

# McIntosh

## MC 502 POWER AMPLIFIER



## SERVICE INFORMATION

STARTING WITH SERIAL NO. CE1001

McINTOSH LABORATORY INC. BINGHAMTON, NEW YORK 13903

039308

## PERFORMANCE LIMITS

## PERFORMANCE

## POWER OUTPUT RATING

STEREO-75 watts into 2.7 to 4 ohm loads, 50 watts into 8 ohm loads, minimum sine wave continuous average power output per channel from 20 Hz to 20,000 Hz, both channels operating.

Which is: 14.2 volts RMS across 2.7 ohms  
17.3 volts RMS across 4 ohms  
20.0 volts RMS across 8 ohms

MONO (Bridged)-150 watts into an 8 ohm load, minimum sine wave continuous average power output from 20 Hz to 20,000 Hz.

Which is: 34.6 volts RMS across 8 ohms

## OUTPUT LOAD IMPEDANCE

STEREO: 2.7 to 8 ohms

MONO: 8 ohms obtained by connecting across the output terminals of both channels.

## RATED POWER BAND

20 Hz to 20,000 Hz

## TOTAL HARMONIC DISTORTION

STEREO: .02% maximum harmonic distortion at any power level from 250 milliwatts to rated power per channel from 20 Hz to 20,000 Hz, both channels operating.

MONO: .02% maximum harmonic distortion at any power level from 250 milliwatts to rated power from 20 Hz to 20,000 Hz.

## INTERMODULATION DISTORTION

STEREO: .02% maximum per channel with both channels operating for any combination of frequencies, 20 Hz to 20,000 Hz.

MONO: .02% maximum at any power level from 250mW to rated power 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

## RATINGS

## OUTPUT VOLTAGES

25 volts for distribution lines

## DAMPING FACTOR

Greater than 50

## INPUT IMPEDANCE

75,000 ohms

## INPUT SENSITIVITY

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

## GENERAL INFORMATION

## POWER REQUIREMENTS

120 volts, 50/60 Hz, 0.2 to 4 amperes

## MECHANICAL INFORMATION

SIZE: Front panel measures 16 inches wide (40.6 cm) by 3-5/8 inches high (9.2 cm). Chassis measures 14-3/4 inches wide (37.5 cm) by 2-3/8 inches high (6 cm) by 14-1/2 inches deep (36.8 cm), including connectors. Knob clearance required is 1-1/4 inches (3.2 cm) in front of mounting panel.

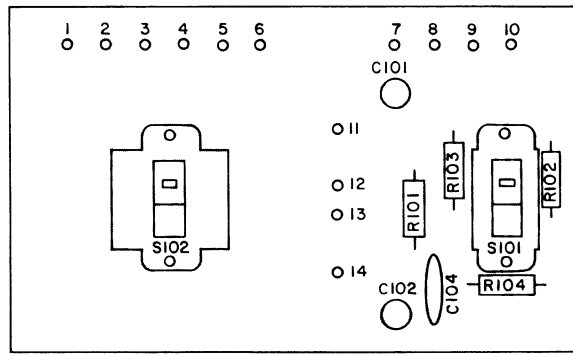
WEIGHT: 27 pounds (12.2 kg) net, 38 pounds (17.2 kg) in shipping carton

## SCHEMATIC NOTES

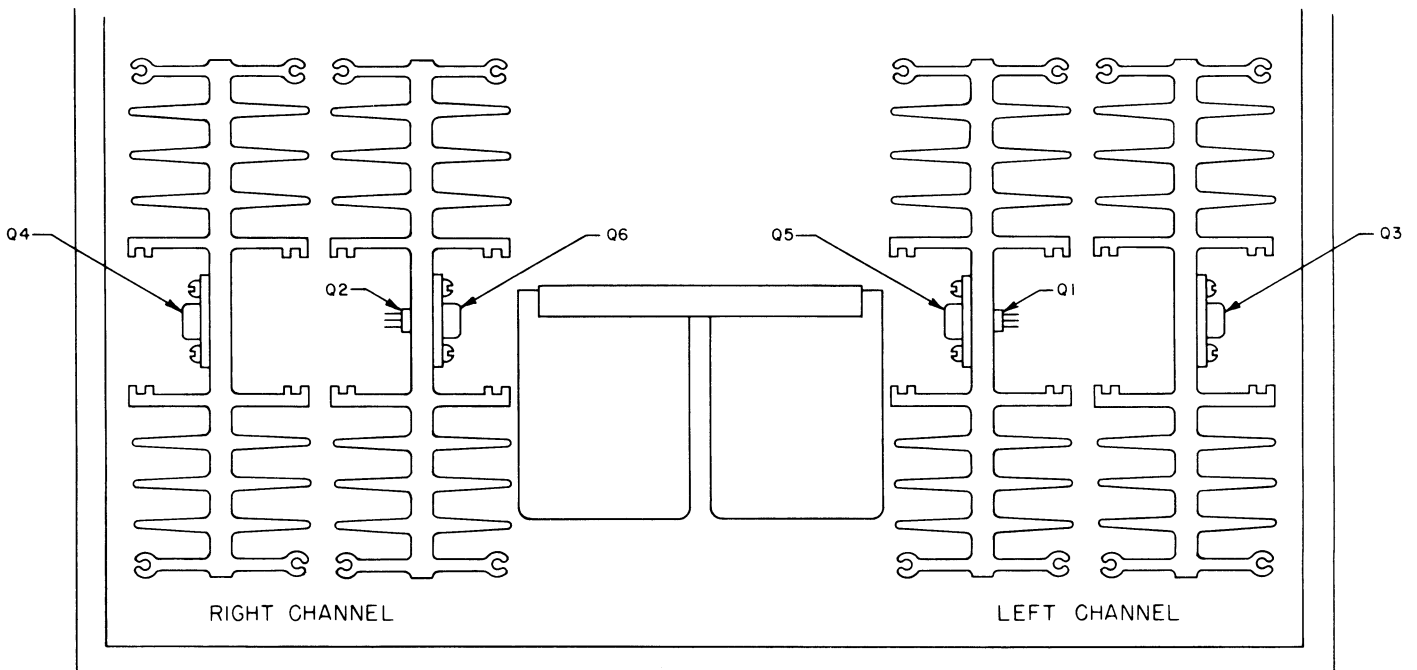
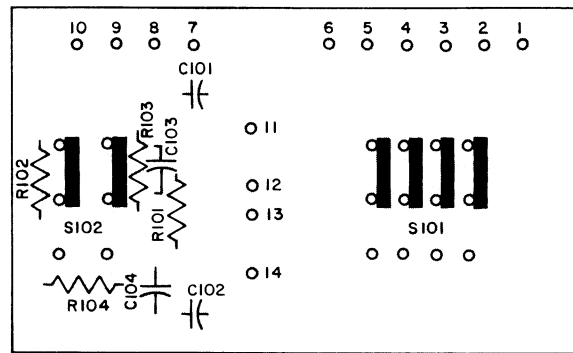
1. Printed circuit board assemblies are outlined on the schematics by dotted lines. The circled numbers on the dotted lines correspond to the numbers on the printed circuit board layouts.
2. The heavy lines on the schematics denote the primary signal path.
3. The heavy dash lines on the schematics denote a secondary signal path.
4. Unless otherwise specified: Resistance values are in ohms, 1/4 watt, and 5% tolerance. Capacitance values smaller than 1 are in microfarads ( $\mu\text{F}$ ); capacitance values greater than 1 are in picofarads (pF).
5. All voltages indicated on the schematics are measured under the following conditions:
 

Use of an 11 megohm input impedance VTVM.	All voltages $\pm 10\%$ with respect to ground.
No signal at input terminals.	AC input at 120 volts, 50/60 Hz.
Voltages not specified are "0" volts.	
6. Front panel controls at:
 

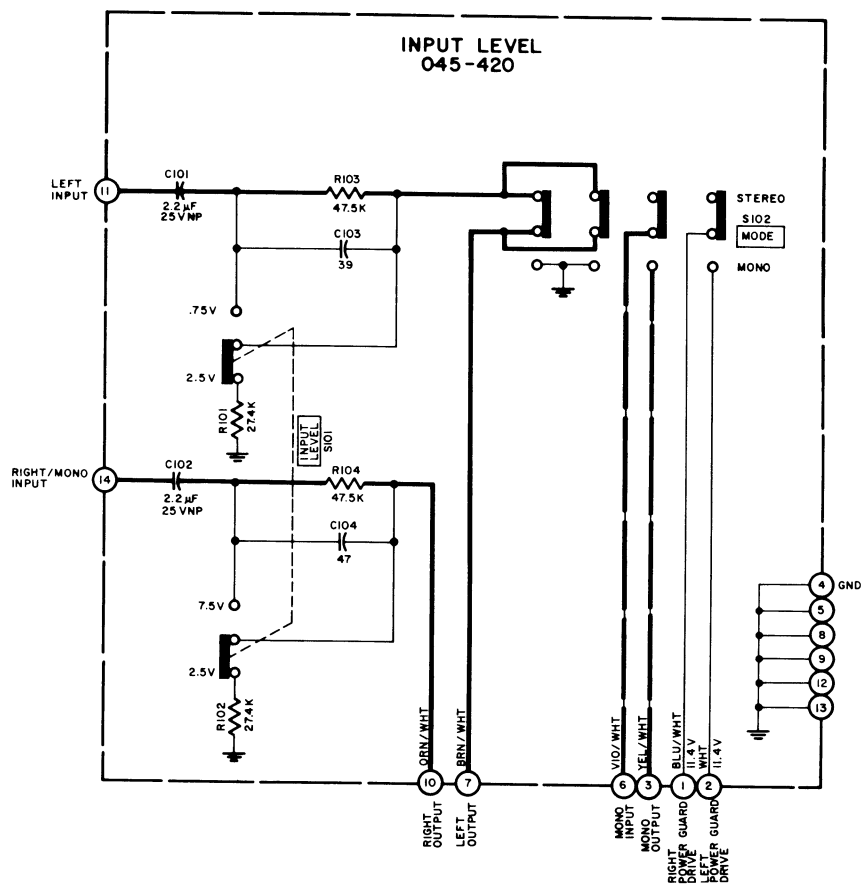
Power	0n	Rear panel switches at:	
Speakers	0n	Input Level	2.5 V
Left Gain	ccw	Mode	Stereo
Right/Mono Gain	ccw		
7. Bias adjustment:
  - a. Operate amplifier at high power (approximately 50 watts) for about 2 minutes to warm the amplifier.
  - b. Remove the input signal and turn R351 and R352 controls full ccw. Bias must be adjusted soon after the input signal is removed while the amplifier is still hot.
  - c. Measure the line input power (approximately 25 watts) or current (approximately 0.2A).
  - d. Rotate R351 bias control cw until the line input increases by 3.5 watts or 0.03 amps.
  - e. Rotate R352 bias control cw until the line input increases by an additional 3.5 watts or 0.03 amps.
8. Units with Serial No's. Below CE1947  
 Left & Right Driver: R365, R366, R367 and R368 were inductive type wirewound resistors, part number 139105.  
 R361, R362, R363 and R364 were 1K $\Omega$ .
9. Units with Serial No's. Below CE2045  
 Left & Right Driver: R349 & R350 were 180 $\Omega$
10. Units with Serial No's. Below CE2177  
 Interconnect: Fuses F2 and F3 were not used
11. Units with Serial No's. Below CE2408  
 Left & Right Driver: L301 and L302 were 1.7 $\mu\text{H}$ , part number 122188
12. Units with Serial No's. Below CE2443  
 Interconnect: Power transformer (T1) was part number 045532
13. Units with Serial No's. Below CE2500  
 Interconnect: Fuses F2 and F3 were used

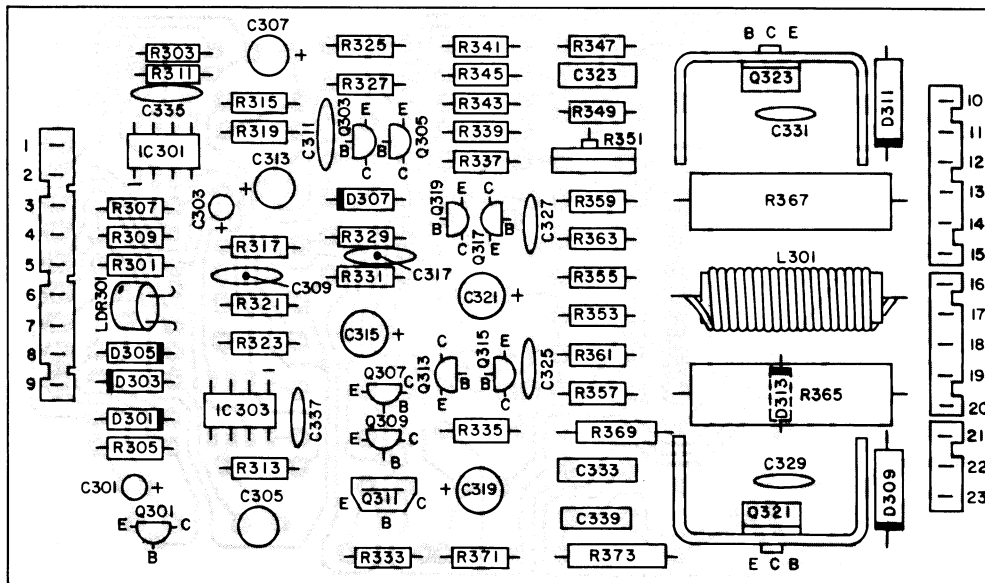


INPUT LEVEL PC BOARD  
045420

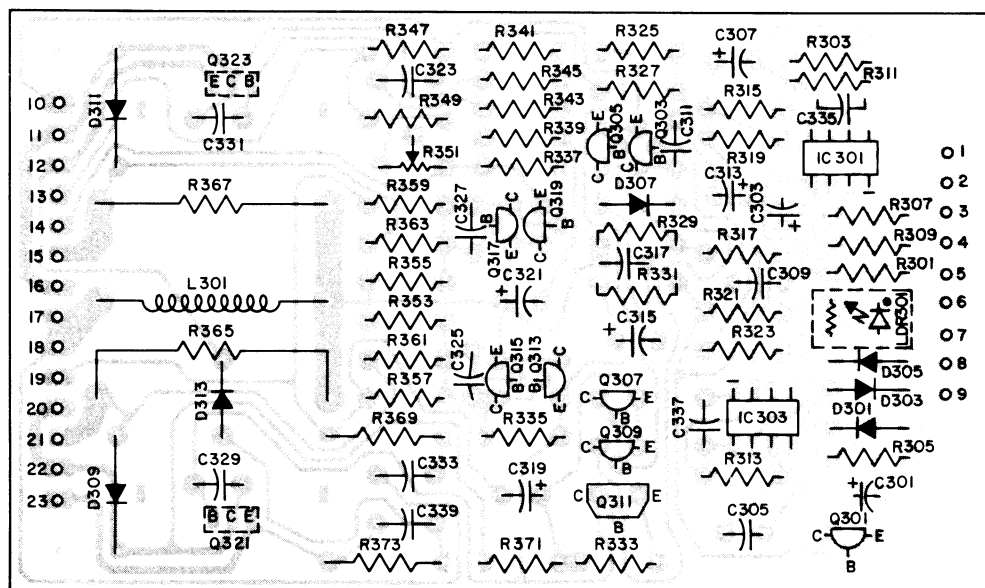


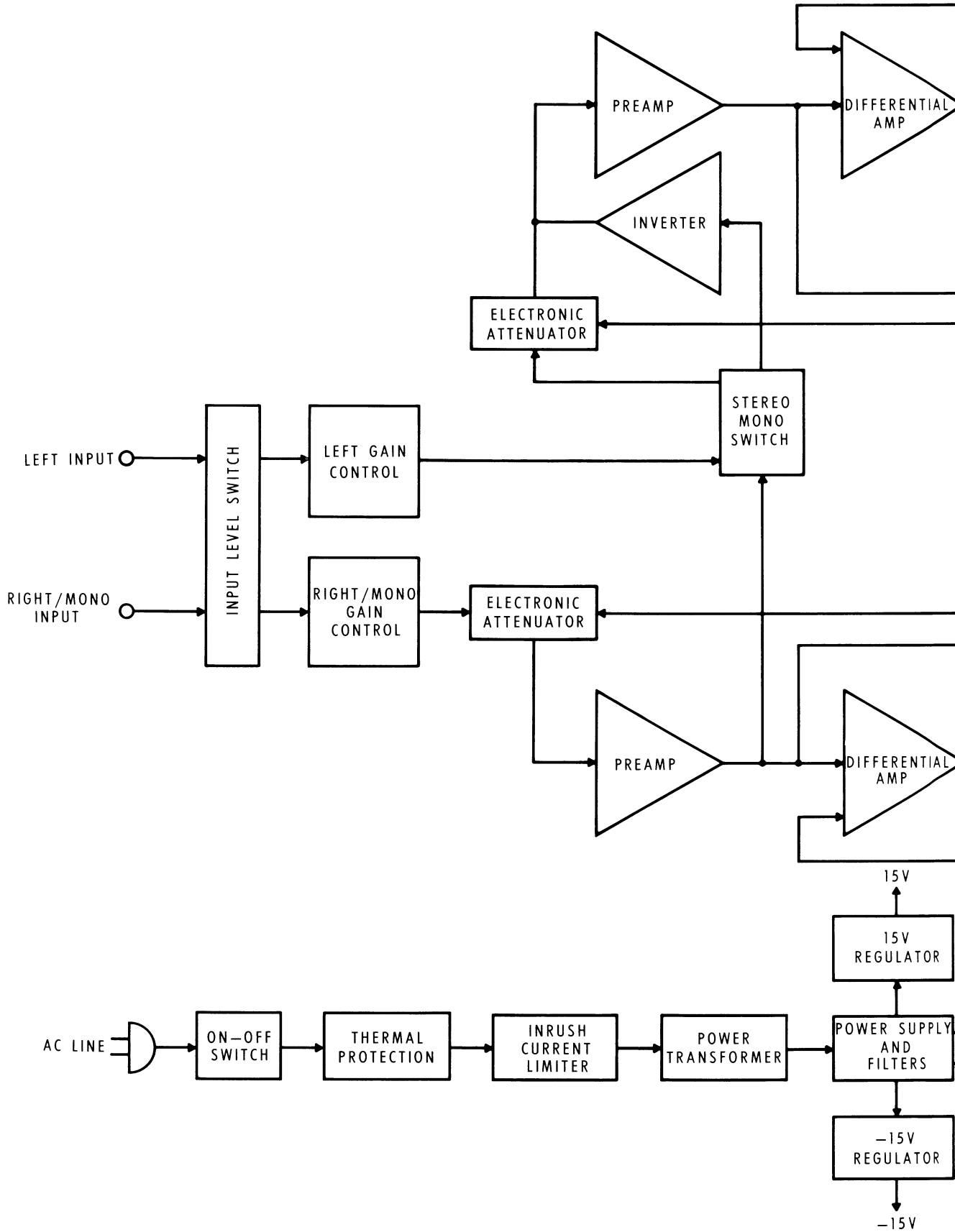
TOP-REAR  
LOCATION OF TRANSISTORS NOT ON PC BOARDS

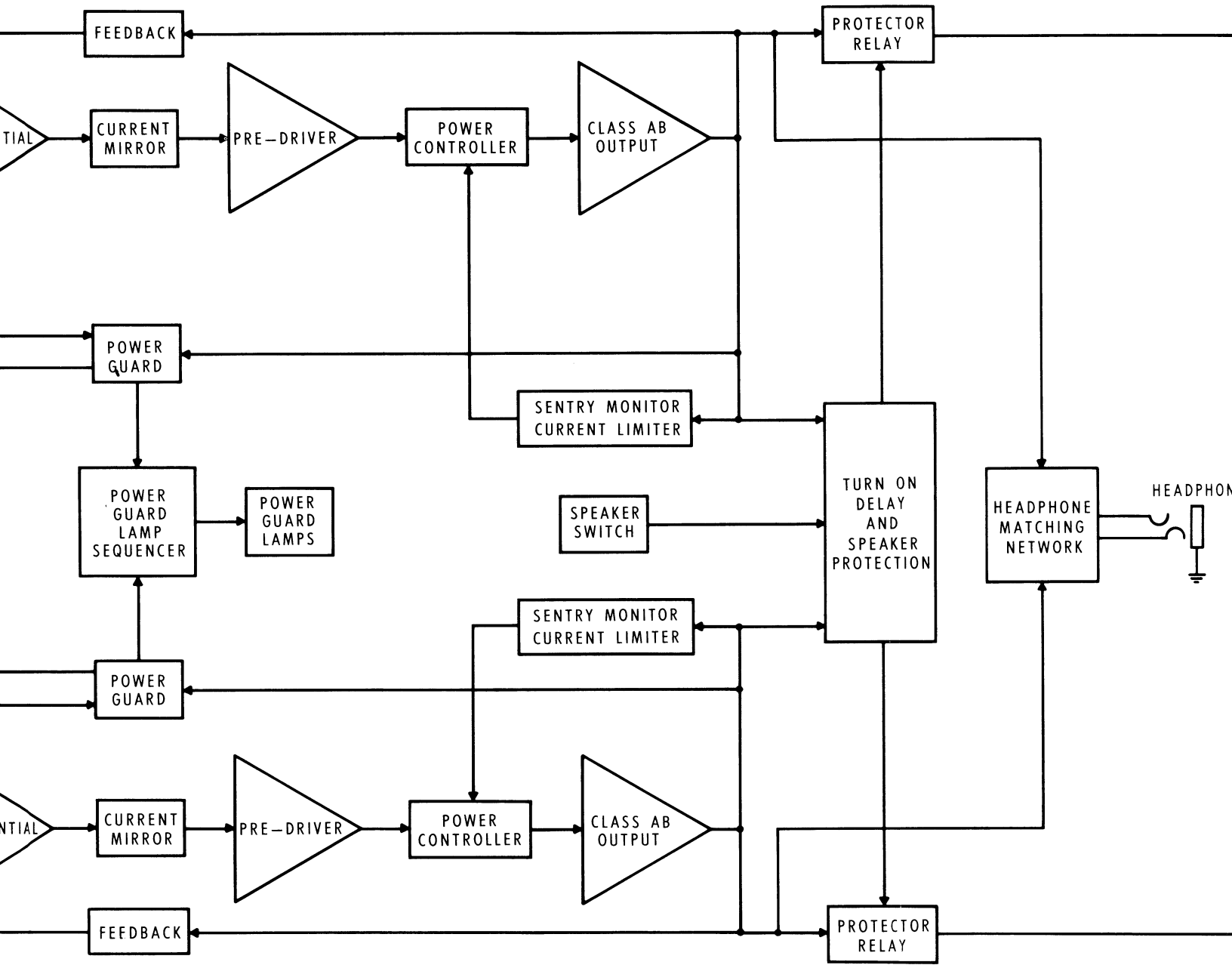




LEFT DRIVER PC BOARD  
045-391

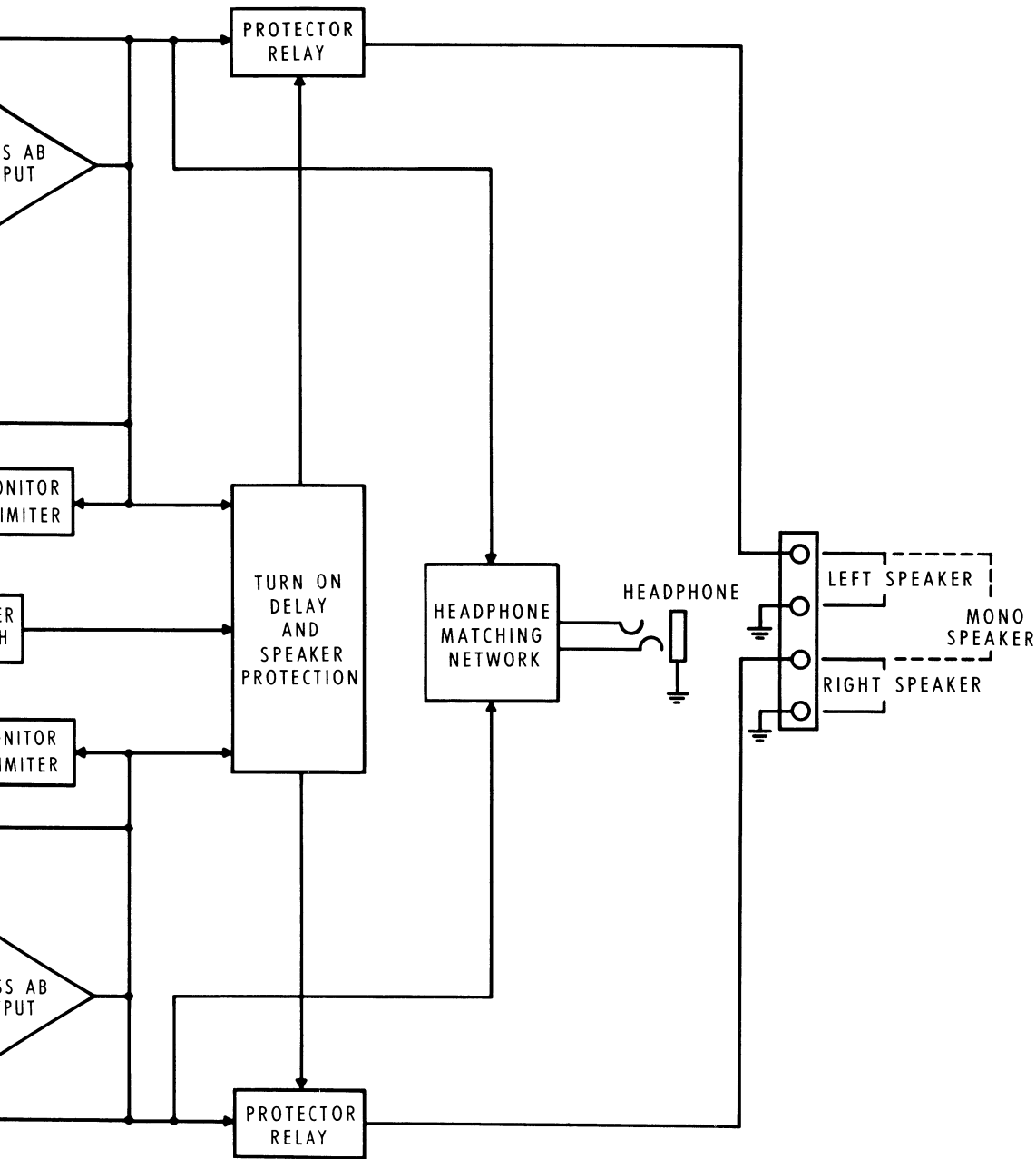


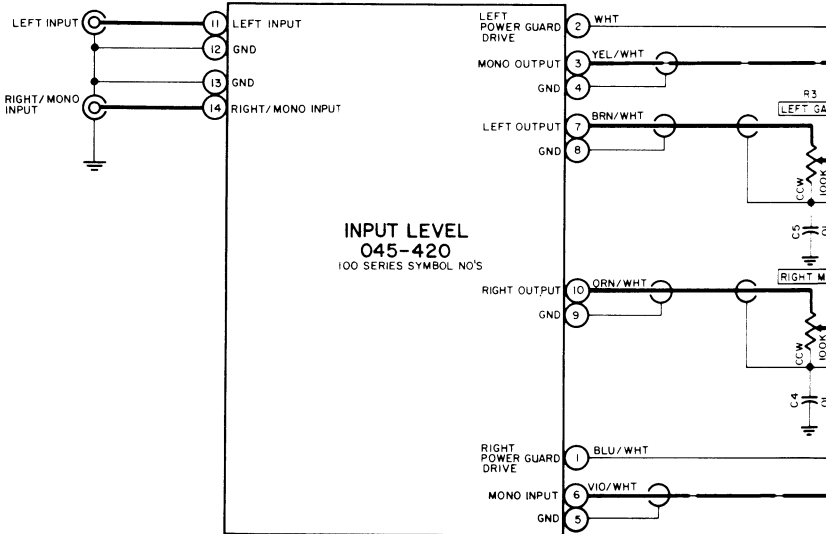
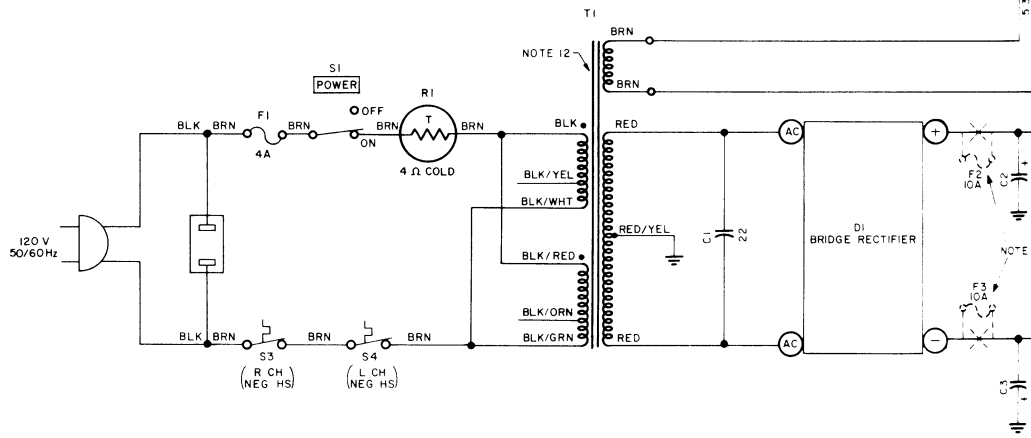
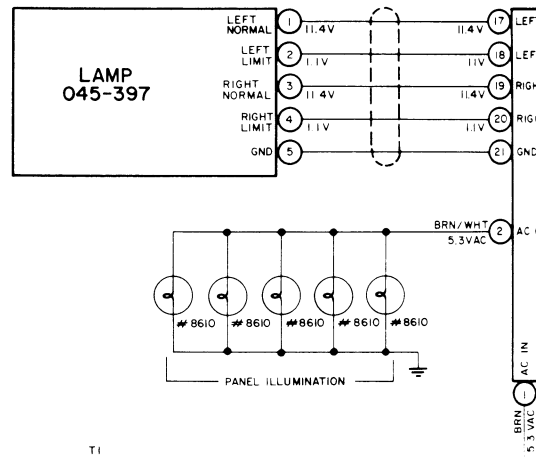


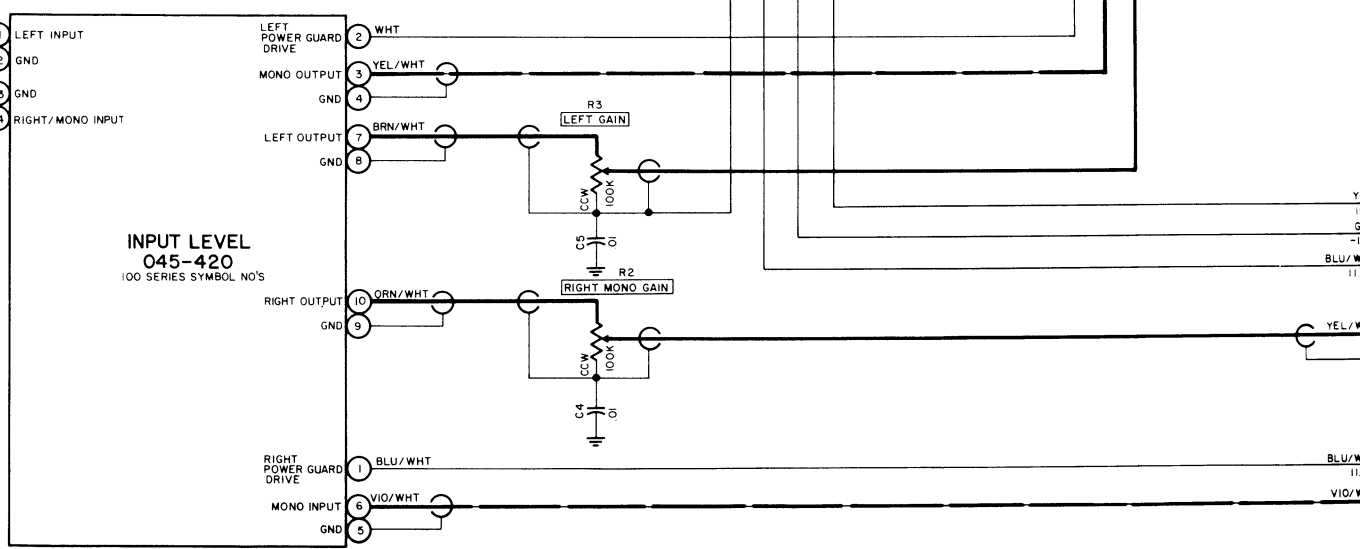
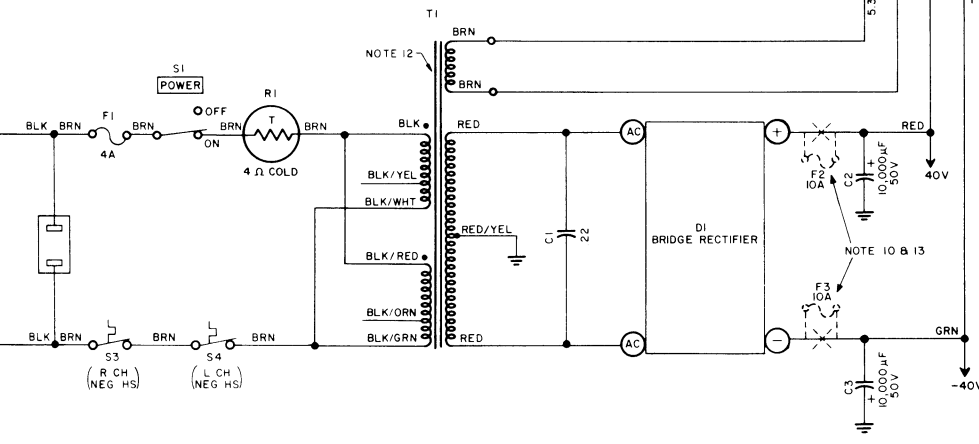
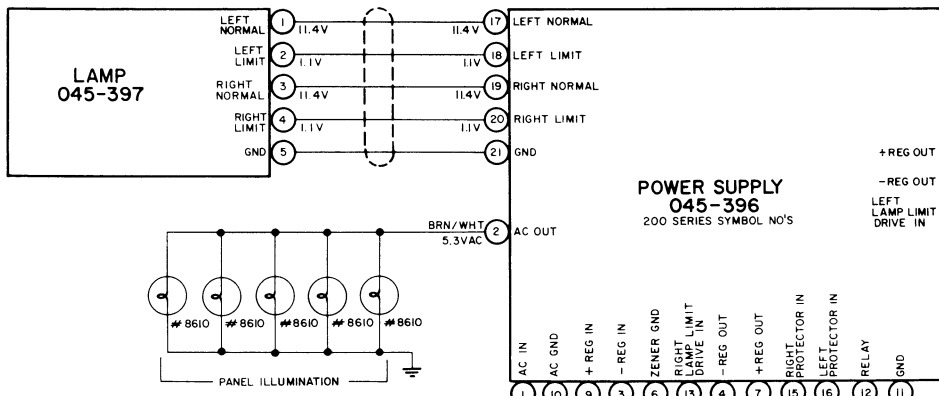


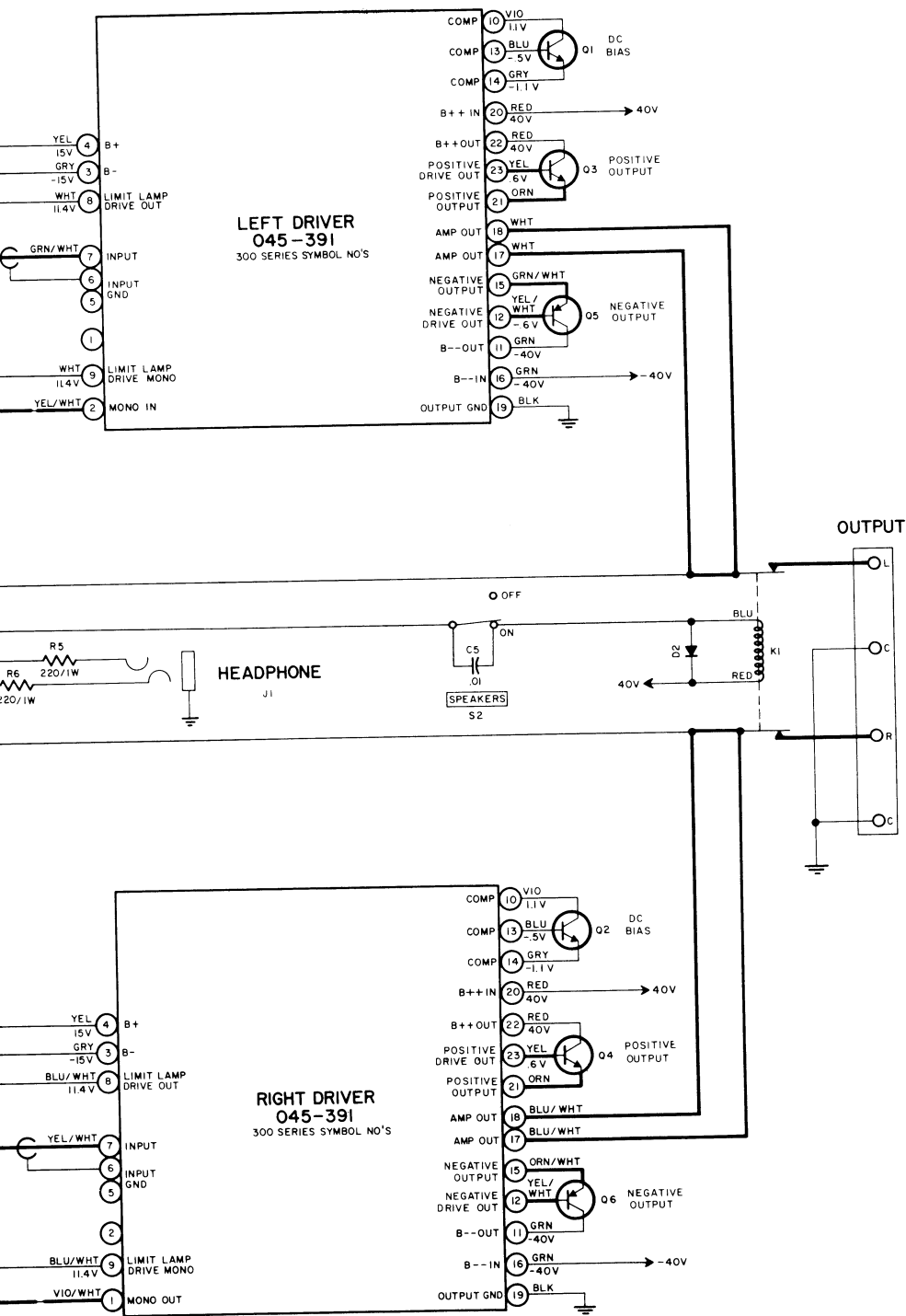
TOR  
 SUPPLY → 40V  
 RS → -40V  
 /  
 TOR

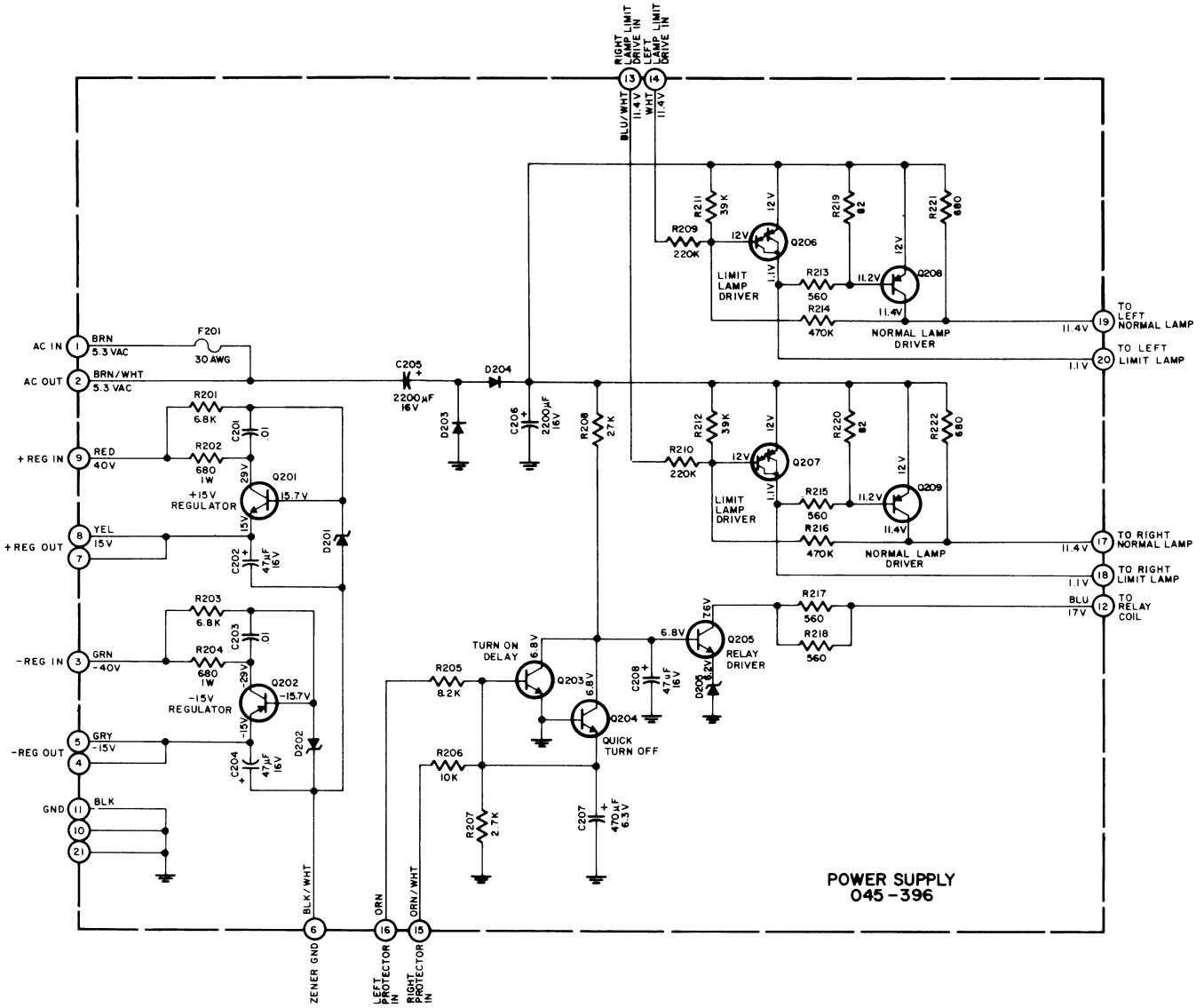




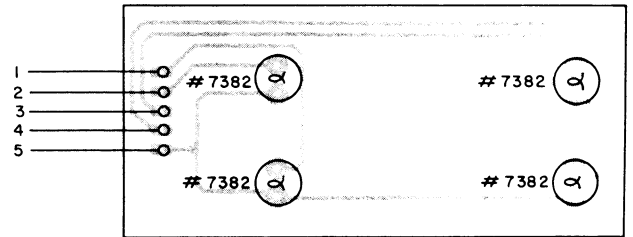
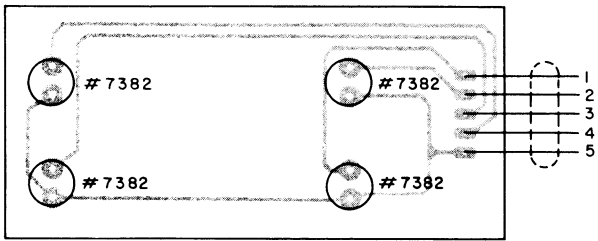
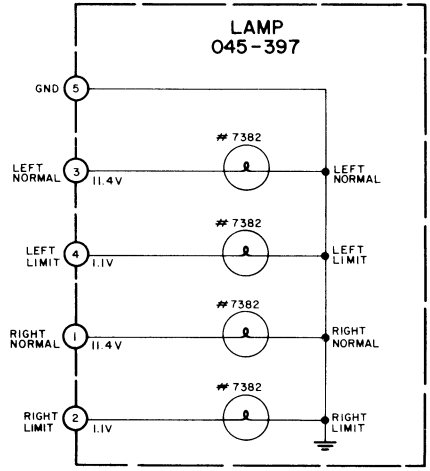






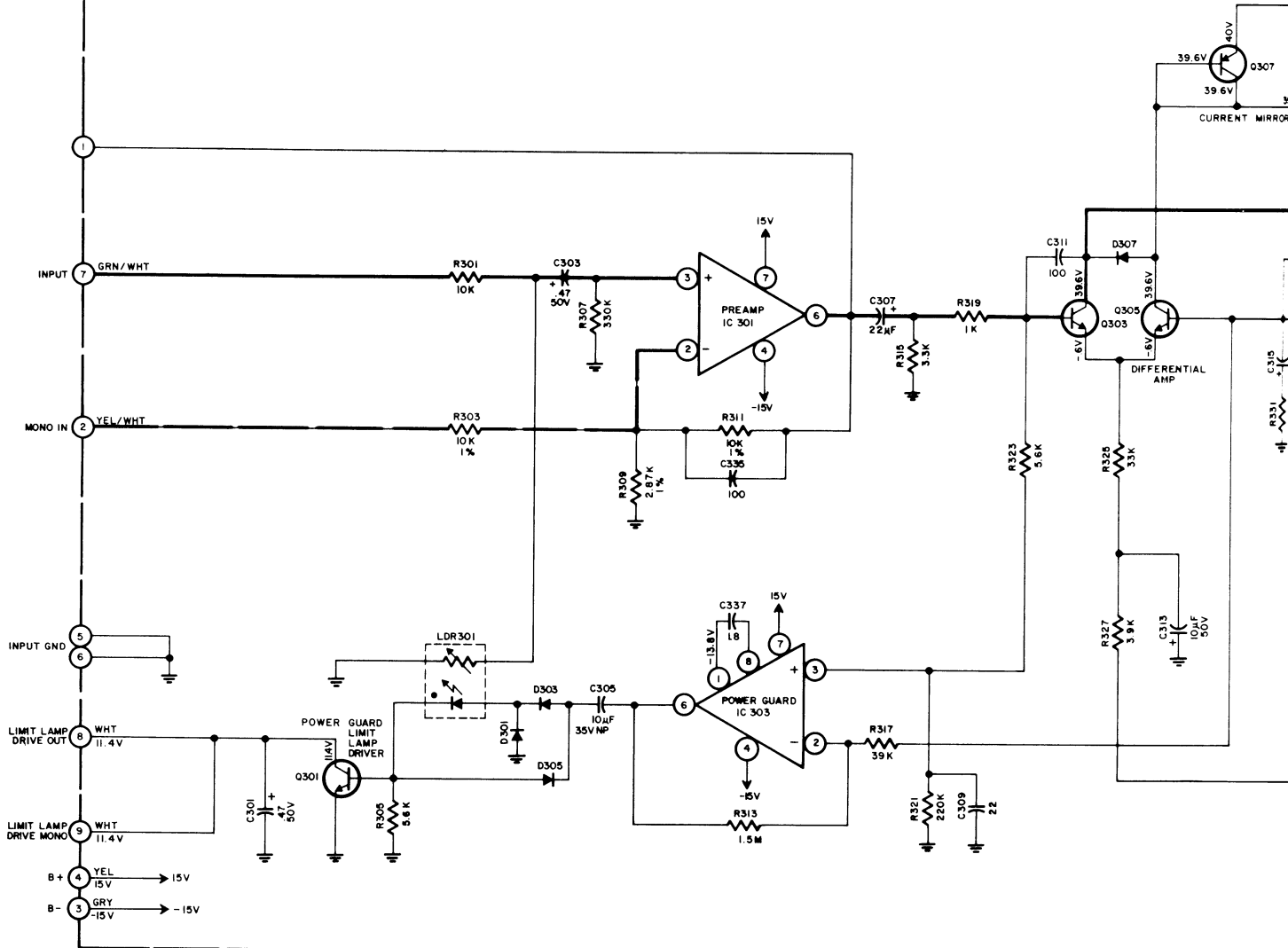


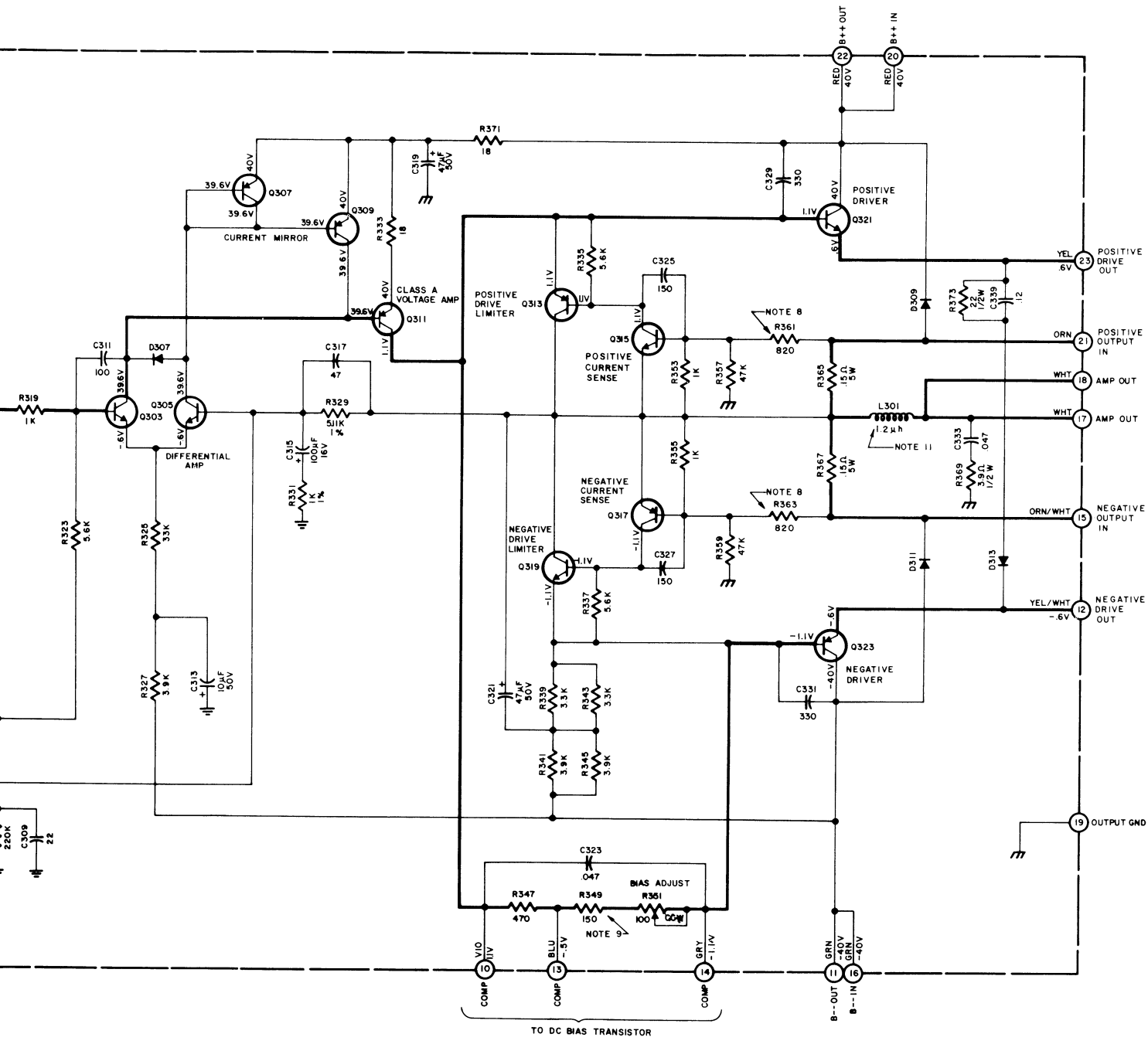
POWER SUPPLY  
045-396



LAMP PC BOARD  
045397

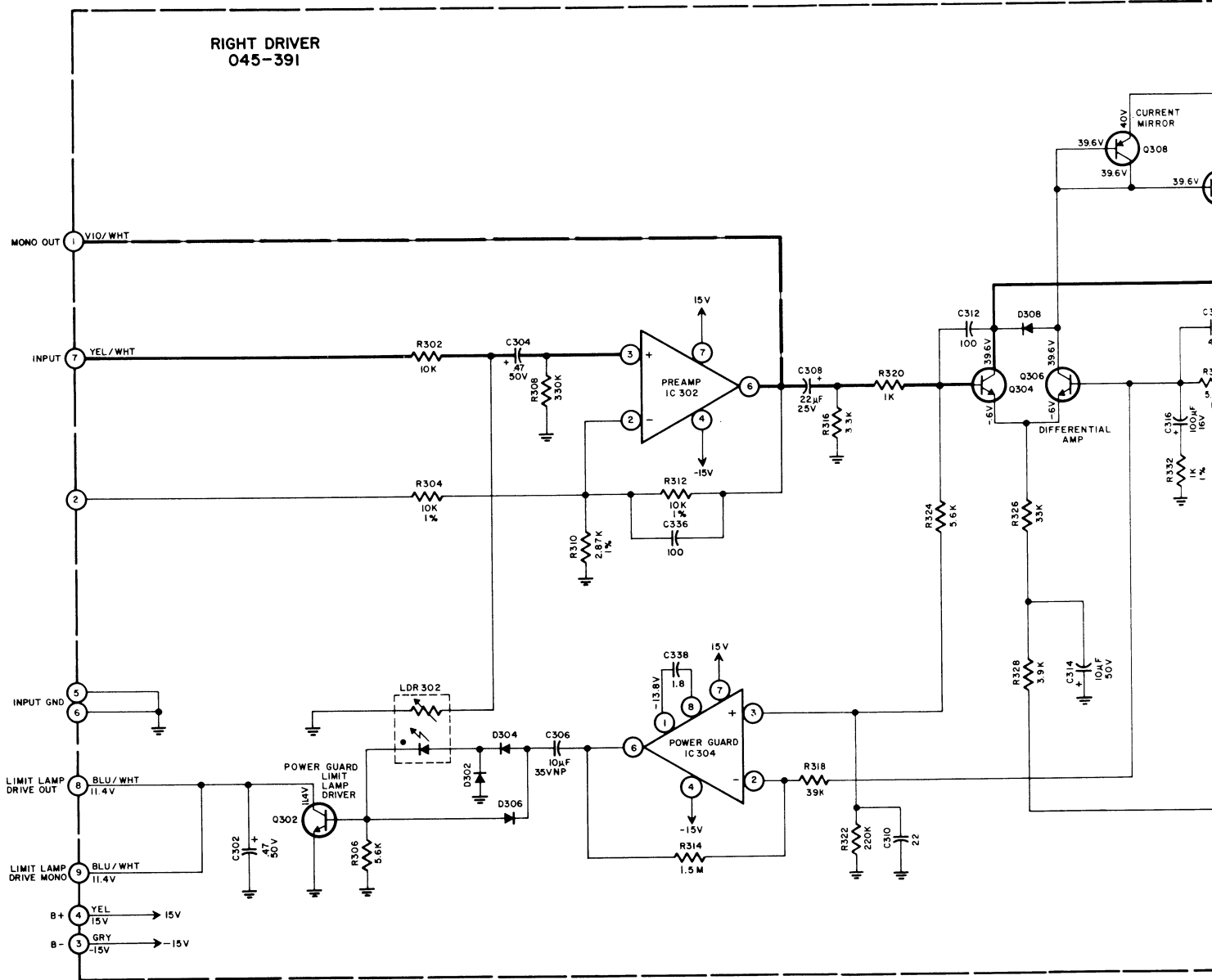
LEFT DRIVER  
045-931

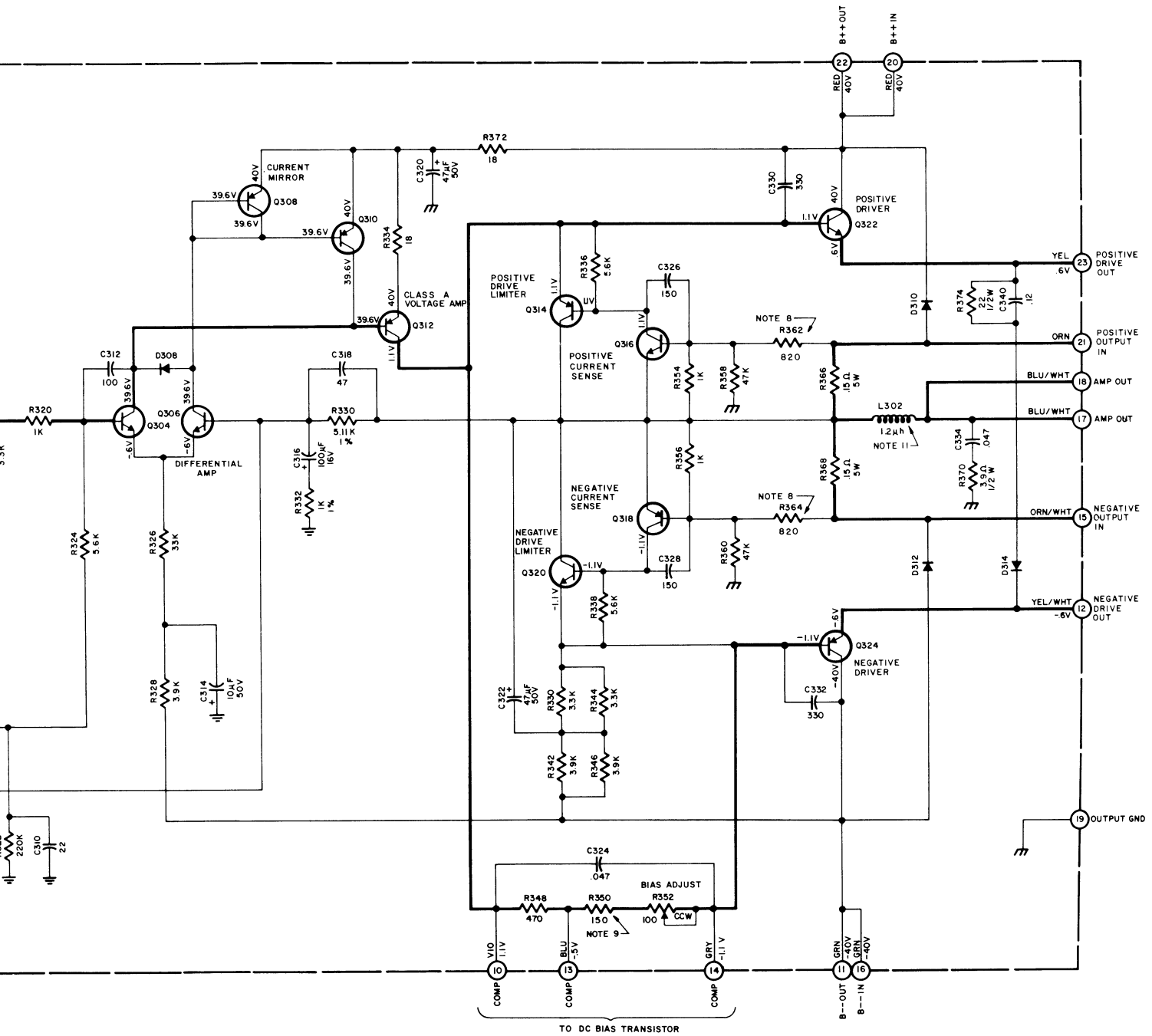




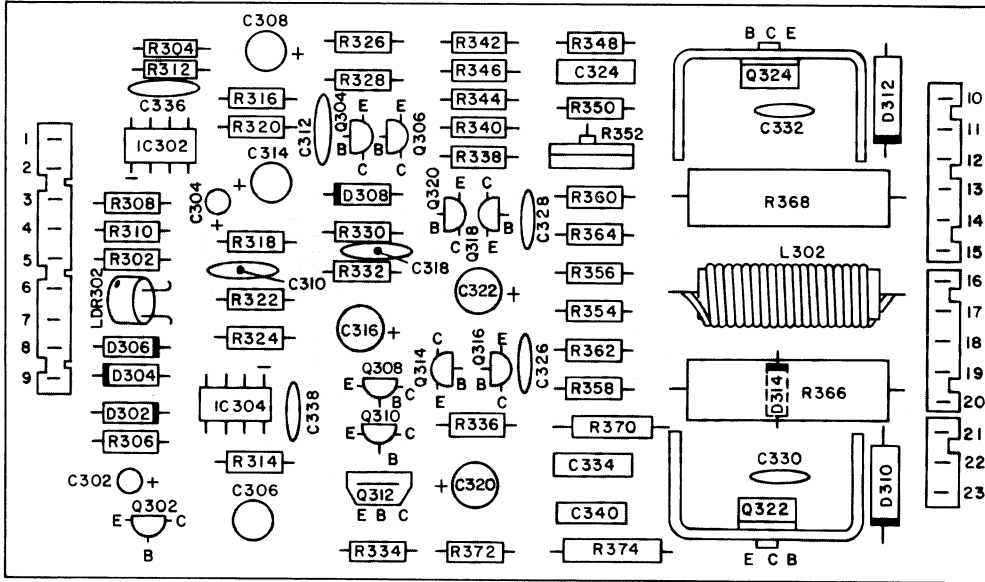
LEFT CHANNEL DRIVER



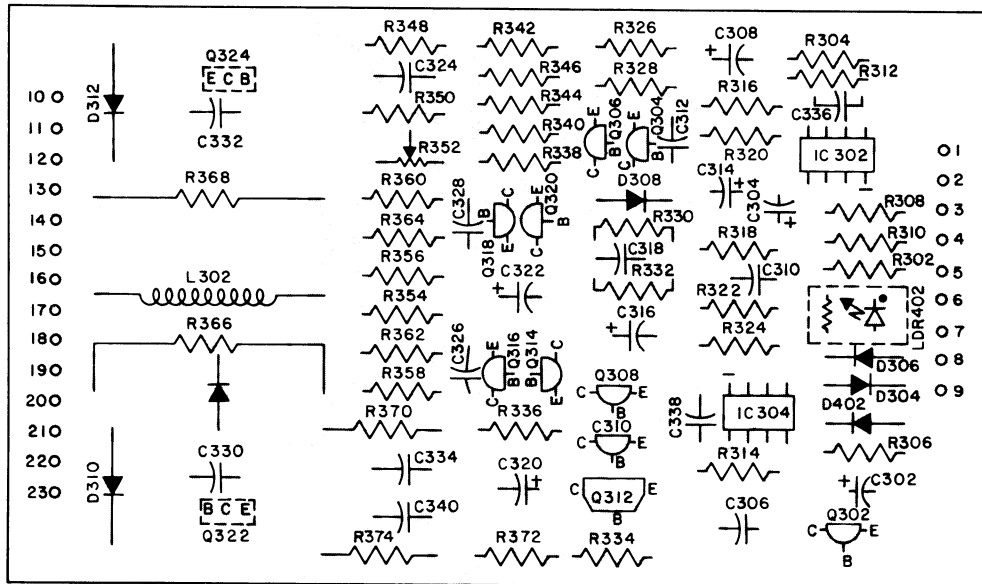


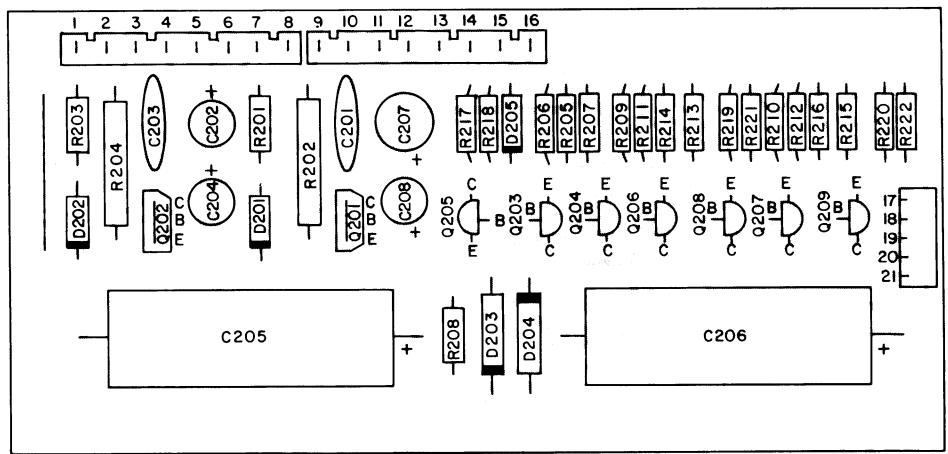


TO DC BIAS TRANSISTOR

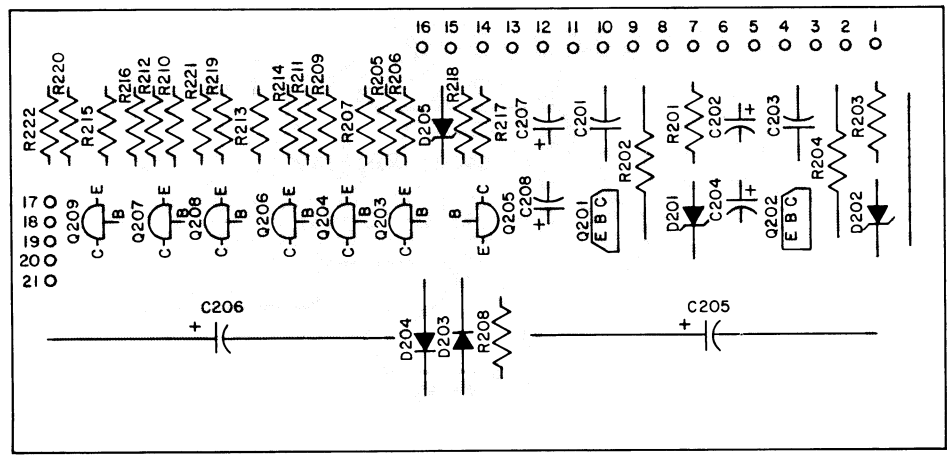


RIGHT DRIVER PC BOARD  
O45-391





POWER SUPPLY PC BOARD  
O45396



## 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, NY 13903-9990  
(Telephone 607-723-3512)

Symbol Number	Description	Part Number		
DIODES				
D1	Bridge rectifier	070092	Q301,302	Si. NPN transistor 132092
D2	Si. signal diode	070031	Q303,304	Si. NPN transistor 132185
D201,202	Zener diode	070114	Q305,306	Si. NPN transistor 132185
D203,204	Si. signal diode	070031	Q307,308	Si. PNP transistor 132096
D205	Zenerdiode	070085	Q309,310	Si. PNP transistor 132096
D301,302	Si. signal diode	070047	Q311,312	Si. PNP transistor 132148
D303,304	Si. signal diode	070047	Q313,314	Si. PNP transistor 132150
D305,306	Si. signal diode	070047	Q315,316	Si. NPN transistor 132143
D307,308	Si. signal diode	070047	Q317,318	Si. PNP transistor 132150
D309,310	Si. signal diode	070031	Q319,320	Si. NPN transistor 132143
D311,312	Si. signal diode	070031	Q321,322	NPN medium power 132183
D313,314	Si. signal diode	070098	Q323,324	PNP medium power 132184
CAPACITORS				
C2,3	Elect. 10000 $\mu$ F 50V	066249	RESISTORS	
C205,206	Elect. 2200 $\mu$ F 16V	066247	LDR301,302	LED photoresistor 144070
C305,306	Elect. 10 $\mu$ F 35V NP	066173	R303,304	Metal film 10K $\Omega$ 1% 1/4W 144053
C323,324	Poly. .047 $\mu$ F 5% 100V	064182	R309,310	Metal film 2.87K $\Omega$ 1% 1/4W 144142
C333,334	Poly. .047 $\mu$ F 5% 100V	064182	R311,312	Metal Film 10K $\Omega$ 1% 1/4W 144053
C337,338	Disc. 1.8pF $\pm$ .25pF NPO	061002	R329,330	Metal film 5.11K $\Omega$ 2% 1/4W 144083
C339,340	Poly. .12 $\mu$ F 5% 100V	064211	R331,332	Metal film 1K $\Omega$ 1% 1/4W 144090
INTEGRATED CIRCUITS				
IC301,302	Integrated circuit	133066	R365,366	Non-Inductive *139125
IC303,304	Integrated circuit	133068	R367,368	Non-Inductive *139125
TRANSISTORS				
Q1,2	Si. NPN Transistor	132143	R373,374	Flameproof 22 $\Omega$ 10% 1/2W 144066
Q3,4	Si. NPN Power transistor	132188	SWITCHES	
Q5,6	Si. PNP Power transistor	132189	S1	Power switch 146204
Q201	Si. NPN transistor	132149	S2	Speaker switch 146204
Q202	Si. PNP transistor	132148	S3,4	Thermal cutout 153017
Q203,204	Si. NPN transistor	132143	S101	Input level 148049
Q205	Si. NPN transistor	132185	S102	Mode 148048
Q206,207	PNP Darlington	132182	POTENTIOMETERS	
Q208,209	Si. PNP transistor	132150	R2	Right/Mono gain 134363
RELAYS				
TRANSFORMERS				
FUSES				
CHOKES				
RELAYS				
CHOKES				

LAMPS

Power guard #7382 058061

Front panel #8610 058069

FRONT PANEL & TRIM

Front panel 045771

Front panel glass 045428

End cap 018204

Power knob 090156

Speaker knob 090156

Right/mono gain knob 090156

Left gain knob 090156

MISCELLANEOUS

Fuseholder 178106

AC power cord 170119

Shipping carton 045454

Hardware package 045531

Panel lamp grommet 078005

6' audio cable 170015

J1 Headphone jack 117049

\* See Note 8

\*\* See Note 10 and 13