10 k Ω load)
1781A:		Corner Frequency:	5 kHz
± 1 dB (minimum gain):	20 Hz - 20 kHz	Slope:	>6 dB at 10 kHz 6 dB/oct (20 dB/dec)
± 1 dB (maximum gain):	50 Hz - 20 kHz		
1781AT:		Attenuation:	(Ref. 100 mVrms output, minimum gain, 10 k Ω load)
± 1 dB (minimum gain):	20 Hz - 20 kHz	Mute:	>60 dB (10 k Ω remote)
± 1 dB (maximum gain):	50 Hz - 15 kHz		

1783

Description

The Altec Lansing 1783 Line Output modules provides the drive capability necessary to interface with other professional equipment. The electronically balanced output stage provides a low source impedance to drive subsequent stages. If transformer isolation is necessary, the module's circuit board accommodates the optional PC-mount 1786 Output Isolation Transformer. The continuously variable output level control is local to the module permitting independent adjustment of each line output.

1783 Specifications

Output Source Impedance:	<50 Ω
Nominal Output Level /Load Impedance:	+8 dBm (Ref. 1 kHz, 0 dBm = 0.775 Vrms with 600 Ω load, output level control at maximum, 100 mVrms input)
Maximum Output Level:	+24 dBm
Frequency Response: ± 1 dB:	(Ref. 1 kHz, +8 dBm output) 20 Hz - 25 kHz
Total Harmonic Distortion (THD):	(Ref. 1 kHz, +8 dBm output, output level control at maximum, 30 kHz low pass filter)
20 Hz - 20 kHz:	<0.05%
Signal to Noise Ratio:	>88 dBm (Below +8 dBm output, output level control at maximum, A-weighted)
Power Requirements:	± 18 VDC at 20 mA (supplied by mainframe)
1786 Output Isolation Transformer	
Impedance Ratio:	1:1 (600 Ω :600 Ω)
Frequency Response: ± 1 dB:	(Ref 1 kHz, +18 dBm output) 20 Hz - 20 kHz
Total Harmonic Distortion (THD):	Ref 1 kHz, +18 dBm output)
20 Hz - 20 kHz:	<0.5%
50 Hz - 20 kHz:	<0.1%

Special Ordering Instructions

NOTE: The modules listed below are required for use with the 1707C/1715C and must be ordered separate from the mainframe.

Plug-in Input Modules:

- 1780A** Mic/Line Input module
- 1780AT** Mic/Line Input module with 10 k Ω bridging transformer installed
- 1781A** Programmable Input module
- 1781AT** Programmable Input module with model 1785A 600 Ω to 10 k Ω isolation transformer installed
- 1785A** 600 Ω to 10 k Ω Input Isolation Transformer for installation on existing model 1781A

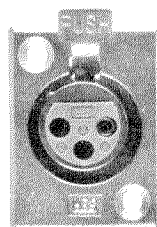
Plug-in Output Module:

- 1783** Line Output module
- 1786** Output Isolation Transformer

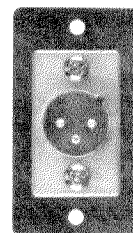
Plug-in EQ Module:

- 8751A** Programmable 14-Band EQ module

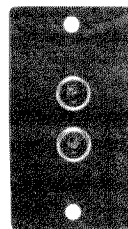
NOTE: Each module selected requires one of the following connectors also be ordered:



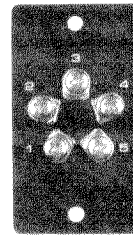
1791
Female XLR



1792
Male XLR



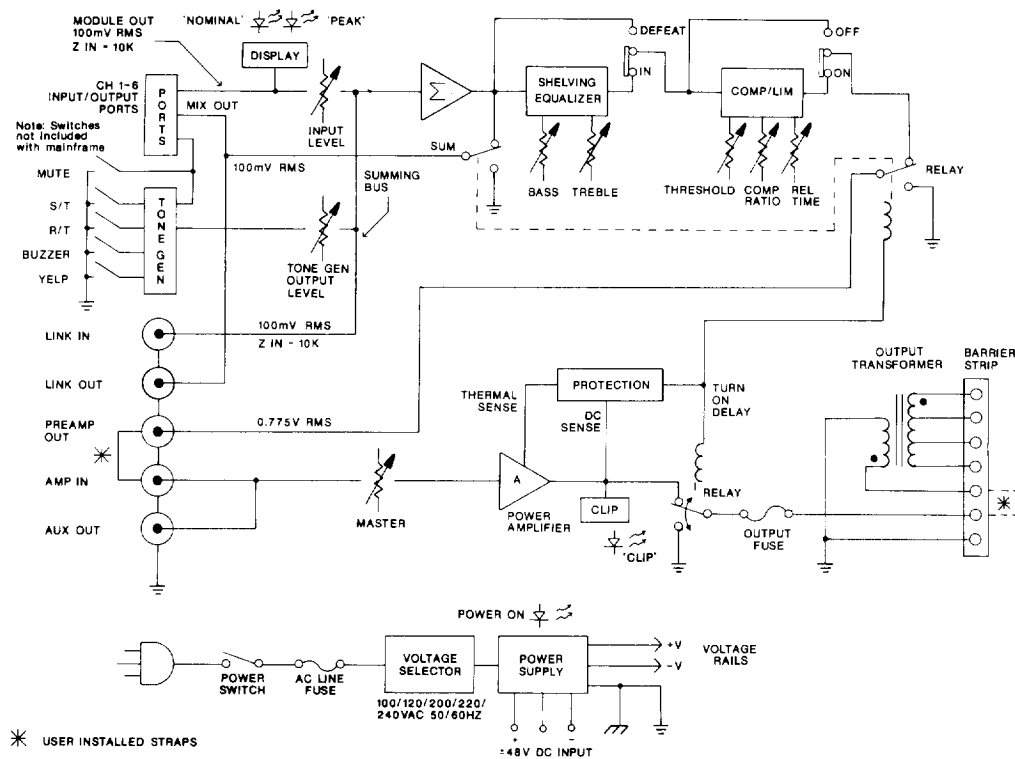
1793
Dual RCA Phono



1794
5-Lug Terminal

CONFIGURING THE MAINFRAME

The Mainframe's Inner Workings



1707C/1715C System Block Diagram

ARCHITECT'S and ENGINEER'S SPECIFICATION

The mixer/power amplifier shall have six configurable ports and be capable of operating from 100, 120, 200, 220, or 240 Vac, 50/60 Hz line, or from ± 48 VDC. Each port shall be usable with a microphone or other high level device. The mixer/power amplifier mainframe shall include a compressor/limiter, low and high frequency shelving equalizers, and a tone generator capable of producing general purpose and emergency warning signals.

The power amplifier shall meet the following performance criteria: Power Output: 75 watts (1707C) at less than 0.05% THD from 20 Hz to 20 kHz (8 Ω direct output), or 150 watts (1715C) at less than 0.05% THD from 20 Hz to 20 kHz (4 Ω direct output). Frequency Response: 20 Hz to 20 kHz, ± 1 dB (direct output). Source Impedance: 150 Ω to 250 Ω nominal with a microphone preamplifier, 600 Ω with a bridging transformer, 150 Ω to 600 Ω with a line matching transformer, and greater than 30 k Ω with a tape preamplifier. Equivalent Input Noise: < -120 dB with

a low impedance microphone preamplifier. Output Noise: < -85 dBm (with all controls off).

The mixer/power amplifier shall be rack mountable and finished in black. The amplifier's dimensions shall be 5 $\frac{1}{4}$ " (H) x 19" (W) x 12 $\frac{1}{4}$ " (D) and its net weight shall be 24.2 lbs. (1707C), or 30.8 lbs. (1715C).

The plug-in accessory modules shall be the 1780A/AT and the 1781A/AT Input modules and the 1783 Line Output module. The accessory transformers usable with the modules shall be the 1785A Input Isolation transformer and the 1786 Output Isolation transformer. The connector subassemblies shall be the 1791 female XLR, 1792 male XLR, 1793 dual phono, and the 1794 5-lug screw terminal connector.

The mixer/power amplifier shall be the Altec Lansing Model 1707C/1715C.



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the sound of experience

1707C & 1715C Mixer/Power Amplifiers

Operating and Service Instructions

ALTEC LANSING CORPORATION

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Description

The 1707C and 1715C Mixer/Power Amplifiers offer a highly flexible integration of a user configurable six input mixer with a fully protected power amplifier in one convenient cost effective package.

The six input ports accept any of the several input modules or output module. The programmable input modules may have their muting circuitry configured in either "priority", "slave" mode, or may be set to ignore muting commands. When a module configured in the "Priority" mode is activated, modules in the "slave" mode

will be muted.

Circuitry is also provided to allow remote volume control of individual inputs.

Multiple mainframes may be dynamically linked together. Separate preamp-out and amplifier-in jacks allow the insertion of equalizers or other signal processing between the mixer and the power amplifier.

A multi-tone generator and a compressor/limiter are also provided.

Specifications

Continuous

Average Power:

1707C: 75 watts
1715C: 150 watts

Maximum Midband

Output Power:

(Reference 1 kHz at 1% THD)
1707C: 100 watts
1715C: 175 watts

Power Bandwidth:

(Ref. 1 kHz at rated output power)
Direct Output: better than 20 Hz – 20 kHz
Transformer Output: better than 50 Hz – 15 kHz

Frequency Response:

Direct Output:

±1 dB, 20 Hz – 20 kHz
(Ref. 1 kHz, 1 watt output)

Transformer Output:

±1.5 dB, 50 Hz – 15 kHz
(Ref. 1 kHz, 1 watt output)

Link Output:

±1 dB, 20 Hz – 20 kHz
(Ref. 1 kHz, 100 mVrms, 10 kΩ load)

Preamp Output:

±1 dB, 20 Hz – 20 kHz
(Ref. 1 kHz, 0 dBm output, 600 Ω load)

Total Harmonic Distortion (THD):

Direct Output:

<0.05%, 20 Hz – 20 kHz
(Ref. 1 kHz, rated output power, 30 kHz low-pass filter)

Transformer Output:

<1.0%, 50 – 100 Hz
<0.1%, 100 Hz – 20 kHz
(Ref. 1 kHz, rated output power, 30 kHz low-pass filter)

Link Output:

<0.05%, 20 Hz – 20 kHz
(Ref. 1 kHz, 100 mVrms output, 10 kΩ load, 30 kHz low-pass filter)

Preamp Output:

<0.05%, 20 Hz – 20 kHz
(Ref. 1 kHz, 0 dBm output, 600 Ω load, EQ flat, compressor/limiter off, 30 kHz low-pass filter)

Intermodulation Distortion: (SMPTE 4:1)

Direct Output:

less than 0.1% at rated power)

Input Sensitivity / Input Impedance:

(For rated output power, Ref. 1 kHz, 0 dBu = 0.775 Vrms)

Using 1780A/1780AT: 0.3 to 100 mVrms / 10 kΩ
(balanced, no pad) (-68 dBu to -18 dBu)

Using 1780A/1780AT: 3 mVrms to 1 Vrms / 10 kΩ
(balanced, w/pad) (-48 dBu to +2 dBu)

Using 1781A: 0.3 to 100 mVrms / 10 kΩ
(balanced) (-68 dBu to -18 dBu)

Using 1781AT: 0.1 to 30 mVrms / 600 Ω
(balanced) (-78 dBu to -28 dBu)

Using 1781A+1785A: 0.1 to 30 mVrms / 600 Ω
(balanced) (-78 dBu to -28 dBu)

Input Sensitivity / Input Impedance:

Link Input: 100 mVrms / 10 kΩ
(unbalanced) (-18 dBu)

Amplifier Input: 0.775 Vrms / 10 kΩ
(unbalanced) (0 dBu)

Rated Output Level /

Minimum Load

Impedance:

Link Output (unbal): 100 mVrms (-18 dBu), 2 kΩ
Preamp Output (unbal): 0 dBm, 600 Ω min. load
Auxiliary Output (unbal): 0 dBm, 600 Ω min. load
Direct Output: Unbalanced
1707C: 24.5 Vrms / 8 Ω min. load
1715C: 24.5 Vrms / 4 Ω min. load
Transformer Output: Balanced
1707C: 17.4 Vrms / 4.0 Ω min load
25.0 Vrms / 8.3 Ω min load
70.7 Vrms / 66.6 Ω min load
1715C: 25.0 Vrms / 4.2 Ω min load
34.6 Vrms / 8.0 Ω min load
70.7 Vrms / 33.3 Ω min load

Damping Factor:

Direct Output: >40, 20 Hz – 1 kHz

Signal-to-Noise Ratio:

Direct Output: >105 dB below rated output power, A weighted.
(master at minimum)
Direct Output: >80 dB below rated output power, A weighted.
(master at maximum)
Link Output: >75 dB below 100 mVrms output, A weighted.
Preamp Output: >75 dB below 0.775 Vrms output, A weighted, EQ defeated, compressor / limiter off.

Protection Systems:

- Amplifier:
- Short circuit current limiting.
 - Over voltage limiting.
 - Thermal Sensing.
 - Spurious oscillatory protection.
 - Low AC line sensing.
 - Output DC detection.
 - Subsonic detection.
 - Turn-on/turn-off transients.
(approx 3 seconds)

Load:

External DC Supply:

Mainframe:

Equalization:

Bass: ±12 dB at 100 Hz.
Treble: ±12 dB at 10 kHz.

Note: 0 dBm into 600 Ω yields 0.775 Vrms.

Compressor / Limiter: Feedforward Topology
Threshold: -20 dB to +20 dB
 Continuously variable.
 (Ref. 100 mVrms on Link input.)

Compression Ratio: 1:1 to ∞:1,
 Continuously variable.

Release Time: 50 msec to 5 sec.
 Continuously variable.

Tone Generator: Electronically produced
Tones: Buzzer, siren, single-tone chime, and repeating tone chime.

Control: All tones are initiated by remote switch closures.
 Rear panel.

Level adjustment:

Connectors:

Inputs:
 Amplifier Input: 1 – RCA phono receptacle
 Link input: 1 – RCA phono receptacle
 Battery: 3-terminal barrier strip

Outputs:
 Amplifier Output: 7-terminal barrier strip
 Preamp Output: 1 – RCA phono receptacle
 Link Output: 1 – RCA phono receptacle
 Auxiliary Input: 1 – RCA phono receptacle

Control:
 Mute and Tone Generator: Screw Terminals (7)

Controls:

Front Panel:
 Input: 6 Input Level adjust
 Compressor/Limiter: 1 Release Time adjust (screwdriver slotted)
 1 Threshold adjust (screwdriver slotted)
 1 Compression Ratio adjust (screwdriver slotted)
 1 On/Off Switch

EQ Controls:
 1 Bass adjust
 1 Treble adjust
 1 EQ In/Defeat switch

Output:
 1 Master Level adjust

Miscellaneous:
 1 AC Power switch

Rear Panel:
 Tone Generator: 1 Output Level adjust (screwdriver slotted)

Indicators:

Front Panel:
 6 Green LED's, (Nominal Input Level)
 6 Red LED's, (Peak Input Level)
 1 Red LED, Main power output CLIP)
 1 AC Power ON

Microphone Phantom Power: 48 VDC @ 200 milliamps consumption

Power Requirements: (Ref. 1 kHz, rated output with no modules installed)

AC Mains:

1707C: 100, 120, 200, 220 or 240 VAC.
 165 watts maximum.

1715C: 100, 120, 200, 220 or 240 VAC.
 320 watts maximum.

Power Requirements:

Battery:

1707C: ±48 VDC bipolar, 1.5 amps maximum.

1715C: ±48 VDC bipolar, 3.0 amps maximum.

Power Consumption and Heat Produced:

1707C:
 75 watts output: 165 watts consumed.
 306 BTU/hour.
 25 watts output: 130 watts consumed.
 357 BTU/hour.

1715C:
 150 watts output: 320 watts consumed.
 578 BTU/hour.
 50 watts output: 230 watts consumed.
 612 BTU/hour.

Operating Temperature Range: Up to 50°C (122°F)

Dimensions:

Width: 19 inches (48.3 cm)
Height: 5¼ inches (13.3 cm)
 3 standard rack units.
Depth: 13 inches (33.0 cm)

Net Weight:

1707C: 25 lbs. (11.4 kg)
1715C: 32 lbs. (14.5 kg)

Finish Color: Black

Included Accessories:

- 4 – Operating/Service Instruction documents. One each for the Mainframe, 1780A/AT, 1781A/AT, and 1783.
- 1 – Shorting Bar (Installed on Direct Output to OT in).
- 1 – "U" Shorting Bar (Installed on Preamp Out to Amp In).
- 4 – Rubber Feet (installed).
- 1 – System Configuration Label installed on top cover.
- 1 – International fuse.
- 1 – International 220/240 VAC voltage sticker.
- 1 – International Fuse sticker.
- 1 – Rack mount hardware kit.

Optional Input Output Accessory Modules:

- 1780A** Mic/Line Input Module.
- 1780AT** Mic/Line Input Module with 10 kΩ bridging transformer installed.
- 1781A** Programmable Input Module.
- 1781AT** Programmable Input Module with **1785A** 600 Ω to 10 kΩ isolation transformer installed.
- 1783** Line Output Module.
- 1785A** 600 Ω to 10 kΩ Input Isolation Transformer.
- 1786** 600 Ω to 600 Ω Output Isolation Transformer.
- 1791** Female XLR Connector.
- 1792** Male XLR Connector.
- 1793** Dual RCA Phono Connector.
- 1794** 5-Lug Screw Terminals.
- 8751A** Programmable 14 Band EQ Module.

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

ELECTRICAL CONNECTIONS FOR THE 1707C/1715C MIXER/POWER AMPLIFIERS

Power Connections (120 Volt, 50/60 Hz)

The mainframe configuration for both mixer/power amplifiers comes with the power transformer's primary line voltage strapped for 120-volt operation from the factory. Refer to Table I for exact strapping details and other voltage options.

Table I. AC Line Voltage Selection and Strapping Chart

Primary Line Voltage	Transformer Primary Lead Color				
	WHITE	YELLOW	RED	BLUE	ORANGE
100V	5	2	11	9	3
120V	2	5	11	3	9
200V	5	2	7	10	8
220V	5	2	7	8	10
240V	2	5	7	8	10

NOTE

Make sure the line voltage corresponds with the selected line voltage power rating **BEFORE** you connect the mainframe to the alternating current line.

Power Connections (100, 200, 220, or 240 Volt; 50/60 Hz)

You may change the mixer/power amplifier's 120-volt power connection to a 100-, 200-, 220-, or 240-volt power connection by re-straping the power transformer's primary line voltage. Use the following procedure to change the factory strapping to another line voltage.

1. If you connected the mixer/power amplifier to an alternating current power source, disconnect it.
2. Remove and save the nine screws that secure the mixer/power amplifier's top cover. There are two screws near the bottom of each side, two screws on top near the rear edge of the front panel, and three screws at the top edge of the rear panel. Refer to Figure 1 for details.

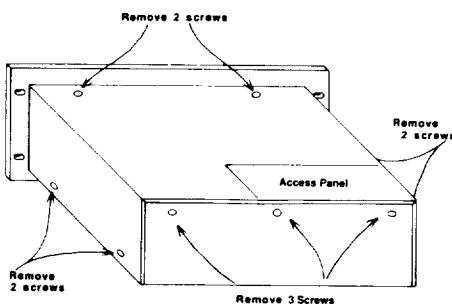


Figure 1. Top-Cover Removal

The numbers in Table I correspond to the numbered positions on the alternating current terminal block connector, which is adjacent to the power transformer. To select a line voltage, install the colored primary lead wires into the corresponding numbered positions on the terminal block.

3. Locate the voltage selection terminal block between the side of the chassis and the power transformer. Refer to Figure 2 for details.

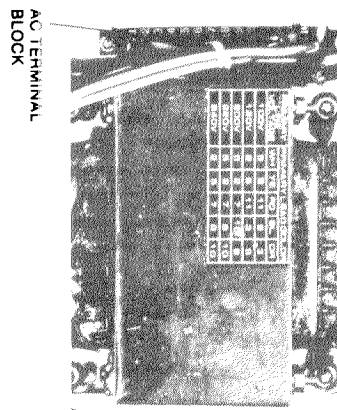


Figure 2. Location of Voltage Selection Terminal Block

4. While referring to Table I, disconnect the primary lead wires from the terminal block. Pull each wire firmly to disengage the push-on connector. Then reconnect each lead wire into its designated position on the terminal block that corresponds to the desired line voltage. Press each connector to snap into place.
5. Install the appropriate fuse value from Table II.

Table II. AC Fuse Selection Chart

AC Line Voltage	AC Line Fuse	
	1707C	1715C
100V	3.5 A/250 V	7.0 A/250 V
120 V	3.5 A/250 V	7.0 A/250 V
200V	2.0 A/250 V	4.0 A/250 V
220V	2.0 A/250 V	4.0 A/250 V
240 V	2.0 A/250 V	4.0 A/250 V

NOTE

Use of fuses other than those listed in Table II will VOID THE WARRANTY.

6. If you connected the power transformer's primary leads for 200-, 220-, or 240-volt operation, perform steps 7, 8, and 9 below to prevent future confusion and possible damage to the amplifier. Otherwise, proceed with step 10 below.
7. Affix the supplied 220/240 VAC label above the power cord and cover the 120 VAC silkscreened designation.
8. Affix the 2-amp fuse/1707C, (4-amp/1715C) label over the original 3.5 amp/1707C, (7-amp/1715C silkscreened designation. Refer to Figure 3 for where to place the fuse label.

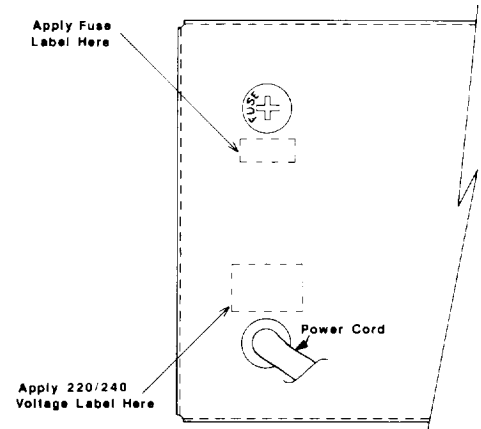


Figure 3. Application of International Stickers

9. Replace the standard AC line fuse with the 2-amp fuse/1707C, (4-amp/1715C) supplied. You should find the labels and the fuse enclosed in the plastic bag with this manual. Refer to Table II for an AC fuse selection chart.
10. If you are not installing additional modules in the mainframe right now, reinstall and secure the top cover with the nine screws previously removed in step 2 above.

NOTE

You can buy and install additional modules into the mixer/power amplifier, which has six ports that you can configure as input or output modules.

INSTALLING MODULES IN THE MAINFRAME

For detailed instructions on how to install additional input and output modules, you may order the following operating instruction manuals from our Order Entry Department:

P/N 42-02-027720 for the **1781A/AT** Mic/Line Input Modules

P/N 42-02-026653 for the **1780A/AT** Mic/Line Input Modules

P/N 42-02-027721 for the **1783** Line Out put Module.

1. Remove and save the two screws that secure the access panel to the top cover. Refer to figure 1 for details.
2. Plug the input or output module into one of the six channel positions with the controls facing the rear as shown in Figure 4. Secure the module with the two screws provided.

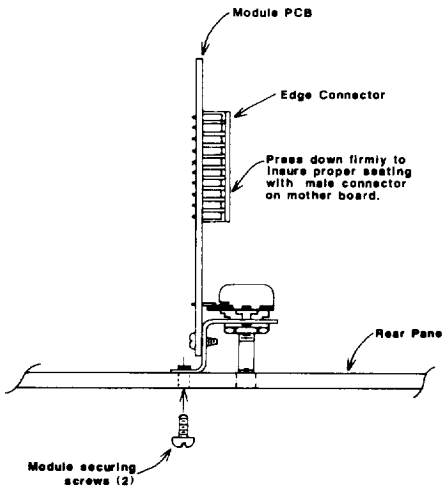


Figure 4. Module Installation

3. Remove the blank cover panel as shown in Figure 5. Install the selected connector assembly with the screws provided. Plug the pigtail connector (from the main connector assembly) onto its appropriate male mating connector on the module's printed circuit board.

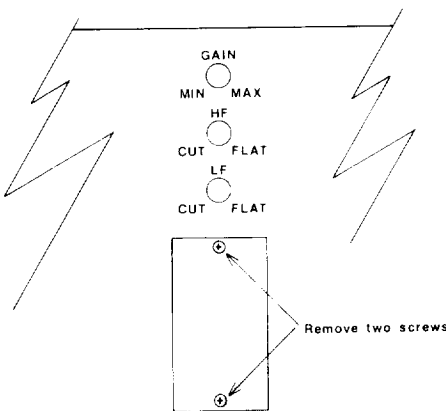


Figure 5. Removal of Blank Cover Panel

4. On the top cover is a System Configuration Label. Use it to indicate the module type, configuration, and any options for future reference. Write directly on the label with a permanent marker. Refer to Figure 6 for a display of this sample label.

NOTE

You may buy connector assemblies to use for installing additional input/output modules from ALTEC LANSING.

6	5	4	3	2	1
INPUT	INPUT	INPUT	INPUT	INPUT	INPUT
OUTPUT	OUTPUT	OUTPUT	OUTPUT	OUTPUT	OUTPUT
NONE	NONE	NONE	NONE	NONE	NONE
MUTE SLAVE	MUTE SLAVE	MUTE SLAVE	MUTE SLAVE	MUTE SLAVE	MUTE SLAVE
PRIORITY	PRIORITY	PRIORITY	PRIORITY	PRIORITY	PRIORITY
XFORMER	XFORMER	XFORMER	XFORMER	XFORMER	XFORMER
RVC	RVC	RVC	RVC	RVC	RVC
+4 dBm	0 dBm		Phantom Pwr		

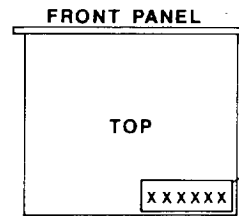


Figure 6. System Configuration Label

SHELF OR RACK MOUNTING THE 1707C/1715C MIXER/POWER AMPLIFIERS

You may shelf mount or rack mount the mainframe. For shelf or countertop applications, four rubber feet on the bottom of the chassis will protect resting surfaces and provide elevation for air flow underneath the unit. For rack or cabinet applications, remove the four rubber feet from the bottom of the chassis. Then install the unit in the rack with the screws and shoulder washers provided. The unit **must** have 1.75" of blank space both above and below it.

Ventilation

The mixer/power amplifier generates minimal heat during normal use. Although the amount of generated heat is low, make sure the mainframe is properly ventilated to prevent an excessive temperature rise. Because the output power devices (transistors) are sensitive to heat, you should not place the amplifier between other heat generating equipment or in areas where the ambient temperature exceeds 50°C (122°F).

If you mount the mainframe in an equipment rack or cabinet with other heat producing

equipment, provide adequate space between the units. Otherwise, the equipment may become too warm.

If a rack or cabinet contains several amplifiers, you may need to check the ambient air temperature. To determine the ambient air temperature, operate the system until the temperature stabilizes. Measure the ambient air with a bulb-type thermometer held at the bottom of the uppermost amplifier.

CAUTION

Don't let the thermometer bulb touch the metal chassis. The chassis might be hotter than the ambient air.

CAUTION

If the air temperature exceeds 60°C (140°F), place the equipment farther apart or install a blower to provide air movement within the cabinet. Make sure you don't block the air-intake holes located on the bottom of the chassis or the exhaust holes on the top cover.

CONFIGURING THE MAINFRAME

The Mainframe's Inner Workings

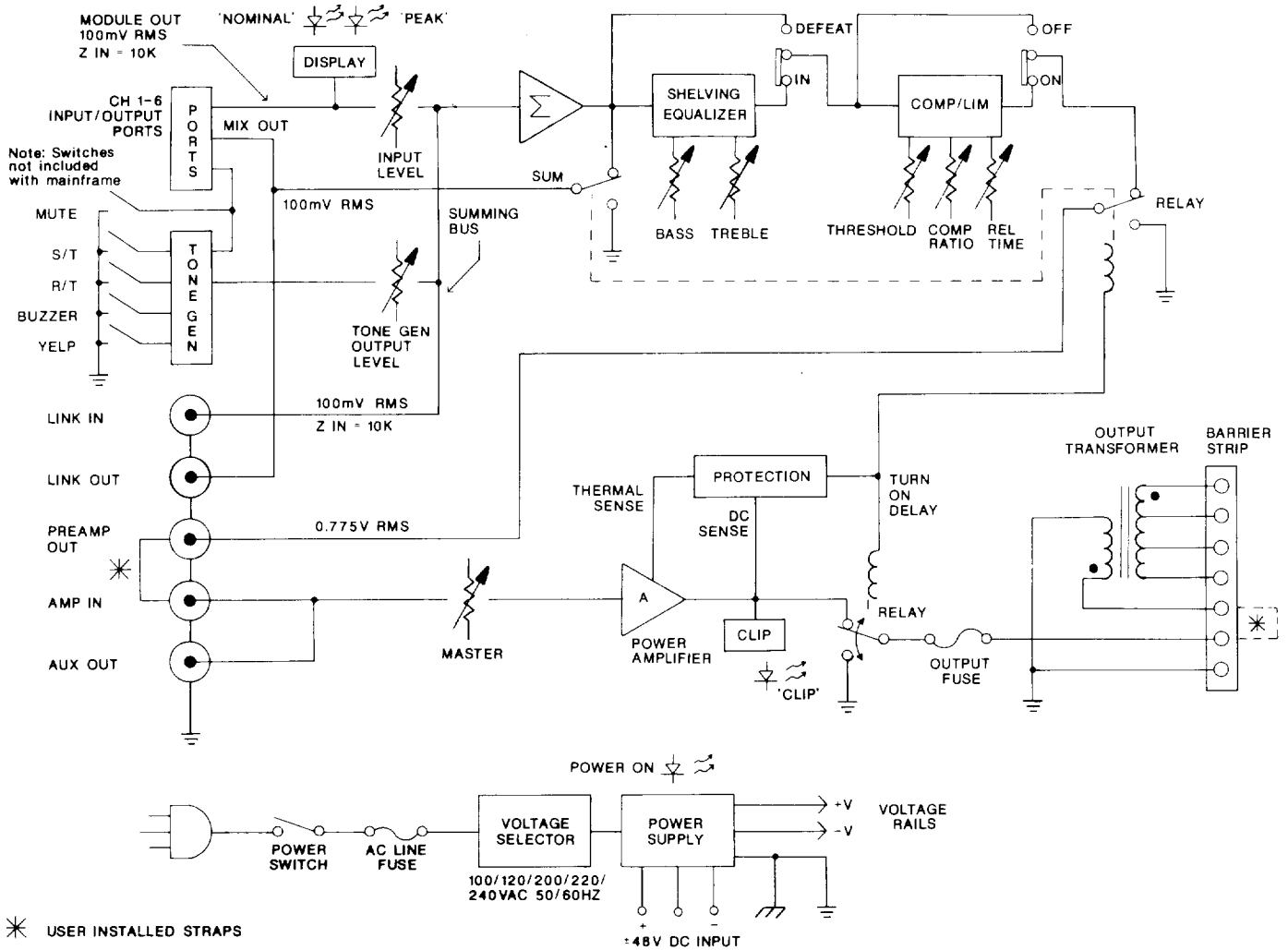


Figure 7. Block Diagram of 1707C/1715C Mixer/Power Amplifiers

Figure 7 above displays a block diagram of the mixer/power amplifier mainframe. Study it carefully. To use the system's full capabilities, you'll need a good understanding of the inner workings of the mainframe. Brief explanations of how the inside of the mainframe works follow in the text below.

The signal coming from each additional input module (like the **1781A**, **1781AT**, **1780A**, or **1780AT**) is simultaneously routed to the mixer/power amplifier's front-panel nominal/peak LED indicators and to the input channel level controls. The dual LED nominal/peak displays are pre-fader and designed to monitor the output level from the corresponding input module. The nominal (green) LED indicators have an approximate 10 dB window over which they will illuminate. This makes it easy to properly adjust the gain for each input module while efficiently using the rest of the system in terms of performance and headroom.

The mixer/power amplifier then sums the signal at the wiper of each input channel level control into a true virtual ground summing node or bus. The summing amplifier has eight input channels — input channels one through six on the front panel, tone generator output, and the link input or LINK IN on the rear panel. The summing amplifier's output signal drives the link output, or LINK OUT, located on the rear panel of the mainframe. The E.Q. and compressor/limiter sections are in series with each other, as shown in Figure 7. The compressor/limiter's output signal drives the preamplifier output, or PREAMP OUT, located on the rear panel which then provides the input signal to the main amplifier section.

The BASS and TREBLE E.Q. controls are ideally suited to make adjustments to the overall response of the mix. The low and high frequency shelving equalizers provide ±12 dB of boost and cut with the maximum boost occurring at 100 Hz and 10kHz, respectively.

The compressor/limiter section features variable release time, compression ratio, and threshold. The circuit uses a feed-forward topology that will minimize level differences for a more nearly constant output level. The compression ratio can approach ∞:1, and the attack time is fixed at approximately 10 ms.

The main amplifier section protects itself and the load against radio frequency interference, spurious oscillatory waveforms, excessive temperatures, direct current, turn-on/turn-off transients, and excess voltage/current phase shift due to reactive loading.

A signal overload circuit monitors the level at the output stage of the amplifier section. The front-panel CLIP LED indicator illuminates

when signal levels are high enough to cause significant output clipping.

A dual slope V-I limiter protects the output devices. It keeps the output devices operating within their SOA (safe operating area) as defined by the device manufacturer.

A special integrated circuit function block monitors the heatsink temperature, power-supply voltage, and the amplifier's output. When it detects a problem, it immediately disengages the output relay.

Output Connections

Make output connections to the seven-terminal barrier strip connector located on the lower-left side of the mainframe's rear panel.

The **1707C** main output connections include an 8 Ω direct output (24.5 vrms) and three transformer balanced outputs; 4 Ω (17.4 vrms), 25 vrms (8.3 Ω), and 70.7 vrms (66.6 Ω).

The **1715C** main output connections include a 4 Ω direct output (24.5 vrms) and a 25 vrms (4.2 Ω), an 8 Ω (34.6 vrms), and a 70.7 vrms (33.3 Ω) balanced transformer output.

Refer to Figure 8 for a display of the direct output connections and Figure 9 to see the transformer output connections.

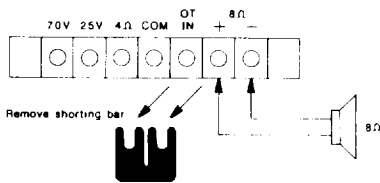


Figure 8. Direct Output Connections

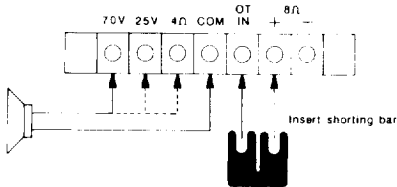


Figure 9. Transformer Output Connections

To use a transformer balanced output, install a U shorting bar between the direct (+) output and the output transformer's input (OT IN).

NOTE

When using the output transformer, you may use any combination of output connections as long as the total connected load does not consume more than 75 watts for the **1707C** or 150 watts for the **1715C**.

Output Fuse: A fuse in series with the output of the amplifier section protects the amplifier from excessive current consumption by a load. If this output fuse blows, replace it only with a fuse that matches the same type and rating as silkscreened on the rear panel of

the unit. If the fuse continues to blow, check the load to see if it shorted or is exceeding the rated power consumption. If the problem continues, have a qualified service technician service the unit.

Mute/Tone Generator Connections

The seven-lug screw terminal connector located on the mid-left rear of the mainframe provides access to the system mute and tone generator. For connection details, refer to Figure 10.

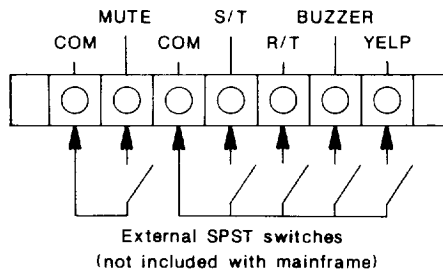


Figure 10. Mute/Tone Generator Switch Connections

A switch closure between the mute and common (COM) terminals will mute any input modules configured in the *slave* mode. You can use the remaining switches to select one of the following sounds:

- A single-tone chime (S/T),
- A repeating-tone chime (R/T),
- A buzzer, or
- A yelp (siren).

For the duration of a tone, the tone generator automatically mutes any input modules configured in the *slave* mode.

Output-Level Control: The tone generator's output-level control is conveniently located on the rear panel of the mainframe. To increase the tone generator's output level, rotate the screwdriver-slotted control shaft clockwise.

NOTE

Optional External Mute, (connected at the factory) allows external muting of the tone generator. If disconnected, the tone generator cannot be externally muted.

Resistance Effects of Long-Cable Runs on Mute/Tone Generator Circuits: Table III shows the maximum allowable cable resistance (total resistance) that the mixer/power amplifier can support. Resistances greater than these values, resulting from excessively long-cable runs or small gauge wire, may cause the mute or tone generator circuitry to fail to operate. Please make sure all cable resistances are less than the values shown in Table III.

Table III. Maximum Allowable Cable Resistances

Function	Resistance Ω	
S/T Chime	13	kΩ
R/T Chime	15.8	kΩ
Buzzer	8	kΩ
Yelp	8	kΩ
Mute	8	kΩ

LINK IN/LINK OUT Connections

The LINK IN/LINK OUT phono connectors on the mid-rear panel of the mainframe permit you to dynamically *link* two or more systems together. If you require more channels, the **1707C/1715C** mixer/power amplifiers are fully compatible with **1700C** mixer/preamplifier. For more information on the **1700C** mixer/preamplifier, you may order the operating instruction manual (P/N 42-02-029241) or the specification sheet (P/N 42-07-029242) from our Order Entry Department.

The signal appearing at the LINK OUT connector is the summation of all input channels as mixed by the input channel level controls. LINK IN is a direct input to a system's mixing amplifier; it's also a seventh input channel.

To link two units together, connect LINK OUT of system one to LINK IN of system two. System two will now control the mix of up to twelve input channels. Please refer to Figure 11 for typical linking connections.

NOTE

The LINK OUT signal is not affected by the compressor/limiter or the E.Q. circuits.

PREAMP OUT/AMP IN Connections

The PREAMP OUT signal is a mix of all input channels processed by the compressor/limiter and tone control circuits. Normally, you would insert a U shorting bar between the PREAMP OUT and AMP IN phono connectors on the rear panel. However, you can remove the shorting bar to patch in an external equalizer or other signal processing device with a proper level match of 0.775 vrms nominal. Figure 12 shows a typical application using an external equalizer or other signal processing device.

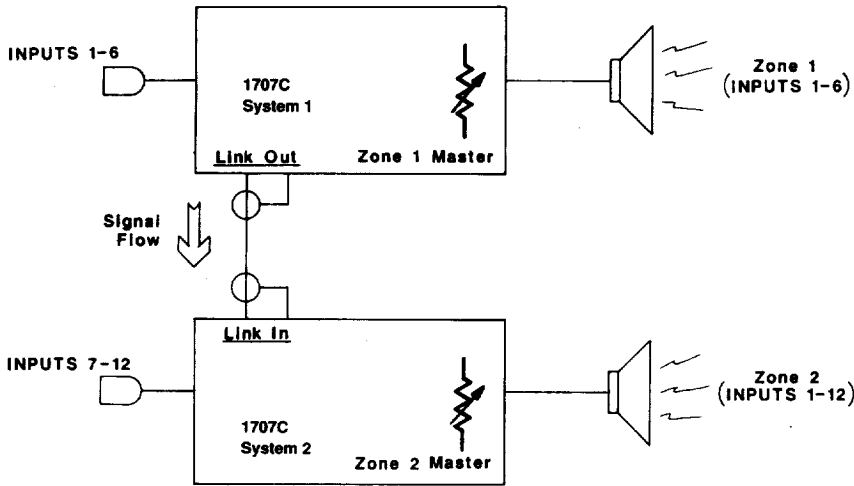


Figure 11. Typical Linking Connections

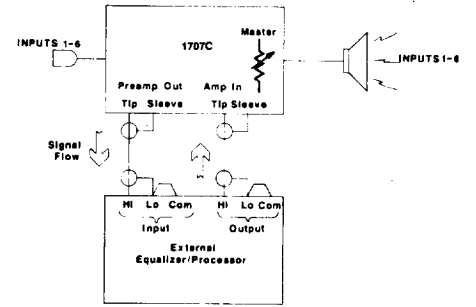
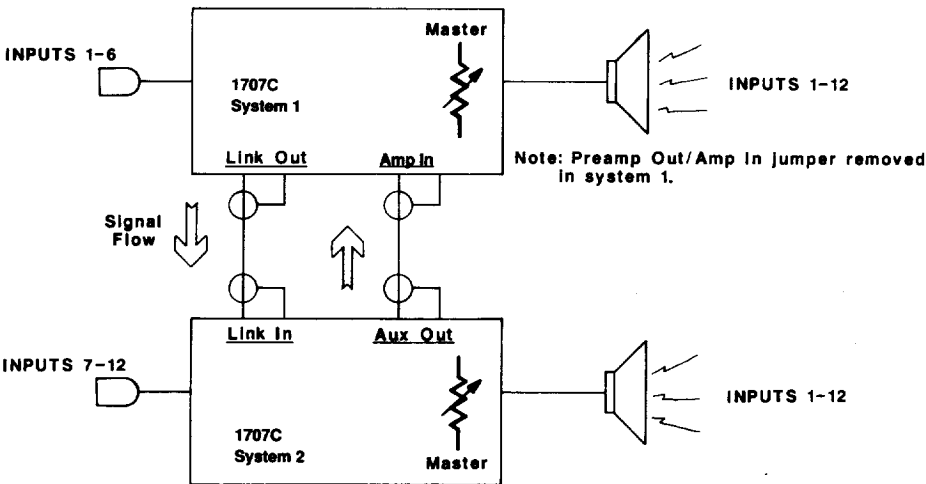


Figure 12. Patching an External Equalizer or Other Signal Processing Device

AUX OUT Connections

The auxiliary output (AUX OUT) phono connector on the rear panel is wired directly (internally) to the AMP IN phono connector. You can use it to drive a second amplifier or a tape recorder. Please refer to the 1707C/1715C mixer/power amplifier's block diagram shown in Figure 7.

Battery Input Connections

You can power a system from the battery input connector for auxiliary operation or standby switchover. The battery input connector is the three-terminal barrier strip located on the upper-left rear panel of the mainframe. The system requires two $\pm 48V$ DC battery power sources.

To connect the battery backup system to the three-terminal barrier strip, follow the three steps shown in Figure 13.

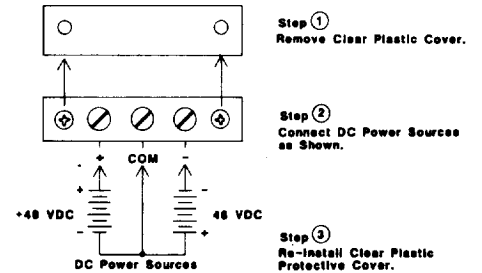
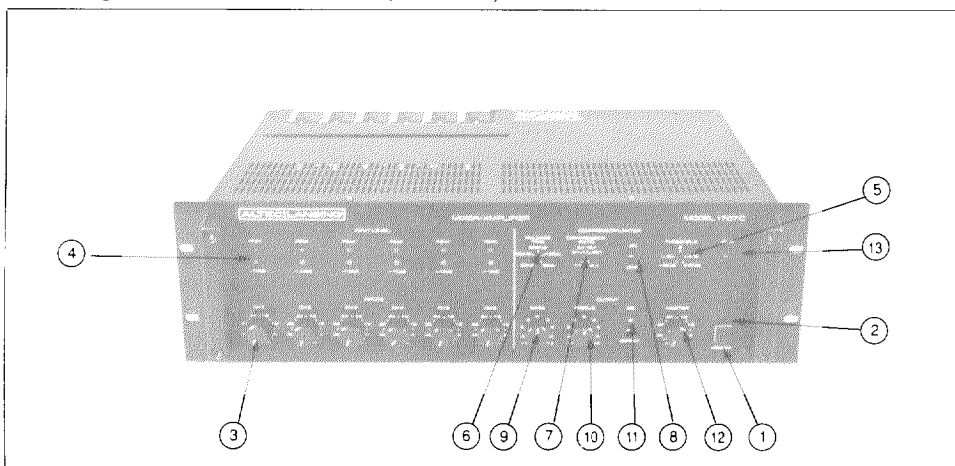


Figure 13. Battery Input Connections

FRONT/REAR-PANELS CONTROLS, SWITCHES, INDICATORS, AND CONNECTORS

Figure 14 below displays the front panel on the **1707C** mixer/power amplifier with numbers that point out each control, indicator, and switch. You can find the corresponding number and name/description of each control, switch, or indicator in the text below Figure 14. These controls, indicators, and switches are identical on the **1715C**.

Figure 14. Front-Panel Control, Switches, and Indicators for the 1707C



Item	Name	Function/Description
1	POWER Switch	Applies primary power. Two-position push-push switch for on/off mode.
2	ON LED Indicator	Illuminates red display on POWER switch when you turn on power.
3	CH 1-6 Controls	INPUTS Continuously variable potentiometers graduated from ∞ to 0 dB. You can increase or decrease level for each corresponding input channel. Rotate clockwise to increase level and counterclockwise to decrease level.
4	Green/Red Dual LED Indicators	INPUT LEVEL Displays nominal (green) and peak (red) indication for each channel.
5	THRESHOLD Control	COMPRESSOR/LIMITER Continuously variable potentiometer. Determines the level at which limiting begins.
6	RELEASE TIME Control	Continuously variable potentiometer. Determines the time required for the system to return to normal after signal falls below threshold.
7	COMPRESSION RATIO Control	Continuously variable potentiometer. Determines the amount of limiting that will occur when the input signal level exceeds the threshold, as set by the THRESHOLD control.
8	ON/OFF Switch	Places compressor/limiter circuit in or out of the signal path.
9	BASS Control	OUTPUT Continuously variable potentiometer. Provides boost or cut in bass response. You can obtain normal or flat response at a zero setting. Rotate clockwise to boost response or counterclockwise to cut response.
10	TREBLE Control	Continuously variable potentiometer. Provides boost or cut in treble response. You can obtain normal or flat response at a zero setting. Rotate clockwise to boost response or counterclockwise to cut response.
11	EQ IN/DEFEAT Switch	Two-position switch. DEFEAT position disconnects BASS and TREBLE controls when appropriate for application, such as Acousta-Voicing. EQ IN connects the BASS and TREBLE controls.
12	MASTER Level Control	Continuously variable potentiometer graduated from ∞ to 0 dB. Use it to simultaneously increase or decrease all input channels. Rotate clockwise to increase level or counterclockwise to decrease level.
13	CLIP LED Indicator	Illuminates when an internal signal overload circuit detects high output signal levels that may cause output clipping.

INITIAL SETUP AND OPERATION OF MAINFRAME WITH MODULES INSTALLED

Initial Setup of an Input Module

You can buy and install the following input modules from ALTEC LANSING:

The **1781A** programmable input module. The **1781AT** programmable input module with **1785A** input isolation transformer, and The **1780A** and **1780AT** mic/line input modules.

To initially set up an input module, follow these steps:

1. Rotate the input module's gain control to the 12:00 o'clock (MID) position for planned microphone inputs or to the MIN (fully counterclockwise) position for line-level inputs. If the input type is unknown, rotate the gain control to the MIN position.
2. Rotate the high-cut (HF) filter to the FLAT position.
3. Rotate the low-cut (LF) filter to the FLAT position.

Initial Setup of an Output Module

You can buy the **1783** line output module from ALTEC LANSING. This module can be installed with or without the optional **1786** output isolation transformer (also available from Altec Lansing).

To initially set up an output module, rotate the output module's output level control (labeled GAIN on the rear panel) to the MIN position.

Initial Setup of the Mainframe

1. Rotate the **MASTER** output level control on the front panel of the mainframe to the ∞ position (fully counterclockwise).
2. Set the compressor/limiter **ON/OFF** switch to the OFF position.
3. Set the tone control **EQ IN/DEFEAT** switch to the DEFEAT position.

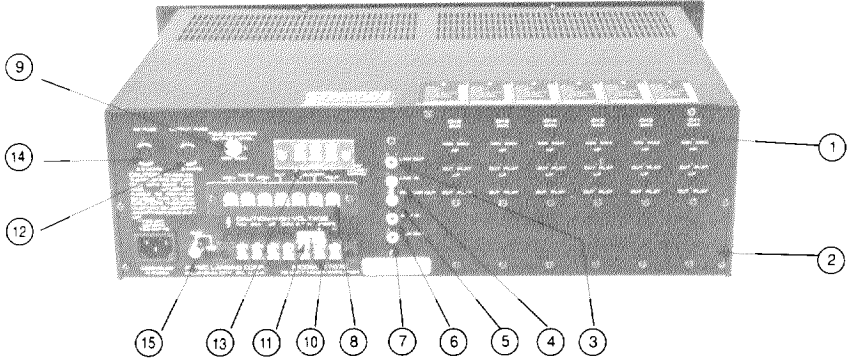
Operating the 1707C/1715C Mixer/Power Amplifiers

1. Connect a source representative of the type of input signal to one of the input module positions, if any. Slowly rotate the input module's gain control clockwise until the mixer/power amplifier's green LED display (-10 dB) on the input-level front-panel section fully illuminates. This is the nominal level for providing the most efficient performance and headroom.

The mixer/power amplifier's red LED display may briefly illuminate on signal peaks. This is permissible as long as it does not flash more than fifty percent of the time. If it does, reduce the gain of the input module by rotating its gain control counterclockwise or use an external pad.

Figure 15 below displays the rear panel on the **1707C** mixer/power amplifier with numbers that point out each connector or control. You can find the corresponding number and name/description of each connector or control in the text below Figure 15. These connectors and controls are identical on the **1715C**.

Figure 15. Rear-Panel Control and Connectors for the 1707C



Item	Name	Function/Description
1	Access Holes	Permits access to the screwdriver adjustable controls on the modules.
2	Blank Cover Panel	Covers connector mounting holes. Protects against internal voltages when not using port and connector.
3	LINK OUT Connector	Combine two units together by connecting LINK OUT of system one to LINK IN of system two. This is an RCA-type phono connector.
4	LINK IN Connector	Provides a direct input to the amplifier. This is an RCA-type phono connector (ref. 1 kHz, 100 mvrms).
5	PREAMP OUT Connector	Use to patch auxiliary equipment between unit's mixer and power amplifier. PREAMP OUT is normally strapped to AMP IN. The PREAMP OUT connector precedes the front-panel MASTER level control. This is an RCA-type phono connector.
6	AMP IN Connector	Provides a direct input to the amplifier. This is an RCA-type phono connector (ref. 1 kHz, .775 mvrms).
7	AUX OUT Connector	Provides an auxiliary output of the signal appearing at the amplifier's input. This is an RCA-type phono connector.
8	Seven-Lug Screw Terminal Connector	Permits connection of external switches to operate the system's mute and tone generator circuits.
9	OUTPUT LEVEL Control	Increase the output level of the tone generator by rotating the screwdriver-slotted control shaft clockwise. To decrease the output level, rotate it counterclockwise.
10	Seven-Terminal Barrier Strip Connector	Permits connection of various loads to the amplifier.
11	U Shorting Strip	Connects output of amplifier to input of output transformer. When in place, use only the transformer outputs.
12	OUTPUT FUSE	Protects load against excessive current from amplifier. Replace only with the same fuse type and power rating.
13	Battery Input Connector	Use to power system from battery supply for auxiliary operation or standby switchover. Requires one $\pm 48V$ DC battery power source, 1.5 amps maximum for the 1707C and 3 amps for the 1715C .
14	AC FUSE	Protects against excessive current drain from an alternating current source. Replace only with same fuse type and power rating.
15	GND	The ground terminal lets you connect auxiliary equipment to the mainframe.

NOTE

The LED display precedes each front-panel input-level control. As a result, it will always indicate the nominal and peak levels regardless of input channel settings. Please refer to the mainframe block diagram shown in Figure 7.

- Once the gain is set for each input module channel, rotate the front-panel input-level channel controls (CH 1-6) on the mixer/power amplifier to their 12:00 o'clock (MID) position. Slowly increase the **MASTER** output level control on the front of the mainframe until you hear a normal operating level through the loudspeaker system. Then readjust the input-level channel controls slightly for the desired mix or blend of signals.
- Adjust the high-cut (HF) and low-cut (LF) filters on the input module as needed for the desired response. The widest possible bandwidth occurs when you rotate both of these controls to the FLAT position. This is the best setting for music. However, in speech-only channels, you should limit the bandwidth to help reduce noise and system feedback.
- To use the mixer/power amplifier's output tone-control section, move the two-position **EQ IN/DEFEAT** slide switch to the EQ IN position. Then adjust the **BASS** and **TREBLE** controls for the desired response. From a center or 12:00 o'clock (MID) position, rotate either control clockwise to boost response or counterclockwise to cut response.
- To use the compressor/limiter section, follow this procedure:

Move the slide **ON/OFF** switch to the ON position.
 Rotate the **RELEASE TIME** control to its maximum position (full clockwise).
 Rotate the **COMPRESSION RATIO** control to minimum position (full counterclockwise).
 Rotate the **THRESHOLD** control to its 12:00 o'clock (MID) position.
 Begin increasing the compressor/limiter by rotating the **COMPRESSION RATIO** control clockwise until you achieve the desired amount of compression or limiting. Since the amount of compression or limiting depends on the incoming signal level, you may need to readjust the **THRESHOLD** control. To lower the triggering threshold, rotate the **THRESHOLD** control counterclockwise. If the system requires a higher incoming signal level to trigger the compressor/limiter, raise the threshold by rotating the **THRESHOLD** control clockwise.

NOTE

A high compression ratio and a low threshold setting may decrease the system's apparent loudness since peak signals and parts of the nominal signal may lie above the threshold. You can correct this by raising the threshold level; just rotate the **THRESHOLD** control clockwise.

NOTE

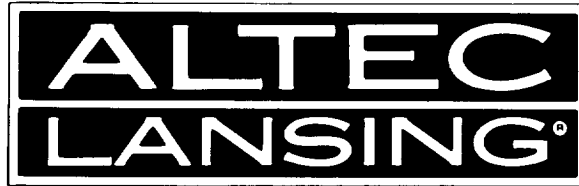
If you set the 1783's output level control at its MAX (full clockwise) level, the output level is +8dBm. However, this level only applies if you use a 100 mvrms reference level on the input of the output module from the mix output bus. It also only applies if you have a balanced 600 Ω load.

WARNING

Repair performed by other than authorized warranty stations (dealers) or qualified service personnel shall void the warranty period of this unit. To avoid loss of warranty, see your nearest ALTEC LANSING authorized dealer. You can also call ALTEC LANSING CUSTOMER SERVICE authorized dealer. You can also call ALTEC LANSING CUSTOMER SERVICE directly at 405/324-5311, FAX 405/324-8981, or write:

**10500 W. RENO
OKLAHOMA CITY, OK 73128 U.S.A.**

6. If you installed the **1783** line output module, adjust the output level control on the **1783** for the desired output level. The higher the output level, the better the signal-to-noise ratio. However, too high a level reduces the available headroom and may cause premature clipping.



the sound of experience

1707C/1715C
MIXER/POWER AMPLIFIERS

SERVICE INSTRUCTIONS

***** CAUTION *****

No user-serviceable parts are inside: you may encounter hazardous voltage within the chassis. 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're qualified to do so. Refer all servicing to qualified service personnel.

SERVICE INFORMATION

WARNING

ALTEC LANSING recommends that you do not modify its products. Such modifications shall be at the sole expense of the person(s) or company responsible. Any damage to persons or property resulting therefrom shall not be covered under warranty or otherwise.

Power Amplifier Bias Adjustment

NOTE

This adjustment requires a DC voltmeter.

Figure 16, shown on the gatefold, is the schematic of the mainframe. You'll need trimpot SVR102, provided in this system's package, to set the bias of the amplifier. You should set the bias current to approximately 20 milliamps DC. To set the bias, use a battery-powered DC voltmeter capable of reading in the millivolt range and follow the procedures outlined below. If you must use an AC-powered voltmeter, float the AC ground wire using the appropriate adapter.

1. With the unit unplugged, remove the top cover from the unit to expose the main circuit board. See Figure 1 on page 5 for how to remove the top cover.
2. Connect the rated load impedance to the direct output of the mixer/power amplifier (8 Ω for the 1707C, 4 Ω for the 1715C).
3. Attach RED probe lead from the DC voltmeter to the junction of R130 (0.27 Ω emitter resistor) and the emitter of Q117. Refer to figure 16.
4. Attach the BLACK probe lead to the junction of R130 (0.27 Ω emitter resistor) and the anode of D403.
5. Locate SVR102 on the main circuit board. Apply power and adjust SVR102 for a reading of approximately 5.5 millivolts.

Power Amplifier DC Offset Adjustment

NOTE

This adjustment requires a DC voltmeter.

1. Set the **POWER** switch to the OFF position. Rotate the **MASTER** level control fully counterclockwise to the ∞ position.
2. Connect the rated load impedance for the unit to the direct output (8 Ω for the 1707C, 4 Ω for the 1715C). Connect the DC voltmeter across the load.
3. Locate SVR101 on the main circuit board. Apply power and adjust SVR101 for a reading of 0.00 VDC \pm 10mV DC.

Parts Ordering

To order replacement parts, refer to the parts list. If part is not included on parts list, note the component designator from the schematic (or printed circuit board) and the component's description. Then call 405/324-5311, FAX 405/324-8981, or write:

ALTEC LANSING Replacement
Electronic Parts
P.O. Box 26105
Oklahoma City, OK 73126-0105 U.S.A.

Factory Service

If the unit requires factory service, ship the unit **prepaid** in the original carton (or a well-packed carton) to the following address:

ALTEC LANSING Customer
Service/Repair
10500 W. Reno
Oklahoma City, OK 73128 U.S.A.

Please enclose a note that provides the following information:

Any details describing the problem, and the conditions under which the problem occurred, such as where used, how used, and so forth.

Failure to enclose any helpful information may delay the processing of your service order.

Technical Assistance

For applications assistance or other technical information, call 405-324-5311, FAX 405-324-8981, or write:

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

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
IC 001	17-01-124804	TA 7317 P
IC 201	17-01-0374081	GD 74HC 368
IC 301, 501	17-01-027463	NJM 4558 DD
IC 605	17-01-0374061	SSM 2120
IC 602	17-01-0374111	TD 62507 P
IC 601	17-01-122833	NJM 5532 DD
IC 701	17-01-0374121	NJM 2068 DD
IC 603, 604	17-01-0374071	KIA 7359 P
Q114, 115 (1715C)	48-03-124821	NPN 2SC 3281 (1715C)
Q114, 115 (1707C)	48-03-0377261	NPN 2SD 718 (1707C)
Q116, Q117 (1715C)	48-03-124820	PNP 2SA 1302 (1715C)
Q116, 117 (1707C)	48-03-0377271	PNP 2SB 688 (1707C)
Q101-104, 107, 901	48-03-124824	NPN KTC 2240 BL
Q105, 106	48-03-0372371	PNP 2SA 965 Y
Q108, Q109	48-03-0374361	NPN 2SC 2235 Y
Q110	48-03-124822	NPN 2SC 2238 Y
Q111	48-03-0372361	PNP 2SA 968 Y
Q001, 408	48-03-0372721	NPN KTD 2058 Y
Q409	48-03-0372731	PNP KTB 1366 Y
Q403	48-03-0376761	NPN 2SD 1302 R
Q113, 301, 407	48-03-0372751	PNP KTA 1015 Y
Q002, 003, 112, 201-203, 302, 401, 402, 404-406, 902- 904	48-03-026624	NPN 2SC 1815 Y
D1	42-02-0375651	BRIDGE KBPC-25-04 LUG TYPE
D001, 002 (1715C)	48-01-0376741	6A2 (1715C)
D001, 002 (1707C)	48-01-0376781	1N 5402 (1707C)

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
D003-007, 012, 104, 601	48-01-027300	1N 4006
D101, 102	48-01-125214U	1N 60
D103-108, 201, 202, 301, 401- 403, 602, 603, 901, 902	48-01-122601	1N 4148
D008, 009	48-01-0374001	ZENER UZ-24BM
D010, 001, 013	48-01-113386	ZENER UZ-18BM
D203	48-01-0376801	ZENER UZ-5.6BM
POWER LED	39-01-0376811	REC KLR 208 2x5 RED
D903	39-01-0374021	LED SLR-54GG R5 GRE ROHM
CLIP LED, D904	39-01-0374031	LED SLR-54UR R5 RED ROHM
RLY A	45-01-0376821	RELAY T90N1D12 12- 24
RLY B	45-01-0373941	RELAY RY 24W-K DC 24V
SWITCH	51-02-0376831	SLIDE S5J622
THERMAL SWITCH	51-02-0374421	T105 ARIUI
F001, 002 (1715C)	51-04-0374381	NB 31.8 mm 4A/250V UL/CSA (1715C)
F1 (1715C)	51-04-0376841	NB 31.8 mm 6A/250V UL/CSA (1715C)
F1 (1707C)	51-04-0377281	SB 31.8mm 3A/250V UL/CSA (1707C)
F2 (1715C)	51-04-0376851	NB 31.8mm 7A/250V UL/CSA (1715C)
F2 (1707C)	51-04-0377291	NB 31.8mm 3.5A/250V UL/ CSA (1707C)
F001, 002 (1707C)	51-04-0377341	NB 31.8 mm 2A/250V UL/CSA (1707C)
SVR101, 102	47-06-0374391	SEMI 470B 10/5
SVR601	47-06-0373991	SEMI CS 100KB 10/5
VR901	47-06-0373951	Φ 16 K161 MOO-20KA

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
VR501, 502	47-06-037396I	Φ 16 K161 MOO-100KB CC
VR503	47-06-037686I	Φ 16 K161 MOO-50KB
VR601	47-06-037397I	Φ 12 K121 LOO-10KA
VR602	47-06-037398I	Φ 12 K121 LOO-10KRD
VR603	47-06-037687I	Φ 12 K121 LOO-100KB CC
tone level adjust	47-06-037688I	Φ 16 10KA×1
R127-130	47-01-124825	WW CE 0.27Ω 5W R
R000, 006	47-01-037201I	MO 10Ω 1W 5%
R131	47-02-037424I	MO 10Ω 3W W/COIL
R132	47-01-037248I	MO 4.7Ω 2W 5%
R010-012	47-01-037417I	WW CE 220Ω 5W R
R133	47-01-037690I	MO 270Ω 1W 5%
R015	47-01-037413I	MO 560Ω 2W 5%
R026, 213	47-01-037426I	MO 680Ω 1W 5%
R028	47-01-037414I	MO 1KΩ 2W 5%
R027	47-01-124803	MO 1.2KΩ 1W 5%
R601, 602	47-01-037691I	CF 33Ω 1/5W 5%
R623	47-01-037692I	CF 47Ω 1/5W 5%
R114	47-01-037422I	CF 68Ω 1/5W 5%
R331	47-01-037120I	CF 100Ω 1/5W 5%
R617, 619	47-01-037694I	CF 200Ω 1/5W 1%
R115, 116, 906	47-01-037252I	CF 220Ω 1/5W 5%
R118, 120 (1715C)	47-01-037210I	CF 470Ω 1/5W 5% (1715C)
R616	47-01-037695I	CF 1.00kΩ 1/5W 1%
R118, 120 (1707C)	47-01-037122I	CF 1.5 kΩ 1/5W 5% (1707C)
R107	47-01-037423I	CF 560Ω 1/5W 5%
R105, 106, 123-126, 404	47-01-037121I	CF 1kΩ 1/5W 5%
R606, 633	47-01-037371I	CF 1.2kΩ 1/5W 5%

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
R101	47-01-037122I	CF 1.5kΩ 1/5W 5%
R029, 030, 413, 416, 505, 506, 607	47-01-037696I	CF 2.2kΩ 1/5W 5%
R909	47-01-037253I	CF 3kΩ 1/5W 5%
R618	47-03-037697I	CF 3.24kΩ 1/5W 1%
R415, 910, 911	47-01-037254I	CF 3.3kΩ 1/5W 5%
R008, 009, 402, 905	47-01-037166I	CF 4.7kΩ 1/5W 5%
R417, 305	47-01-037255I	CF 5.6kΩ 1/5W 5%
R627, 628, 308 Note: If Q302 is a KTC1815(Y), then R308 is:	47-01-037168I 47-01-037125I	CF 7.5kΩ 1/5W 5% CF 15kΩ 1/5W 5%
R319, 504	47-01-037256I	CF 8.2kΩ 1/5W 5%
R002, 003, 119, 110-113, 208, 608-611, 630, 631, 904	47-01-037169I	CF 10kΩ 1/5W 5%
R502, 702, 706, 912	47-01-037124I	CF 12kΩ 1/5W 5%
R017, 103, 104, 108, 212	47-01-037125I	CF 15kΩ 1/5W 5%
R621	47-03-037700I	CF 15.0kΩ 1/5W 1%
R018	47-01-037171I	CF 18kΩ 1/5W 5%
R117	47-01-037172I	CF 20kΩ 1/5W 5%
R121, 122 (1715C)	47-01-037421I	CF 20 kΩ 1/5W 5% (1715C)
R620, 626	47-03-037701I	CF 30.1kΩ 1/5W 1%
R121, 122 (1707C)	47-01-037258I	CF 47kΩ 1/5W 5% (1707C)
R001, 022, 102, 403, 414	47-01-037257I	CF 22kΩ 1/5W 5%
R330	47-01-037357I	CF 27kΩ 1/5W 5%
R020, 204, 320,	47-01-037174I	CF 33kΩ 1/5W 5%
R615	47-03-037703I	CF 39.2kΩ 1/5W 1%
R908	47-01-037285I	CF 47kΩ 1/5W 5%

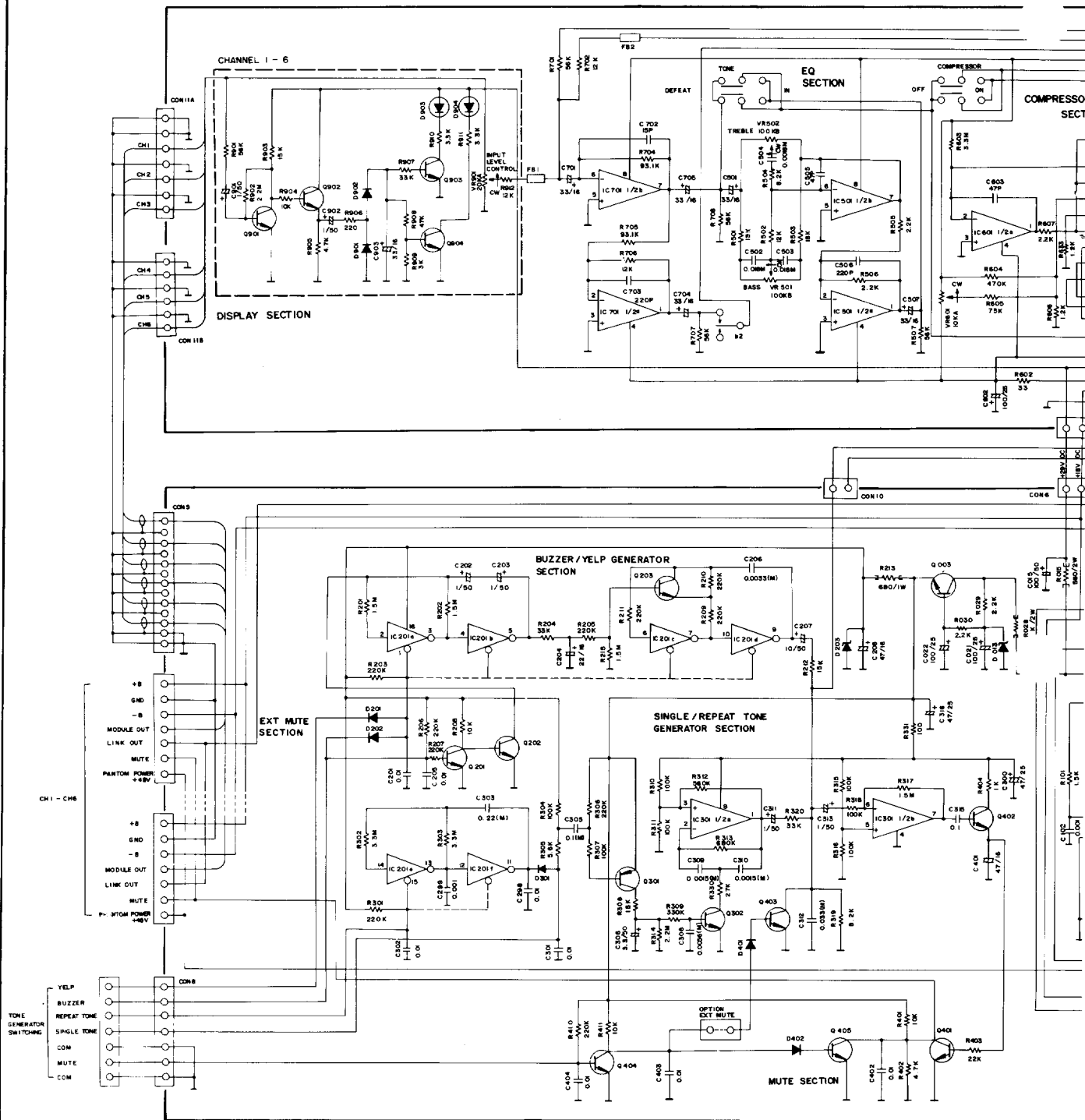
DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
R023, 109,	47-01-037258I	CF 47kΩ 1/5W 5%
R019, 024, 025, 507, 629, 632, 901, 707, 708, 701	47-01-037175I	CF 56kΩ 1/5W 5%
R605	47-01-037369I	CF 75KΩ 1/5W 5%
R704, 705	47-03-037704I	CF 93.1kΩ 1/5W 1%
R016, 304, 307, 310, 311, 315, 316, 318	47-01-037126I	CF 100kΩ 1/5W 5%
R412	47-01-037260I	CF 120kΩ 1/5W 5%
R624	47-03-037706I	CF 162kΩ 1/5W 1%
R021, 203, 209, 205-207, 210, 211, 301, 306, 410	47-01-037261I	CF 220kΩ 1/5W 5%
R612	47-03-037707I	CF 267kΩ 1/5W 1%
R625	47-03-037708I	CF 316kΩ 1/5W 1%
R309	47-01-037262I	CF 330kΩ 1/5W 5%
R613	47-03-037710I	CF 330kΩ 1/5W 5%
R604	47-01-037128I	CF 470kΩ 1/5W 5%
R312	47-01-037364I	CF 560kΩ 1/5W 5%
R313	47-01-037365I	CF 680kΩ 1/5W 5%
R201, 202, 215, 317	47-01-037363I	CF 1.5mΩ 1/5W 5%
R314, 902	47-01-037368I	CF 2.2mΩ 1/5W 5%
R302, 303, 603	47-01-037415I	CF 3.3mΩ 1/5W 5%
C017	15-01-037219I	AF RSA 0.47 μF 50V
C016, 202, 203, 311, 313, 605, 901, 902	15-01-124507	AF RSA 1 μF 50V
C306	15-01-037711I	AF RSA 3.3 μF 50V
C609	15-01-037712I	AF RSA 4.7 μF 25V
C607	15-01-037221I	AF RSA 4.7 μF 50V
C101, 112, 606, 615	15-01-122935	AF RSA 10 μF 35V

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
C111, 112, 207, 409	15-01-037222I	AF RSA 10 μF 50V
C204	15-01-037715I	AF RSA 22 μF 16V
C018	15-01-037143I	AF RSA 22 μF 25V
C501, 507, 612, 701, 704, 705, 903	15-01-037380I	AF RSA 33 μF 16V
C019, 103, 105, 208, 401	15-01-037716I	AF RSA 47 μF 16V
C300, 316	15-01-027327	AF RSA 47 μF 25V
C110	15-01-026641	AF RSA 47 μF 50V
C004, 005, 009, 010	15-01-037144I	AF RSA 47 μF 63V
C000	15-01-037717I	AF NP 47 μF 25V
C604, 614	15-01-037432I	AF RSA 100 μF 16V
C011, 012, 021, 022, 601, 602	15-01-037225I	AF RSA 100 μF 25V
C015	15-01-124503	AF RSA 100 μF 50V
C003	15-01-124501	AF RSA 100 μF 100V
C007	15-01-037427I	AF RSA 470 μF 50V
C001, 002 (1715C)	15-01-037428I	AF HM 6800 μF 63V (1715C)
C001, 002 (1707C)	15-01-037731I	AF HM 4700 μF 63V (1707C)
C309, 310	15-02-037429I	M 0.0015 μF 100V J
C504	15-06-037139I	M 0.0018 μF 100V J
C206	15-06-037140I	M 0.0033 μF 100V J
C308	15-06-037194I	M 0.0056 μF 100V J
C502, 503	15-06-037285I	M 0.018 μF 100V J
C312	15-06-037719I	M 0.033 μF 100V J
C408	15-06-037213I	M 0.047 μF 100V J
C305, 113	15-02-100109	M 0.1 μF 100V J
C303	15-06-037432I	M 0.22 μF 100V J
C702	15-02-100014	C 15pF 50V J

DESIGNATOR	ALTEC PART NUMBER	DESCRIPTION
C104, 505, 603, 613	15-02-107455	C 47pF 50V J
C106, 108, 109, 611	15-02-037205I	C 100pF 50V J
C506, 703	15-02-107470	C 220pF 50V J
C102, 107, 299, 608, 616	15-02-100304	C 0.001 μ F 50V Z
C201, 205, 298, 301, 302, 402-404	15-02-037179I	C 0.01 μ F 50V Z
C610	15-02-037164I	C 0.047 μ F 50V Z
C315	15-02-037165I	C 0.1 μ F 50V Z
C1	15-02-037724I	C 0.0047 μ F 400VAC
PT (1715C)	56-08-037441I	POWER TRANSFORMER (1715C)
PT (1707C)	56-08-037732I	POWER TRANSFORMER (1707C)
OPT (1715C)	56-07-037725I	OUTPUT TRANSFORMER (1715C)
OPT (1707C)	56-07-037733I	OUTPUT TRANSFORMER (1707C)

SCHEMATIC

SCHEMATIC



SERVICE INFORMATION

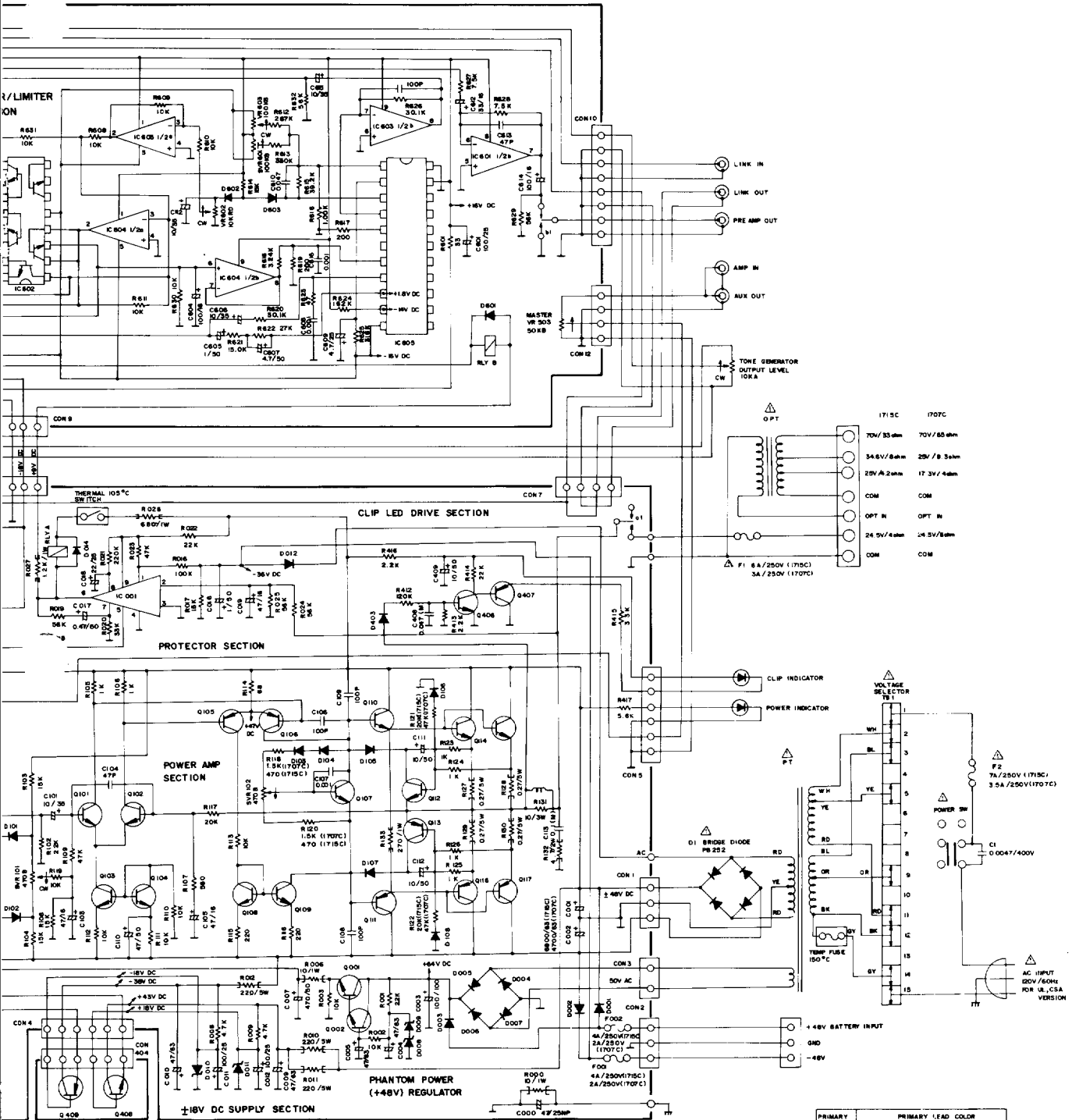
- RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
(E = 1,000; M = 1,000,000)
- CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
(P = MICRO - MICROFARADS)
- ALL VOLTAGES ARE REFERRED TO GROUND UNDER THE FOLLOWING CONDITIONS:
DC - NO SIGNAL EXCEPT WHITE INDICATED
AC - RMS
- PRECAUTION -
A) ALL COMPONENTS ARE MARKED MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER, INTEL PA CORPORATION AND INSTALLED AS THE ORIGINAL, SPACERS POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.
B) ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER WITH ROSIN CORE ONLY.
C) ALL COVERS, SHIELDS AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
D) A DAMAGED POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING TO CUSTOMER.
E) DIELECTRIC TEST CONSISTING OF 200V AC 60Hz IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUG AND THE EXPOSED CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.
F) THE 3-WAVE MARKED RESISTORS ARE MOUNTED THE P.C.B ON SLEEVES.

NOTE :

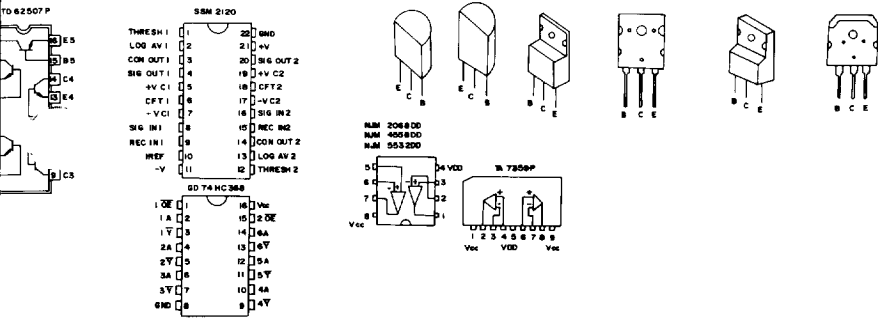
Q101 - Q104, Q107, Q109	: KTC 2240 (BL)	IC 201	: TA 7317P
Q105, Q108	: KTA 965 (Y)	IC 201, 201	: 6074 HC 368
Q106, Q109	: KTC 2280 (Y)	IC 301, 301	: 4561 (DUAL OP AMP)
Q110	: 2SC 2288 (Y)	IC 701	: 2068 (DUAL OP AMP)
Q111	: 2SA 968 (Y)	IC 401	: 3032 (DUAL OP AMP)
Q114, Q115	: 2BC 328 (O) - 1715C	IC 403, 404	: TA 7358P
	: 2BD 718 (O) - 1707C	IC 405, 405	: YD828 (7P)
Q116, Q117	: 2SA 808 (O) - 1715C	IC 602	: 258 888 (O) - 1707C
Q118, Q119	: 2SB 888 (O) - 1707C	IC 605	: 59M 2120
Q201, Q408	: KTD 2058 (Y) (REG)		
Q409	: KTB 1568 (Y) (REG)		
Q202, Q203, Q112, Q 201 - Q203, Q401, Q402, Q404 - 406, 302 - 304, 302	: KTC 1815 (Y)		
Q408	: KTD 1820P		
Q15, Q303, Q407	: KTA 1015 (Y)		
D1	: BRDIE DIODE PR252		
D001, D002	: 6A2 - 1715C		
	: 1N5402 - 1707C		
D003 - D007, D002, D004, D006	: 1N 4008		
D101, D102	: 1N 60		
D103 - D108, D201, D202, D301, D401 - D403, D802, D803, D804, D902	: 1N 4148		
D004, D1, D3	: ZENER 18 8M		
D203	: ZENER 5.6 8M		
D006, D009	: ZENER 24 8M		

CD
C1
E1
B1
SUB
2
E2
B2

DIAGRAM



PRIMARY LINE VOLTAGE	PRIMARY LEAD COLOR							
	WHITE	YELLOW	RED	BLUE	ORANGE			
100V	5	2	11	8	3			
120V	2	5	11	3	9			
200V	5	2	7	10	8			
220V	5	2	7	8	10			
240V	2	5	7	8	10			



EQUIPMENT	MIXER / AMPLIFIER	MODEL	1715C (1707C)
DRAWN	CHECKED	APPROVED	DATE
			90. 6.4
			DRAWING NO. 9880192