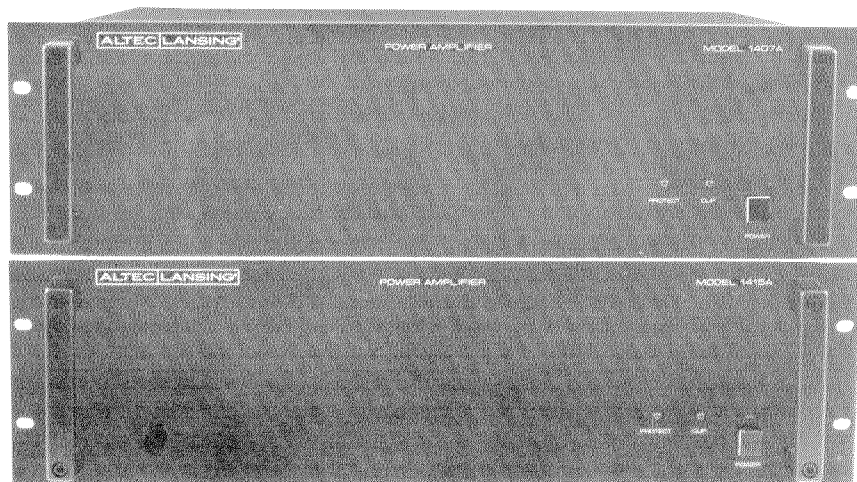


HIGH QUALITY, LOW COST

GENERAL PURPOSE MONAURAL POWER AMPLIFIERS



1407A and 1415A Power Amplifiers

- MASTER LEVEL CONTROL AND CONFIGURATION SWITCHES ARE REAR MOUNTED
- TWO AUXILIARY UNBALANCED OUTPUTS ARE PROVIDED
- FULLY PROTECTED FROM SHORT CIRCUITED LOADS

APPLICATIONS

- Clubs
- Convention Centers
- Hotel Paging Systems
- Houses of Worship
- Meeting Halls
- Monitoring Installations
- Touring Sound

DESCRIPTION

The Altec Lansing **1407A** and **1415A** power amplifiers are high quality low cost monaural power amplifiers for general purpose applications and those involving the use of ALTEC LANSING'S **1700** series mixer products.

Both amplifier models are identical in size and features and differ only in their output power ratings. The **1407A** is a 75 watt amplifier while the **1415A** produces 150 watts of continuous average output power. Included are many built-in features that far exceed what is normally found in amplifiers of this type. This fact undeniably eases any design chore. For example, the amplifiers include a 15 k Ω input bridging transformer, a 300 Hz high pass filter (switchable), a 15 dB input pad (switchable), and a choice of four input connector types; a 5-lug screw terminal, female XLR, male XLR, and a phono connector. The male XLR is also usable as a convenient patch output point for routing the input signal to another amplifier.

Two auxiliary unbalanced outputs are also provided. One is before (pre-fader), and the other after (post-fader), the MASTER output level control. These outputs greatly simplify many complex system designs. In addition to a 4 Ω direct output (8 Ω in **1407A**), a built-in output transformer provides a plurality of true balanced outputs including 8 Ω (4 Ω in **1407A**), 25 volts, and 70.7 volts.

The amplifiers are fully protected from short circuited loads, over temperature, and excessive load reactance, and the loads from turn-on/turn-off transients, subsonic signals, and DC. When a problem is detected the output relay automatically disconnects the load and illuminates the front panel PROTECT indicator. In addition, a front panel clipping indicator warns of excessive output levels. The MASTER level control and configuration switches are rear mounted for extra protection against "accidental" changes made by non-qualified personnel.

The Altec Lansing **1407A** and **1415A** power amplifiers are the choice in professional designs where quality, reliability, flexibility, and cost are of prime concern.

SPECIFICATIONS FOR THE 1407A AND 1415A POWER AMPLIFIERS

(Note: The following specifications apply to both models unless noted.)

Continuous Average Output Power

(Direct or transformer output)

1415A	150 watts
1407A	75 watts

Maximum Midband Output Power

(Ref. 1 kHz, 1% THD)

Direct Output

1415A	200 watts
1407A	100 watts

Transformer Output

(Any output tap)

1415A	190 watts
1407A	95 watts

Power Bandwidth

(+0/−3 dB. Ref. 1 kHz at rated output power)

Direct Output 20 Hz - 20 kHz

Transformer Output 50 Hz - 15 kHz
(Any output tap)

Frequency Response

Ref. 1 kHz at 1 watt output power)

Direct Output

±1 dB	20 Hz - 20 kHz
±3 dB	10 Hz - 30 kHz

Transformer Output

(Any output tap)

±1 dB	20 Hz - 16 kHz
±3 dB	10 Hz - 30 kHz

Total Harmonic Distortion (THD)

(Ref. 1 kHz at rated output power, 30 kHz low pass filter)

Direct Output

20 Hz	< 0.1%
1 kHz	< 0.01%
20 kHz	< 0.1%

Transformer Output

(Any output tap)

50 Hz	< 1.0%
1 kHz	< 0.02%
15 kHz	< 0.1%

Intermodulation

Distortion (SMPTE)

< 0.01%

SMPTE 4:1, at rated output power, direct output

Input High Pass Filter

Frequency 300 Hz, switchable

Slope −12 dB/oct (−40 dB/dec)

Input Sensitivity/Input Impedance

(Ref. 1 kHz, 0 dBu = 0.775 vrms)

Balanced Line Input 0 dBu/SB-15kΩ

(Pad switched "out")

Balanced Line Input −15 dBu/SB-15kΩ

(Pad switched "In")

Unbalanced Line

Input

(Phono connector) 0 dBu/47 kΩ

Input Pad

(Ref. 1 kHz)

Type Balanced "H", switchable

Attenuation 15 dB, ±1 dB

Maximum Input Level +35 dBu (43.5 vrms)

(Ref. 1 kHz, pad in, signal applied to XLR female, MASTER off)

Output Level/Load Impedance

(Ref. 1 kHz,) dBu = 0.775 vrms applied to balanced line input, ±1 dB)

Line Output 0 dBu/15 kΩ

(XLR male, balanced)

PRE Auxiliary 0 dBu/600 Ω

Output

(Pre-fader, unbalanced, phono connector)

POST Auxiliary 0 dBu/600 Ω

Output (Post-fader,

unbalanced, phono connector)

1415A Direct 24.5 vrms/4 Ω

Output

(Unbalanced)

1415A Transformer Output (Balanced)	25 vrms/4.2 Ω 34.6 vrms/8 Ω 70.7 vrms/33.3 Ω
1407A Direct Output (Unbalanced)	24.5 vrms/8 Ω
1407A Transformer Output (Balanced)	17.3 vrms/4 Ω 25 vrms/8.3 Ω 70.7 vrms/66.7 Ω
Damping Factor (20 Hz - 1 kHz, direct output)	> 50
Output Regulation (Ref. 1 kHz, no load to full load)	
Direct Output	< 0.5 dB
Transformer Output	< 1.0 dB
Signal-to-Noise Ratio (A-weighted, MASTER at full clockwise position, input shorted, pad and high pass filter switched out)	> 100 dB
Connectors	
Input	1 - XLR female 1 - 5-lug screw terminal 1 - Phono
Output	1 - XLR male 2 - phono 1 - 7-terminal barrier strip
AC	1 - Aux AC grounding outlet (500 watts max)
Controls and Indicators	
Front Panel	1 - Power on-off switch 1 - Power indicator LED 1 - CLIP indicator LED 1 - PROTECT indicator LED
Rear Panel	1 - MASTER output level control 1 - 15 dB PAD switch

1 - 300 Hz high pass filter switch

Amplifier/Load Protection

Short Circuited loads
Excessive load reactance
RF

Requirements

Excessive temperature
Power
100, 120, 200, 220, or
240 vac, 50/60 Hz,

Power Consumption/Heat Generated

1415A (Max. output power) 365 watts/580 BTU/hr

1407A (Max. output power) 175 watts/255 BUT/hr

1415A (1/3 rd Max. output power) 230 watts/560 BTU/hr

1407A (1/3 rd Max. output power) 130 watts/330 BTU/hr

Operating

Temperature Range

Up to 60 °C (140 °F)

Dimensions

5¼" (13.3 cm) H x 19" (48.2 cm) W x 12½" (31.7 cm) D

Weight

(Net)

1415A 30.8 lbs (14 kg)

1407A 24.2 lbs (11 kg)

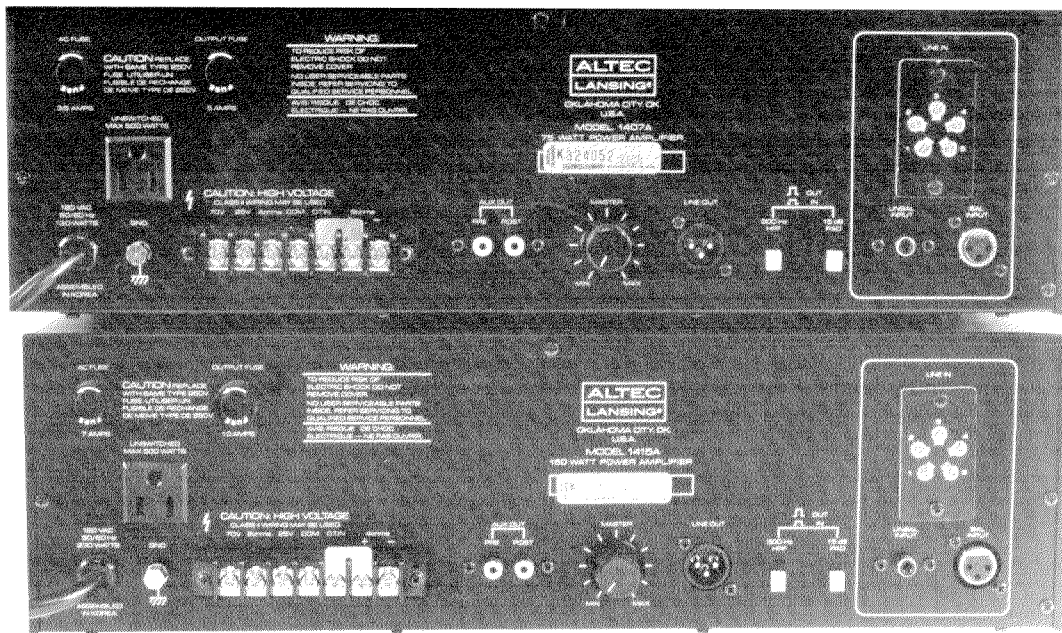
Color

Black

Included Accessories

1 - Operating/Service Instructions
1 - Shorting bar (Direct out to OT IN, installed)
4 - Rubber feet (installed)
1 - 220/240 voltage sticker (for Int'l use)
1 - Fuse sticker (for Int'l use)
1 - Fuse (for Int'l use)
1 - Rack mount hardware kit

ALTEC LANSING continually strives to improve products and performance. Therefore specifications are subject to change without notice.



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The power amplifier shall be a monaural amplifier of solid state design employing true complementary symmetry output circuitry and capable of operating from a 100, 120, 200, 220, or 240 vac, 50/60 Hz line. The amplifier shall provide a plurality of balanced transformer output taps as well as an unbalanced direct output, and a bridging input transformer for input isolation. The amplifier shall contain sensing circuitry to provide protection for the output transistors against over temperature, excessive output voltage, radio frequency interference, excessive output current, and excessive output phase shift. The load shall be similarly protected against subsonic signals, start-up/shutdown transients, low AC line voltage, and DC.

Rear mounted panel controls and switches shall include an input level control, a 300 Hz high pass filter in/out switch, and an attenuator in/out switch. The attenuator, when engaged, shall attenuate the input level by 15 dB. Input connectors shall include a 5-lug screw terminal connector and a 3-pin XLR female connector for balanced inputs, and a phono connector for unbalanced inputs. Output connectors shall include a 3-pin XLR male connector, two phono connectors as auxiliary unbalanced outputs, and a 7-terminal barrier strip connector.

Front panel illuminated indicators shall include a power on/off indicator, a signal clipping indicator, and a protection circuit activation indicator. The front panel control shall be the power on/off switch.

The amplifier shall include an input bridging transformer with a nominal input impedance of 15 k Ω . A power output isolation transformer shall provide balanced outputs of 25 volts (4.2 Ω load), 8 ohms (34.6 volts), and 70 volts (33.3 Ω load) (**1415A**), or 4 ohms (17.3 volts), 25 volts (8.3 Ω load), and 70 volts (66.7 Ω load) (**1407A**);

The power amplifier shall meet the following performance criteria. Maximum input voltage: 9.75 vrms (pad out). Input voltage for rated output power: 0.775 vrms (MASTER at maximum). Rated output power (direct output): 150 watts from 20 Hz to 20 kHz at less than 0.1% THD (**1415A**), or 75 watts from 20 Hz to 20 kHz at less than 0.1% THD (**1407A**). Minimum load impedance (direct power output): 4 Ω (**1415A**) or 8 Ω (**1407A**). Hum and noise: at least 100 db below rated output power (A weighted). Damping factor: greater than 50 from 20 Hz up to 1 kHz. Intermodulation distortion (SMPTE): less than 0.01%. Heat Generated (at 1/3rd rated output power): not more than 680 BTU/hr (**1415A**), or 340 BTU/hr (**1407A**). Operating temperature range: up to 60 $^{\circ}$ C (140 $^{\circ}$ F) ambient. Dimensions: 5 1/4" H x 19" W x 12 1/2" D. Net weight: 30.8 lbs (**1415A**), or 24.2 lbs (**1407A**). Color: black. Enclosure: Rack mountable chassis.

The power amplifier shall be the ALTEC LANSING Model **1415A** (or the ALTEC LANSING Model **1407A**).



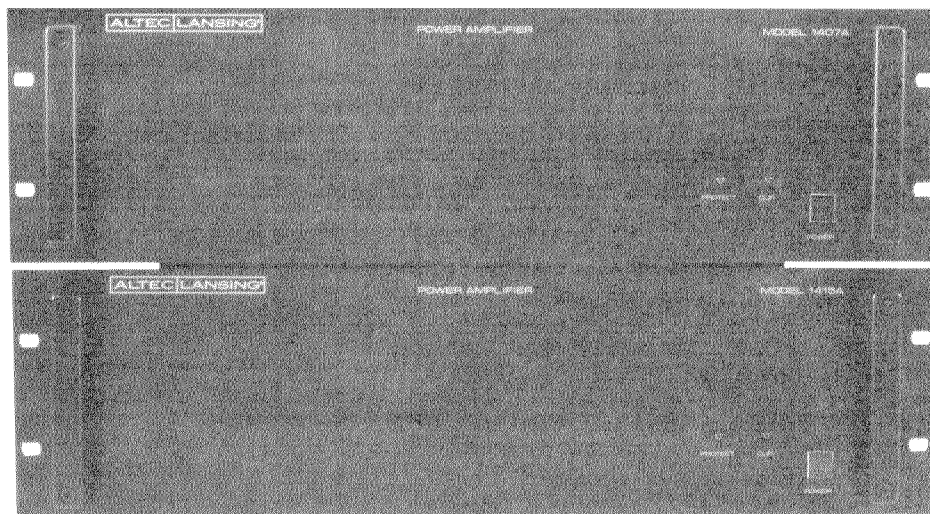
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1407A AND 1415A POWER AMPLIFIERS



DESCRIPTION

The ALTEC LANSING **1407A** and **1415A** power amplifiers are high quality low cost monaural power amplifiers for general purpose applications and those involving the use of ALTEC LANSING's **1700** series mixer products.

Both amplifier models are identical in size and features and differ only in their output power ratings. The **1407A** is a 75 watt amplifier while the **1415A** produces 150 watts of continuous average output power. Included are many built-in features that far exceed what is normally found in amplifiers of this type. This fact undeniably eases any design chore. For example, the amplifiers include a 15 k Ω input bridging transformer, a 300 Hz high pass filter (switchable), a 15 dB input pad (switchable), and a choice of four input connector types; a 5-lug screw terminal, female XLR, male XLR, and a phono connector. The male XLR is also usable as a convenient patch output point for routing the input signal to another amplifier.

Two auxiliary unbalanced outputs are also provided. One is before (pre-fader), and the other

after (post-fader), the MASTER output level control. These outputs greatly simplify many complex system designs. In addition to a 4 Ω direct output (8 Ω in **1407A**), a built-in output transformer provides a plurality of true balanced outputs including 8 Ω (4 Ω in **1407A**), 25 volts, and 70.7 volts.

The amplifiers are fully protected from short circuited loads, over temperature, and excessive load reactance, and the loads from turn-on/turn-off transients, subsonic signals, and DC. When a problem is detected, the output relay automatically disconnects the load and illuminates the front panel PROTECT indicator. In addition, a front panel clipping indicator warns of excessive output levels. The MASTER level control and configuration switches are rear mounted for extra protection against "accidental" changes made by non-qualified personnel.

The ALTEC LANSING **1407A** and **1415A** power amplifiers are the choice in professional designs where quality, reliability, flexibility, and cost are of prime concern.

SPECIFICATIONS

(Note: The following specifications apply to both models unless noted.)

Continuous Average Output Power

(Direct or transformer output)

1415A	150 watts
1407A	75 watts

Maximum Midband Output Power

(Ref. 1 kHz, 1% THD)

Direct Output

1415A	200 watts
1407A	100 watts

Transformer Output

(Any output tap)

1415A	190 watts
1407A	95 watts

Power Bandwidth

(+0/−3 dB. Ref. 1 kHz at rated output power)

Direct Output 20 Hz - 20 kHz

Transformer Output 50 Hz - 15 kHz

(Any output tap)

Frequency Response

Ref. 1 kHz at 1 watt output power)

Direct Output

±1 dB	20 Hz - 20 kHz
±3 dB	10 Hz - 30 kHz

Transformer Output

(Any output tap)

±1 dB	20 Hz - 16 kHz
±3 dB	10 Hz - 30 kHz

Total Harmonic Distortion (THD)

(Ref. 1 kHz at rated output power, 30 kHz low pass filter)

Direct Output

20 Hz	< 0.1%
1 kHz	< 0.01%
20 kHz	< 0.1%

Transformer Output

(Any output tap)

50 Hz	< 1.0%
1 kHz	< 0.02%
15 kHz	< 0.1%

Intermodulation

Distortion (SMPTE)

< 0.01%

SMPTE 4:1, at rated output power, direct output

Input High Pass Filter

Frequency	300 Hz, switchable
Slope	−12 dB/oct (−40 dB/dec)

Input Sensitivity/Input Impedance

(Ref. 1 kHz, 0 dBu = 0.775 vrms)

Balanced Line Input 0 dBu/15Ω
(Pad switched "out")

Balanced Line Input −15 dBu/15Ω
(Pad switched "In")

Unbalanced Line

Input

(Phono connector) 0 dBu/47 kΩ

Input Pad

(Ref. 1 kHz)

Type	Balanced "H", switchable
Attenuation	15 dB, ±1 dB

Maximum Input Level +35 dBu (43.5 vrms)

(Ref. 1 kHz, pad in, signal applied to XLR female, MASTER off)

Output Level/Load Impedance

(Ref. 1 kHz,) dBu = 0.775 vrms applied to balanced line input, ±1 dB)

Line Output 0 dBu/15 kΩ
(XLR male, balanced)

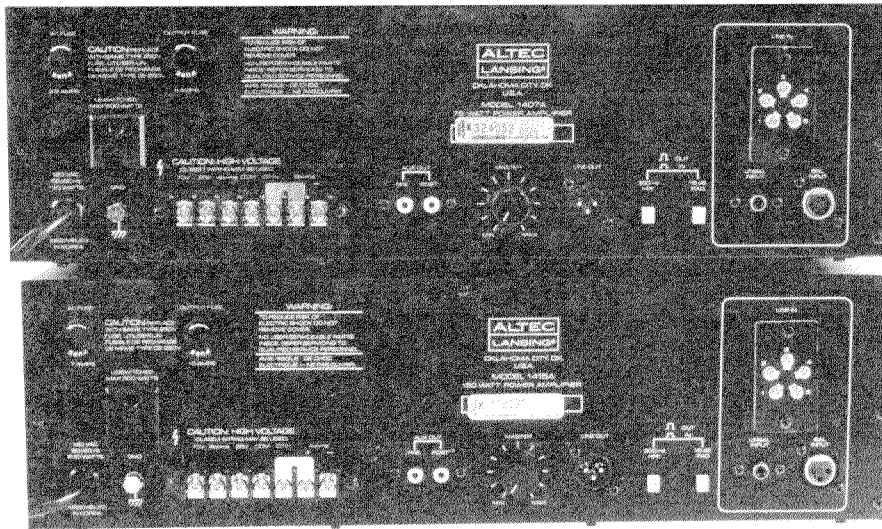
PRE Auxiliary Output 0 dBu/600 Ω
(Pre-fader, unbalanced, phono connector)

POST Auxiliary Output 0 dBu/600 Ω
(Post-fader, unbalanced, phono connector)

1415A Direct Output 24.5 vrms/4 Ω
(Unbalanced)

1415A Transformer Output (Balanced)	25 vrms/4.2 Ω 34.6 vrms/8 Ω 70.7 vrms/33.3 Ω	1 - 300 Hz high pass filter switch
1407A Direct Output (Unbalanced)	24.5 vrms/8 Ω	
1407A Transformer Output (Balanced)	17.3 vrms/4 Ω 25 vrms/8.3 Ω 70.7 vrms/66.7 Ω	
Damping Factor (20 Hz - 1 kHz, direct output)	> 50	
Output Regulation (Ref. 1 kHz, no load to full load)		
Direct Output	< 0.5 dB	
Transformer Output	< 1.0 dB	
Signal-to-Noise Ratio (A-weighted, MASTER at full clockwise position, input shorted, pad and high pass filter switched out)	> 100 dB	
Connectors		
Input	1 - XLR female 1 - 5-lug screw terminal 1 - Phono	
Output	1 - XLR male 2 - phono 1 - 7-terminal barrier strip	
AC	1 - Aux AC grounding outlet (500 watts max)	
Controls and Indicators		
Front Panel	1 - Power on-off switch 1 - Power indicator LED 1 - CLIP indicator LED 1 - PROTECT indicator LED	
Rear Panel	1 - MASTER output level control 1 - 15 dB PAD switch	
Amplifier/Load Protection		Short Circuited loads Excessive load reactance RF Excessive temperature
Requirements		C Power 100, 120, 200, 220, or 240 vac, 50/60 Hz,
Power Consumption/Heat Generated		
1415A (Max. output power)	365 watts/580 BTU/hr	
1407A (Max. output power)	175 watts/255 BUT/hr	
1415A (1/3 rd Max. output power)	230 watts/560 BTU/hr	
1407A (1/3 rd Max. output power)	130 watts/330 BTU/hr	
Operating Temperature Range		Up to 60 °C (140 °F)
Dimensions		5¼" (13.3 cm) H x 19" (48.2 cm) W x 12½" (31.7 cm) D
Weight (Net)		
1415A	30.8 lbs (14 kg)	
1407A	24.2 lbs (11 kg)	
Color		Black
Included Accessories		1 - Operating/Service Instructions 1 - Shorting bar (Direct out to OT IN, installed) 4 - Rubber feet (installed) 1 - 220/240 voltage sticker (for Int'l use) 1 - Fuse sticker (for Int'l use) 1 - Fuse (for Int'l use) 1 - Rack mount hardware kit

ALTEC LANSING continually strives to improve products and performance. Therefore specifications are subject to change without notice.



ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The power amplifier shall be a monaural amplifier of solid state design employing true complementary symmetry output circuitry and capable of operating from a 100, 120, 200, 220, or 240 vac, 50/60 Hz line. The amplifier shall provide a plurality of balanced transformer output taps as well as an unbalanced direct output, and a bridging input transformer for input isolation. The amplifier shall contain sensing circuitry to provide protection for the output transistors against over temperature, excessive output voltage, radio frequency interference, excessive output current, and excessive output phase shift. The load shall be similarly protected against subsonic signals, start-up/shutdown transients, low AC line voltage, and DC.

Rear mounted panel controls and switches shall include an input level control, a 300 Hz high pass filter in/out switch, and an attenuator in/out switch. The attenuator, when engaged, shall attenuate the input level by 15 dB. Input connectors shall include a 5-lug screw terminal connector and a 3-pin XLR female connector for balanced inputs, and a phono connector for unbalanced inputs. Output connectors shall include a 3-pin XLR male connector, two phono connectors as auxiliary unbalanced outputs, and a 7-terminal barrier strip connector.

Front panel illuminated indicators shall include a power on/off indicator, a signal clipping indicator, and a protection circuit activation indicator. The front panel control shall be the power on/off switch.

The amplifier shall include an input bridging transformer with a nominal input impedance of 15 k Ω . A power output isolation transformer shall provide balanced outputs of 25 volts (4.2 Ω load), 8 ohms (34.6 volts), and 70 volts (33.3 Ω load) (**1415A**), or 4 ohms (17.3 volts), 25 volts (8.3 Ω load), and 70 volts (66.7 Ω load) (**1407A**);

The power amplifier shall meet the following performance criteria. Maximum input voltage: 9.75 vrms (pad out). Input voltage for rated output power: 0.775 vrms (MASTER at maximum). Rated output power (direct output): 150 watts from 20 Hz to 20 kHz at less than 0.1% THD (**1415A**), or 75 watts from 20 Hz to 20 kHz at less than 0.1% THD (**1407A**). Minimum load impedance (direct power output): 4 Ω (**1415A**) or 8 Ω (**1407A**). Hum and noise: at least 100 db below rated output power (A weighted). Damping factor: greater than 50 from 20 Hz up to 1 kHz. Intermodulation distortion (SMPTE): less than 0.01%. Heat Generated (at 1/3rd rated output power): not more than 680 BTU/hr (**1415A**), or 340 BTU/hr (**1407A**). Operating temperature range: up to 60 $^{\circ}$ C (140 $^{\circ}$ F) ambient. Dimensions: 5 $\frac{1}{4}$ " H x 19" W x 12 $\frac{1}{2}$ " D. Net weight: 30.8 lbs (**1415A**), or 24.2 lbs (**1407A**). Color: black. Enclosure: Rack mountable chassis.

The power amplifier shall be the ALTEC LANSING Model **1415A** (or the ALTEC LANSING Model **1407A**).



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OPERATING AND INSTALLATION INSTRUCTIONS FOR THE **1407A** AND **1415A** POWER AMPLIFIERS

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1.0 ELECTRICAL CONNECTIONS

1.1 120 Volt, 50/60 Hz Power Connections

The amplifier is configured with the primary of the power transformer strapped for 120 volt operation from the factory. Refer to Table I. for the exact strapping details and other voltage options.

The numbers in Table I. correspond to numbered positions on the AC terminal block connector adjacent to the power transformer. A line voltage is selected by installing the colored primary leads into the designated numbered positions on the terminal block.

NOTE

Verify that the line voltage is in accordance with the selected voltage before connecting the amplifier to the AC line.

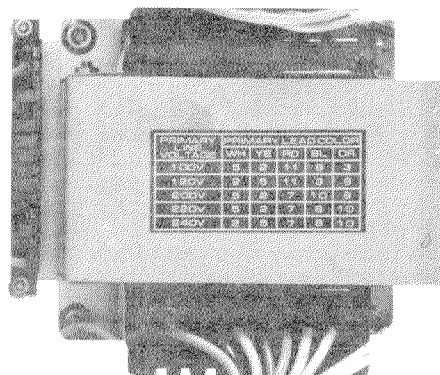


Figure 2. Location of Voltage Selection Terminal Block

Table I. AC Line Voltage Selection and Strapping Options 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

1.2 100, 200, 220, and 240 volt, 50/60 Hz Power Connections

The amplifier may be powered from line voltages other than 120 volts by re-strapping the primary of the power transformer. Follow the procedures below to change the factory strapping to the desired line voltage.

1. Remove the seven screws securing the top cover. There are two screws on each side, two screws on the top near the rear edge of the rear panel. Refer to Figure 1 for details.

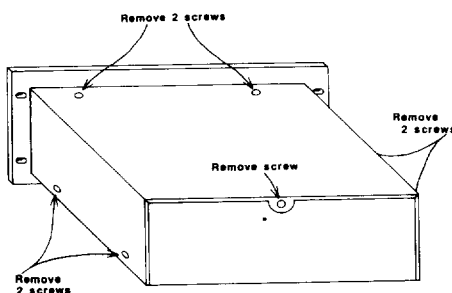


Figure 1. Top Cover Removal

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

3. While referring to Table I., disconnect the primary leads from the terminal block and reconnect each lead into its designated position on the terminal block corresponding to the desired line voltage. Pull each wire firmly to disengage the push-on connector. Press each connector firmly to snap into place.

4. Install the appropriate fuse value from Table II. below.

Table II. Fuse Value Selection Chart

AC Line Voltage	1415A AC Line Fuse (Type 3AG)	1407A AC Line Fuse (Type 3AG)
100V	7 Amp/250 Volt	3.5 Amp/250 Volt
120V	7 Amp/250 Volt	3.5 Amp/250 Volt
200V	4 Amp/250 Volt	2 Amp/250 Volt
220V	4 Amp/250 Volt	2 Amp/250 Volt
240V	4 Amp/250 Volt	2 Amp/250 Volt

NOTE

Use of fuses other than those listed in Table II. will void the warranty.

If the power transformer's primary leads were connected for 100, 220, or 240 volt operation, perform Steps 5, 6, and 7 to prevent future confusion and possible damage to the amplifier. Otherwise, proceed with Step 8.

5. Affix the 220/240 VAC label above the power cord's strain relief to cover the 120 VAC silkscreened designation.
6. Affix the appropriate fuse label over the original silkscreened designation. Refer to Figure 3. Apply the 4 Amp label to the 1415A. The 1407A requires the 2 Amp label. The appropriate label is included with each amplifier.

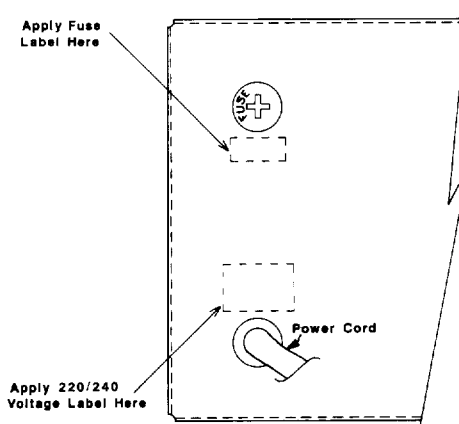


Figure 3. Location of Voltage Stickers for 220/240 V Installations

7. Replace the AC line fuse with the appropriate fuse type and value from Table II. The proper fuse for the amplifier was enclosed in the plastic bag along with this manual.
8. Re-install the top cover. Secure with the seven screws previously removed in Step 1.

2.0 SHELF OR RACK MOUNTING THE AMPLIFIERS

The power amplifier may be either shelf or rack mounted. For shelf or countertop applications, rubber feet are provided to protect the resting surface and to provide elevation for air flow underneath the unit. For rack or cabinet applications, remove the four rubber feet from the bottom of the chassis and install the unit in the rack with the screws and shoulder washers provided.

2.1 Ventilation

The amplifier generates minimal heat during normal use. Although the amount of heat is relatively low, the amplifier must be ventilated to prevent an excessive temperature rise. Because the output power devices (transistors) are sensitive to heat, the amplifier should not be sandwiched between other heat generating equipment or in areas where the ambient temperature exceeds 60°C (140°F).

If the amplifier is mounted in an equipment rack or cabinet with other heat-producing equipment, space must be provided between the units or they may become too warm. A 1¼ in. (4.45 cm) perforated panel is recommended for this purpose.

In a rack or cabinet containing several amplifiers, the acceptability of the air temperature may be in question. To determine the ambient 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. Do not let the thermometer bulb touch the metal chassis because the chassis will probably be hotter than the ambient air. If the air temperature exceeds 60°C (140°F), the equipment should be spaced farther apart or a blower should be installed to provide air movement within the cabinet.

CAUTION
Do not block the air intake holes located on the bottom of the chassis or the exhaust holes on the top cover.

3.0 SIGNAL CONNECTIONS

A block diagram of the power amplifier is shown in Figure 4. Study it carefully. A good understanding of the amplifier is mandatory if it is to be utilized to its fullest extent.

3.1 Balanced Input Connections

Two balanced input connectors are provided, a 5-lug screw terminal and an XLR-female connector. The 5-lug screw terminal connector is suitable for fixed installations where permanent wiring is preferable. The XLR-female connector is provided primarily for portable applications. Both connectors are wired in parallel. Select one connector only and leave the other disconnected. Do not attempt to use both connectors at the same time. For wiring purposes, refer to Table III.

A 15 kΩ input bridging transformer is supplied in the amplifier to provide full transformer isolation and protection from radio frequency interference. Between the input connectors and the transformer's primary winding is a 25

dB attenuation pad which may be switched in or out as needed. The pad permits high line levels in excess of +15 dBu (Ref: 0 dBu = 0.775 vrms) to be handled by the amplifier's input circuitry.

Table III. Balanced Input Connector Wiring

Signal Connections	5-lug Screw Terminal	3 Terminal XLR-female
Gnd (Shield)	1	1
Hi (+)	2	2
Lo (-)	3	3
	4 Not used	
	5 Not used	

NOTE

With the output level control fully clockwise and the pad switched "out", a nominal input signal level of 0 dBu (0.775 vrms) will produce rated output power.

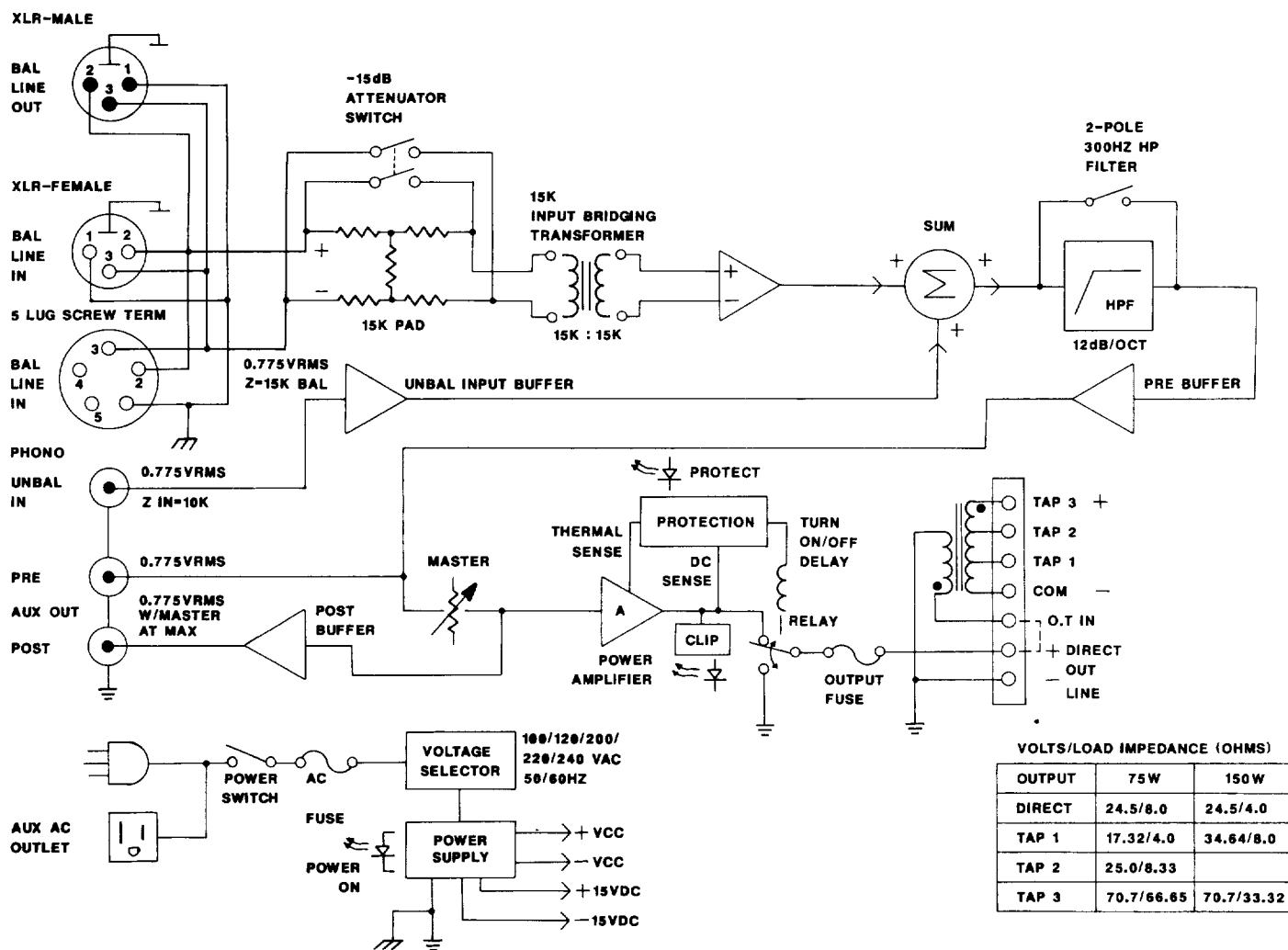


Figure 4. Power Amplifier Block Diagram

Since the input transformer provides a bridging (high impedance) input, many amplifiers may be "paralleled" and driven from a single source. However if only one amplifier is used and the driving source requires a terminating resistor, a 600 Ω (or other appropriate value) resistor should be installed between terminals 2 and 3 of the 5-lug screw terminal connector. Refer to Figure 5 for some typical input configurations.

3.2 Unbalanced Input Connections

The unbalanced input (phono connector) has an input impedance of approximately 47 k Ω and a sensitivity of 0 dBu. The input may be driven directly from background music sources such as tape, cassette, or CD players. The input is also designed to interface directly with the preamp out or AUX OUT outputs from a 1700 series mixer/power amplifier or compatible products.

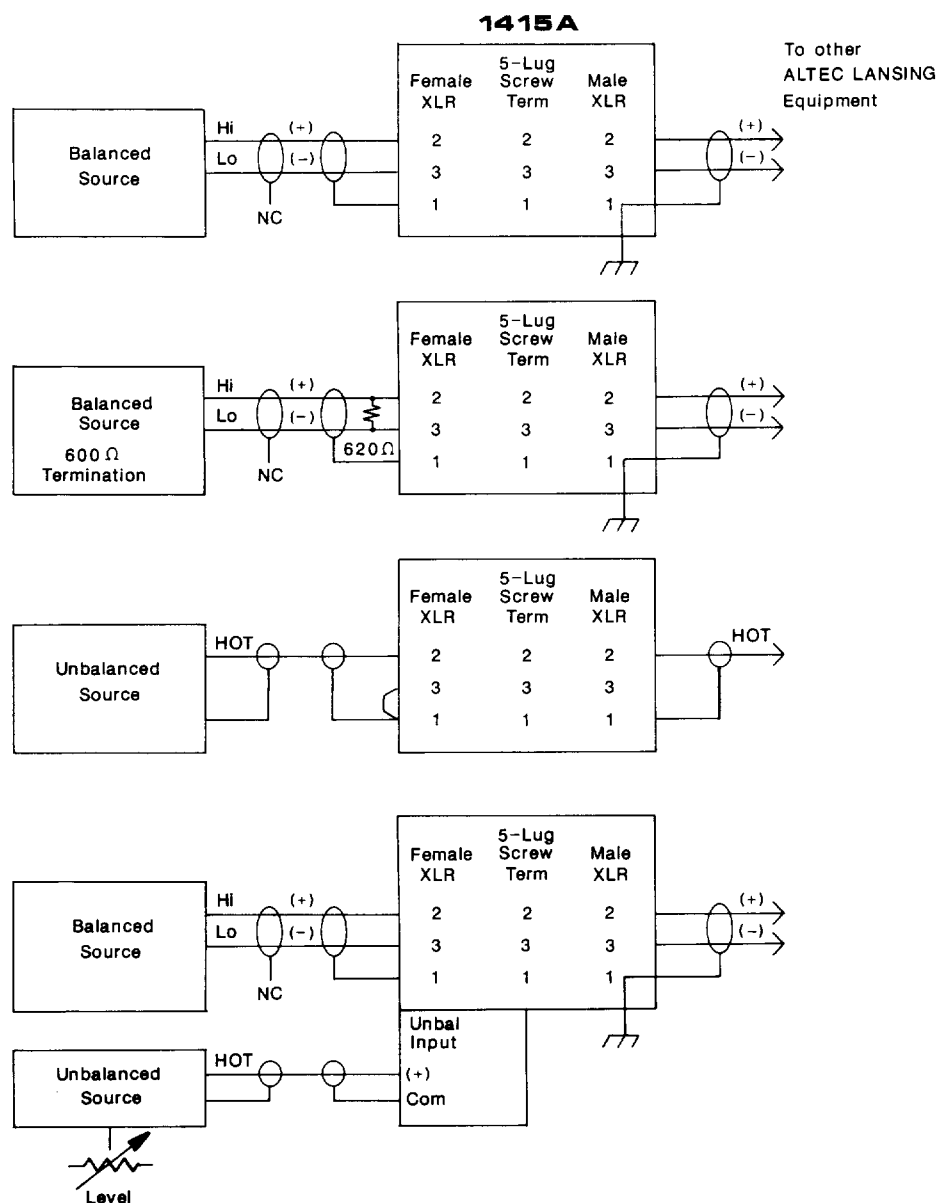


Figure 5. Typical Input Connection Options

As mentioned earlier, a 15 dB pad is included as a standard feature of the input circuitry. When the push-push switch (rear panel) is "out", the pad will be bypassed. The pad affects the balanced input signal only. It does not affect the unbalanced input signal (phono connector).

Since the balanced and unbalanced inputs are actively and equally mixed in the summing amplifier, it is possible to use them both simultaneously with two different sources. For example, the unbalanced input could be used as a background music input while the balanced input accepts a feed from a separate

mixer such as the 1700B. One word of caution, however, the unbalanced input signal is mixed in equal proportion to the balanced input signal and no means exist within the amplifier to perform "mixing" via level controls or trims. Therefore, any level adjustments must be done at the signal sources. Refer to Figure 4.

3.3 300 Hz High Pass Filter

A switchable 300 Hz high pass filter is included in the signal path of the amplifier. When the push-push switch (rear panel) is "out", the filter is bypassed. Since the filter is preceded by the summing amplifier, it will affect the balanced and unbalanced signals when switched to the "in" position.

3.4 The Line Output

An XLR-male connector wired in parallel with the balanced input connector(s) provides a signal "flow-thru" connection or patch point to another amplifier. The LINE OUT capabilities are limited only by the driving source feeding the amplifier. Refer to the block diagram shown in Figure 4 and to the typical input connections in Figure 5.

NOTE

If the balanced input is configured in an unbalanced mode, then the LINE OUTPUT will be unbalanced.

3.5 Auxiliary Outputs: PRE and POST

Two other unbalanced outputs are provided in the amplifier, the PRE and POST auxiliary outputs. The PRE output is pre-fader meaning that the signal appearing at this output is the signal feeding the MASTER level control. The signal appearing at the POST output is the signal taken from the wiper of the MASTER level control. As a result, the POST output signal level is variable as a function of the MASTER control setting.

The PRE output may feed the unbalanced input of a second amplifier where its level may be independently controlled by the second unit's MASTER control. If it is necessary for one MASTER to simultaneously control the levels of several 1400-series amplifiers, connect the POST output to the unbalanced inputs of the additional units.

The PRE or POST outputs may be used with the unbalanced input of another 1400 series amplifier, or the LINK IN or AMP IN on a 1715A mixer/power amplifier mainframe. Refer to Figure 6 for typical connection schemes.

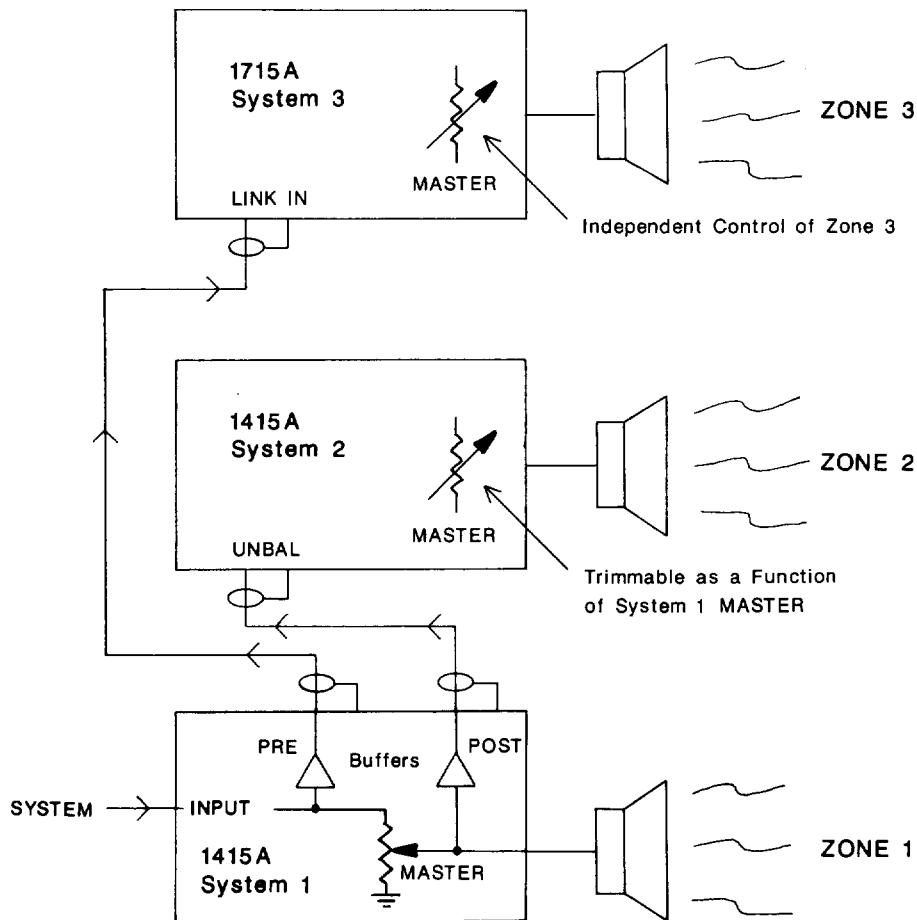
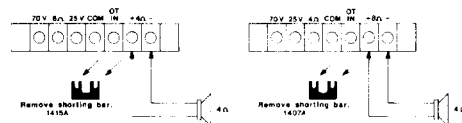


Figure 6. Typical PRE and POST Connections

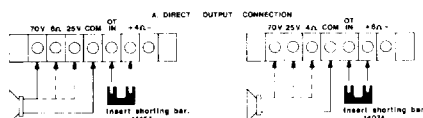
The nominal level of the PRE output is 0 dBu (0.775 vrms). The POST output level varies from less than -70 dBu (MASTER at full counterclockwise) up to 0 dBu. Both outputs are fully buffered and can drive loads as low as 600 ohms.

3.6 Output Connections

All power output connections are made to the 7-terminal barrier strip connector on the rear panel. The 1415A provides a 4 Ω direct output (24.5 vrms), and a 25 vrms (4.2 Ω), 8 Ω (34.6 vrms), and 70.7 vrms (33 Ω) balanced transformer output. The 1407A provides an 8 Ω direct output (24.5 vrms), along with a 4 Ω (17.3 vrms), 25 vrms (8.3 Ω), and a 70.7 vrms (66.7 Ω) balanced transformer output. For connection details, refer to Figures 7a and b.



a. Direct Output Connections



b. Transformer Output Connections

Figure 7. Output Connections

NOTE

When using the output transformer, any combination of 70.7V, 25V, or 8/4 Ω outputs may be used simultaneously as long as the total connected load does not consume more than the total rated output power of the amplifier.

If only the direct output is used, remove (and save) the shorting bar normally installed by the factory between the direct output and OT IN (Output Transformer Input).

4.0 PROTECTION SYSTEMS

4.1 Output Fuse

The output of the amplifier is fused to prevent damage from excessive current flow. If replacement of the fuse ever becomes necessary, replace only with a fuse of the same type and rating as the original installed in the unit. If the fuse continues to blow, check for a shorted load or a load consuming more than the amplifier's rated output power. If the load appears normal, refer the unit to a qualified service technician.

4.2 Amplifier Internal Protection Mechanisms

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

A signal overload circuit monitors the level at the input stage of the amplifier section. A front panel CLIP LED warns that high input signal levels are present which may cause significant output clipping.

The output devices are protected by a dual slope V-I limiter. The limiter is used to keep the 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 a problem is detected, the front panel PROTECT LED is illuminated and the output relay disengaged.

5.0 OPERATION

After installation and hookup, rotate the MASTER level control to the MIN (full counterclockwise) position. Apply power and slowly increase the level control until the desired output power is obtained. If the CLIP LED illuminates, reduce the output with the MASTER control or reduce the input signal level at its source.

5.1 In Case of Problems

Please check the following items:

1. Check that the amplifier is properly connected to an AC power source and that the power switch is "on" (depressed). The rectangular LED power indicator mounted in the switch bezel should be illuminated.
2. Check the AC line fuse. Refer to Table II.
3. Check that the MASTER output level control is not at the MIN position.
4. Verify that the input connections are properly made. Refer to Figure 5, and Sections 3.1 and 3.2.
5. Verify that the output connections are properly made. Refer to Figures 7a and b, and Section 3.6.
6. Check the output fuse.
7. Check the input and output cables for proper wiring. Refer to Table III.
8. Check the signal source and the load.
9. Refer the unit to a qualified service technician.

NOTICE

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 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.**



1407A POWER AMPLIFIER
1415A POWER AMPLIFIER

SERVICE INSTRUCTIONS

*** * * CAUTION * * ***

No use 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.

6.0 SERVICE INFORMATION

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Modifications to ALTEC LANSING products are not recommended. Such modifications shall be at the sole expense of the person(s) or company responsible, and any damage to persons or property resulting therefrom shall not be covered under warranty or otherwise.

6.1 Biasing the Amplifier

Figure 8 is the schematic of the amplifier. Trimpot VR202 is provided to set the bias for the amplifier. The bias current should be set 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 an AC-powered voltmeter must be used, 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. Refer to Figure 2.

2. Attach the RED probe lead from the DC voltmeter to the junction of R232 (0.27 Ω emitter resistor) and the emitter of Q217. Refer to Figure 9.

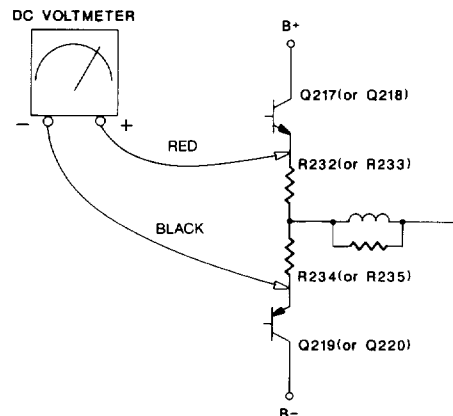


Figure 9. Setting the Bias with DC Voltmeter

3. Attach the BLACK probe lead to the junction of R234 (0.27 Ω emitter resistor) and the emitter of Q219.
4. Apply power and adjust VR202 for a reading of approximately 5.5 millivolts.

6.2 Adjusting the DC Offset

(Requires DC voltmeter as above)

1. Turn power off. Rotate the MASTER level control fully counterwise.

2. Connect the rated load to the direct output of the amplifier (8 Ω for 1407A or 4 Ω for 1415A). Connect the DC voltmeter across the load.

3. Locate VR201 on the main circuit board. Apply power and adjust VR201 for a reading of 0.00 VDC $\pm$ 10 mv DC.

6.3 Parts Ordering

To order replacement parts, note the component designator from the schematic and call (405) 324-5311, Telex 160369, FAX (405) 324-8981, or write:

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

6.4 Factory Service

Should factory service be required, ship the unit prepaid in a well packed carton to:

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

Enclose a note describing the problem along with any other helpful information such as where used, how used, etc.

6.5 Technical Assistance

For applications assistance or other technical information, call (405) 324-5311, Telex 160369, FAX (405) 324-8981, or write:

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

Figure 8. 1407A and 1415A Power Amplifiers

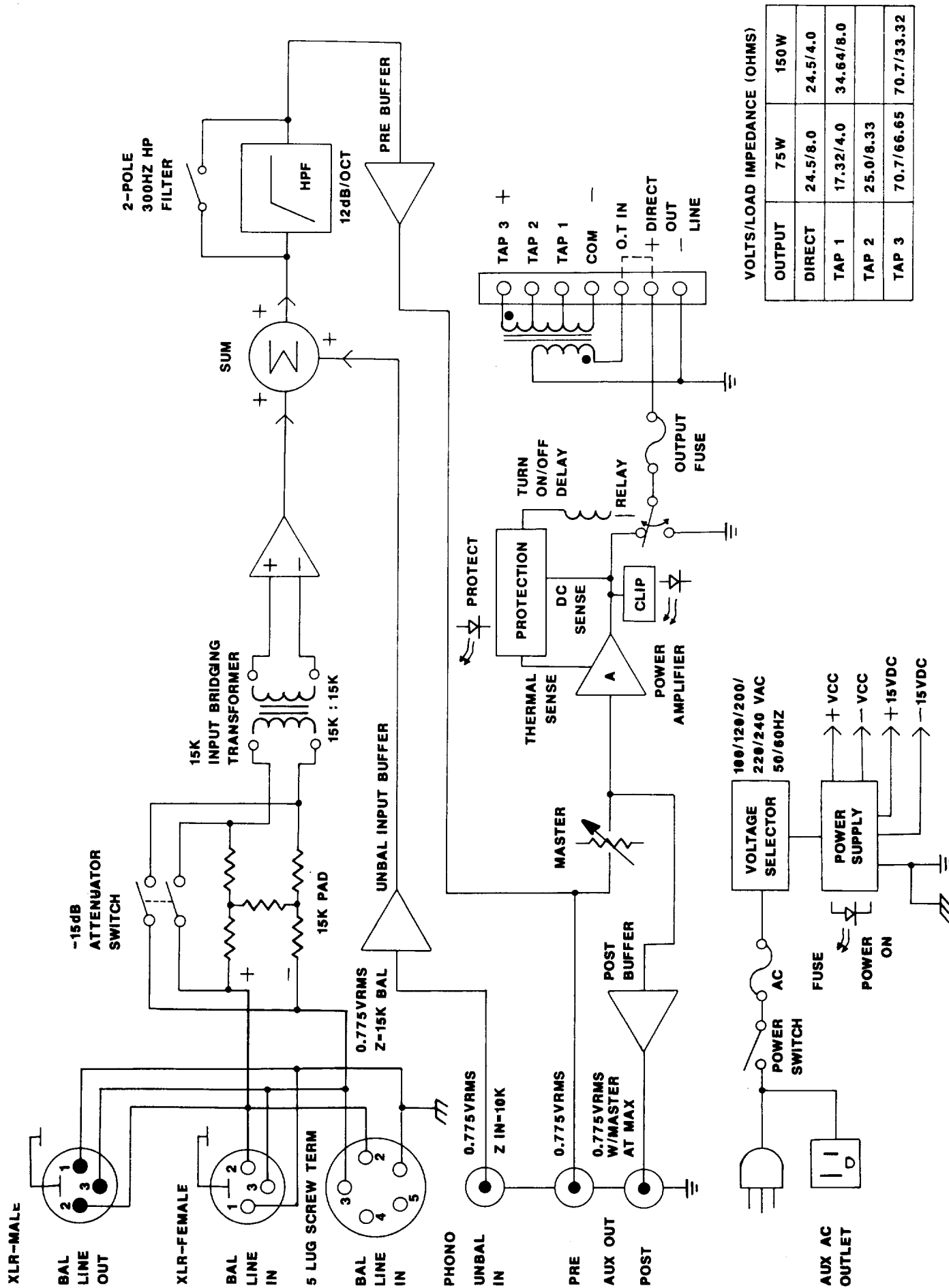


Figure 9. Power Amplifier Block Diagram