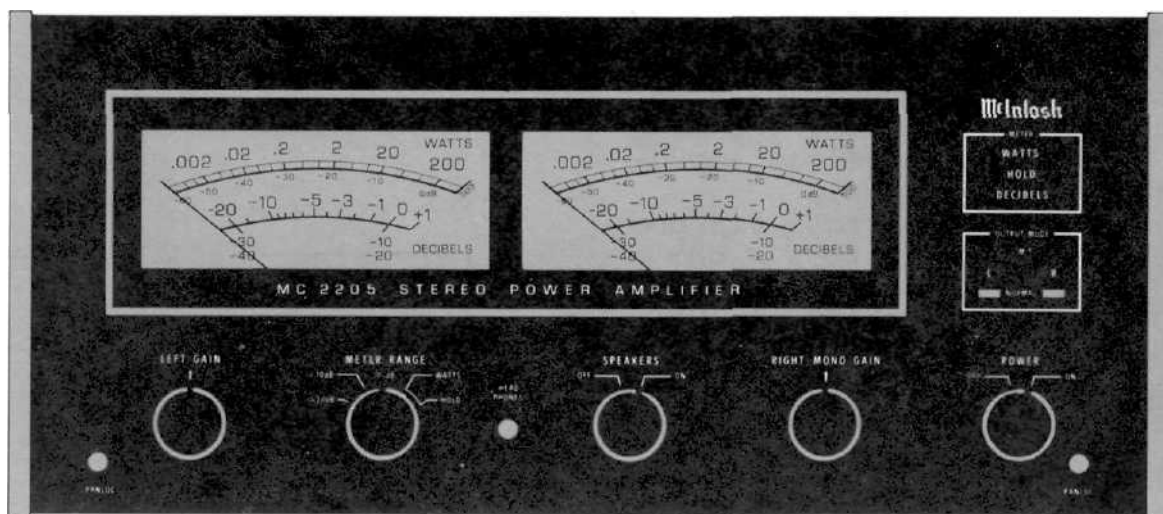


# McIntosh

## MC 2205 POWER AMPLIFIER



## SERVICE INFORMATION

STARTING WITH SERIAL NO. **AX1001**

McINTOSH LABORATORY INC. BINGHAMTON, NEW YORK 13903

038-980

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 PERFORMANCE
 

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McIntosh audio power ratings are in accordance with the Federal Trade Commission Regulation of November 4, 1974 concerning power output claims for amplifiers used in home entertainment products.

## POWER OUTPUT

STEREO: 200 watts minimum sine wave continuous average power output, per channel, both channels operating into 1 ohm, 2 ohms, 4 ohms, or 8 ohms load impedance, which is:

14.1 volts RMS across 1 ohm  
 20.0 volts RMS across 2 ohms  
 28.3 volts RMS across 4 ohms  
 40.0 volts RMS across 8 ohms

MONO: 400 watts minimum sine wave continuous average power output into 0.5 ohm, 1 ohm, 2 ohms, or 4 ohms load impedance, which is:

14.1 volts RMS across 0.5 ohm  
 20.0 volts RMS across 1 ohm  
 28.3 volts RMS across 2 ohms  
 40.0 volts RMS across 4 ohms

## OUTPUT LOAD IMPEDANCE

STEREO: 1 ohm, 2 ohms, 4 ohms, and 8 ohms; separate terminals are provided for each output

MONO: 0.5 ohm, 1 ohm, 2 ohms, and 4 ohms; obtained by connecting together the appropriate terminals of both channels

## RATED POWER BAND

20 Hz to 20,000 Hz

## TOTAL HARMONIC DISTORTION

STEREO: 0.1% maximum harmonic distortion at any power level from 250 milliwatts to 200 watts per channel from 20 Hz to 20,000 Hz, both channels operating

MONO: 0.1% maximum harmonic distortion at any power level from 250 milliwatts to 400 watts from 20 Hz to 20,000 Hz

## INTERMODULATION DISTORTION

STEREO: 0.1% maximum if instantaneous peak power output is 400 watts or less per channel with both channels operating for any combination of frequencies, 20 Hz to 20,000 Hz

MONO: 0.1% maximum if instantaneous peak power output is 800 watts or less for any combination of frequencies, 20 Hz to 20,000 Hz

## FREQUENCY RESPONSE

(at one watt output)

20 Hz to 20,000 Hz, +0 -0.25 dB  
 10 Hz to 100,000 Hz +0 -3.0 dB

## NOISE AND HUM

95 dB below rated output

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 RATINGS
 

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## OUTPUT VOLTAGES

25 volts for distribution lines

## DAMPING FACTOR

STEREO: 16 at 1 ohm output, 50 at 2 ohms output, 30 at 4 ohms output, 16 at 8 ohms output

MONO: 16 at 0.5 ohms, 50 at 1 ohm, 30 at 2 ohms, and 16 at 4 ohms output

## INPUT IMPEDANCE

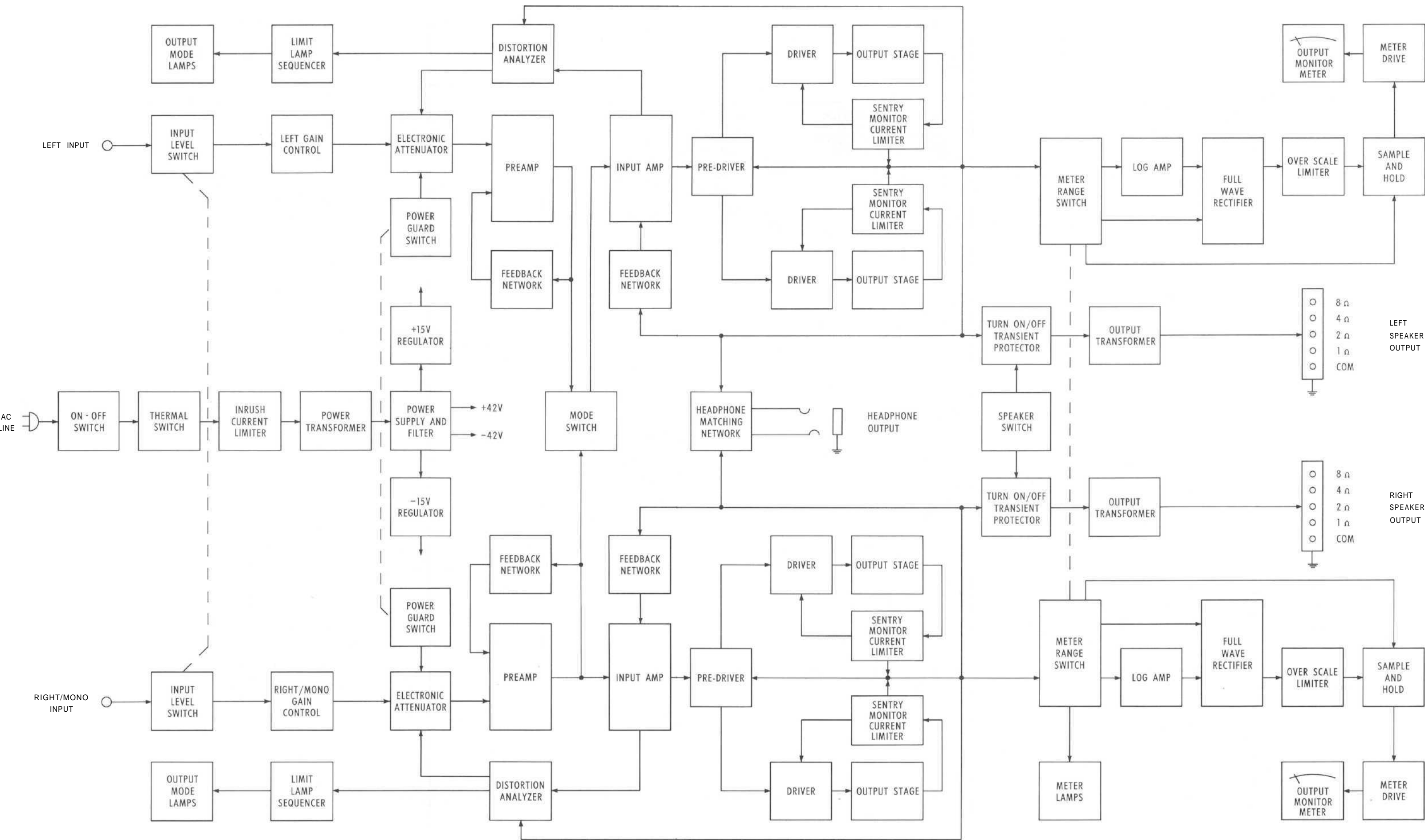
100,000 ohms

## INPUT SENSITIVITY

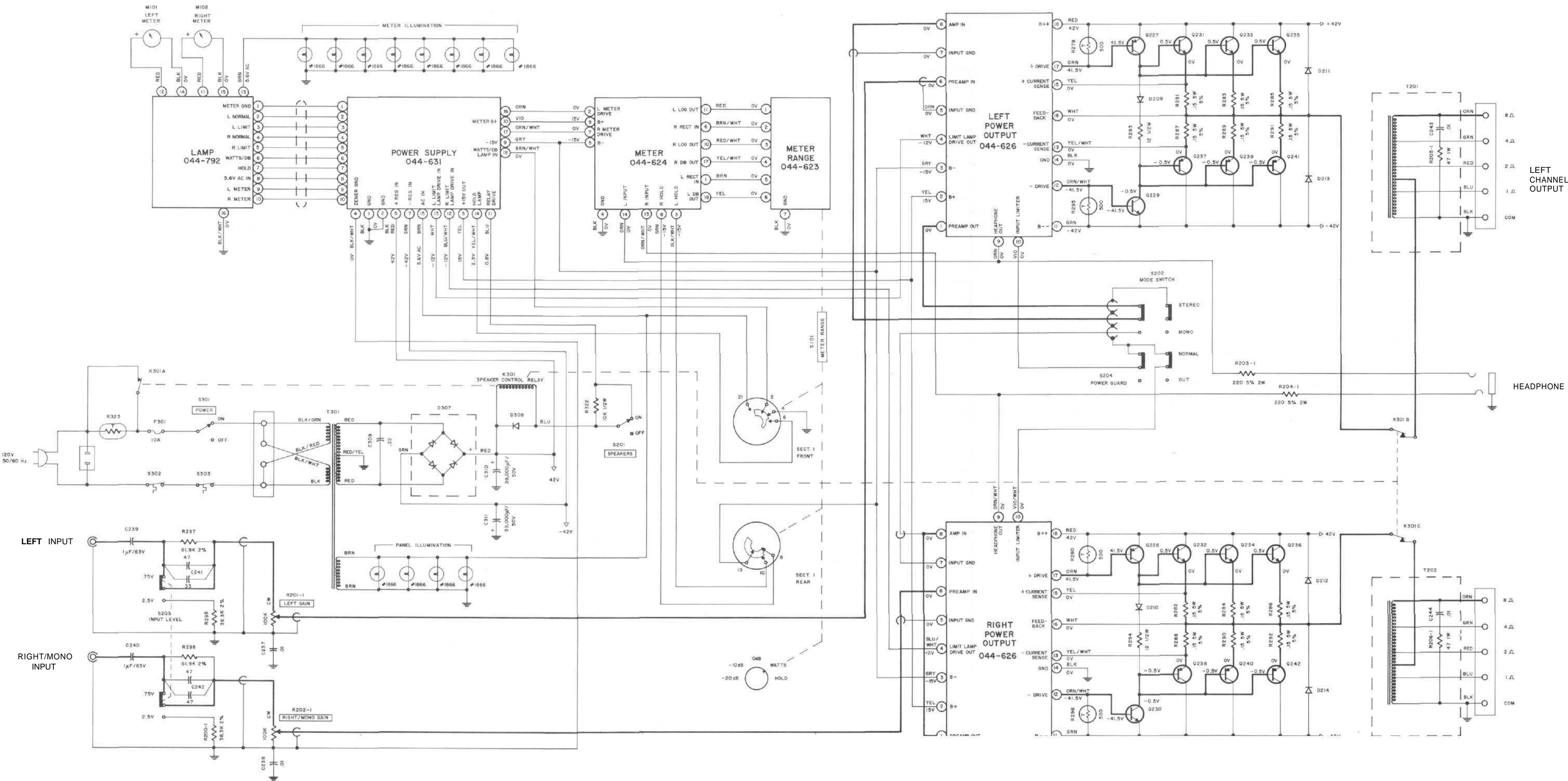
Switchable: 0.75 volt or 2.5 volts - Level control provided for higher input voltages

## POWER REQUIREMENTS

120 volts 50/60HZ, 70 to 550 watts.



BLOCK DIAGRAM



## SCHEMATIC NOTES

1. Unless otherwise specified: Resistance values are in ohms, 1/4 watt, and 10% tolerance; capacitance values smaller than 1 are in microfarads ( $\mu\text{F}$ ); capacitance values greater than 1 are in picofarads (pF); inductors are in microhenries ( $\mu\text{H}$ ).
2. Printed circuit board components are outlined on the schematics by dotted lines. The circled numbers on the dotted lines correspond to the numbers on the PC board layouts.
3. The heavy lines on the schematics denote the primary signal path.
4. The terminal numbering of rotary switches is for reference only.
5. All voltages indicated on the schematics are measured under the following conditions:
  - a. Use of an 11 megohm impedance VTVM.
  - b. All voltages  $\pm 10\%$  with respect to chassis ground.
  - c. No signal at input terminals.
  - d. AC input at 120 volts AC, 50/60Hz.
  - e. Front panel controls at:
 

Left Gain	FULLY CCW	Input Level	0.75V
Meter Range	WATTS	Mode	Stereo
Right/Mono Gain	FULLY CCW	Power Guard	Normal
Speakers	ON		
Power	ON		

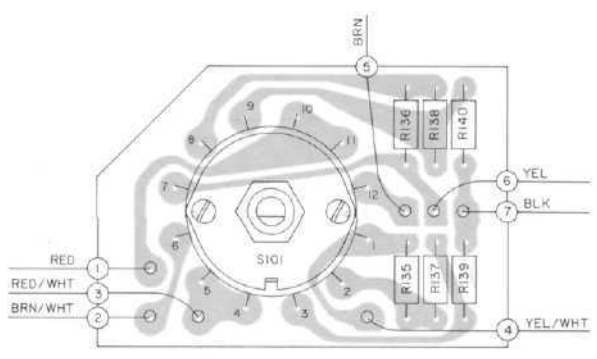
 Rear panel switches at:
6. Relay K301 shown in energized position.
7. Meter adjustments:
 

Amplifier must be working properly to adjust meters. Operate amplifier at full power (40V rms) into 8 ohm loads with 1 KHz input signal.

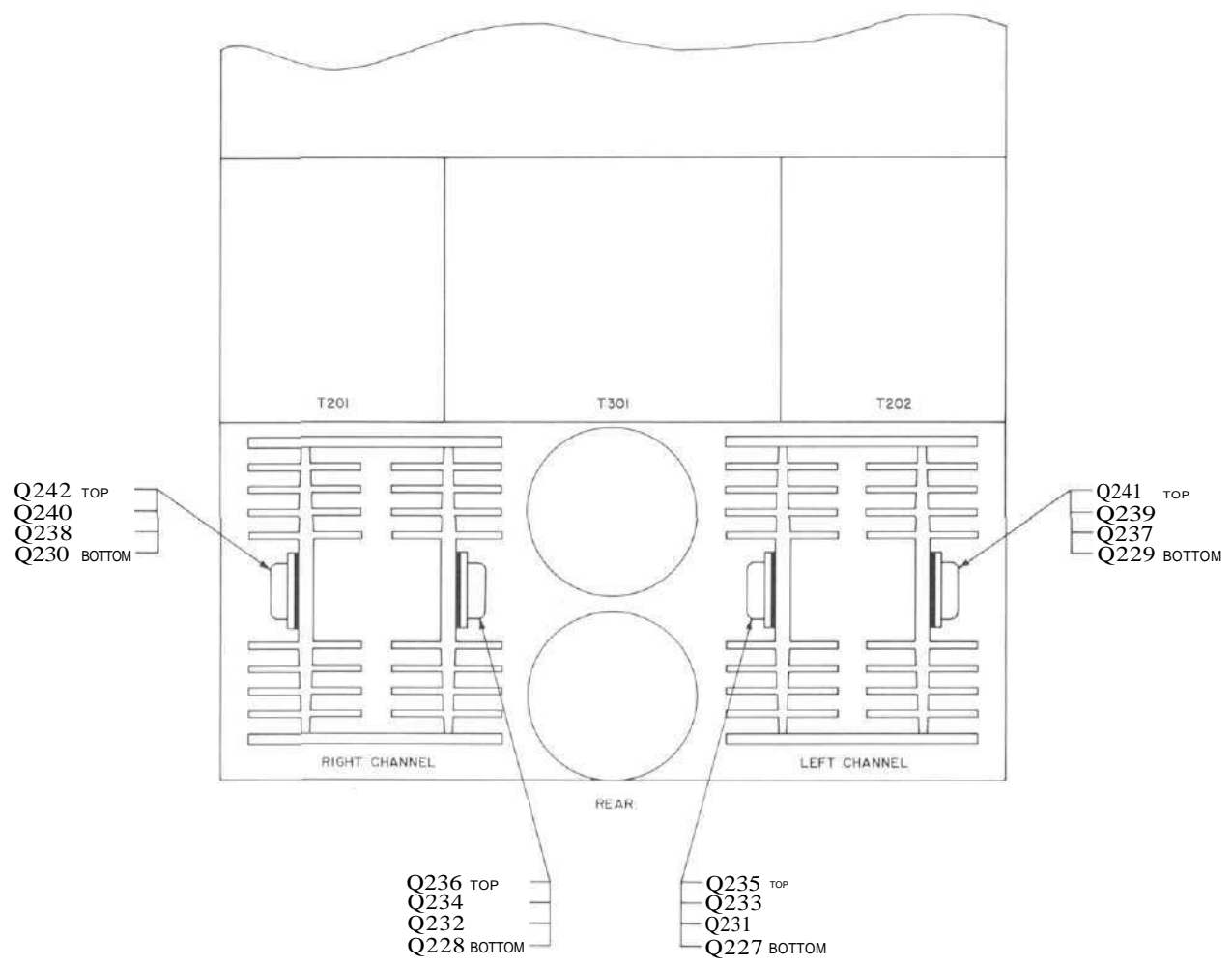
  - a. Set METER RANGE switch to WATTS.
  - b. Adjust potentiometer R125 on meter board for a reading of 200 watts on the left meter.
  - c. Adjust R126 for a reading of 200 watts on the right meter.
  - d. Set METER RANGE switch to 0 dB
  - e. Adjust potentiometer R105 on meter board for a reading of 0 on the DECIBEL scale of the left meter.
  - f. Adjust R106 for a reading of 0 on the right meter.
8. Power amplifier bias adjustment:
 

Operate MC 2205 at 120 volts line input with no input signal. Measure the input power (approximately 50 watts) or current (approximately 0.4 amps). The bias potentiometers R241 & R242 are located on the power output PC boards.

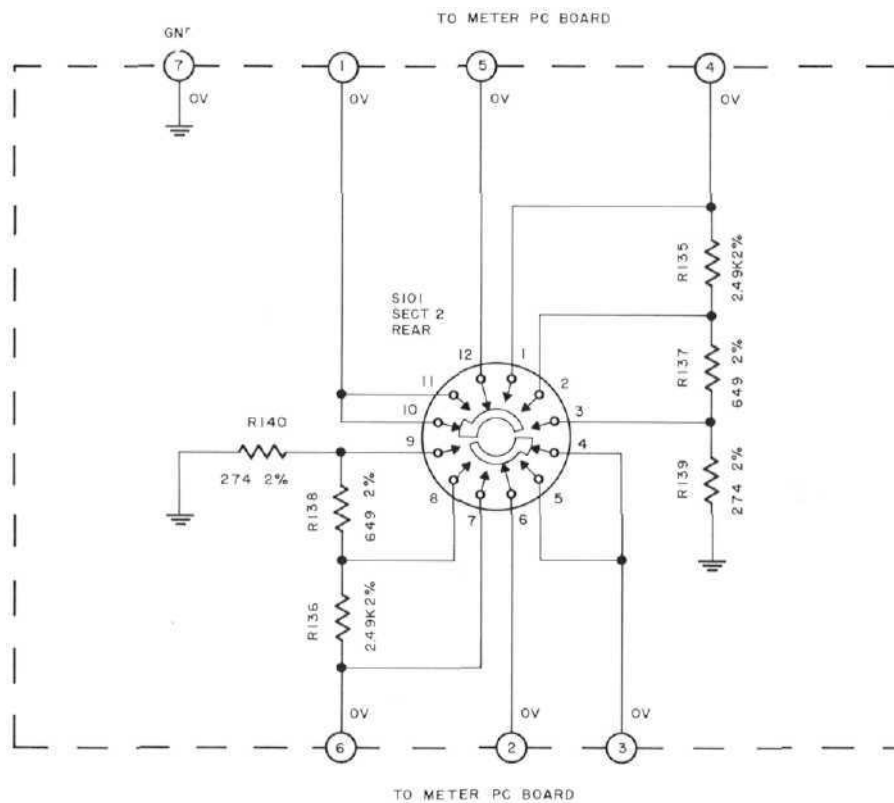
  - a. Turn both bias potentiometers fully ccw
  - b. Rotate bias adjustment cw to the point where the line input power or current begins to increase then back off slightly to the point where the line input reaches its lowest value.
  - c. Repeat step b for each channel independently.



METER RANGE PC BOARD 044-623

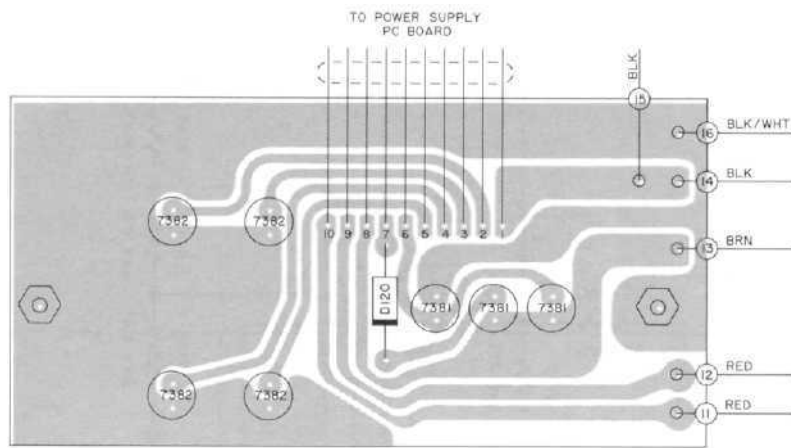


LOCATION OF TRANSISTORS NOT ON PC BOARD



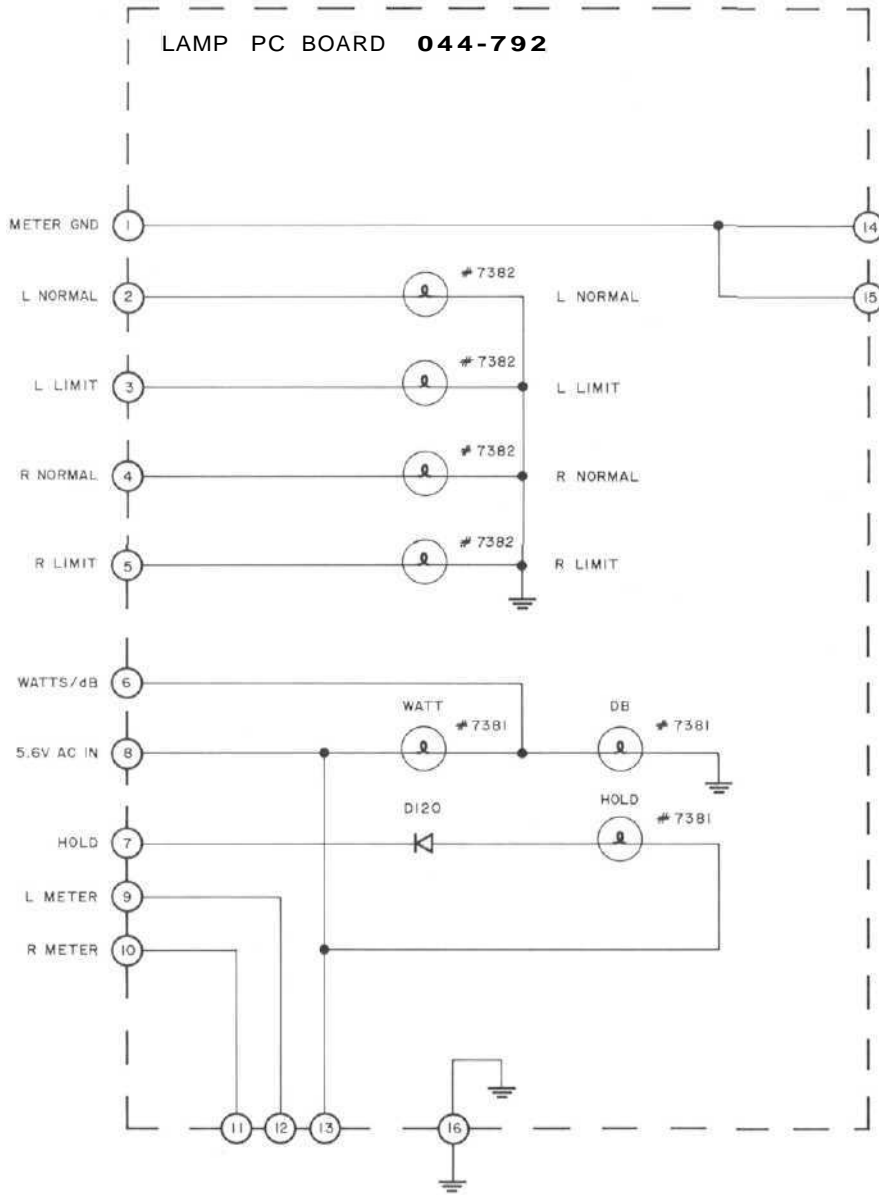
METER RANGE PC BOARD 044-623

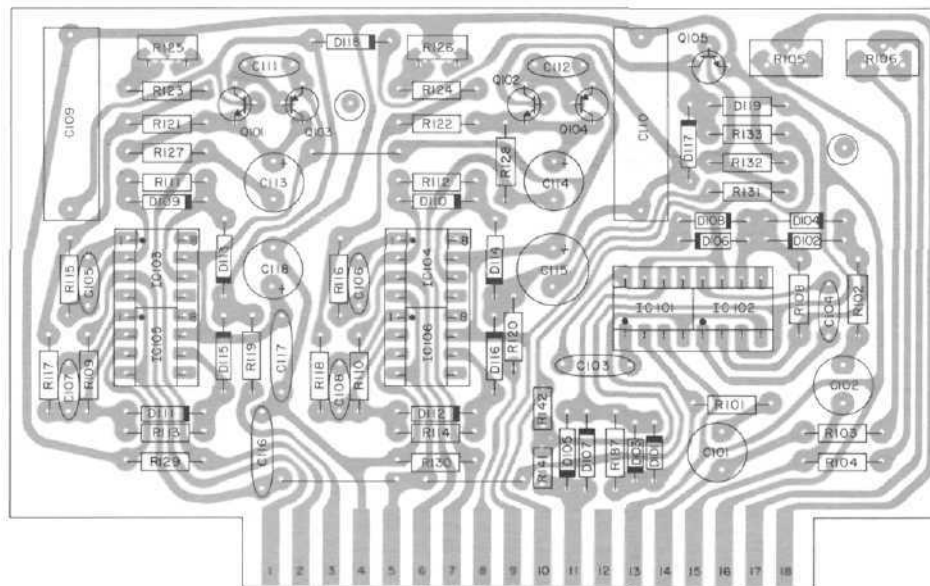
SWITCH IS SHOWN FRONT VIEW  
IN WATTS POSITION



LAMP PC BOARD 044-792

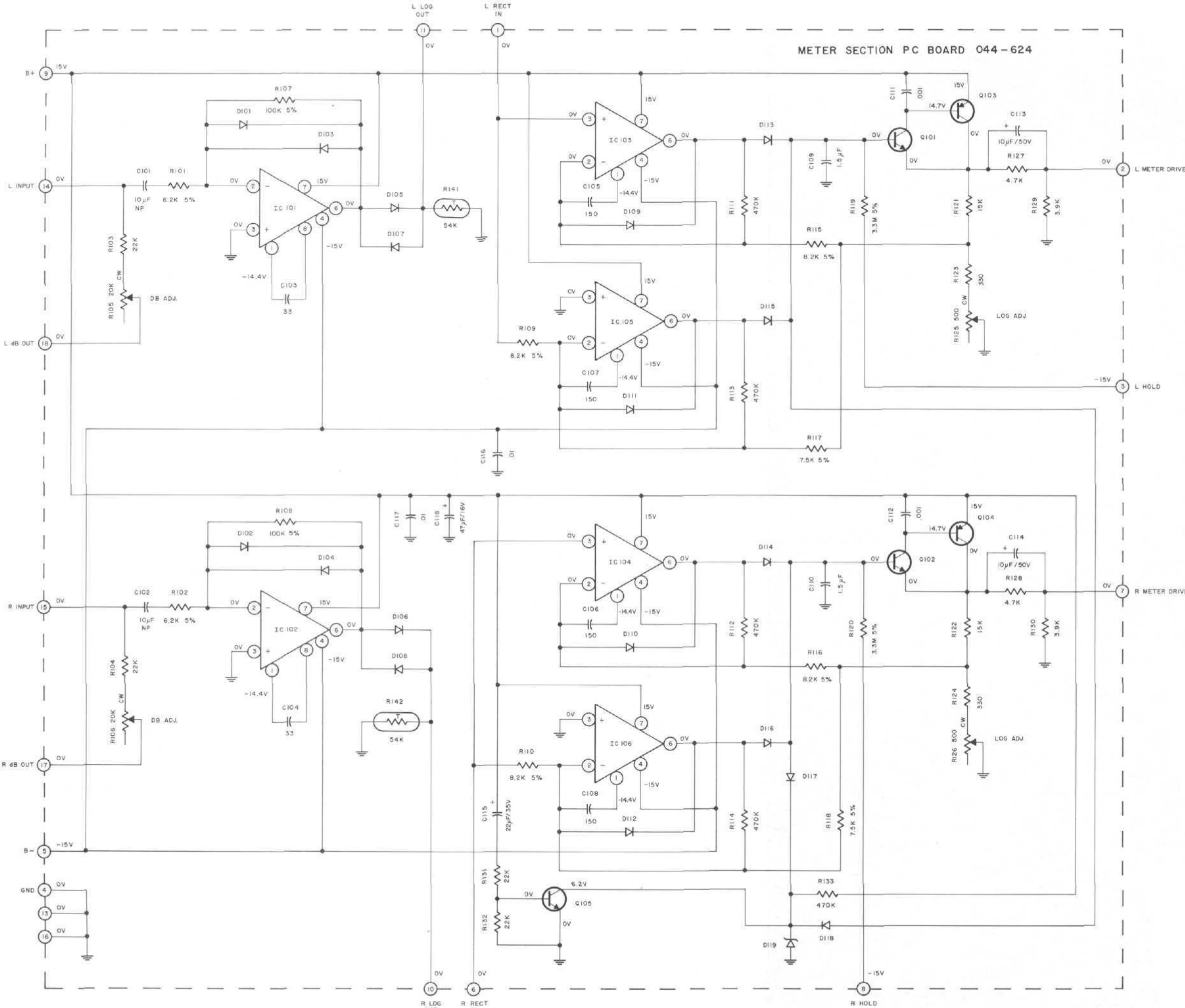


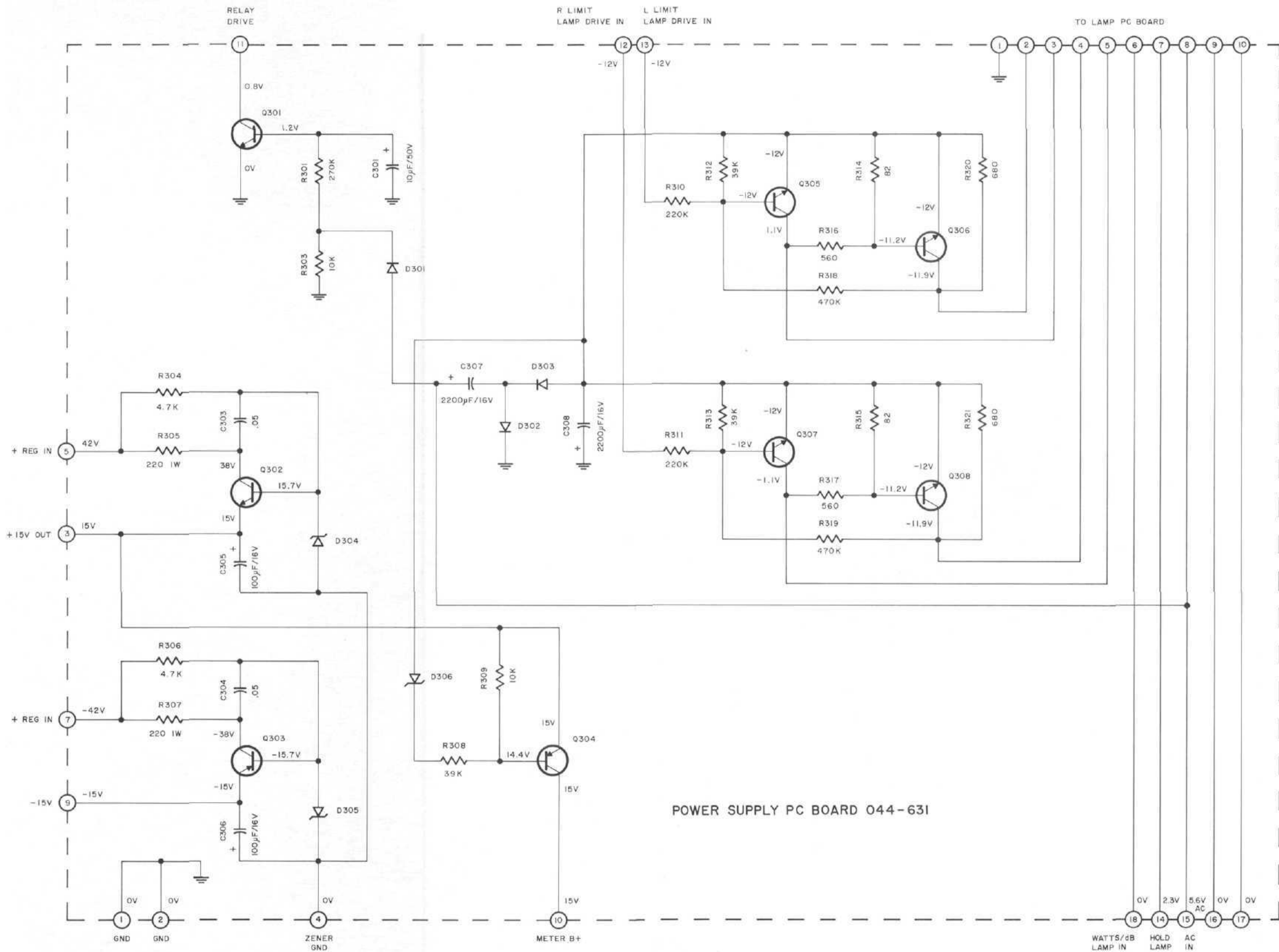




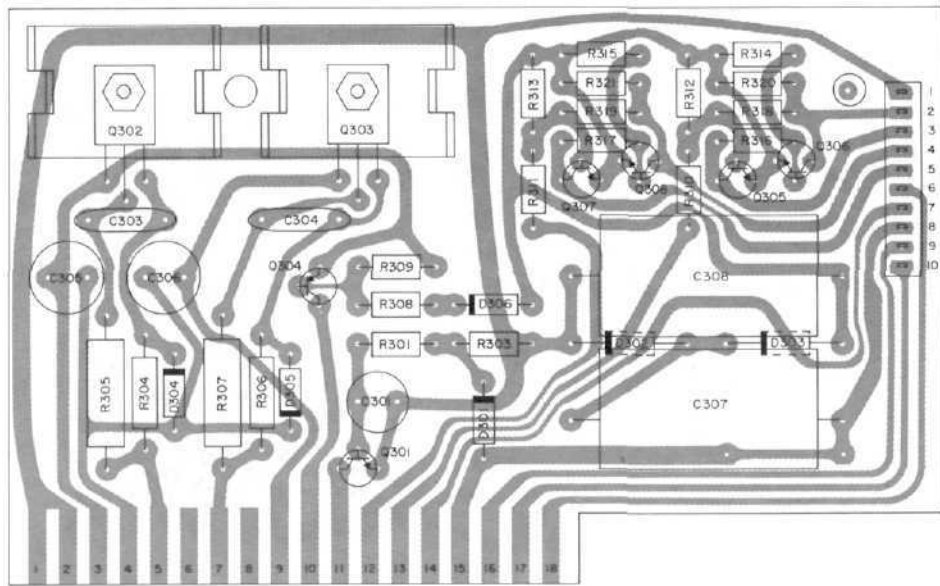
METER PC BOARD 044-624

METER SECTION PC BOARD 044-624





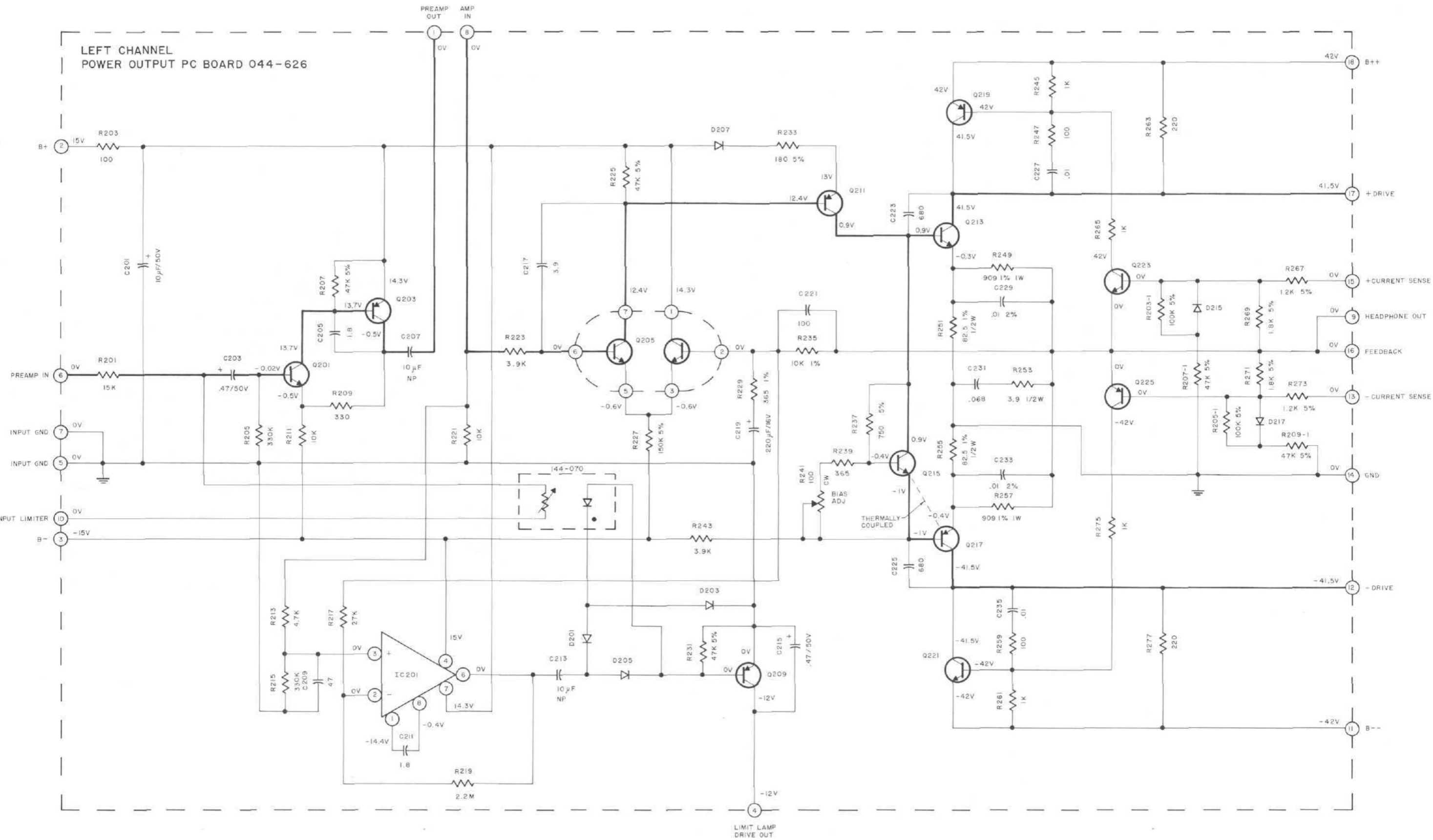
POWER SUPPLY PC BOARD 044-631

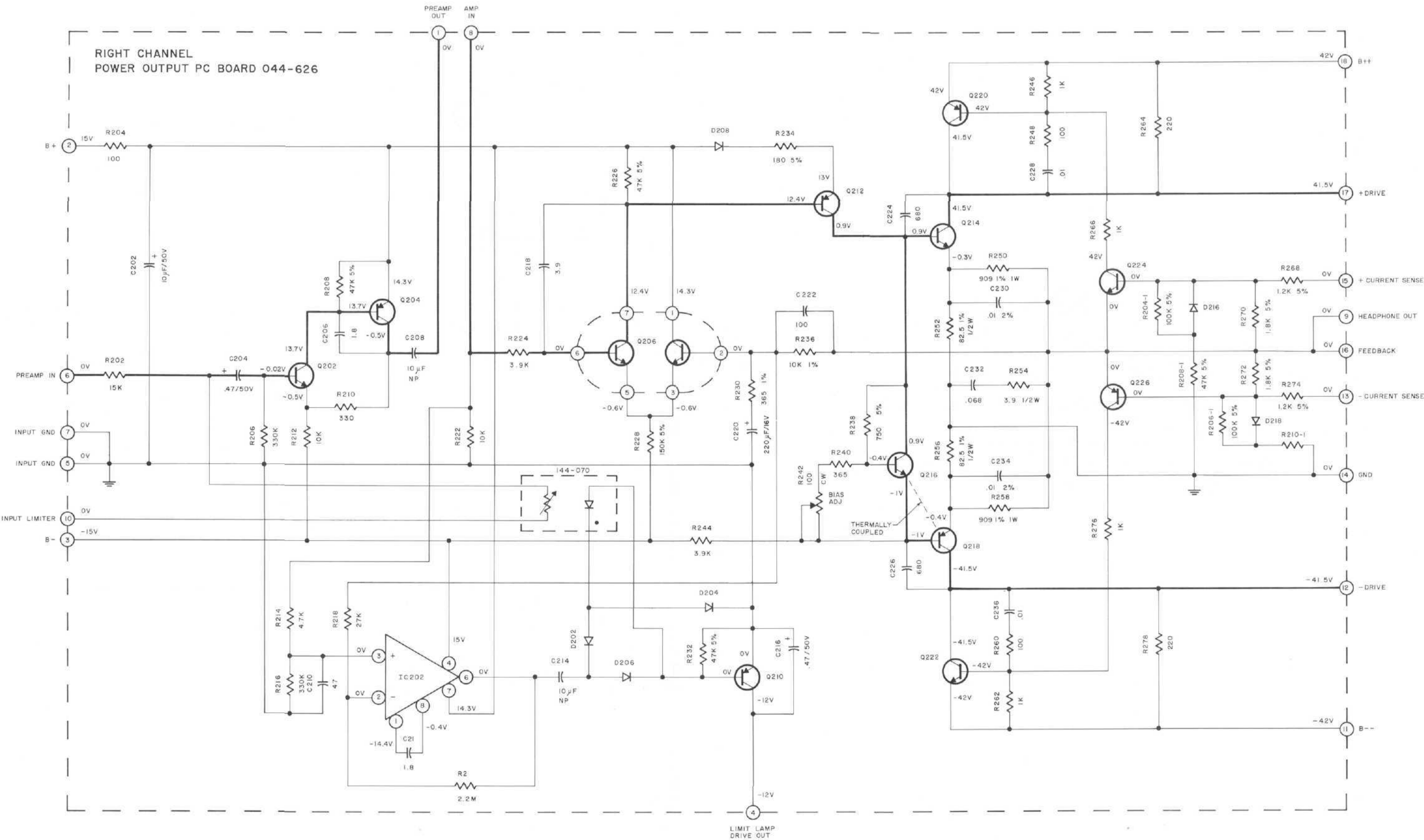


POWER SUPPLY PC BOARD 044-631

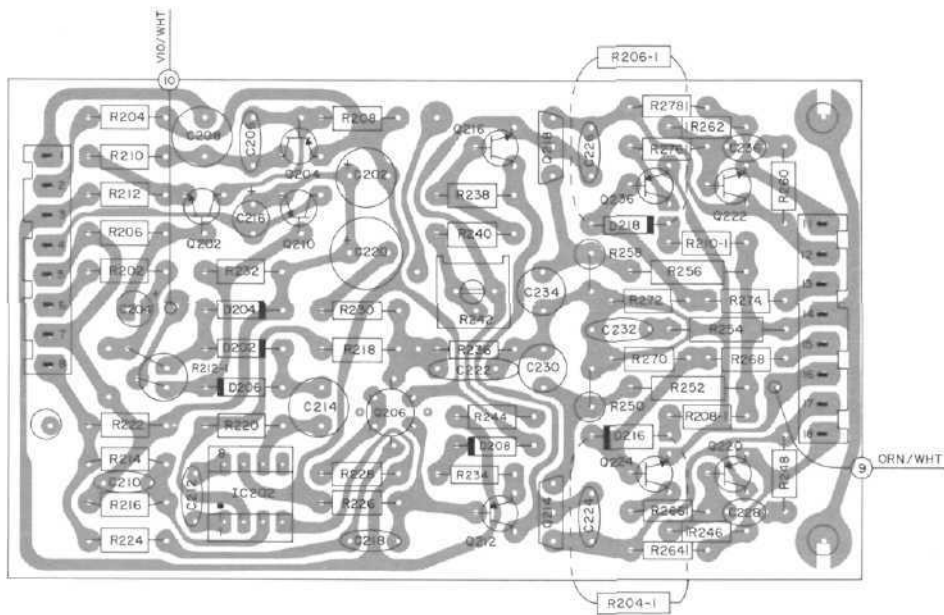


LEFT CHANNEL  
POWER OUTPUT PC BOARD 044-626









RIGHT CHANNEL POWER OUTPUT PC BOARD 044-626

## REPLACEMENT PARTS

All parts not listed are common items obtainable from radio parts jobbers.

Replacement parts may be obtained when ordered by PART NUMBER from:

McIntosh Laboratory, Inc.  
Customer Service Department  
2 Chambers Street  
Binghamton, New York 13903  
(telephone 607-723-3512)

## CAPACITORS

Symbol Number	Description	Part Number
C101, 102	Elect 10 $\mu$ F 35V	066-173
C109,110	Mylar 1 .5 $\mu$ F 100V	064-143
C113,114	Elect 10 $\mu$ F 50V	066-221
C115	Elect 22 $\mu$ F 35V	066-214
C118	Elect 47 $\mu$ F 16V	066-182
C201,202	Elect 10 $\mu$ F 50V	066-221
C203,204	Elect .47 $\mu$ F 50V	066-244
C207,208	Elect 10 $\mu$ F 35V	066-173
C213,214	Elect 10 $\mu$ F 35V	066-173
C215,216	Elect .47 $\mu$ F 50V	066-244
C219,220	Elect 220 $\mu$ F 16V	066-218
C227,228	Mylar .0047 $\mu$ F 100V	064-132
C229,230	Poly .01 $\mu$ F 2.5% 63V	064-142
C231,232	Mylar .068 $\mu$ F 100V	064-136
C233,234	Poly .01 $\mu$ F 2.5% 63V	064-142
C235,236	Mylar .0047 $\mu$ F 100V	064-132
C239,240	Elect 1 $\mu$ F 63V	066-248
C301	Elect 10 $\mu$ F 50V	066-221
C305,306	Elect 100 $\mu$ F 16V	066-226
C307,308	Elect 2200 $\mu$ F 16V	066-247
C309	Mylar .22 $\mu$ F 630V	064-052
C310,311	Elect 39000 $\mu$ F 50V	066-225

## DIODES

D101, 102	Si. signal diode	070-047
D103, 104	Si. signal diode	070-047
D105, 106	St. signal diode	070-047
D107, 108	Si. signal diode	070-047
D109, 110	Si. signal diode	070-047
D111,112	Si. signal diode	070-047
D113,114	Si. signal diode	070-047
D115, 116	Si. signal diode	070-047
D117,118	Si. signal diode	070-047
D119	Zener diode	070-085
D120	Si. rectifier	070-031

D201,202	Si. signal diode	070-047
D203,204	Si. signal diode	070-047
D205,206	Si. signal diode	070-047
D207,208	Si. signal diode	070-047
D209,210	Si. rectifier	070-031
D211,212	Si. rectifier	070-031
D213,214	Si. rectifier	070-031
D215,216	Si. signal diode	070-047
D217,218	Si. signal diode	070-047
D301	Si. signal diode	070-047
D302,303	Si. signal diode	070-031
D304,305	Zener diode 16V	070-089
D306	Zener diode 16V	070-089
D307	Rectifier bridge	070-050
D308	Si. rectifier	070-031

## FUSES

F301	Fuse 10A	089-034
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## METERS

M101, 102	Meter (power level)	124-026
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## TRANSISTORS

Q101, 102	Si. NPN transistor	132-092
Q103, 104	Si. PNP transistor	132-096
Q105	Si. NPN transistor	132-092
Q201,202	Si. NPN transistor	132-093
Q203,204	Si. PNP transistor	132-096
Q205,206	Dual NPN transistor	132-155
Q209,210	Si. PNP transistor	132-096
Q211,212	Si. PNP transistor	132-096
Q213,214	Si. NPN transistor	132-149
Q215,216	Si. NPN transistor	132-093
Q217,218	Si. PNP transistor	132-148
Q219,220	Si. PNP transistor	132-150
Q221,222	Si. NPN transistor	132-143
Q223,224	Si. NPN transistor	132-136
Q225,226	Si. PNP transistor	132-147
Q227,228	Si. PNP transistor	132-151
Q229,230	Si. NPN transistor	132-152
Q231,232	Si. NPN transistor	132-164
Q233,234	Si. NPN transistor	132-164
Q235,236	Si. NPN transistor	132-164
Q237,238	Si. PNP transistor	132-165
Q239,240	Si. PNP transistor	132-165

Q241 ,242	Si , PNP transistor	132-165
Q301	Si . NPN transistor	132-090
Q302	Si . NPN transistor	132-078
Q303	Power transistor	132-079
Q304	Si . PNP transistor	132-096
Q305	Si . NPN transistor	132-090
Q306	Si . NPN transistor	132-143
Q307	Si . NPN transistor	132-090
Q308	Si . NPN transistor	132-143

## INTEGRATED CIRCUITS

IC101 , 102	Integrated circuit	133-037
IC103, 104	Integrated circuit	133-037
IC105,106	Integrated circuit	133-037
IC201 ,202	Integrated circuit	133-037

## POTENTIOMETERS

R105,106	dB Adjust	134-294
R125,126	Log Adjust	134-293
R241 ,242	Bias Adjust	134-298
R201-1,202-1	Gain controls	134-273

## RESISTORS

R135,136	Film 2.49K	2%	1/4W	144-049
R137,138	Film 649R	2%	1/4W	144-050
R139,140	Film 274R	2%	1/4W	144-048
R141,142	Thermistor			144-075
R229,230	Film 365n	1%	1/4W	144-071
R249,250	Film 909R	1%	1/4W	144-073
R251 ,252	Film 82.5R	1%	1/4W	144-072
R255,256	Film 82.5R	1%	1/4W	144-072
R257,258	Film 909R	1%	1/4W	144-073
R279,280	Thermistor			144-074
R281 ,282	Wirewound	.1 5R	5W	139-105
R283,284	Wirewound	.1 5R	5W	139-105
R285,286	Wirewound	.1 5R	5W	139-105
R287,288	Wirewound	.1 5R	5W	139-105
R289,290	Wirewound	.1 5R	5W	139-105
R291 ,292	Wirewound	.1 5R	5W	139-105
R295,296	Thermistor			144-074
R297,298	Film 61.9K	2%	1/4W	144-077
R299	Film 38.3K	2%	1/4W	144-076
R323	Thermistor			144-012
R200-1	Film 38.3K	2%	1/4W	144-076
R203-1,204-1	Wirewound	220R	2W	139-076

## SWITCHES

S101	Meter range switch	146-180
S201	Power on-off switch	146-167
S301	Speaker switch	146-167
S302,303	Thermal cutout	153-017

## RELAY

K301	Speaker control	087-017
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## TRANSFORMERS

T201 ,202	Output transformer	044-636
T301	Power transformer	044-637

## FRONT PANEL &amp; TRIM

Front panel	044-634
Front panel end caps	018-173
Knobs (all controls)	090-156

## LAMPS

#1866 Panel & meters	058-014
#7382 Normal & limit	058-061
#7381 Hold, dB & watts	058-062

## PANLOC SYSTEM

Shelf bracket (right)	043-678
Shelf bracket (left)	043-679
Mounting template #300	038-244
Hardware package	044-871

## MISCELLANEOUS ITEMS

Plastic feet	017-218
Shipping carton	045-008
Owners manual	038-950
Line cord	170-021
Fuse holder ,	178-001

MC2205