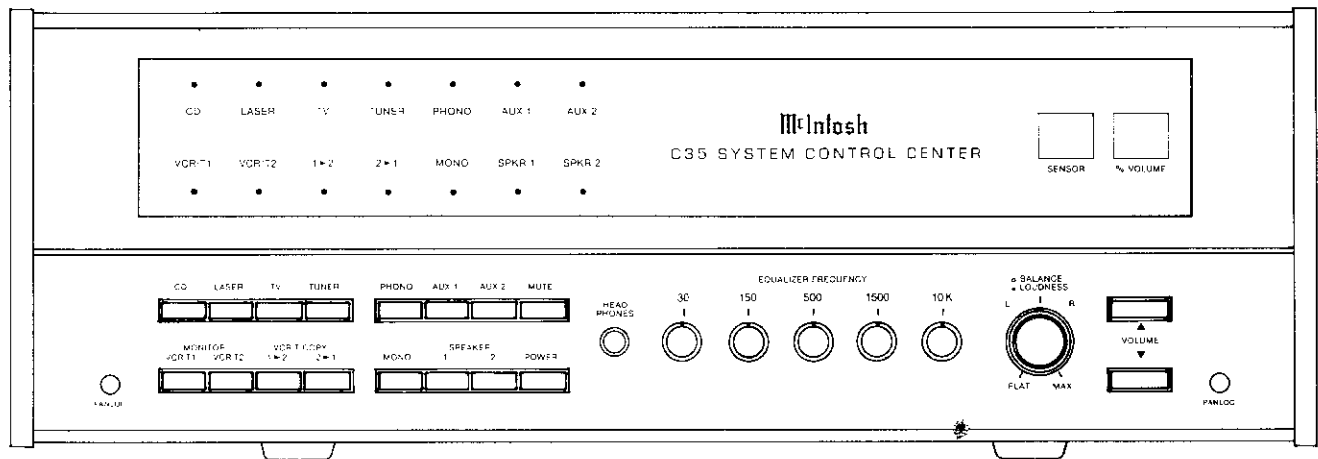


# C35

## SYSTEM CONTROL CENTER



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# McIntosh® Service Manual

# Performance Specifications

## FREQUENCY RESPONSE

+0, -0.5dB from 20Hz to 20,000Hz

## RATED OUTPUT

2.5V

## OUTPUT IMPEDANCE

Balanced 600 ohm  
Unbalanced 600 ohm

## MAXIMUM VOLTAGE OUTPUT

Main and Tape Output- 8V from 20 to 20,000Hz

## TOTAL HARMONIC DISTORTION

0.002% maximum from 20 to 20,000Hz at rated output

## SENSITIVITY

Phono- 2.5mV for 2.5V rated output  
(0.5mV IHF High Level- 250mV for 2.5V rated output (50mV IHF)

## SIGNAL TO NOISE RATIO, A-WEIGHTED

Phono- 90dB below 10mV input (84dB IHF)  
High Level- 105dB below rated output (95dB IHF)

## MAXIMUM INPUT SIGNAL

Phono- 90mV  
High Level- 10V

## INPUT IMPEDANCE

Phono- 47K ohms and 65pF capacitance  
High Level- 22k ohms

## VOLTAGE GAIN

Phono to Tape- 40dB  
Phono to Main- 60dB  
High Level to Tape- 0dB  
High Level to Main- 20dB

## EQUALIZER CONTROLS

Variable 12dB boost to 12dB cut at center frequencies of 30, 150, 500, 1500 10kHz

## GENERAL INFORMATION

### SEMICONDUCTOR COMPLEMENT

49 Bipolar Transistors  
73 Field Effect Transistors  
35 Integrated Circuits  
112 Diodes

### AC POWER OUTLETS

4 Black, switched, and 1 red, unswitched, 1500 watts total capacity

### POWER REQUIREMENTS

120 Volts, 50/60Hz, 25 watts

### MECHANICAL INFORMATION

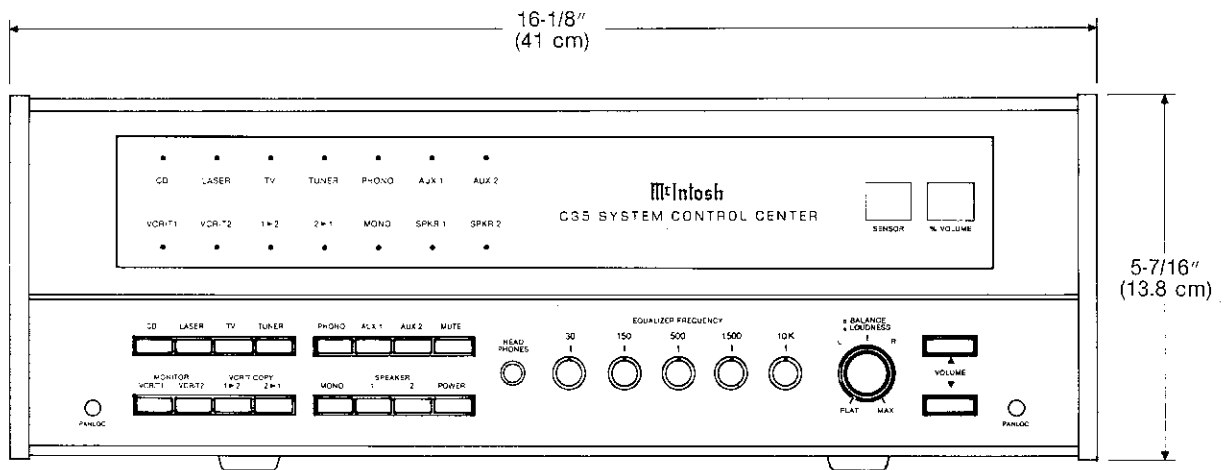
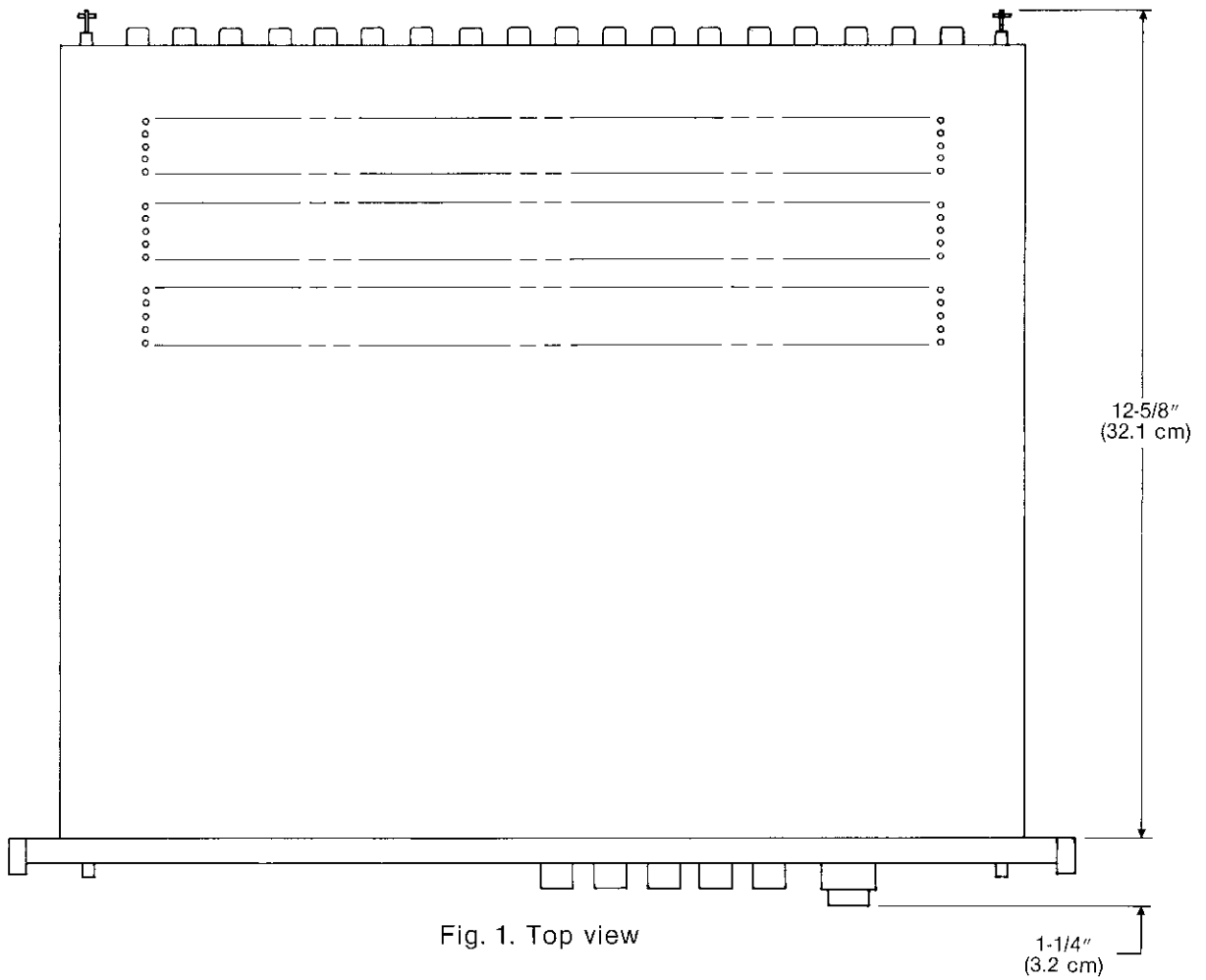
#### SIZE:

Front panel measures 16-1/8 inches wide (41 cm) by 5-7/16 inches high (13.8 cm) by 13 inches deep (33 cm), including connectors. Knob clearance required is 1-3/8 inches (3.5 cm) in front of mounting panel.

#### WEIGHT

18 pounds (8.2 kg) net, 30 pounds (13.6 kg) in shipping carton.

# Mechanical Views



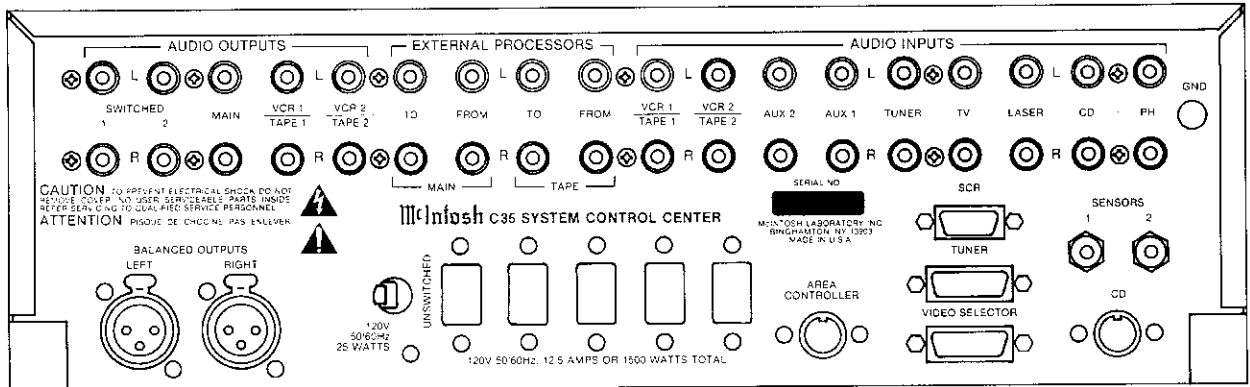


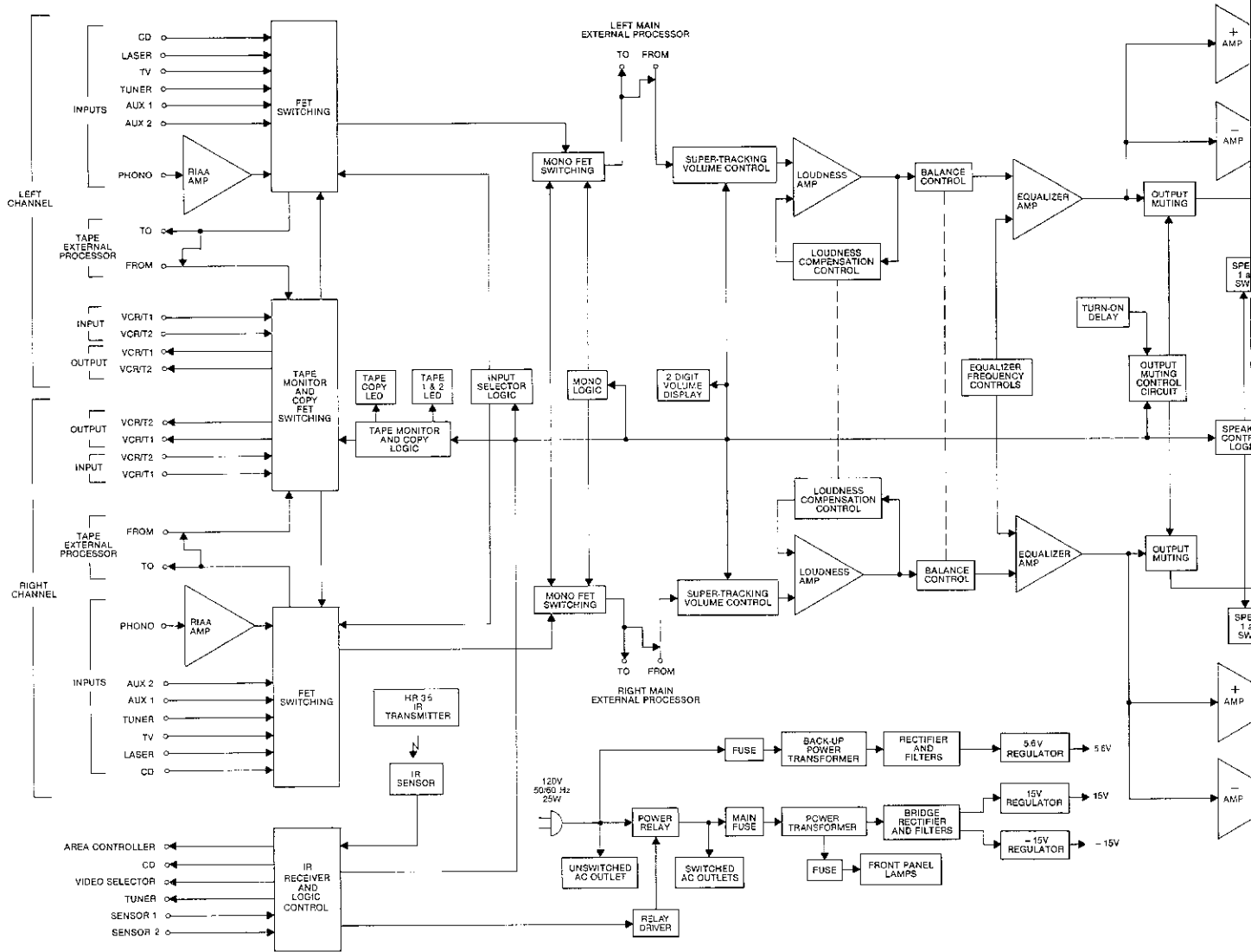
Fig. 3. Rear view

## Notes

- The heavy lines on the schematics denote the primary signal path.
- Unless otherwise specified:
  - Resistor values are in ohms.
  - Capacitance values smaller than 1 are in microfarads ( $\mu\text{F}$ ) and greater than 1 are in picofarads ( $\text{pF}$ ).
  - Inductor values are in microhenries ( $\mu\text{H}$ ).
- Unless otherwise noted, all voltages indicated on the schematics are measured under the following conditions:
  - AC input at 120 volts, 50/60Hz.
  - All voltages are  $\pm 10\%$  with respect to ground. A high impedance (10 megohm) voltmeter must be used.
  - Front panel controls are set at:
 

POWER	ON
INPUT	TUNER
EQUALIZER (5)	CENTER DETENT
BALANCE	CENTER DETENT
LOUDNESS	FLAT
VOLUME	FULL
- The voltages enclosed in a box are signal voltages that are measured with a 250mV, 1kHz signal connected to both channels at the TUNER input jacks.

# Block Diagram



# Section Locations

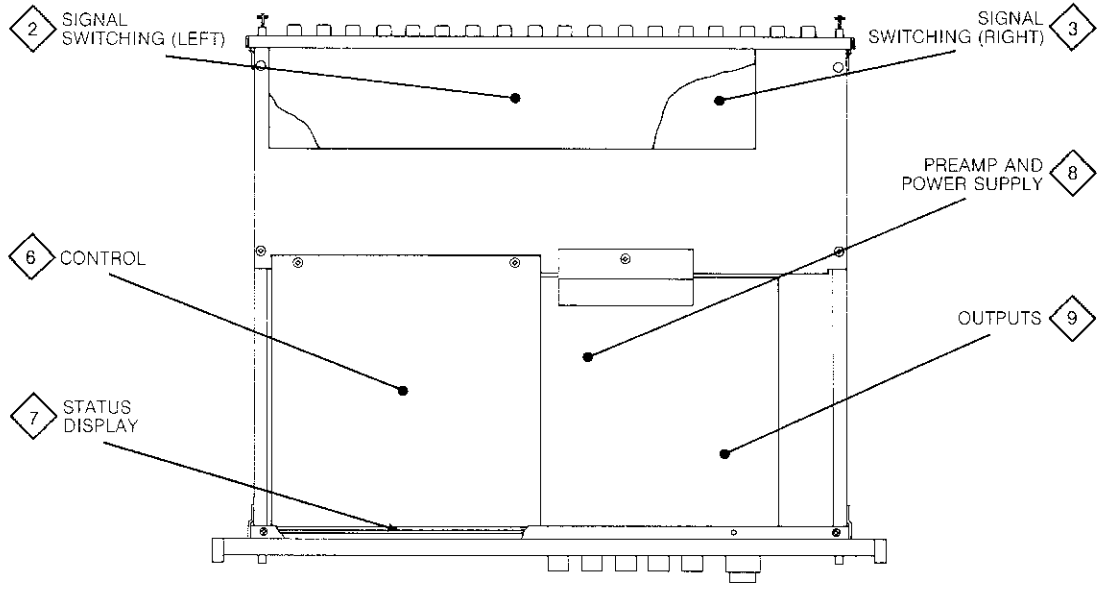
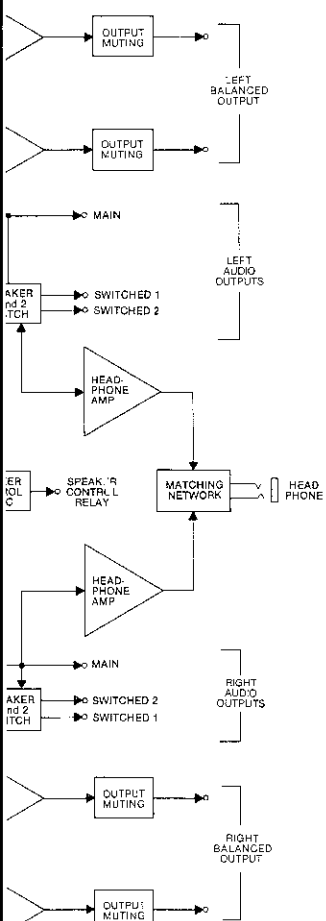


Fig. 4. Top view with cover removed.

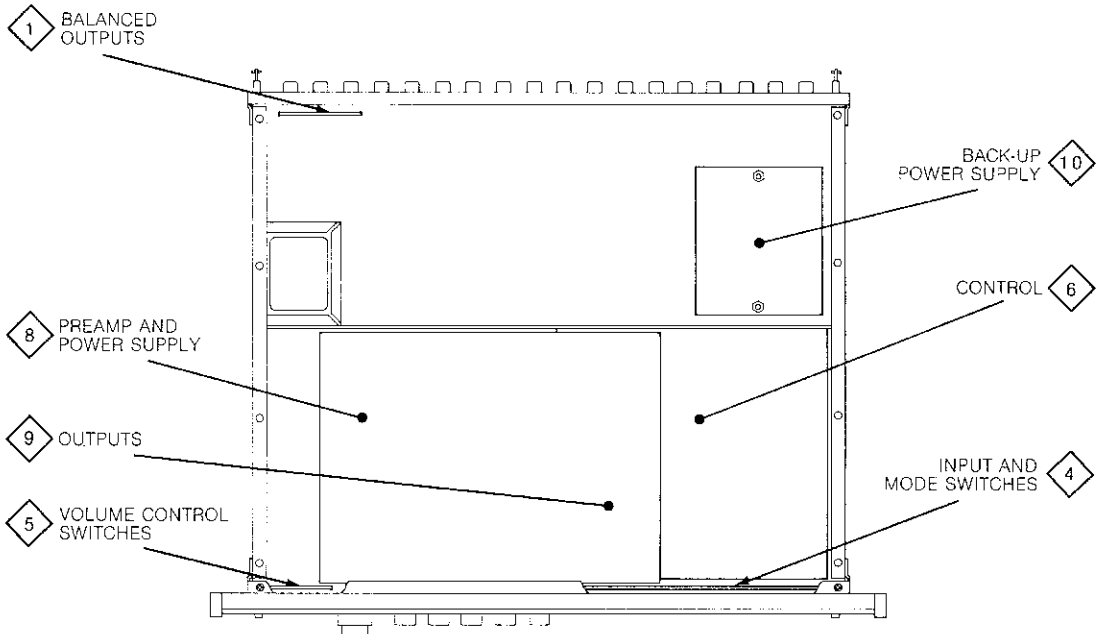


Fig. 5. Bottom view with cover removed.

# Interconnection Diagram

# 1

## FRONT PANEL and TRIM PARTS LIST

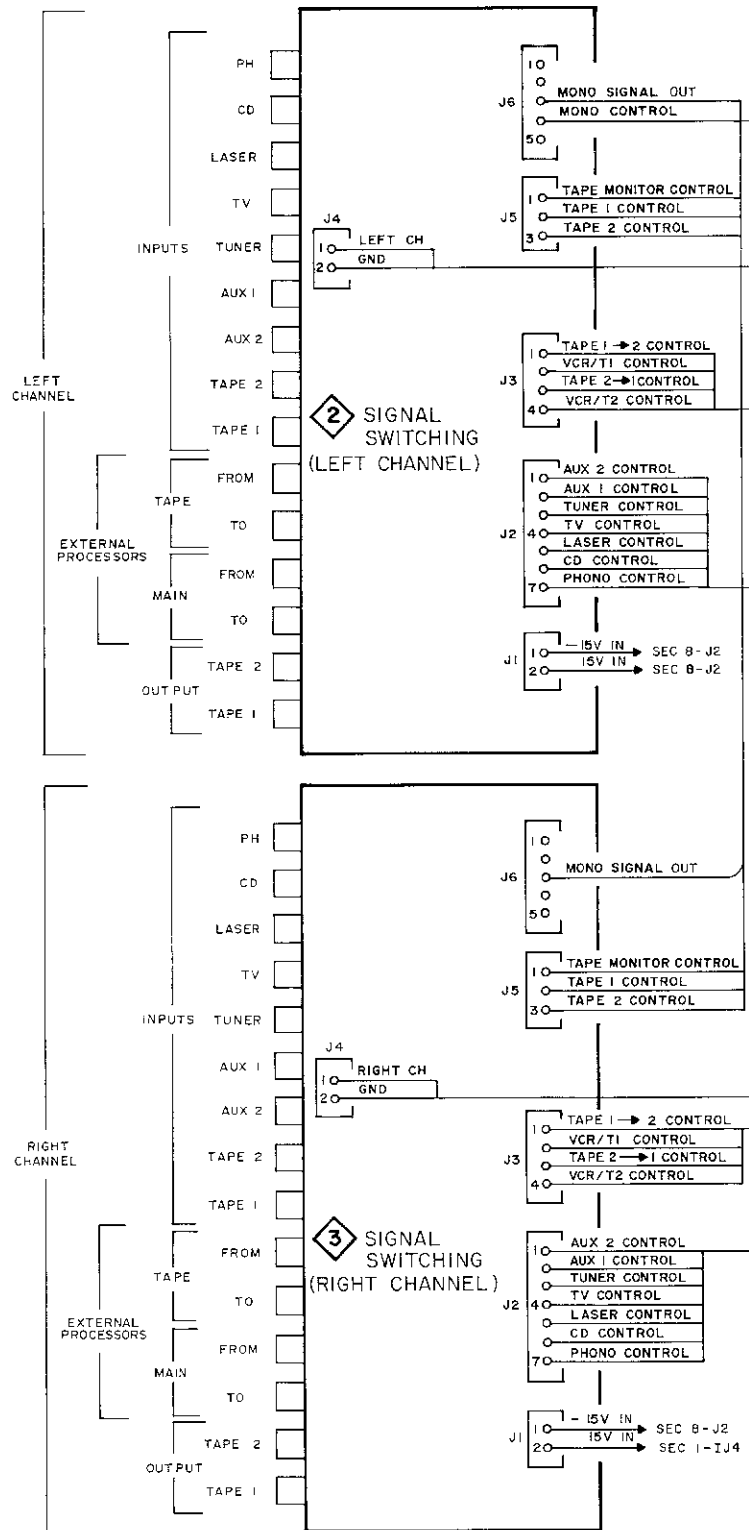
Part	Description
017341	Pushbutton, Black, Volume
017396	Pushbutton, Black
017397	Pushbutton, Red
018364	Bottom Extrusion
018375	Top Panel Rail, Secure W/100147 Screws
018232	End Cap, Secure W/101042 Screws
046958	Front Panel, Glass
046959	Front Panel, Complete
090207	Balance Knob, Rear
090218	Loudness Knob, Front
090221	Equalizer Frequency Knob
104017	Knob Felt Washer, 3/4 Dia.

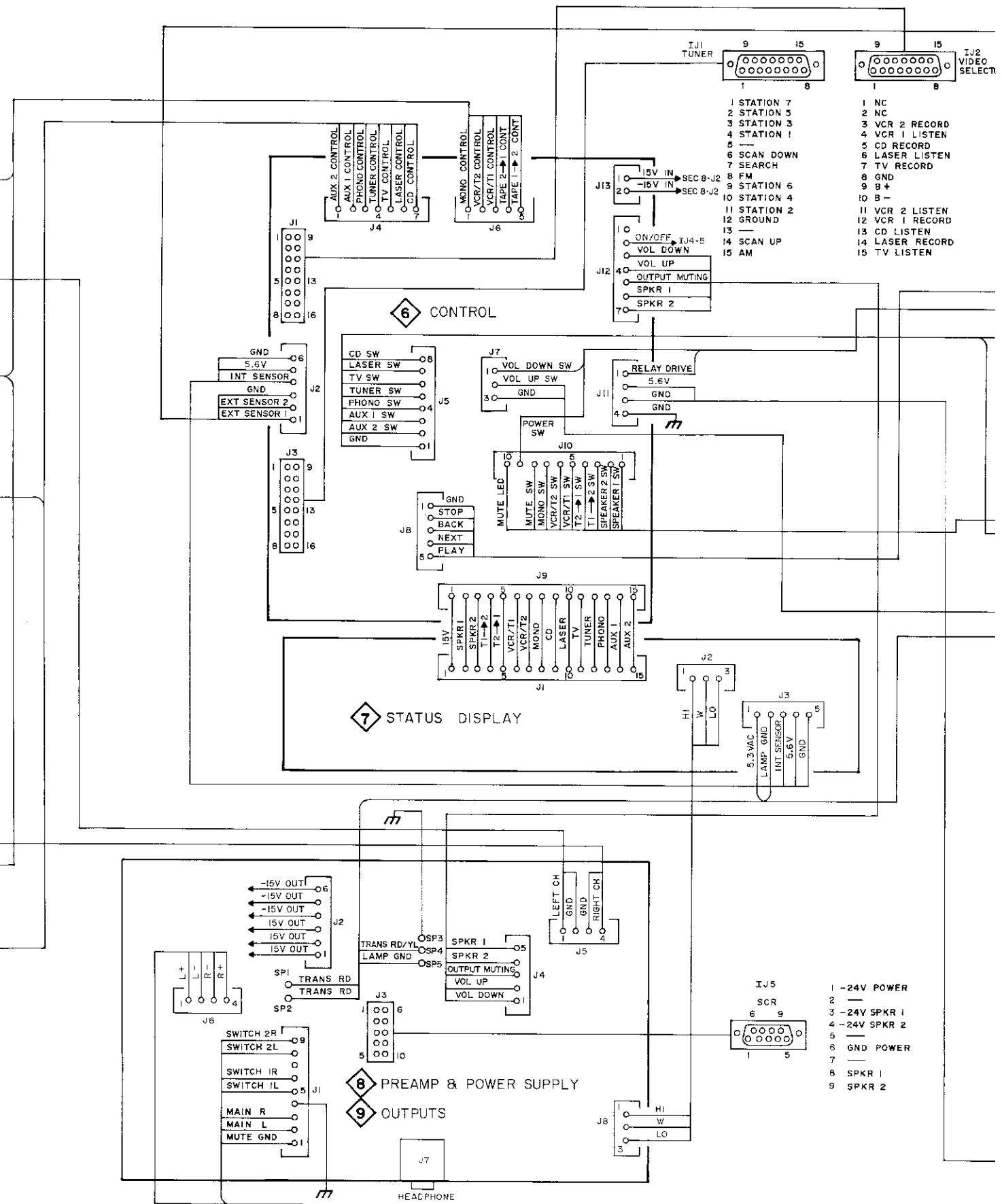
## INSTALLATION HARDWARE PARTS LIST

Part	Description
003508	Panloc Shelf Bracket, Right
003509	Panloc Shelf Bracket, Left
017156	Plastic Foot, 3/4 in. high (Earlier Units), Secure W/100160 Screws
017218	Plastic Foot, 1 in. high (Later Units), Secure W/100159 Screws
039671	Mounting Template
043401	Mounting Strip
046722	Hardware Package

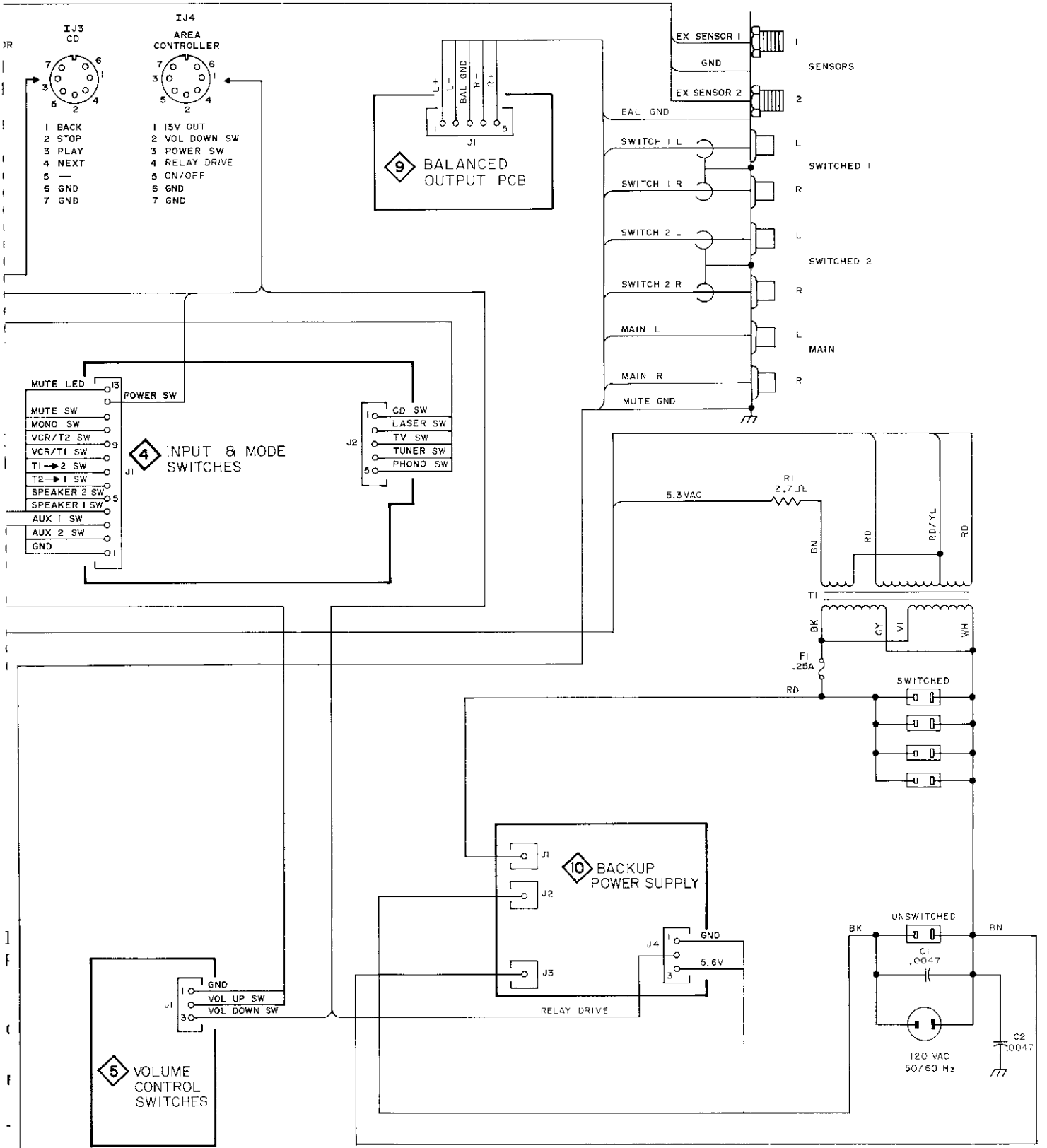
## INTERCONNECTION PARTS LIST

Symbol	Part	Description
<b>CAPACITORS</b>		
C1,C2	061276	CD, 0.0047uF, 400V, UL/CSA
<b>FUSES</b>		
F1	089048	Fuse, SB, 0.25A, 250V, MDL-1/4
<b>TRANSFORMERS</b>		
T1	159198	Power

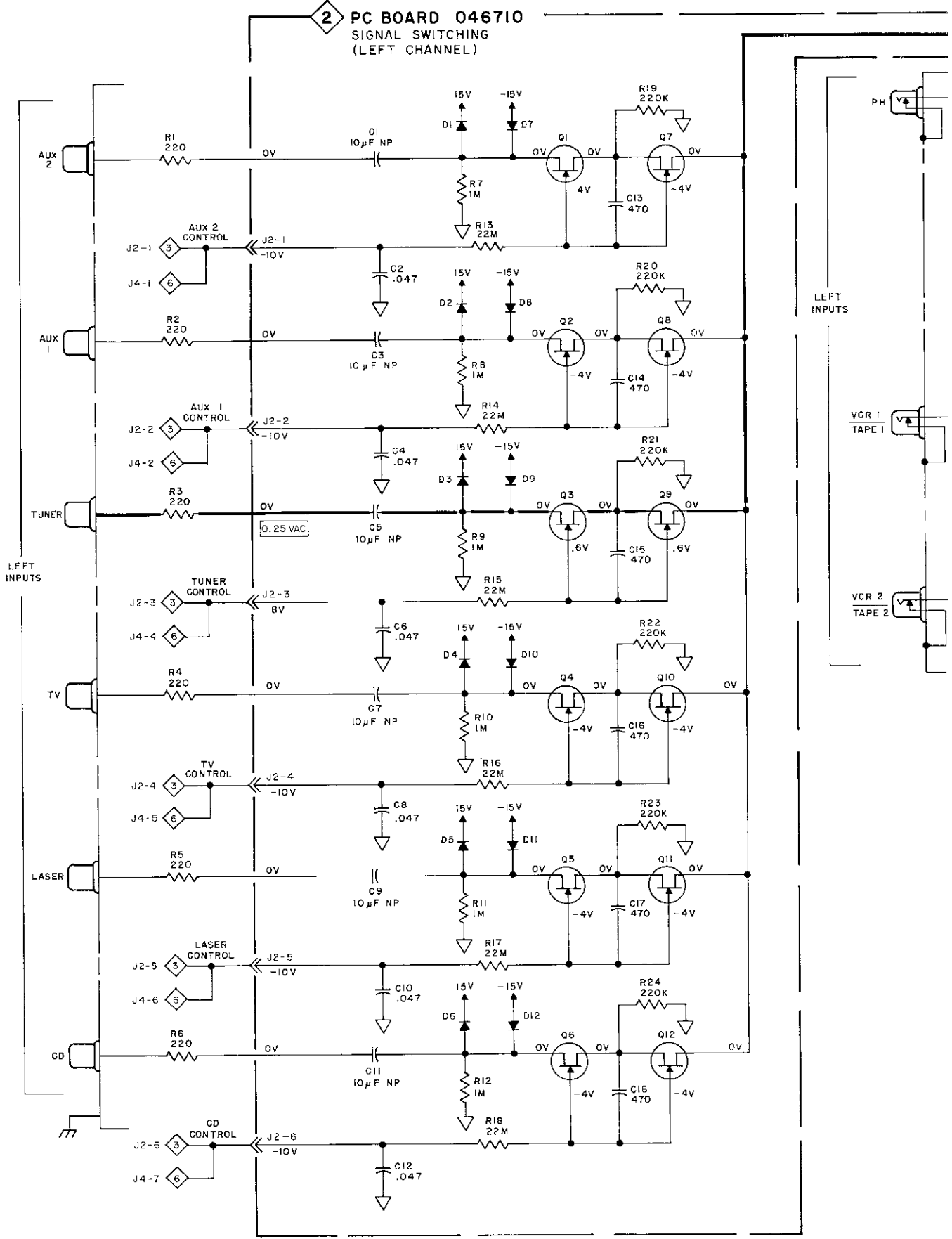


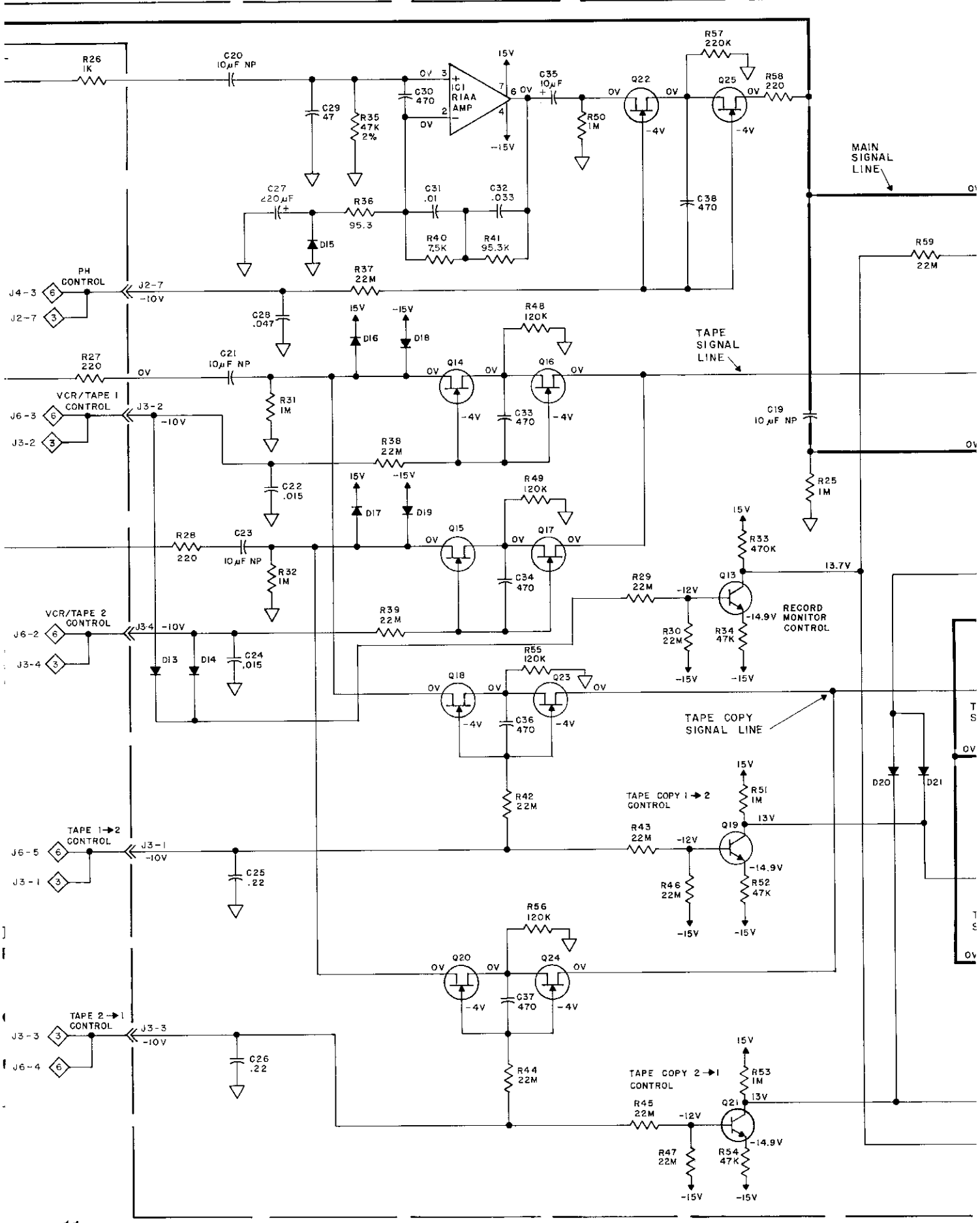


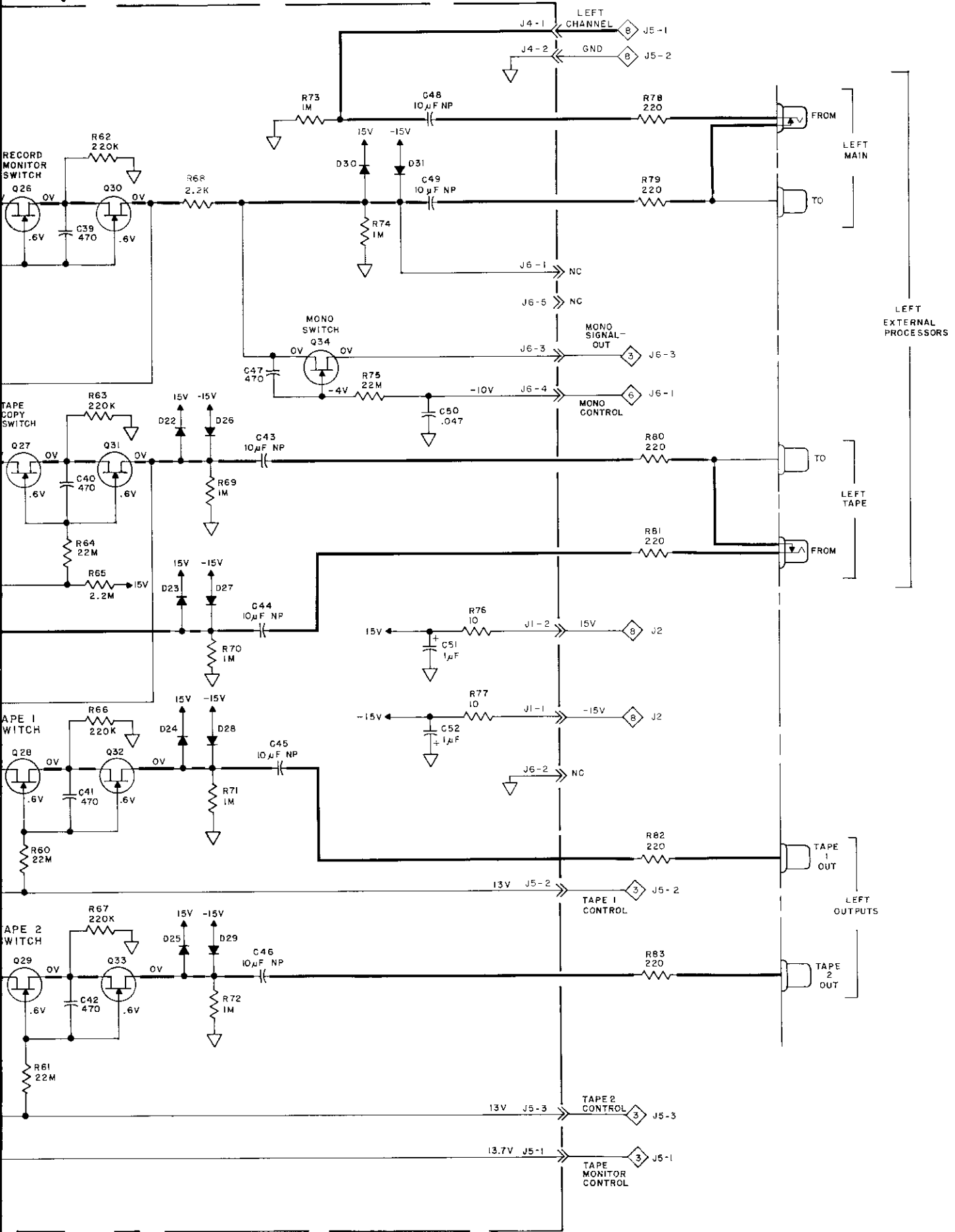




# 2 Signal Switching (Left Channel)

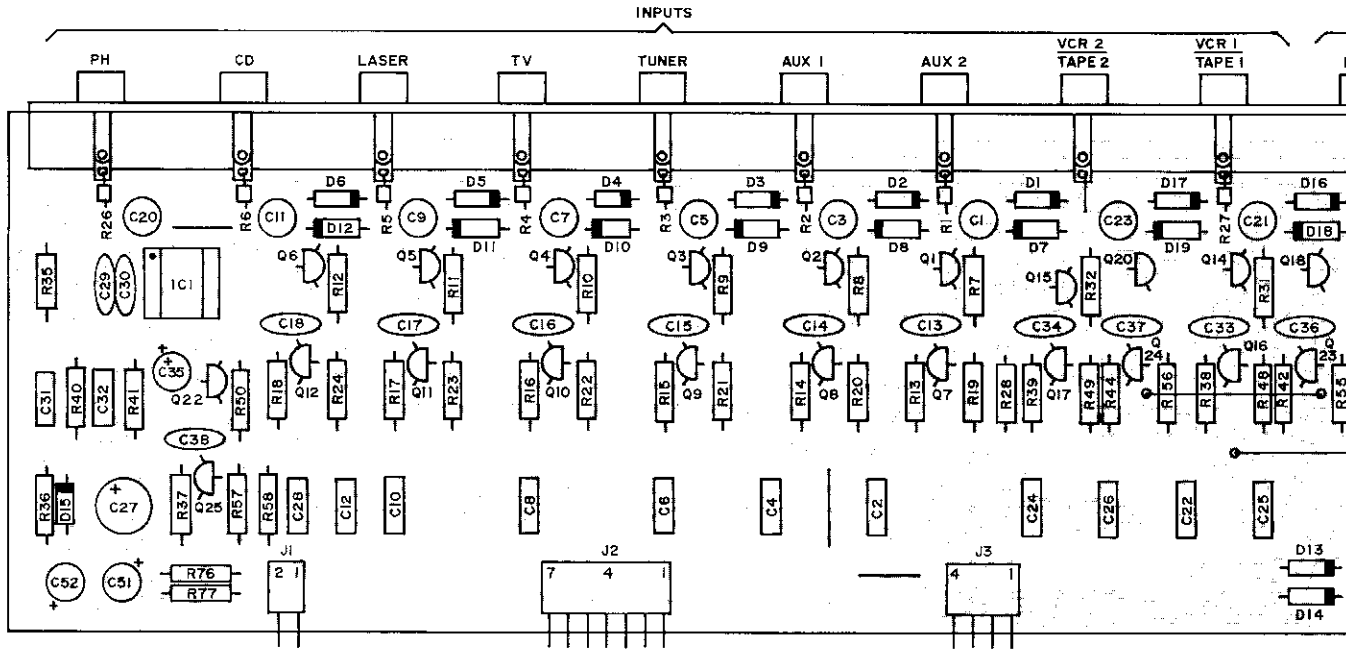






# Signal Switching (Left Channel)

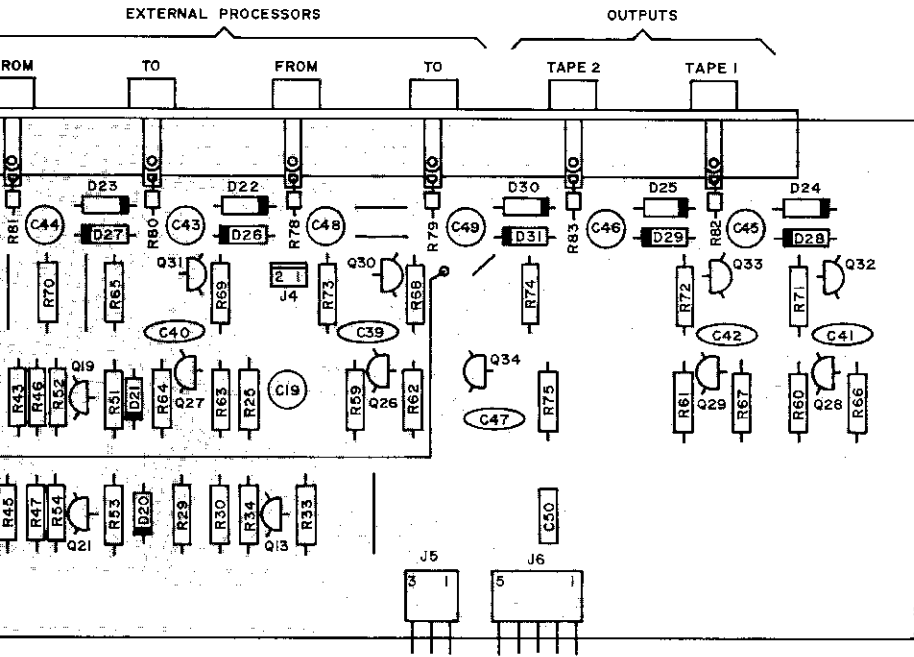
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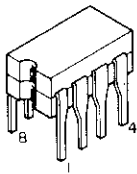
SIGNAL SWITCHING (LEFT CHANNEL) PC

## SIGNAL SWITCHING (LEFT CHANNEL) PARTS LIST

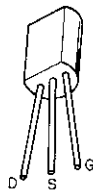
Symbol	Part	Description
<b>DIODES</b>		
D1-D31	070047	SIG, 75V, 150mA, 1N4148
<b>INTEGRATED CIRCUITS</b>		
IC1	133067	Operational Amp, Low Noise, NE5534AN
<b>TRANSISTORS</b>		
Q1-Q12	132193	N, JFET, 2N4392
Q13	132235	NPN, 2SC2240-BL
Q14-Q18	132193	N, JFET, 2N4392
Q19	132235	NPN, 2SC2240-BL
Q20	132193	N, JFET, 2N4392
Q21	132235	NPN, 2SC2240-BL
Q22-Q34	132193	N, JFET, 2N4392



CB 046710



IC1

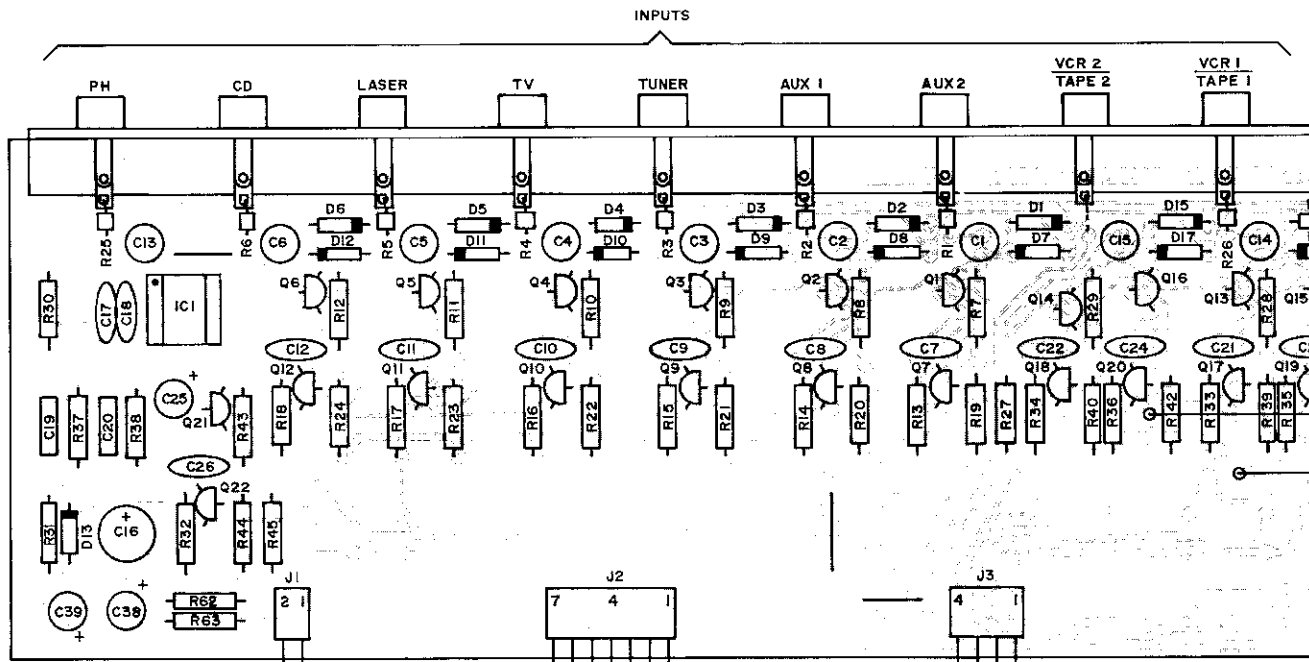


Q1-Q12, Q14-Q18,  
Q20, Q22-Q34



Q13, Q19, Q21

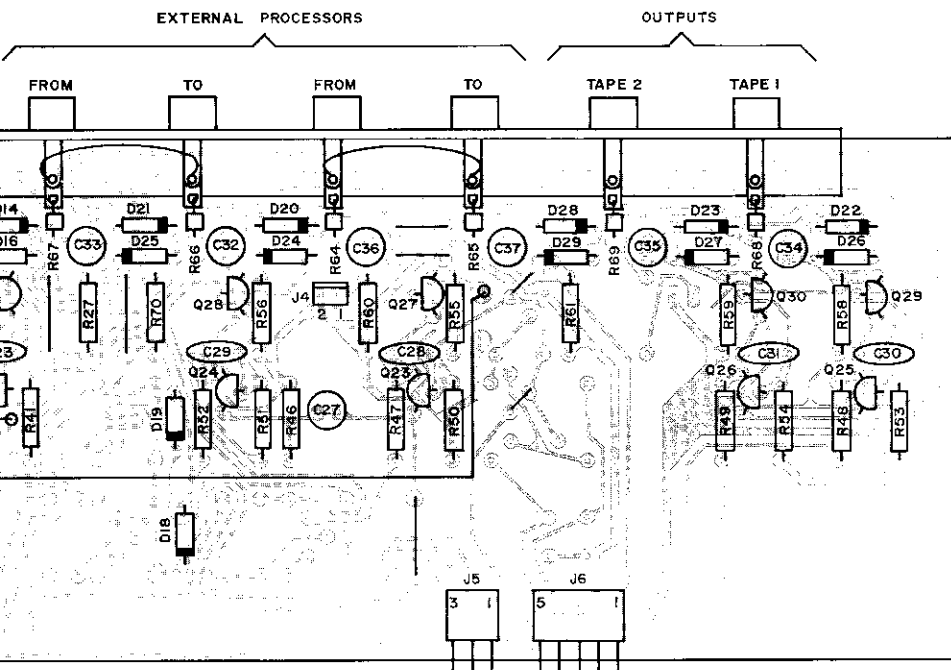
# 3 Signal Switching (Right Channel)



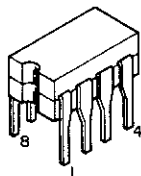
SIGNAL SWITCHING (RIGHT CHANNEL)

## SIGNAL SWITCHING (RIGHT CHANNEL) PARTS LIST

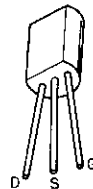
Symbol	Part	Description
<b>DIODES</b>		
D1-D29	070047	SIG, 75V, 150mA, 1N4148
<b>INTEGRATED CIRCUITS</b>		
IC1	133067	Operational Amp, Low Noise, NE5534AN
<b>TRANSISTORS</b>		
Q1-Q30	132193	N, JFET, 2N4392



PCB 046711



IC1

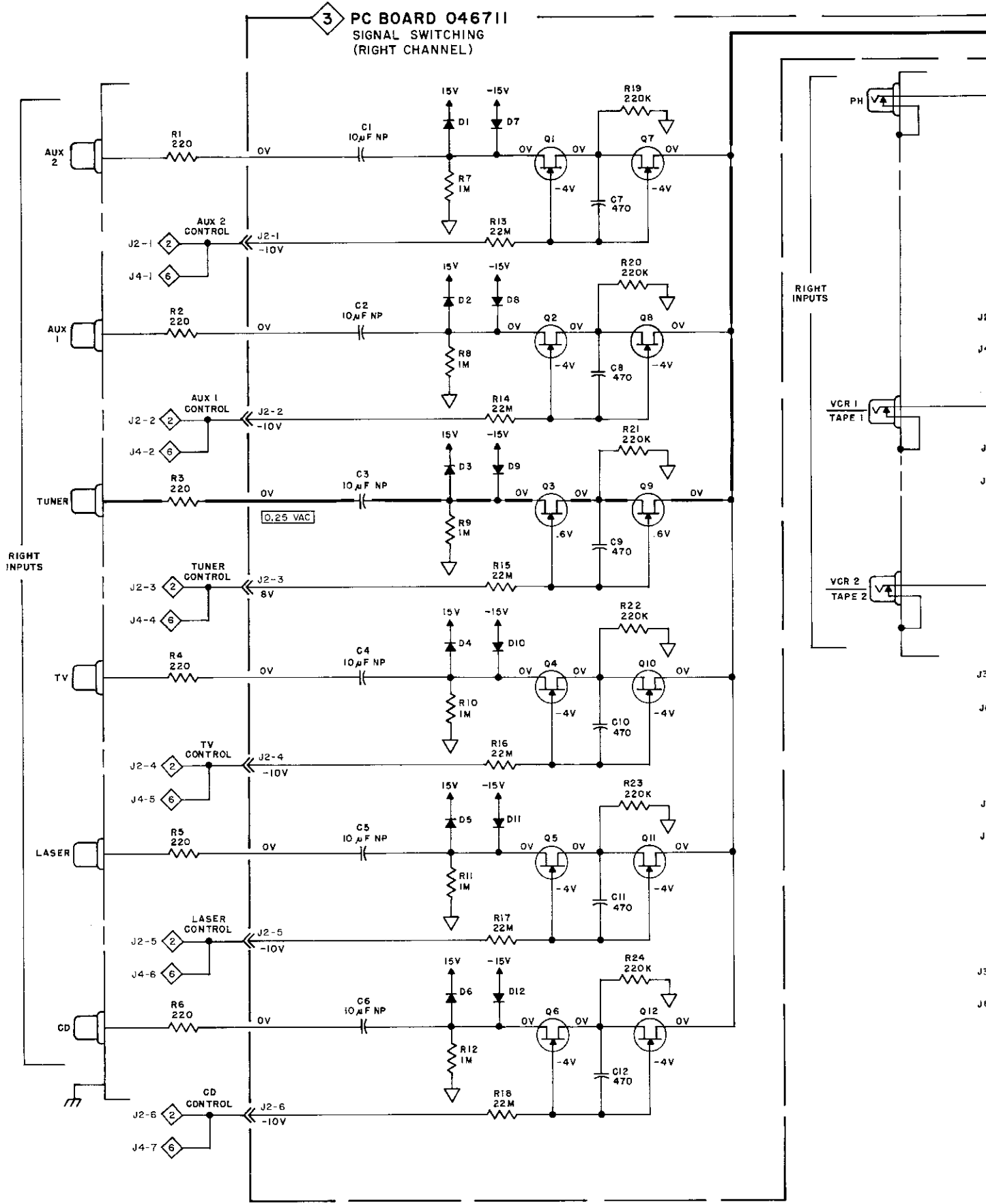


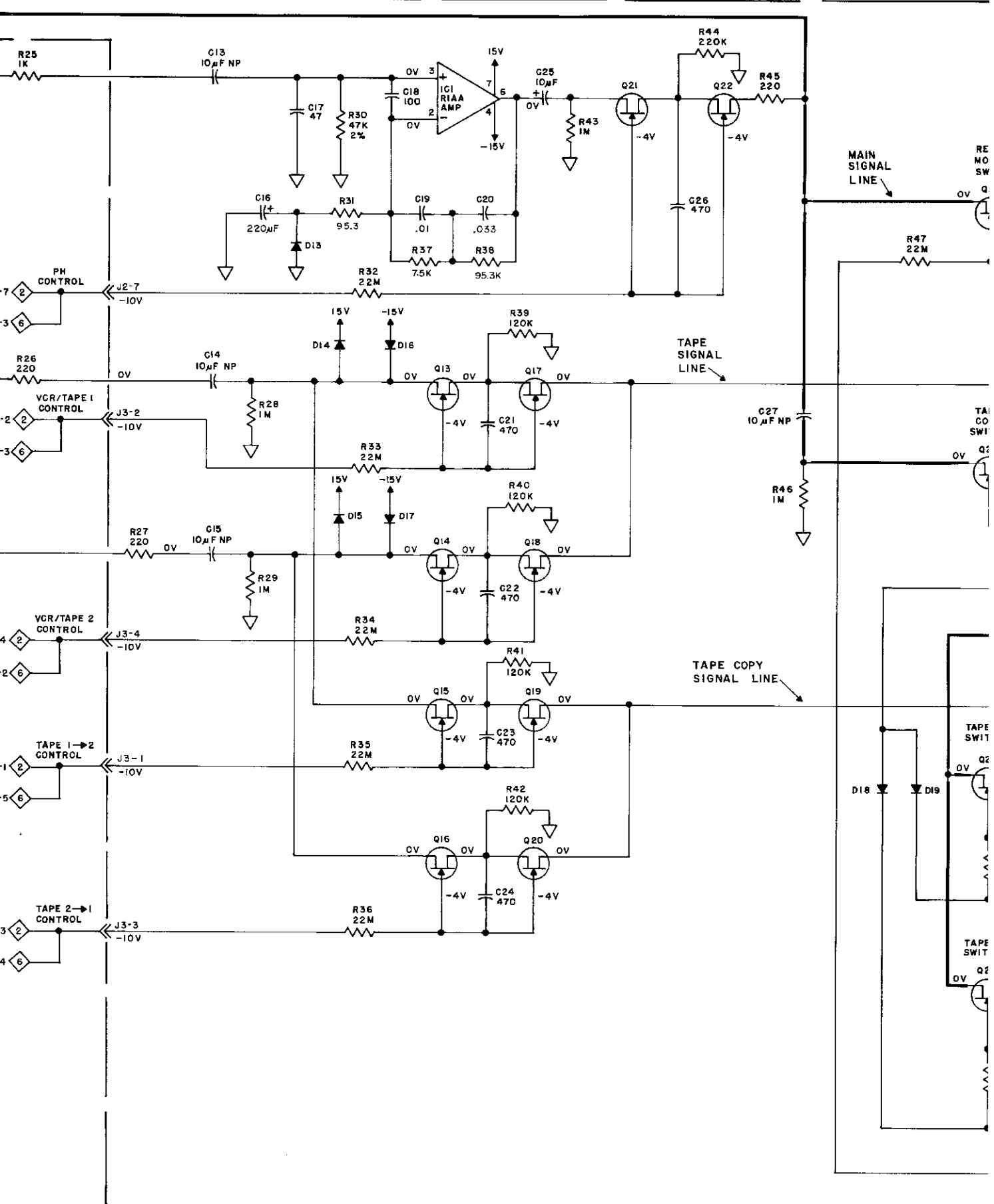
Q1-Q30

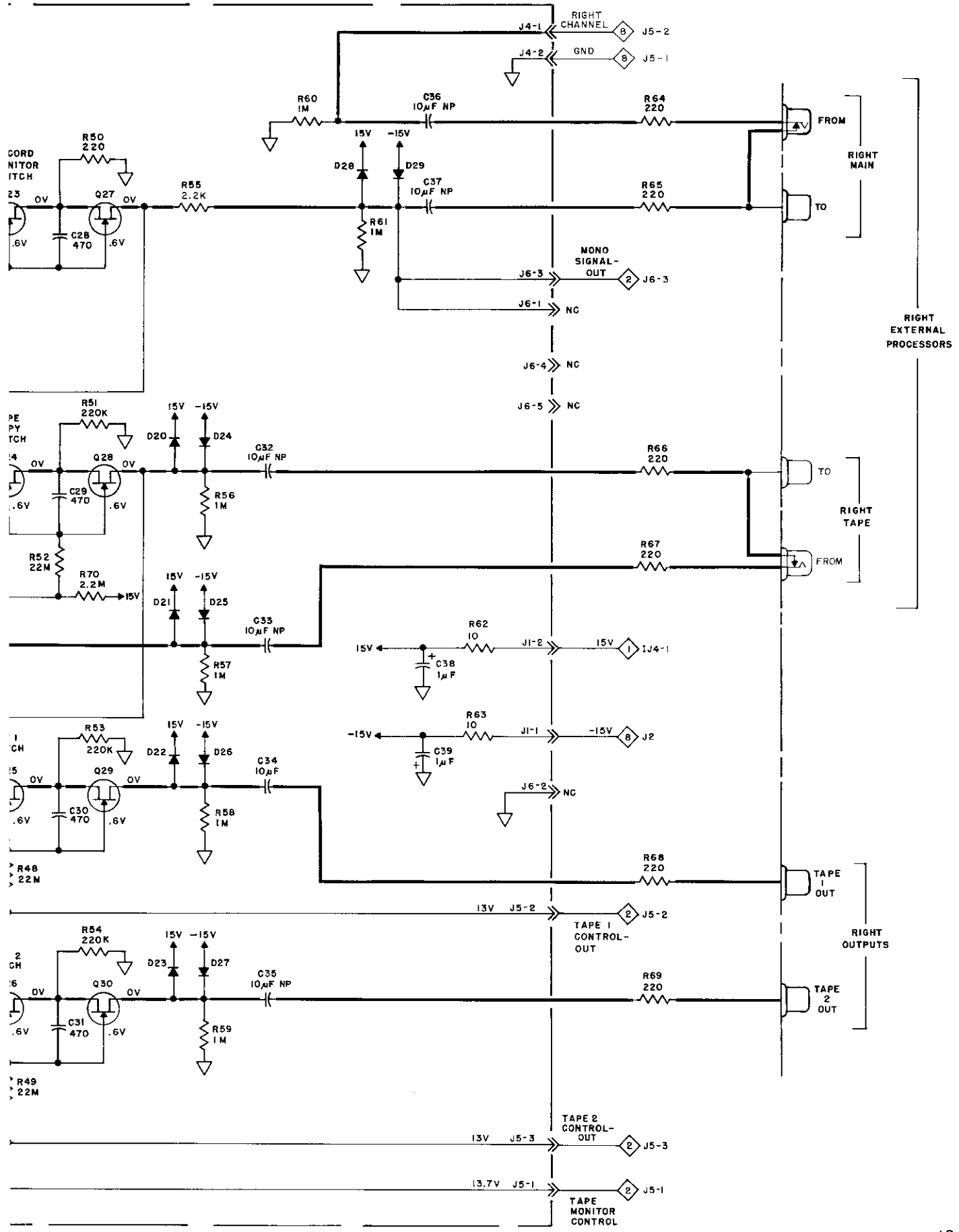


# Signal Switching (Right Channel)

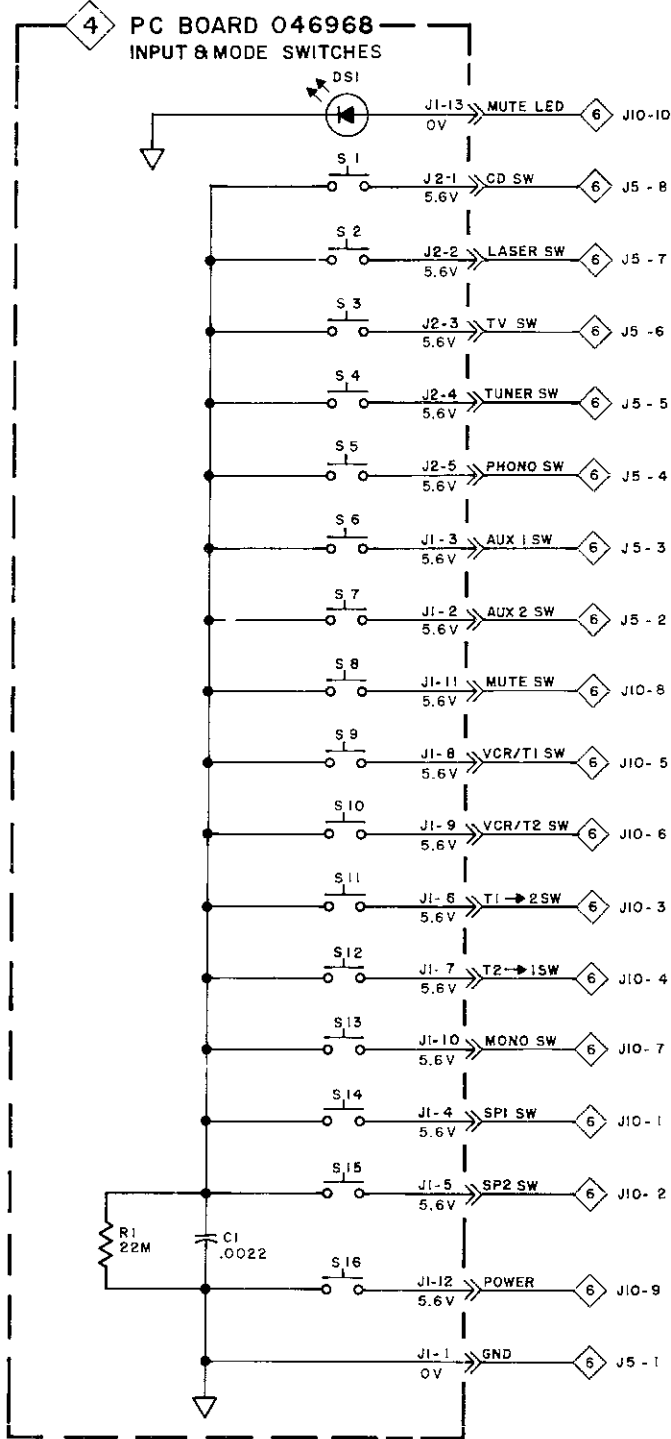
3





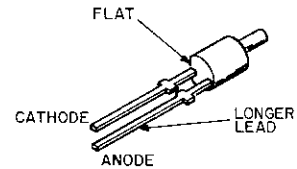


# 4 Input and Mode Switches

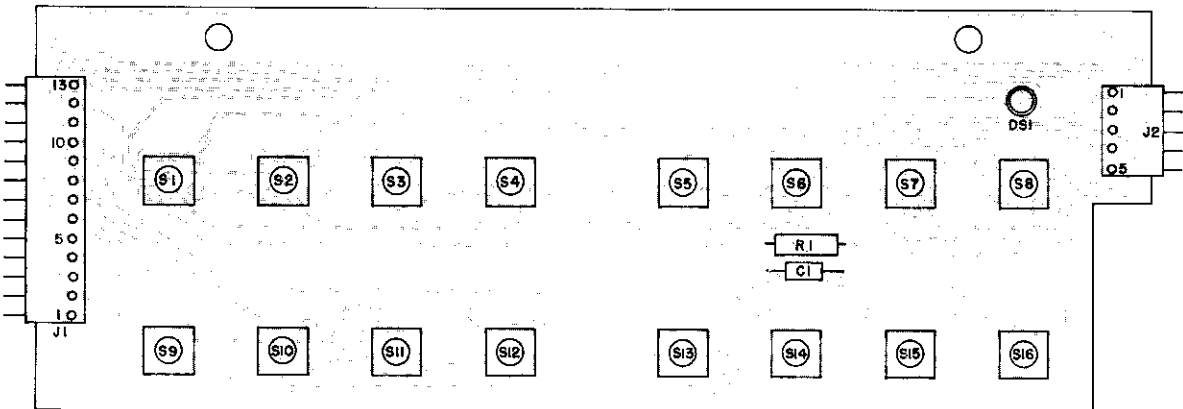


## INPUT and MODE SWITCHES PARTS LIST

Symbol	Part	Description
<b>LIGHTING DEVICES</b>		
DS1	058078	LED, Red, SLP144B
<b>SWITCHES</b>		
S1-S16	150051	TACT, MOMENTARY



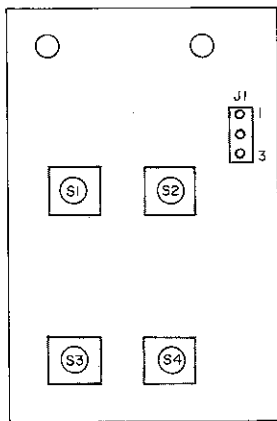
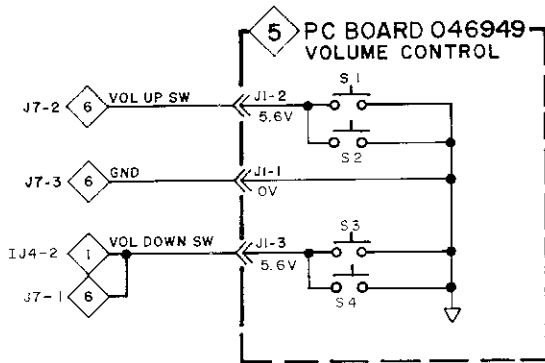
DS1



INPUT AND MODE SWITCHES PCB 046968

# 5 Volume Control Switches

# 6 Control



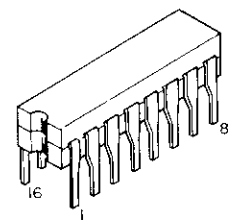
VOLUME CONTROL SWITCHES  
PCB 046949

## VOLUME CONTROL SWITCHES PARTS LIST

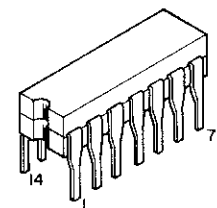
Symbol	Part	Description
<b>SWITCHES</b>		
S1-S4	150051	TACT, MOMENTARY

## CONTROL PARTS LIST

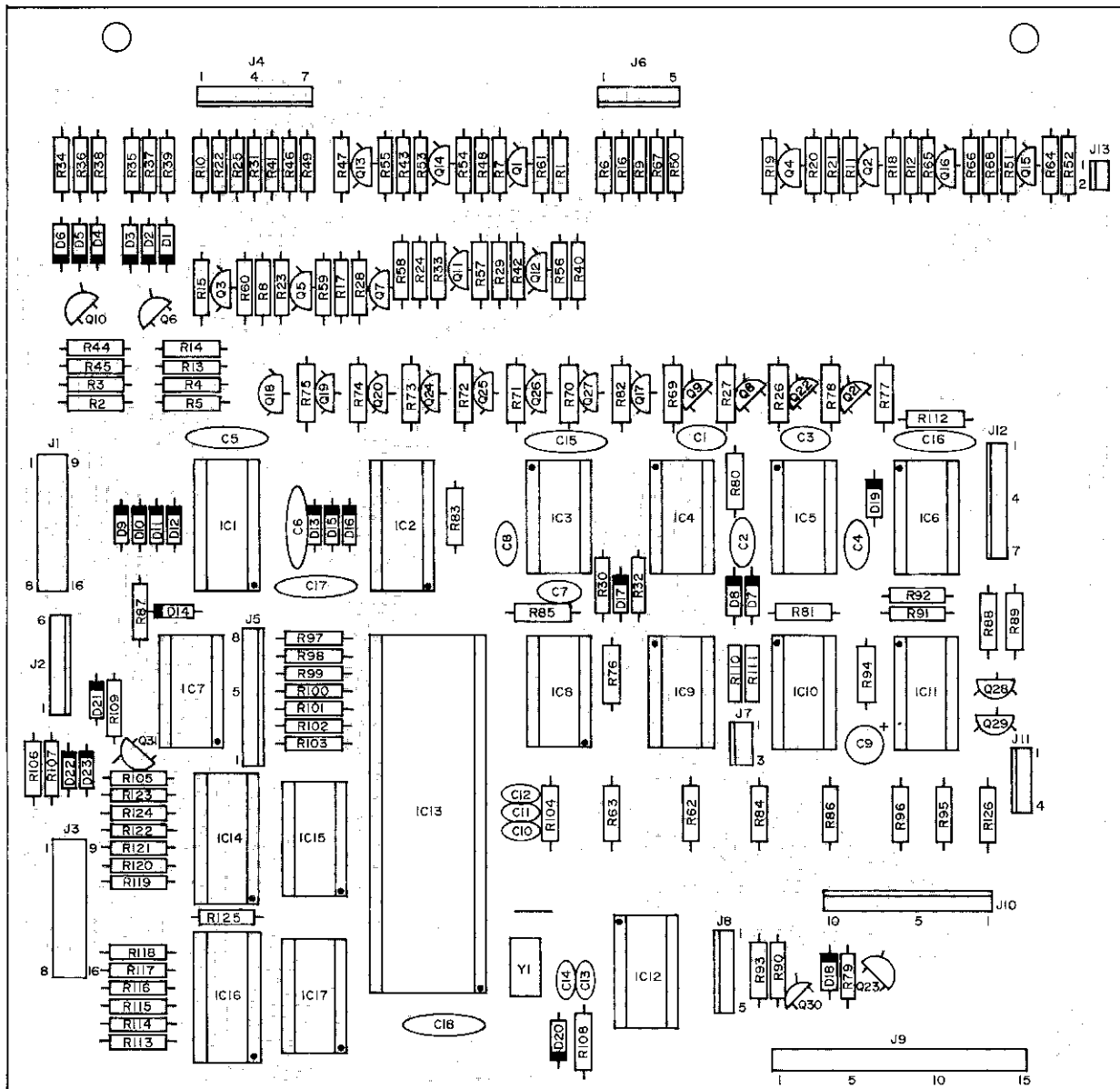
Symbol	Part	Description
<b>DIODES</b>		
D1-D23	070047	SIG, 75V, 150mA, 1N4148
<b>INTEGRATED CIRCUITS</b>		
IC1, IC2	133135	CMOS, 4-Bit Register, HEF4076BPN
IC3-IC6	133053	CMOS, Dual Type-D F-F, MC14013AL
IC7, IC8	133124	CMOS, Hex Inv, HEF4069UB
IC9-IC11	133064	CMOS, Quad 2-input NOR Gate, MC14001B
IC12	133076	CMOS, Quad 2-input AND Gate, MC14081B
IC13	132123	CMOS, IR Receiver, TC9134P
IC14, IC16	133137	6-input Strobed Driver, LB17
IC15, IC17	133124	CMOS, Hex Inv, HEF4069UB
<b>TRANSISTORS</b>		
Q1-Q5	132056	PNP, 2N5087
Q6	132235	NPN, 2SC2240-BL
Q7	132056	PNP, 2N5087
Q8-Q10	132235	NPN, 2SC2240-BL
Q11-Q16	132056	PNP, 2N5087
Q17-Q20	132223	NPN, MPS4124
Q21, Q22	132235	NPN, 2SC2240-BL
Q23	132090	NPN, DAR, MPSA25
Q24-Q29	132223	NPN, MPS4124
Q30, Q31	132235	NPN, 2SC2240-BL
<b>CRYSTALS</b>		
Y1	180033	Ceramic Resonator, 455kHz,



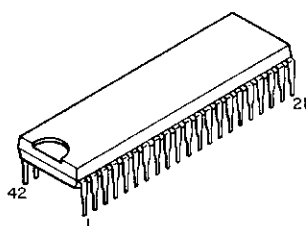
IC1, IC2,  
IC14, IC16



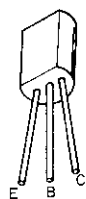
IC3-IC12  
IC15, IC17



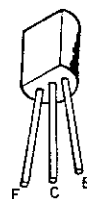
CONTROL PCB 046706



IC13

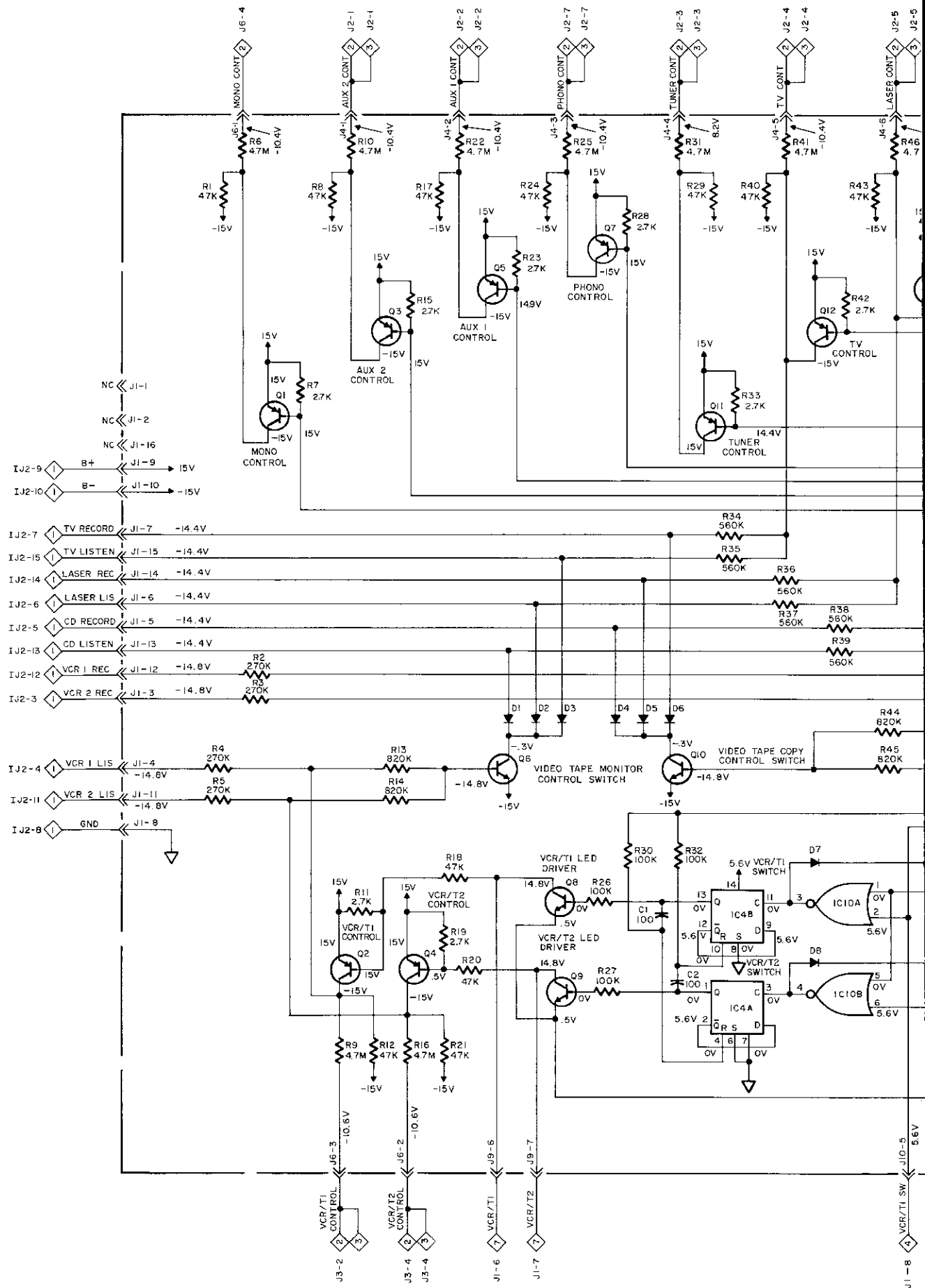


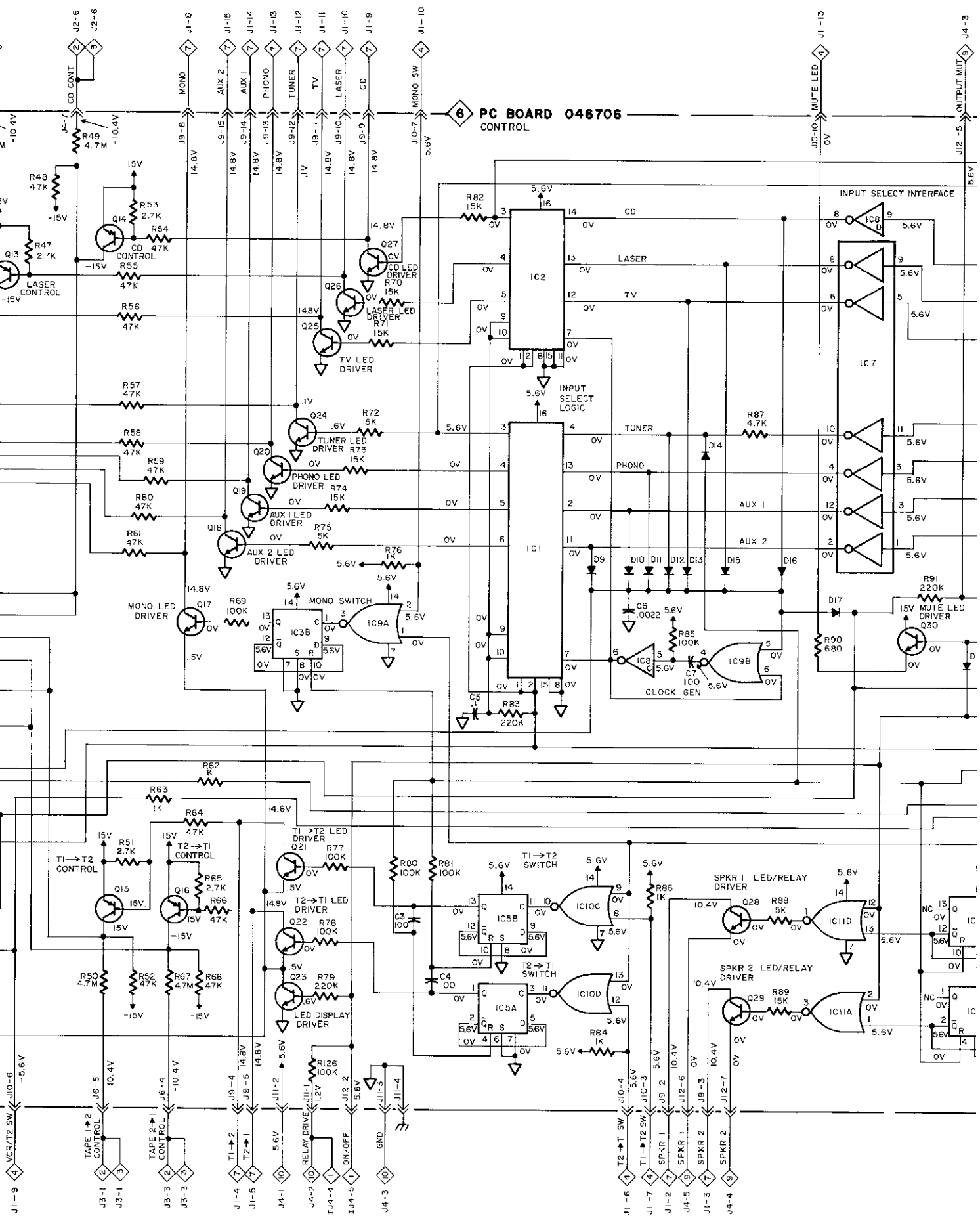
Q1-Q5, Q7,  
Q11-Q20  
Q23-Q29



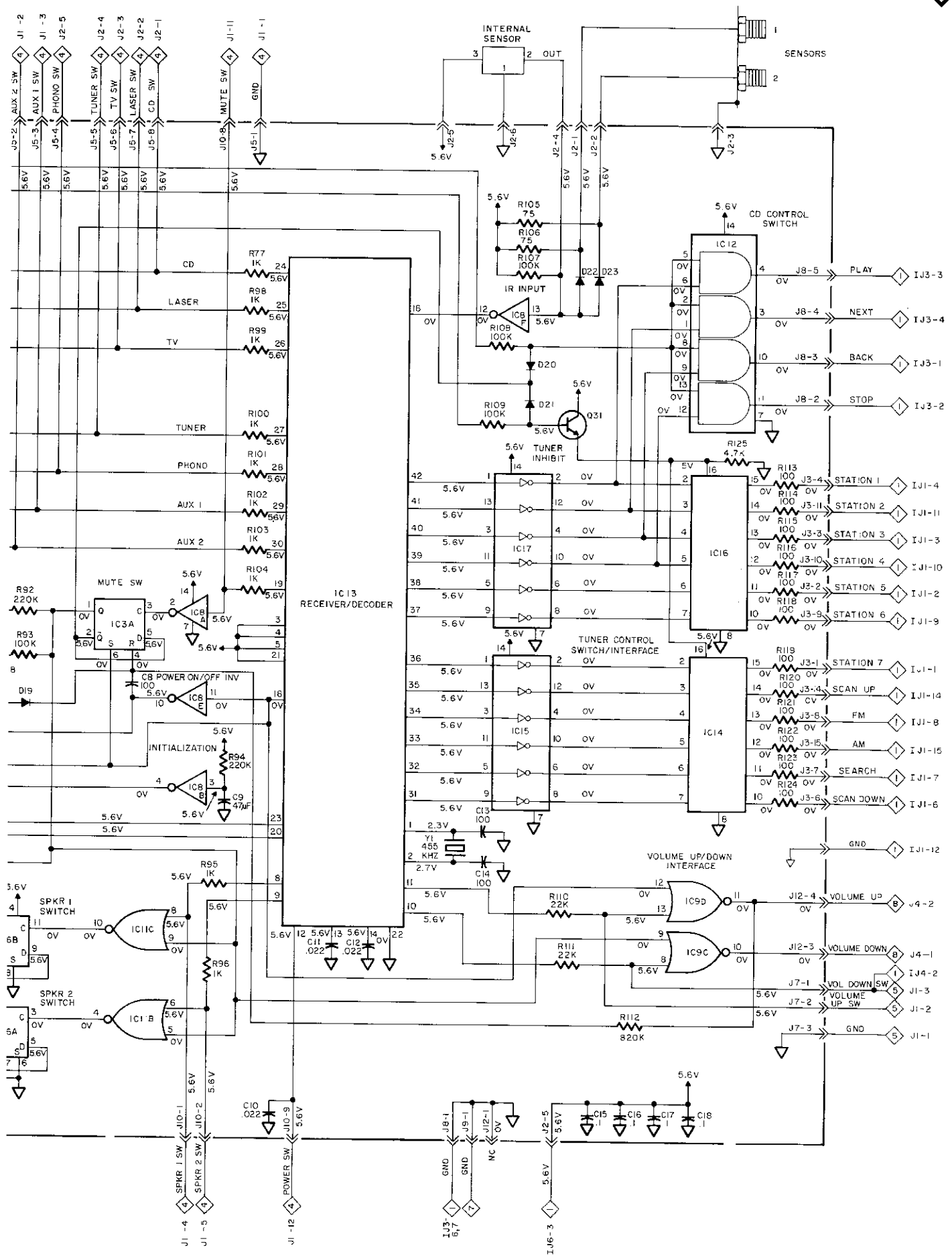
Q6, Q8-Q10,  
Q21, Q22  
Q30, Q31

# Control 6

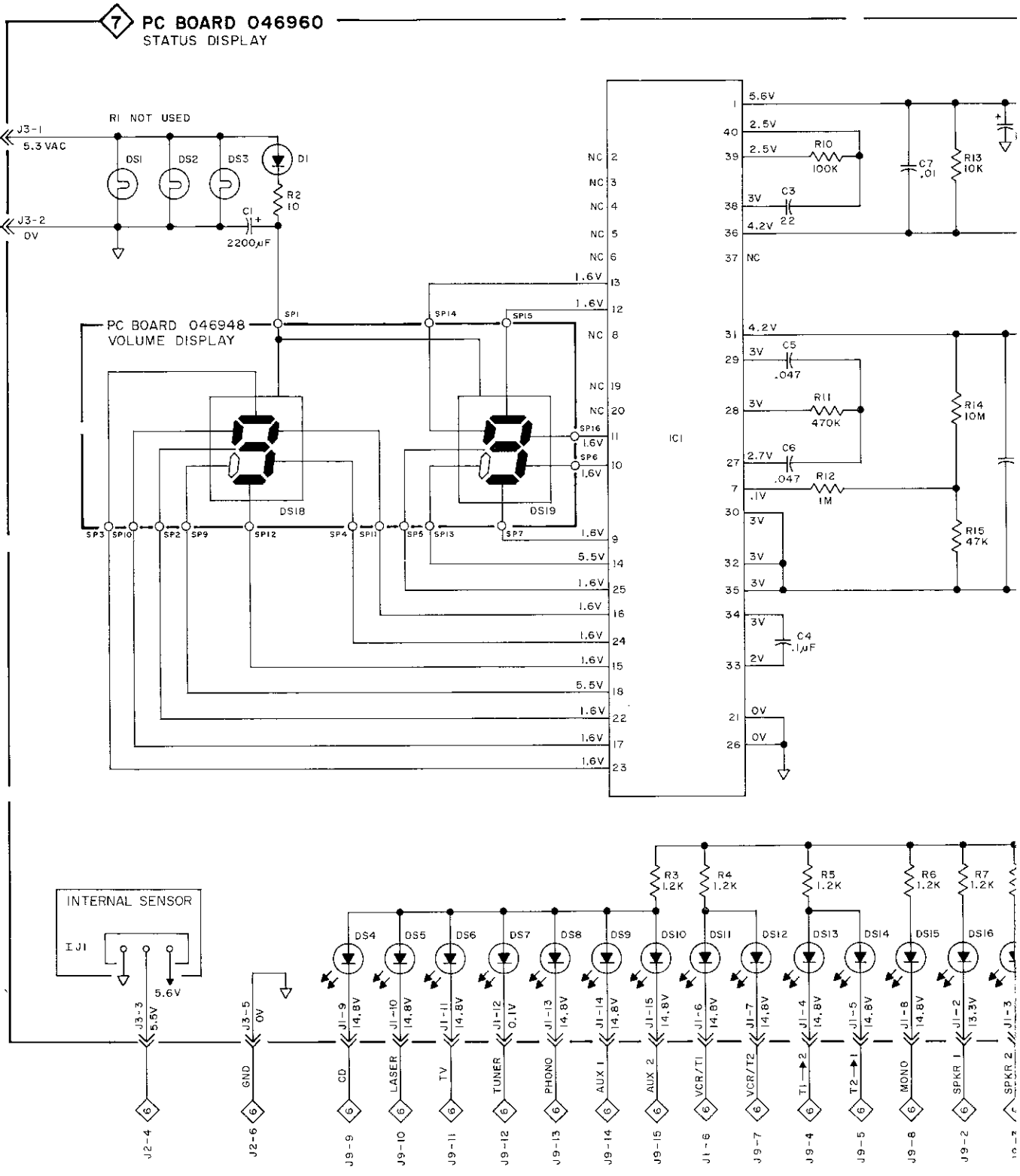


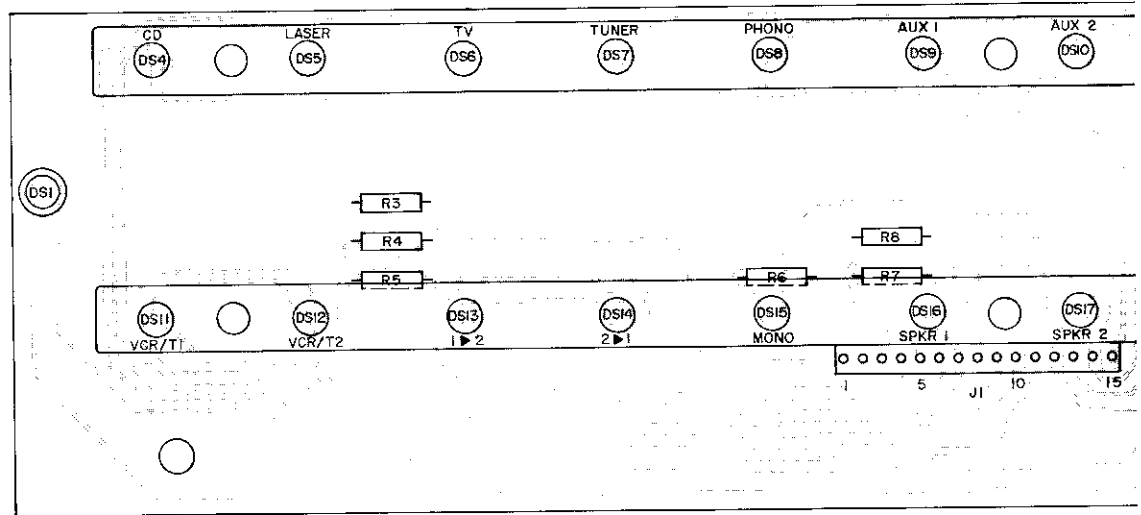
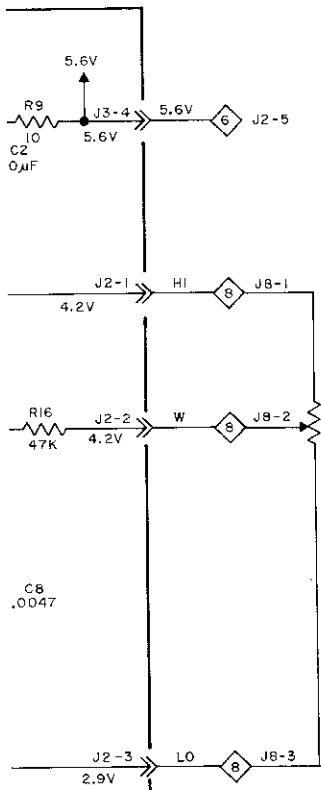






# 7 Status Display





STATUS DISPLAY PCB 046960

STATUS DISPLAY  
PARTS LIST

Symbol Part Description

DIODES

D1 070131 RECT, 400V, 1A, 1N4004

LIGHTING DEVICES

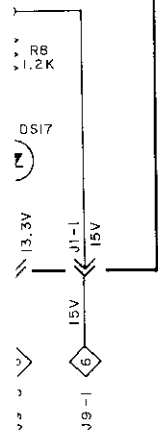
DS1-DS3 058062 INC, 6.3V, 7381  
 DS4-DS17 070093 LED, Red, HP5082-4658  
 DS18,DS19 058093 LED, 7-Segment Display

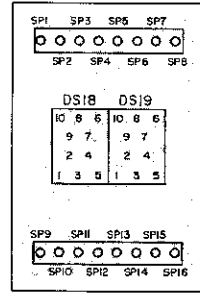
INTEGRATED CIRCUITS

IC1 133152 3-1/2 Digit A/D Converter

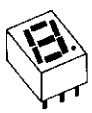
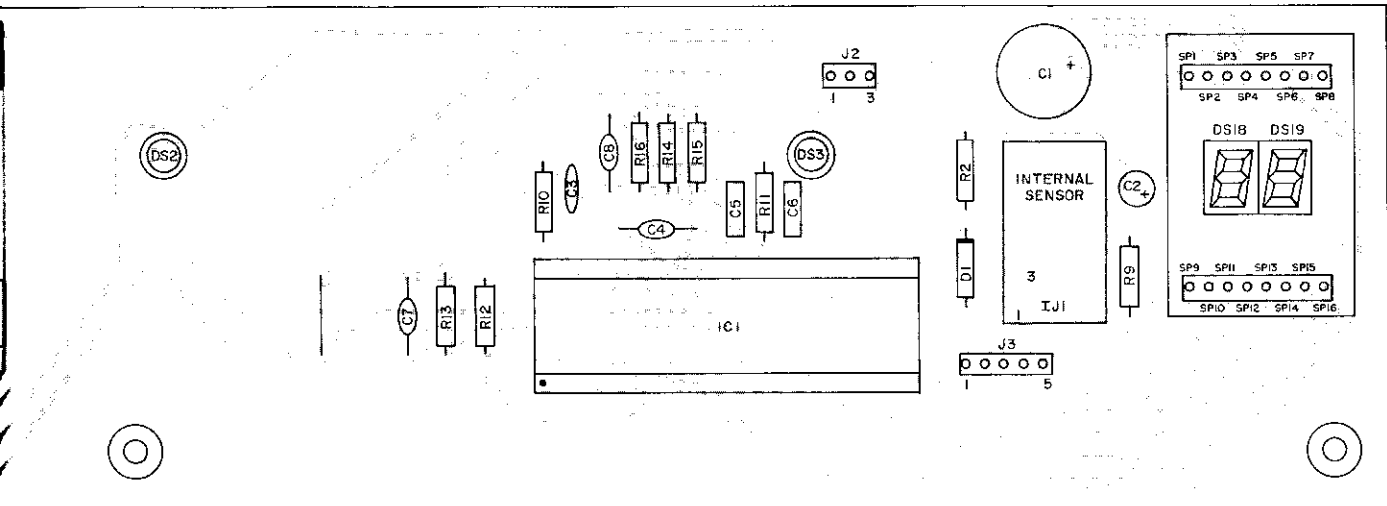
SENSORS

121010 Sensor, IR

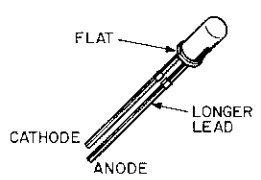




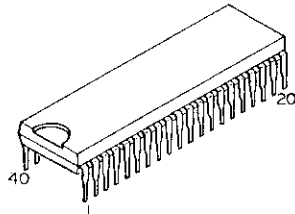
VOLUME DISPLAY PCB 046973



DS18, DS19



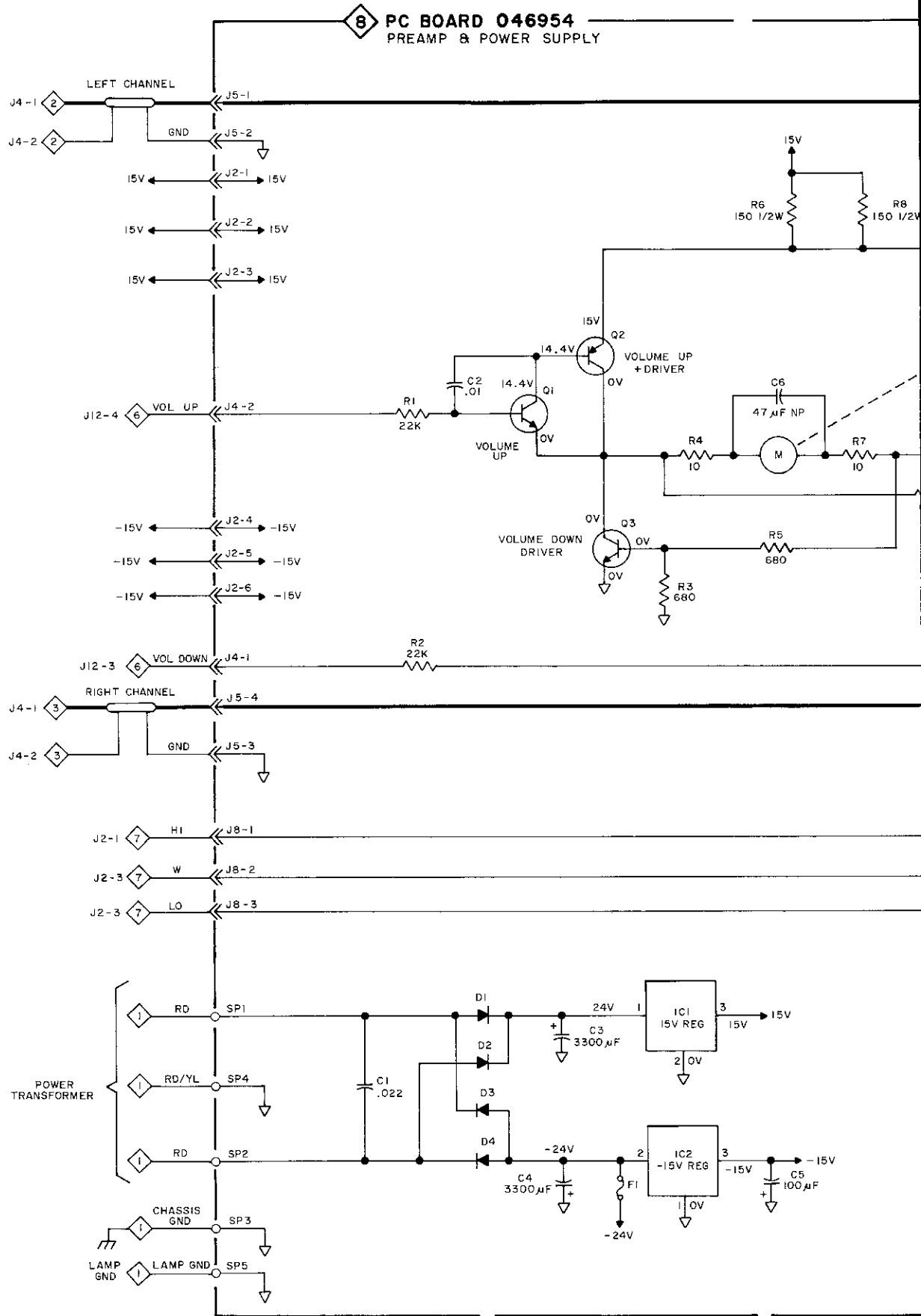
DS4-DS17

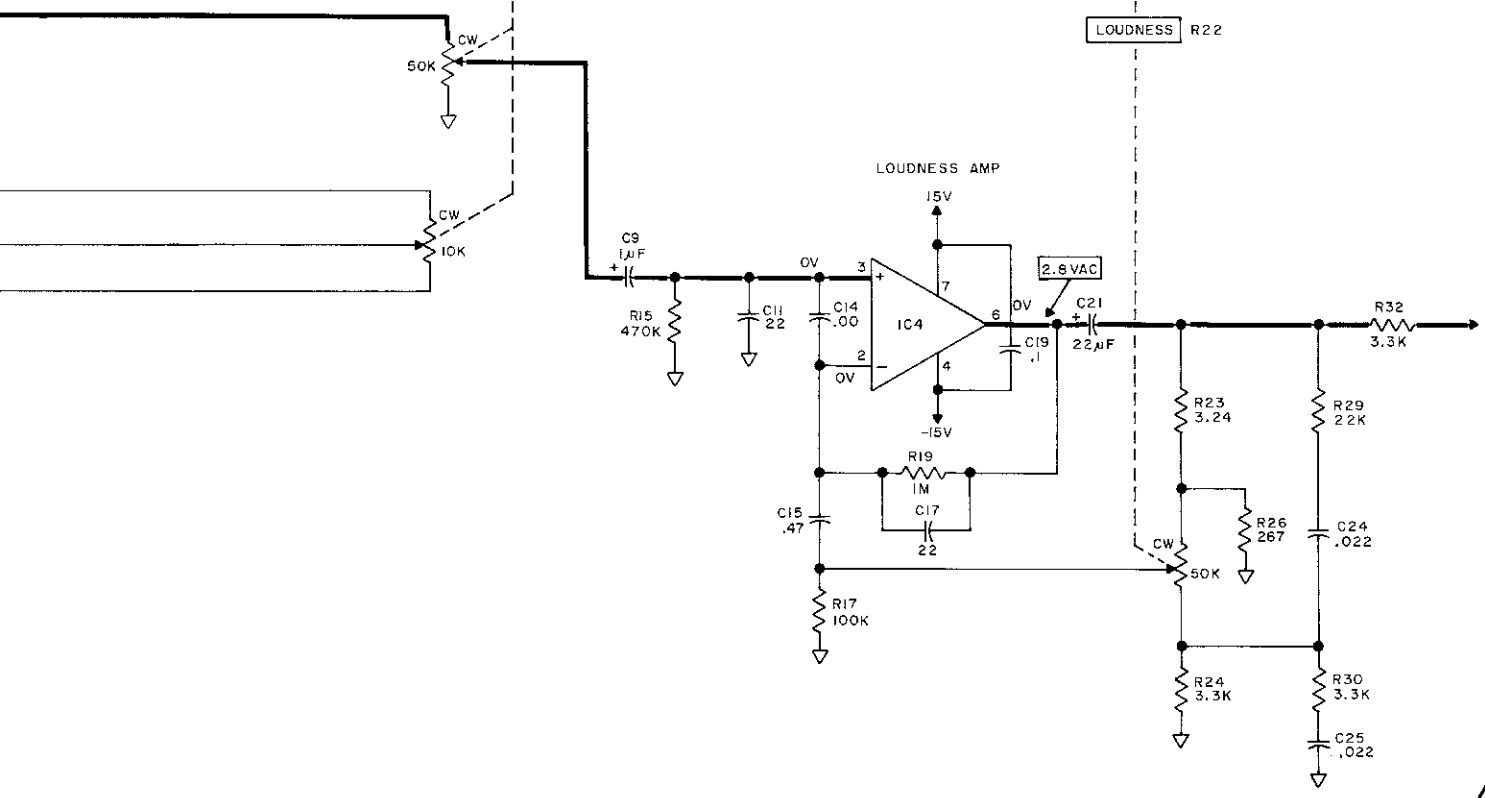
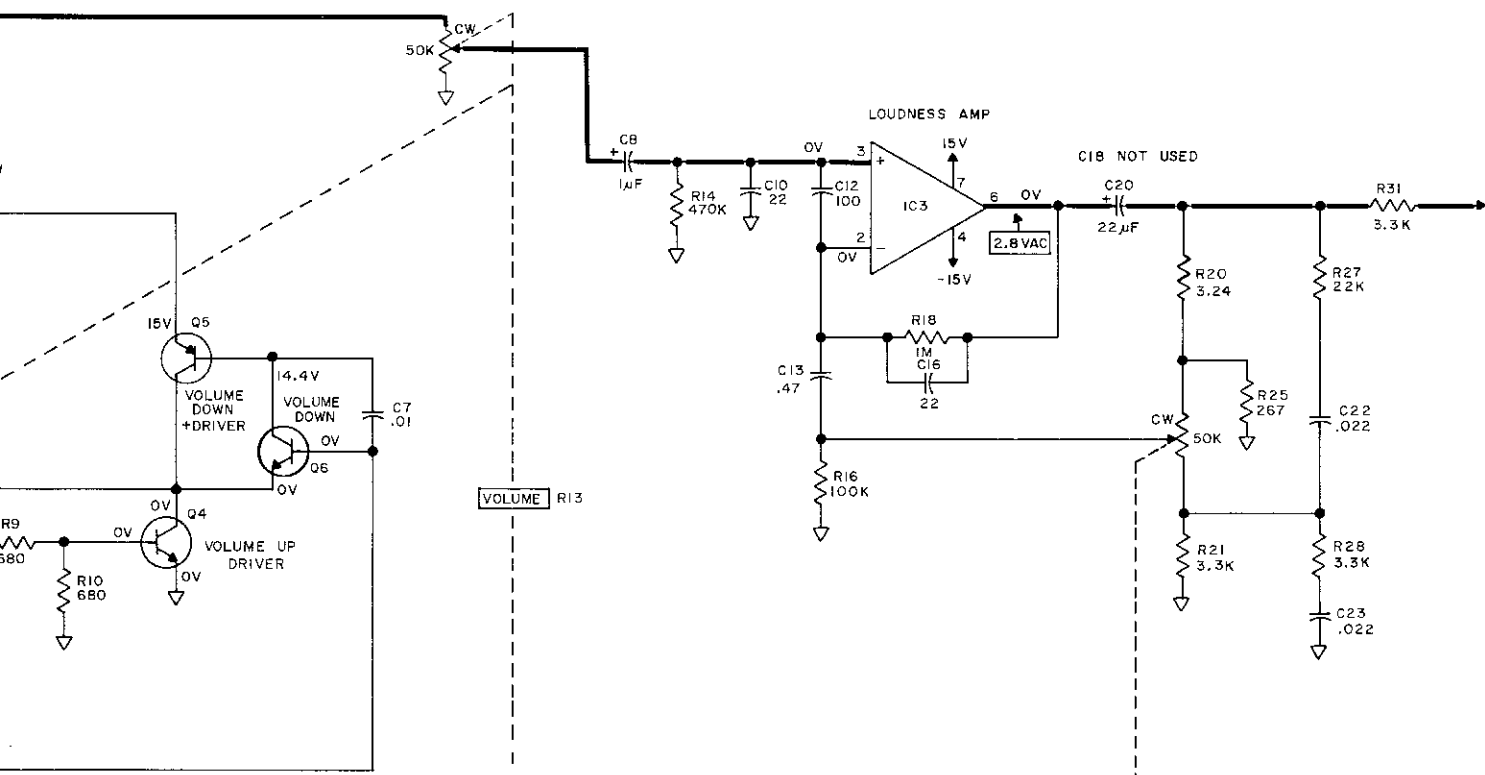


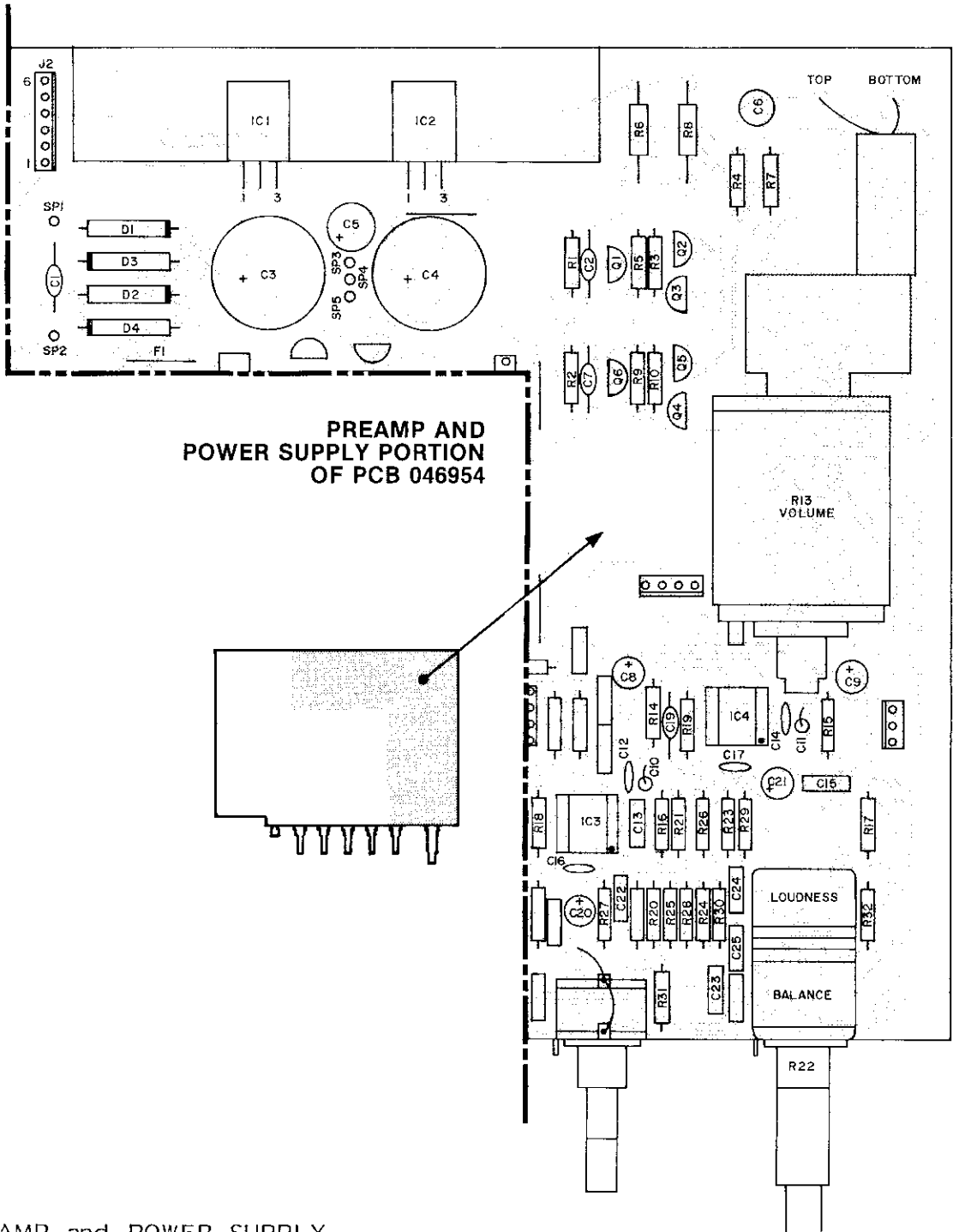
IC1

# Preamp and Power Supply

8







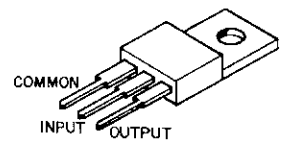
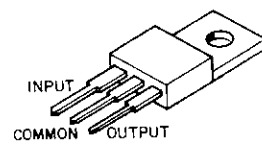
**PREAMP AND POWER SUPPLY PORTION OF PCB 046954**

L OUT

R OUT

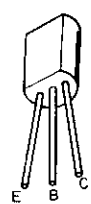
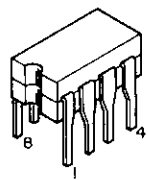
**PREAMP and POWER SUPPLY PARTS LIST**

Symbol	Part	Description
<b>DIODES</b>		
D1-D4	070131	RECT, 400V, 1A 1N4004
<b>FUSES</b>		
F1	174198	Fuse, 36 Gauge Tinned Copper Wire
<b>INTEGRATED CIRCUITS</b>		
IC1	133154	+15V Regulator, MC78M15CT
IC2	133153	-15V Regulator, MC79M15CT
IC3, IC4	133066	Operational Amp, NE5534N
<b>TRANSISTORS</b>		
Q1, Q3	132223	NPN, MPS4124
Q2	132224	PNP, MPS4126
Q4, Q6	132223	NPN, MPS4124
Q5	132224	PNP, MPS4126
<b>RESISTORS</b>		
R13	134436	POT, Motor Driven Volume Control
R22	134437	POT, Balance/Loudness



IC1

IC2

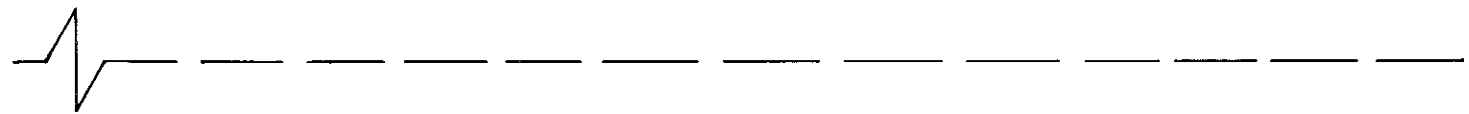
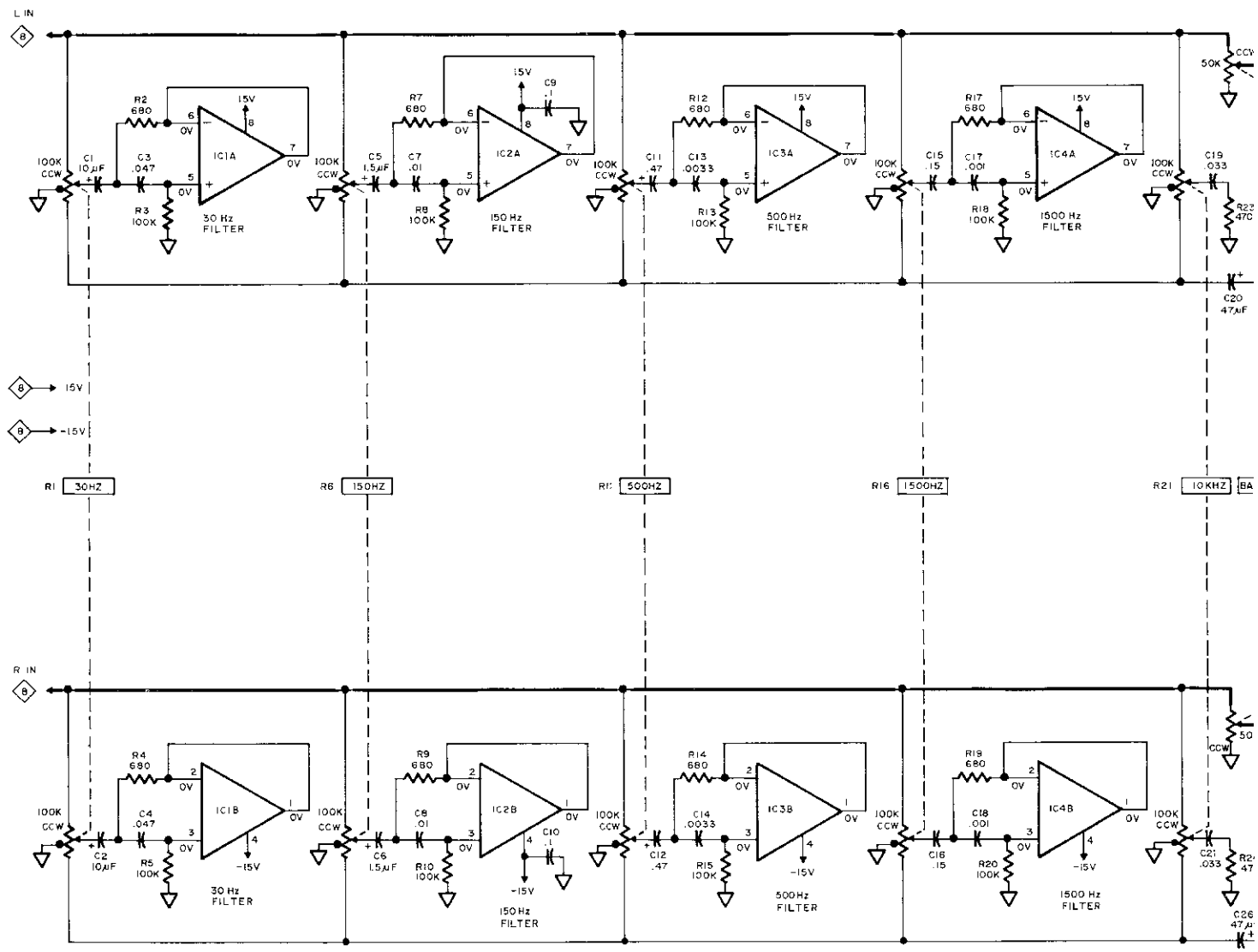


IC3, IC4

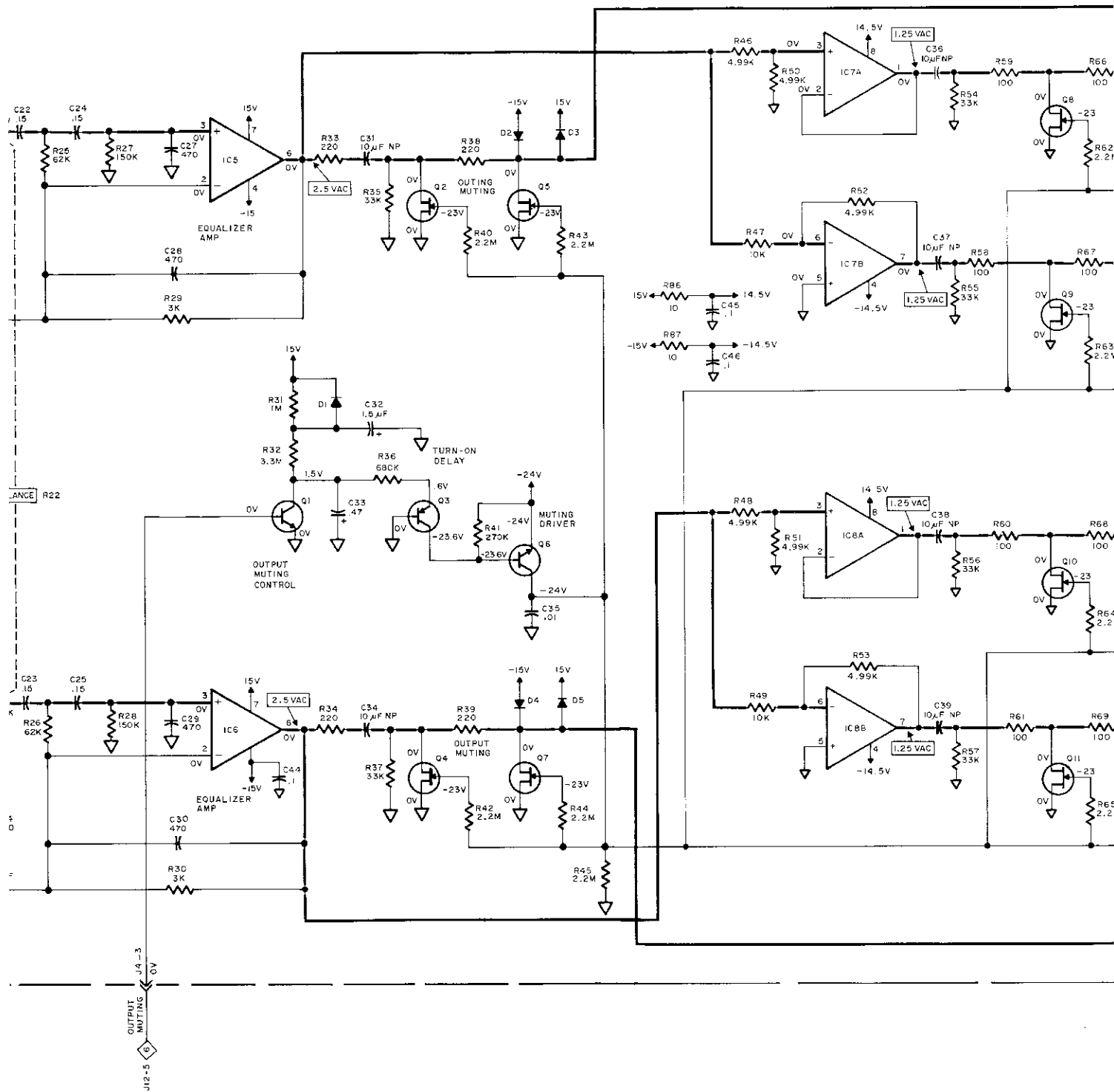
Q1-Q6

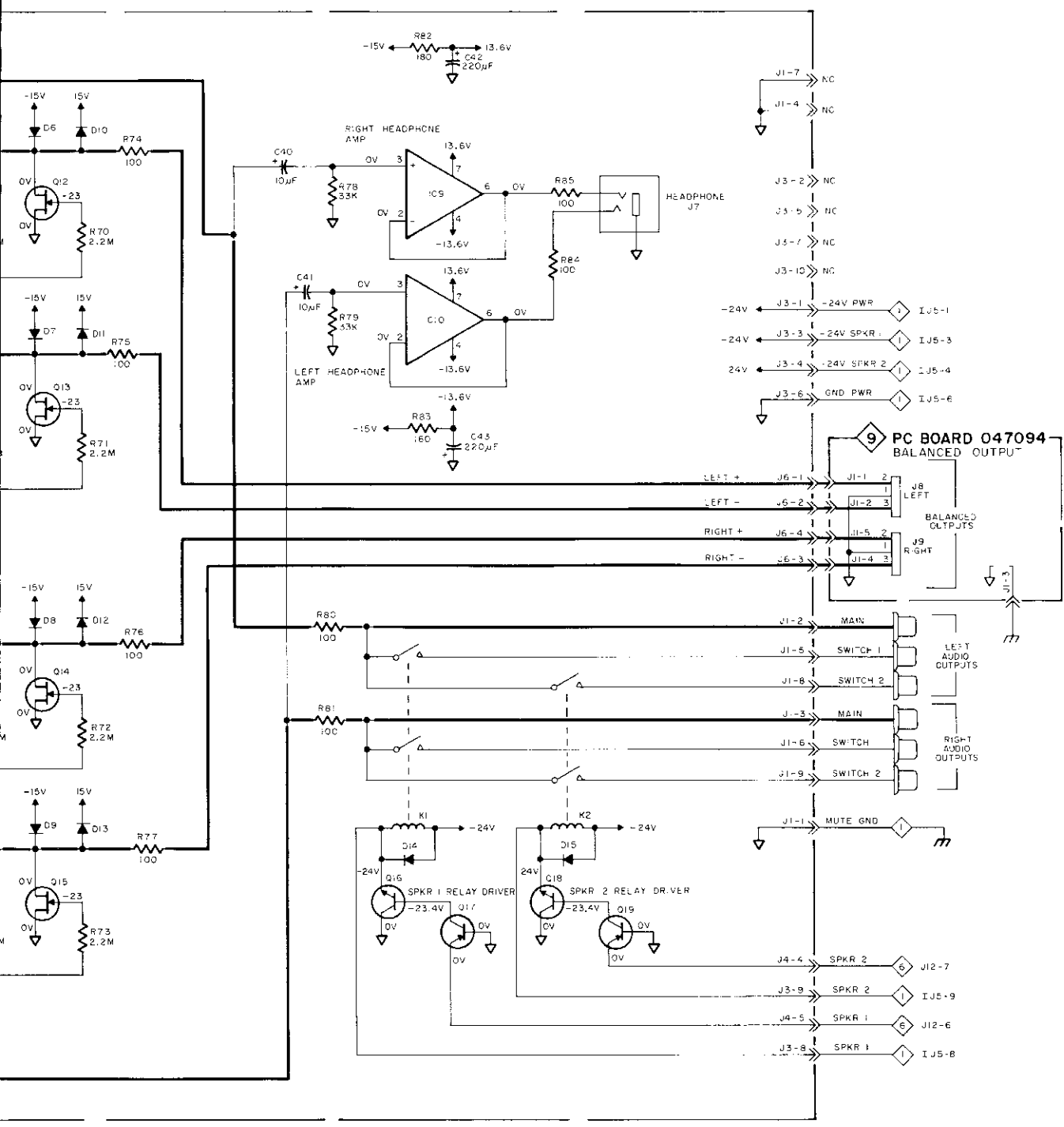
# 9 Outputs

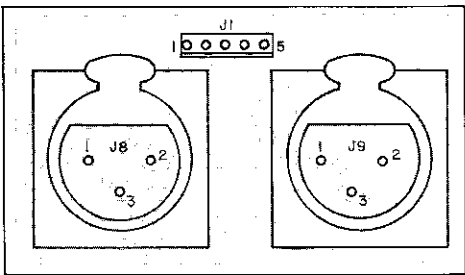
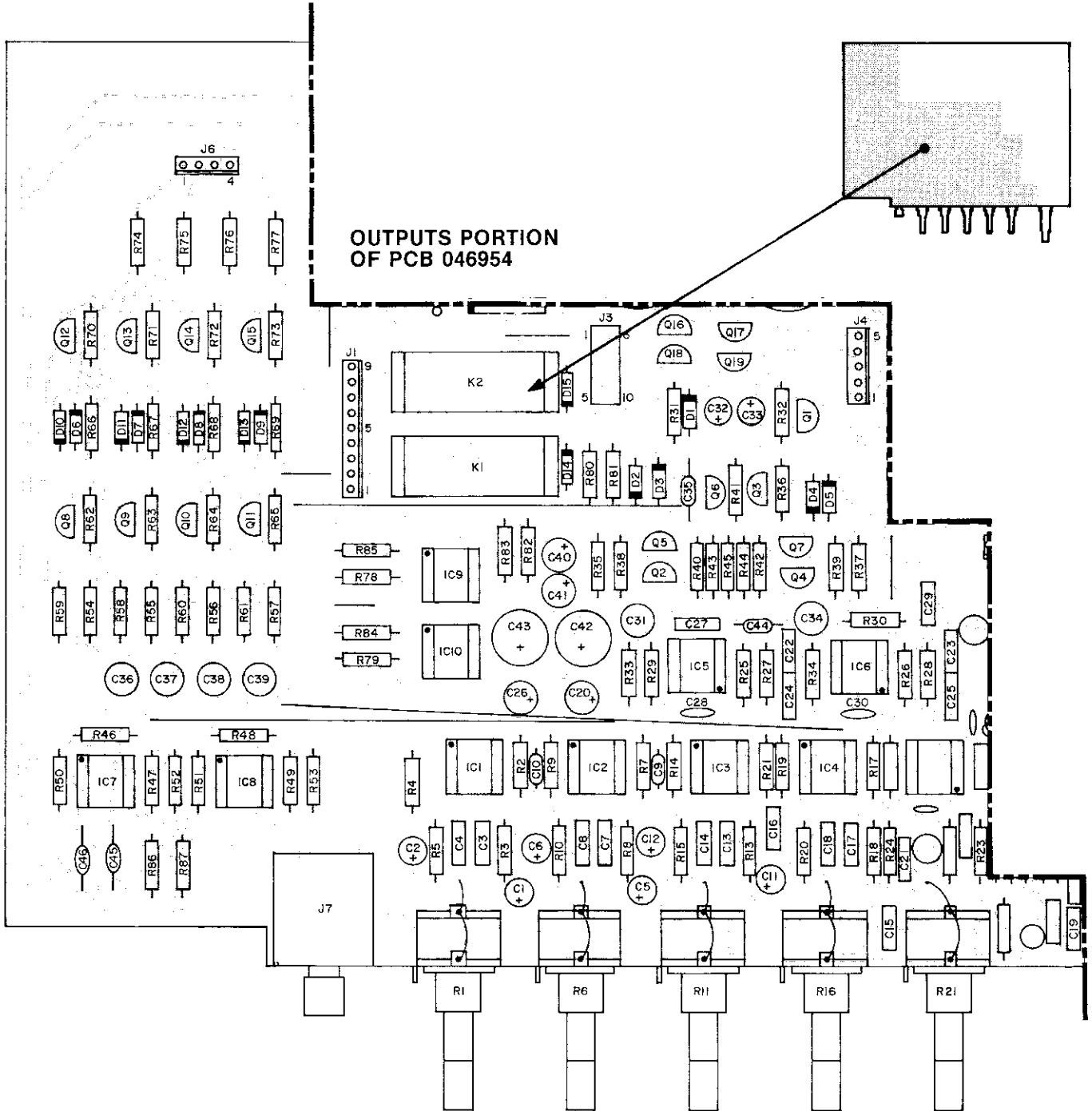
PC BOARD 046954  
OUTPUTS











**BALANCED OUTPUT  
PCB 047094**

OUTPUTS  
PARTS LIST

Symbol	Part	Description
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DIODES

D1-D15	070047	SIG, 150mA, 1N4148
--------	--------	--------------------

INTEGRATED CIRCUITS

IC1-IC4	133028	Dual Hi-speed Operational Amp, MC4558CP1
IC5,IC6	133066	Operational Amp, NE5534N
IC7,IC8	133094	Dual Operational Amp, NE5532N
IC9,IC10	133066	Operational Amp, NE5534N

JACKS

J7	117340	Headphone Jack
J8,J9	117414	XLR Connector, Male, PCB

RELAYS

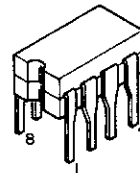
K1,K2	087041	DPST, 2VDC, REED
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TRANSISTORS

Q1	132235	NPN, 2SC2240-BL
Q2	132222	N, FET, J108
Q3	132056	PNP, 2N5087
Q4,Q5	132222	N, FET, J108
Q6	132235	NPN, 2SC2240-BL
Q7-Q15	132222	N, FET, J108
Q16,Q18	132171	NPN, MPSA05
Q17,Q19	132056	PNP, 2N5087

RESISTORS

R1,R6	134316	POT, 100K ohm/100K ohm, Equalizer
R11,R16	134316	POT, 100K ohm/100K ohm, Equalizer
R21	134316	POT, 100K ohm/100K ohm, Equalizer
R22	134437	POT, Balance/Loudness



IC1-IC10



Q1,Q6

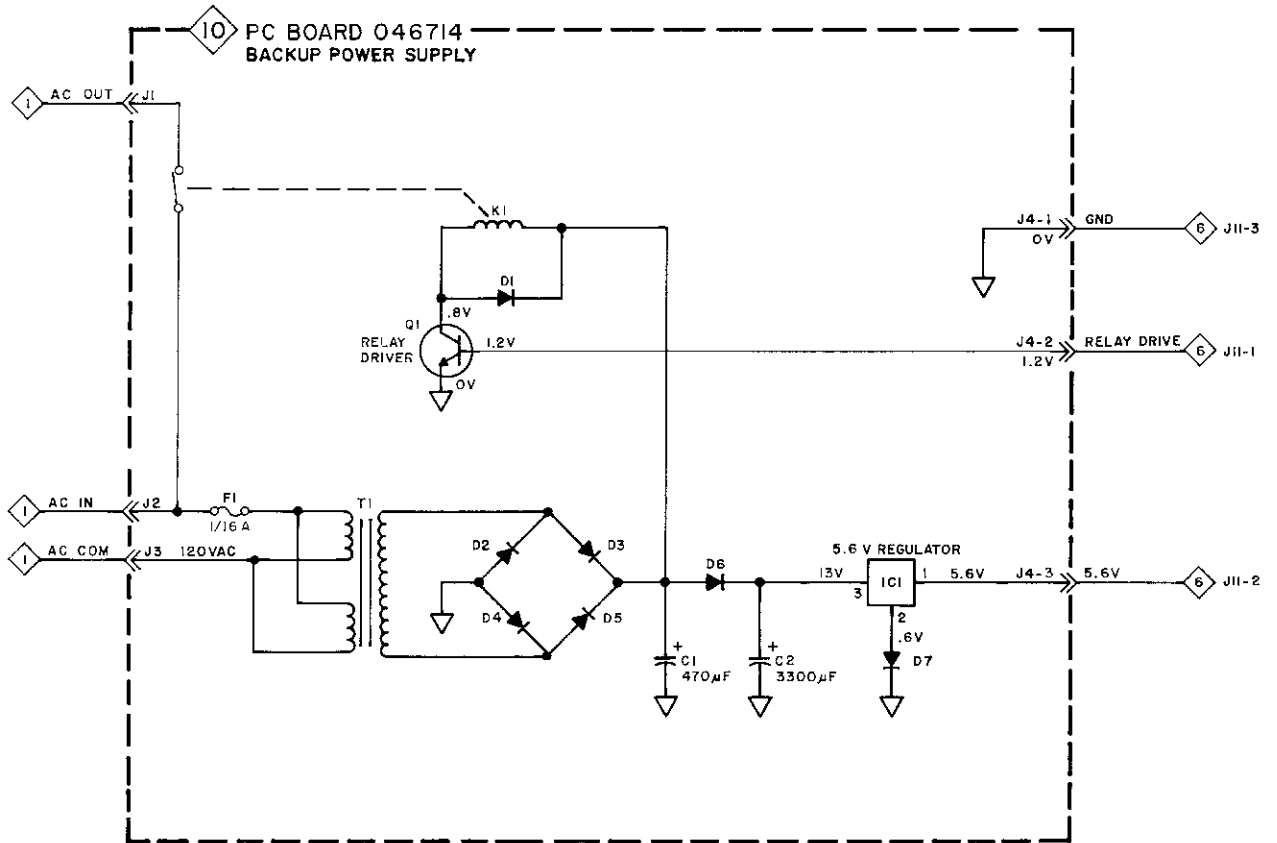


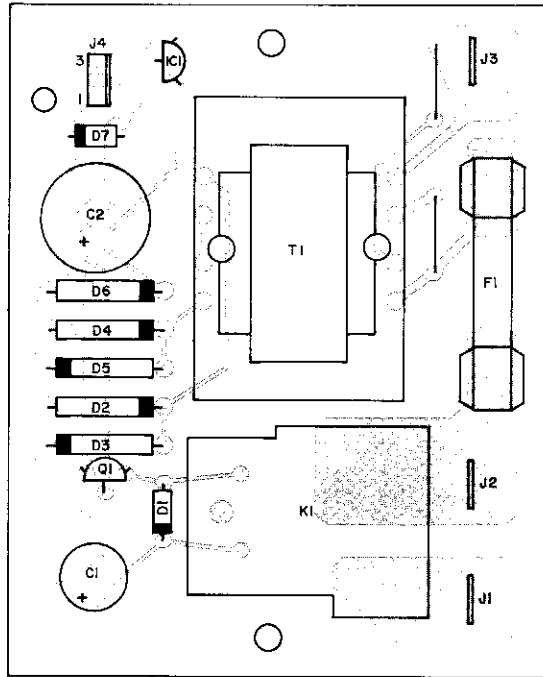
Q2,Q4,Q5  
Q7-Q15



Q3,Q16-Q19

# 10 Backup Power Supply

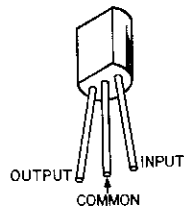




BACKUP POWER SUPPLY PCB 046714

BACKUP POWER SUPPLY  
PARTS LIST

Symbol	Part	Description
<b>DIODES</b>		
D1	070047	SIG, 75V, 150mA, 1N4148
D2-D6	070131	RECT, 400V, 1A, 1N4004
D7	070047	SIG, 75V, 150mA, 1N4148
<b>FUSES</b>		
F1	089047	Fuse, FA, 1/16A, 250V
<b>INTEGRATED CIRCUITS</b>		
IC1	133093	+5V Regulator, MC78L05ACP
<b>RELAYS</b>		
K1	087038	SPST, 12VDC
<b>TRANSISTORS</b>		
Q1	132090	NPN, DAR, MPSA25
<b>TRANSFORMERS</b>		
T1	159195	POWER



IC1



Q1

# Repacking Instructions

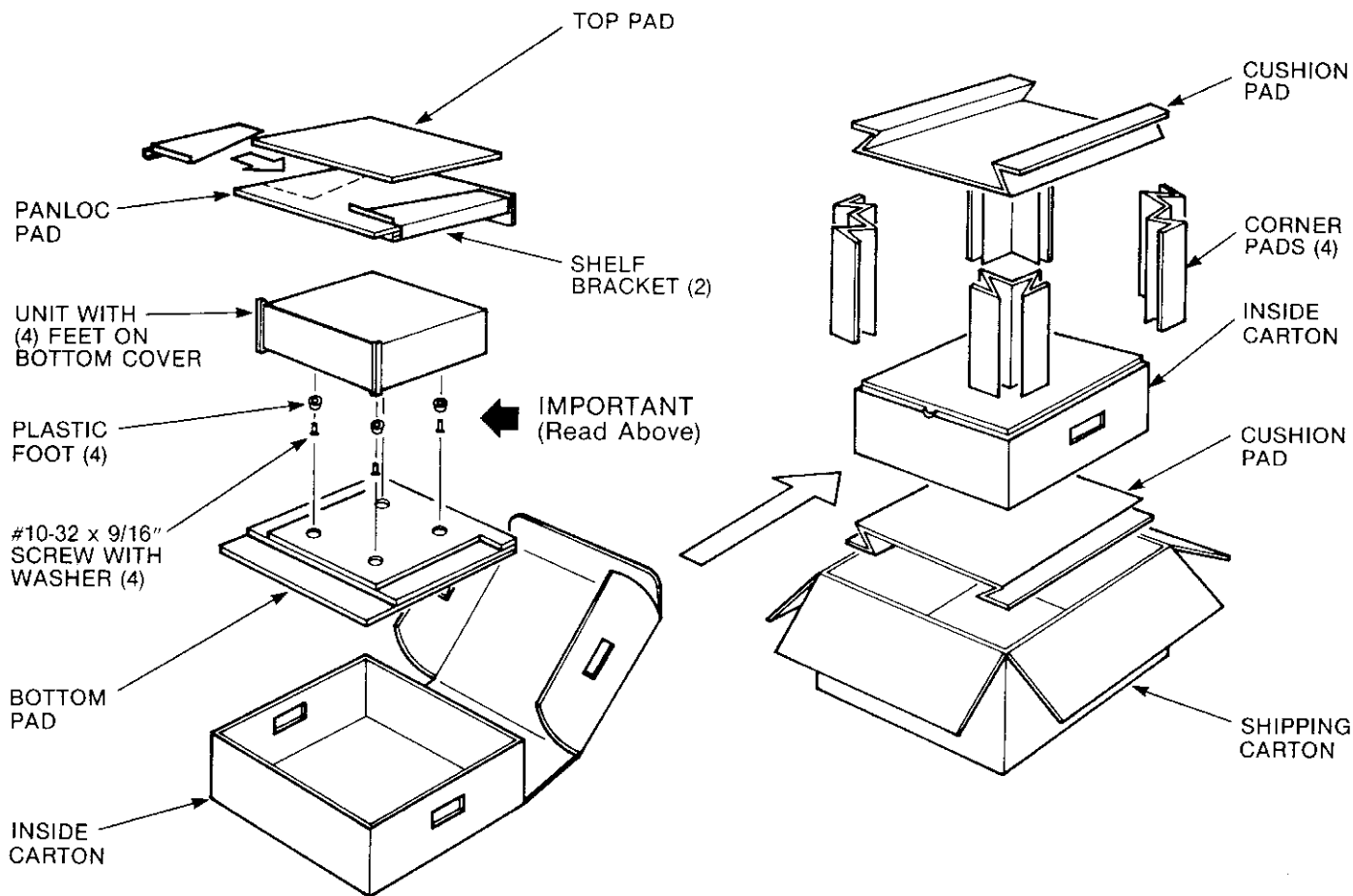
In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below. The shelf brackets do not have to be included in the carton for the unit to be packed properly, but their position in the carton is indicated.

**IMPORTANT** - The four plastic feet must be attached to the bottom of the unit so they will locate in the four holes of the bottom pad. Failure to do this will result in shipping damage.

If a shipping carton or any of the interior parts is needed, please call or write the Customer Service Department of McIntosh Laboratory. Order parts from the accompanying list by part number.

Use the original shipping carton and interior parts only if they are all in good serviceable condition.

Qty	Part No.	Description
1	033466	Shipping carton only
2	033332	Cushion pad
4	033333	Corner pad
1	033118	Inside carton only
1	033331	Top pad
1	033330	Panloc pad
1	033456	Bottom pad
4	017156	Plastic foot, 3/4" high on earlier units, held originally with 101089 screw and later with 100160 screw listed below.
4	017218	Plastic foot, 1" high on later units, held with 100159 screw.
4	100159	#10-32 x 3/4 Machine screw.
4	100160	#10-32 x 9/16 Machine screw.
4	101089	#8 x 5/8 Sheetmetal screw.
4	104080	#10 Flat washer
1	047167	Shipping carton complete with all the above parts



# McIntosh<sup>®</sup>

## C35 SYSTEM CONTROL CENTER

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Part No. 039720

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