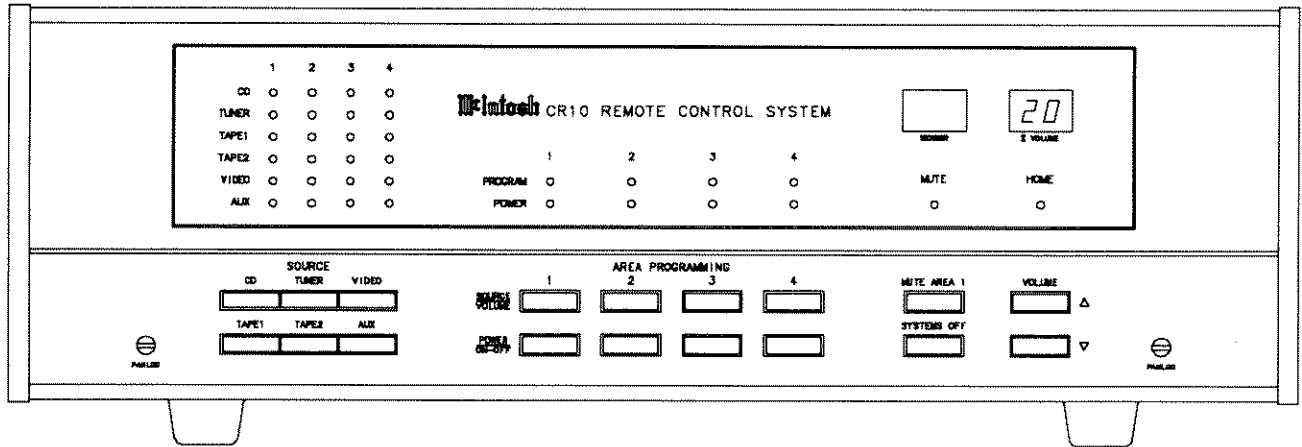


# CR10

## REMOTE CONTROL SYSTEM



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# Performance Specifications

## **FREQUENCY RESPONSE**

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

## **RATED OUTPUT VOLTAGE**

2.5 volts, (8 volts maximum)

## **SENSITIVITY**

ALL inputs; 0.25 volts for 2.5 volts rated output

## **TOTAL HARMONIC DISTORTION**

0.004% maximum from 20Hz to 20,000Hz at rated output

## **SIGNAL TO NOISE RATIO, A-WEIGHTED**

86dB below rated output.

98dB below rated output, (A-Weighted)

## **MAXIMUM INPUT SIGNAL**

8 volts

## **INPUT IMPEDANCE**

22K ohms

## **MECHANICAL**

### **SIZE**

Front Panel: 17.5 inches (44.5cm) wide by 5-3/8 inches (13.7cm) high. Depth behind the mounting panel including clearance for connectors is 15-1/2 inches (39.4cm). Clearance required in front of the mounting panel is 1 inch (2.54cm).

### **FINISH**

The top section of the front panel is glass with gold/teal nomenclature illumination. The bottom section is anodized black aluminum.

### **WEIGHT**

16.5 pounds (7.5Kg) net, 28.5 pounds (12.9Kg) in shipping carton.

# Mechanical Views

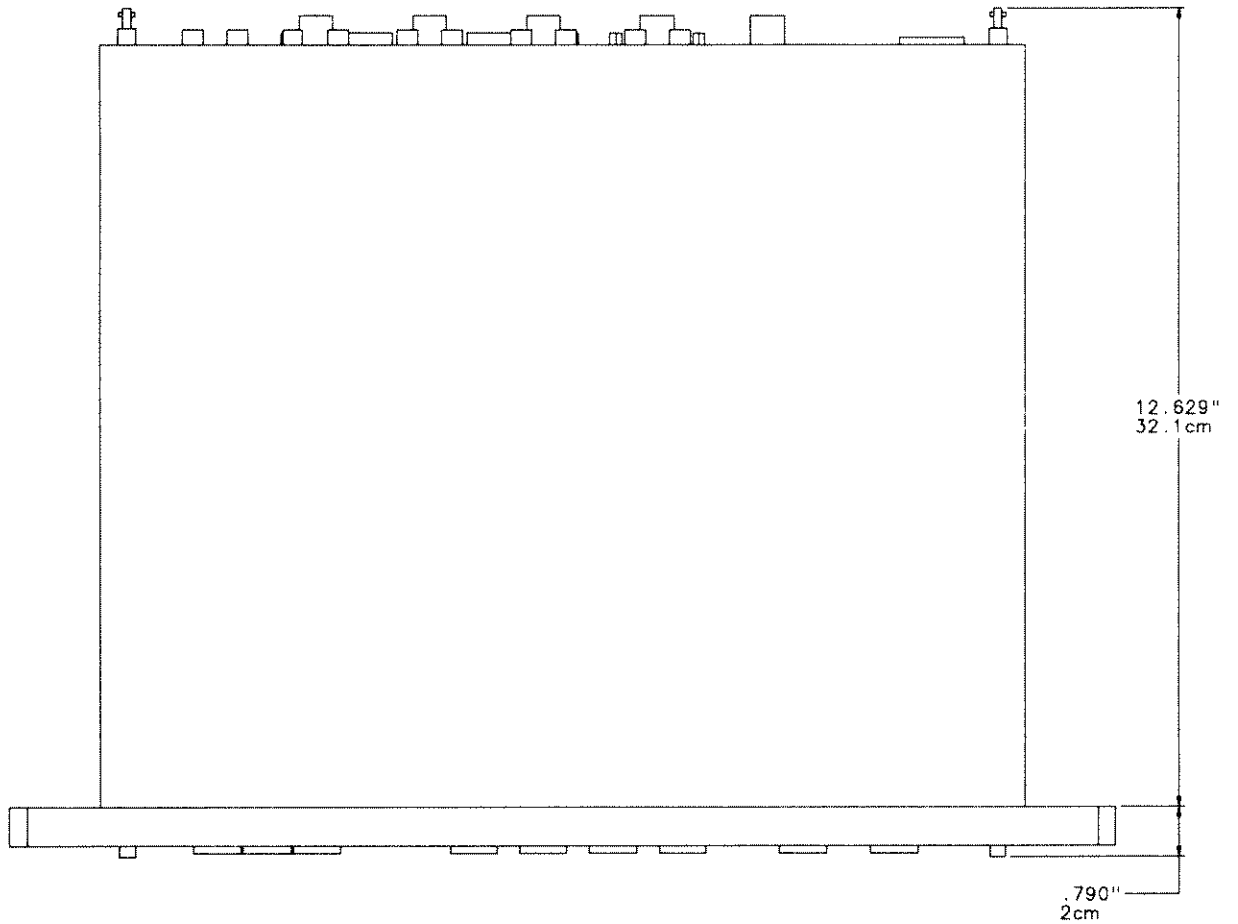


Fig. 1. Top view

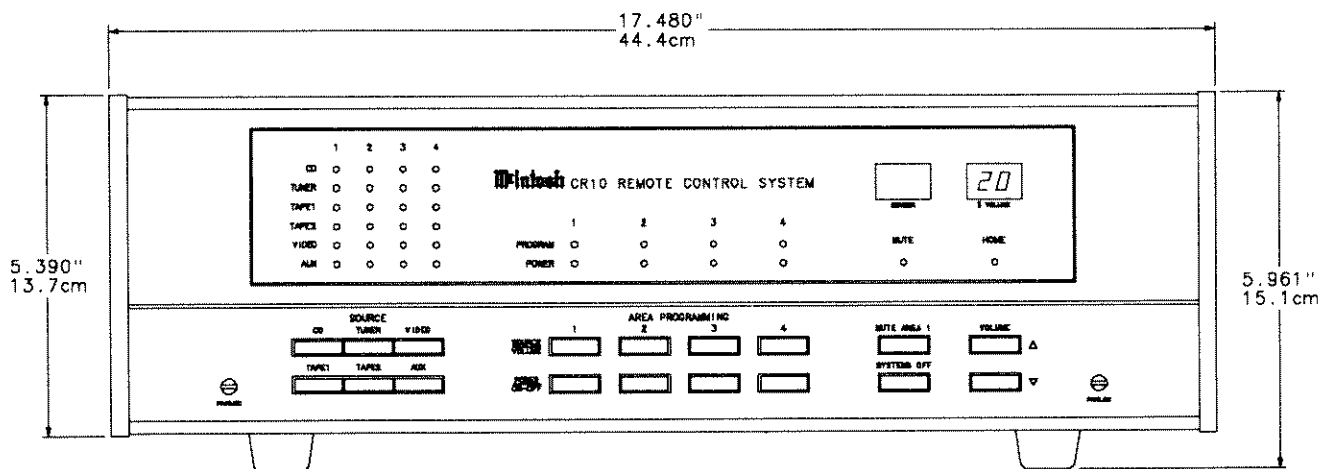


Fig. 2. Front view

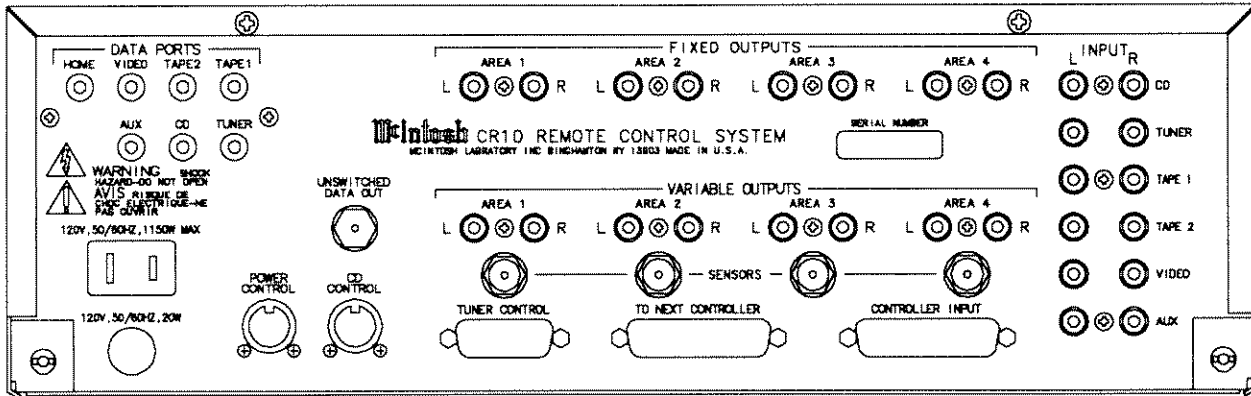



Fig. 3. Rear view

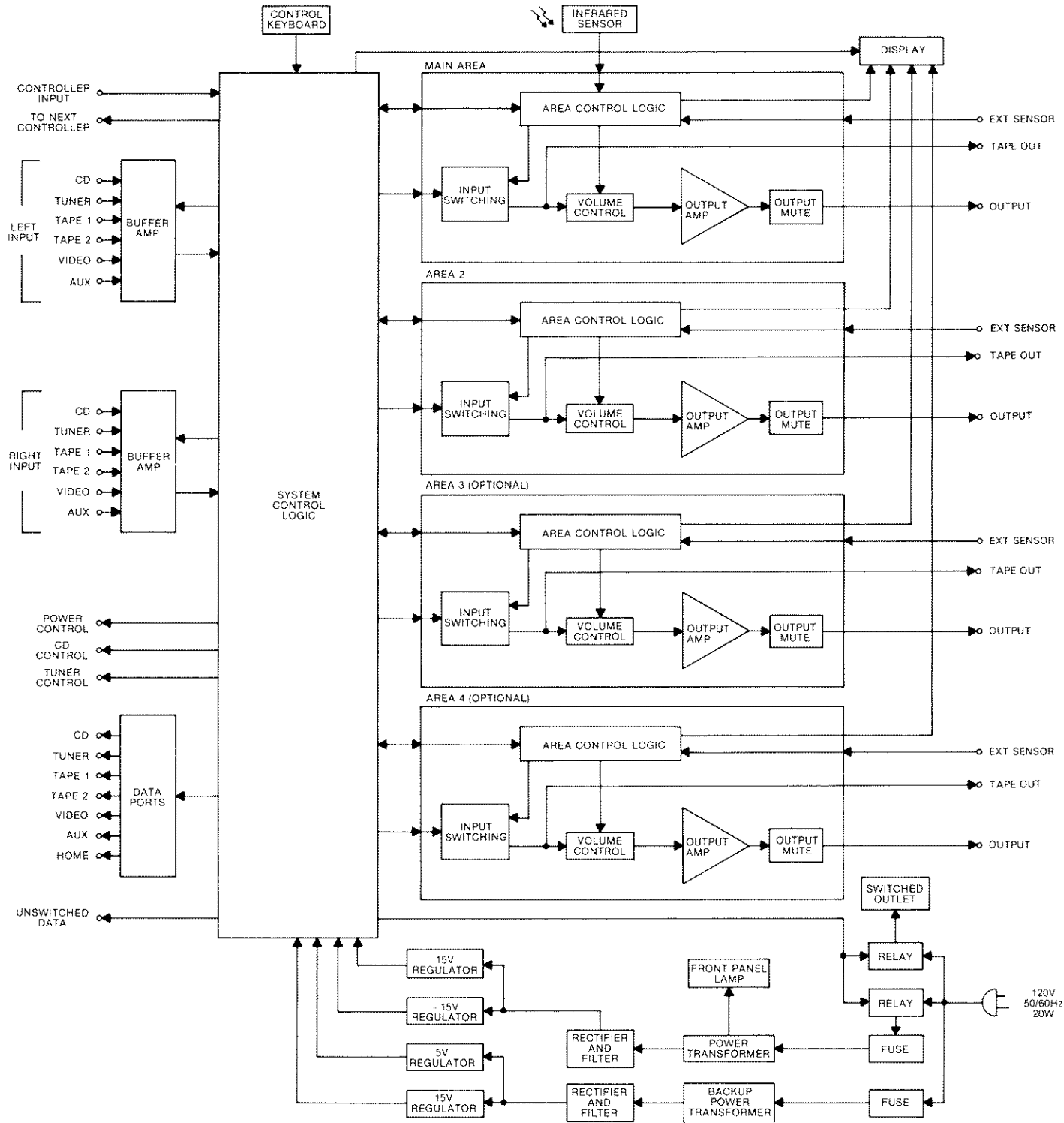
## Notes

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

### WARNING:

Parts marked with the symbol  have critical characteristics.  
Use ONLY replacement parts recommended by the manufacturer.

# Block Diagram



# Section Locations

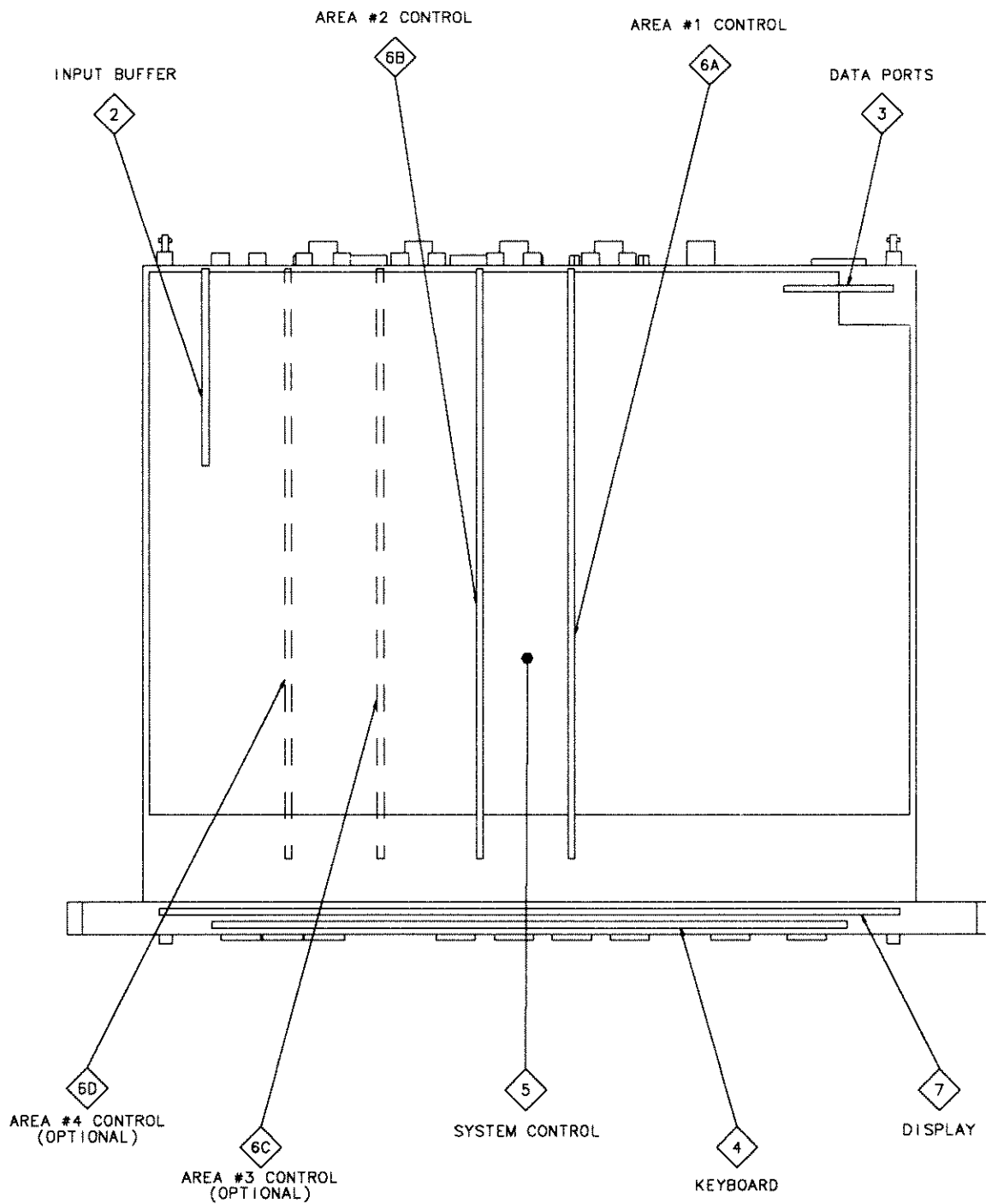


Fig. 4. Top view with cover removed

# Interconnection Diagram



## FRONT PANEL AND TRIM PARTS LIST

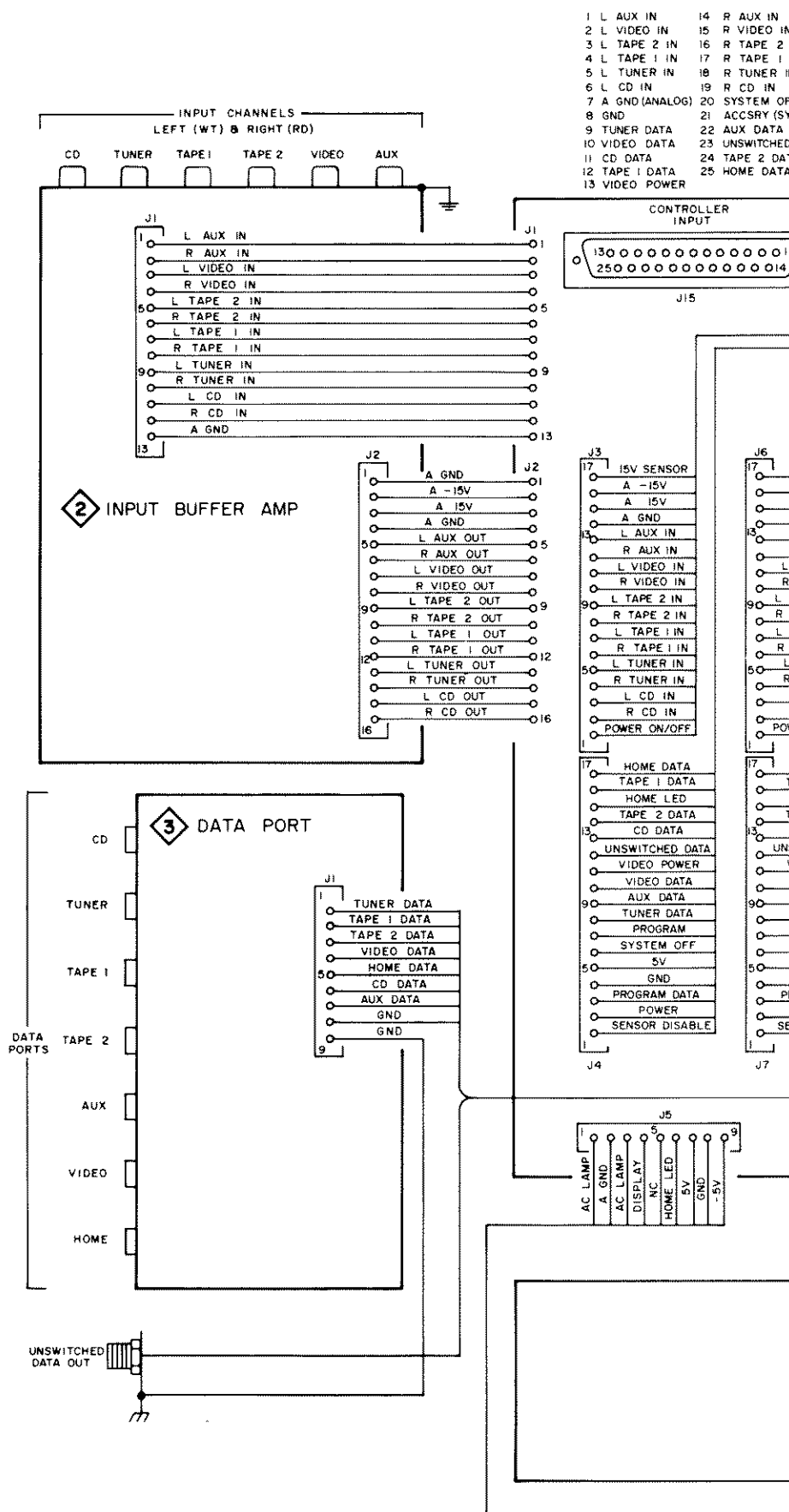
Part	Description
017485	Pushbutton, Red
017486	Pushbutton, Black
018428	Top Panel Rail
018394	Bottom Extrusion
018232	End Cap
047154	Front Panel, Glass
047155	Front Panel, Complete

## INSTALLATION HARDWARE PARTS LIST

Part	Description
003508	Panloc Shelf Bracket, Right
003509	Panel Shelf Bracket, Left
017218	Plastic Secure W/100159 Screws
039671	Mounting Template
043401	Mounting Strip
047153	Hardware Package
100159	Mach Screw, 10-32 x 3/4

## INTERCONNECTION PARTS LIST

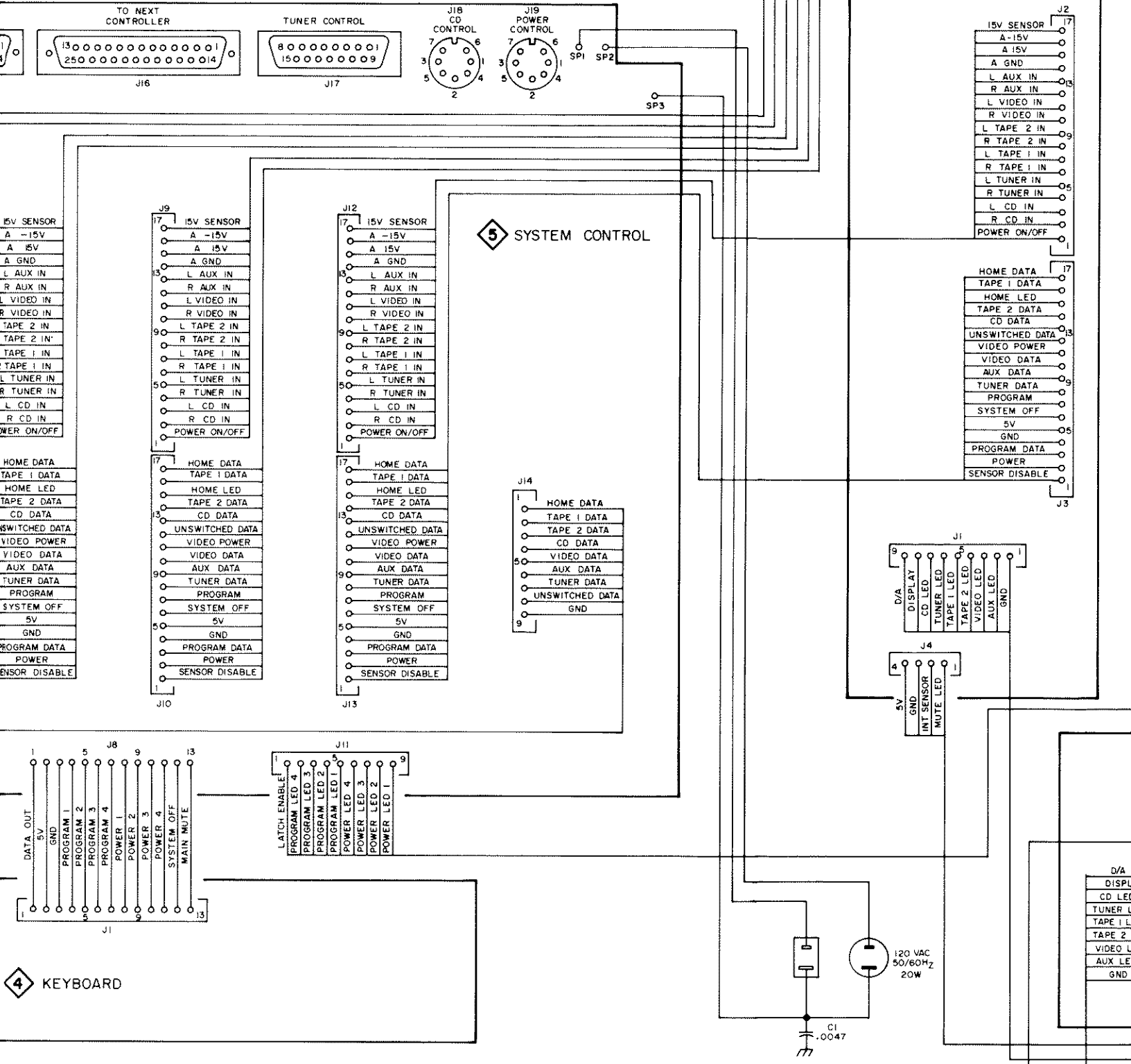
Symbol	Part	Description
<b>CAPACITORS</b>		
C1	061276	CD, .0047uF, 400V, UL/CSA



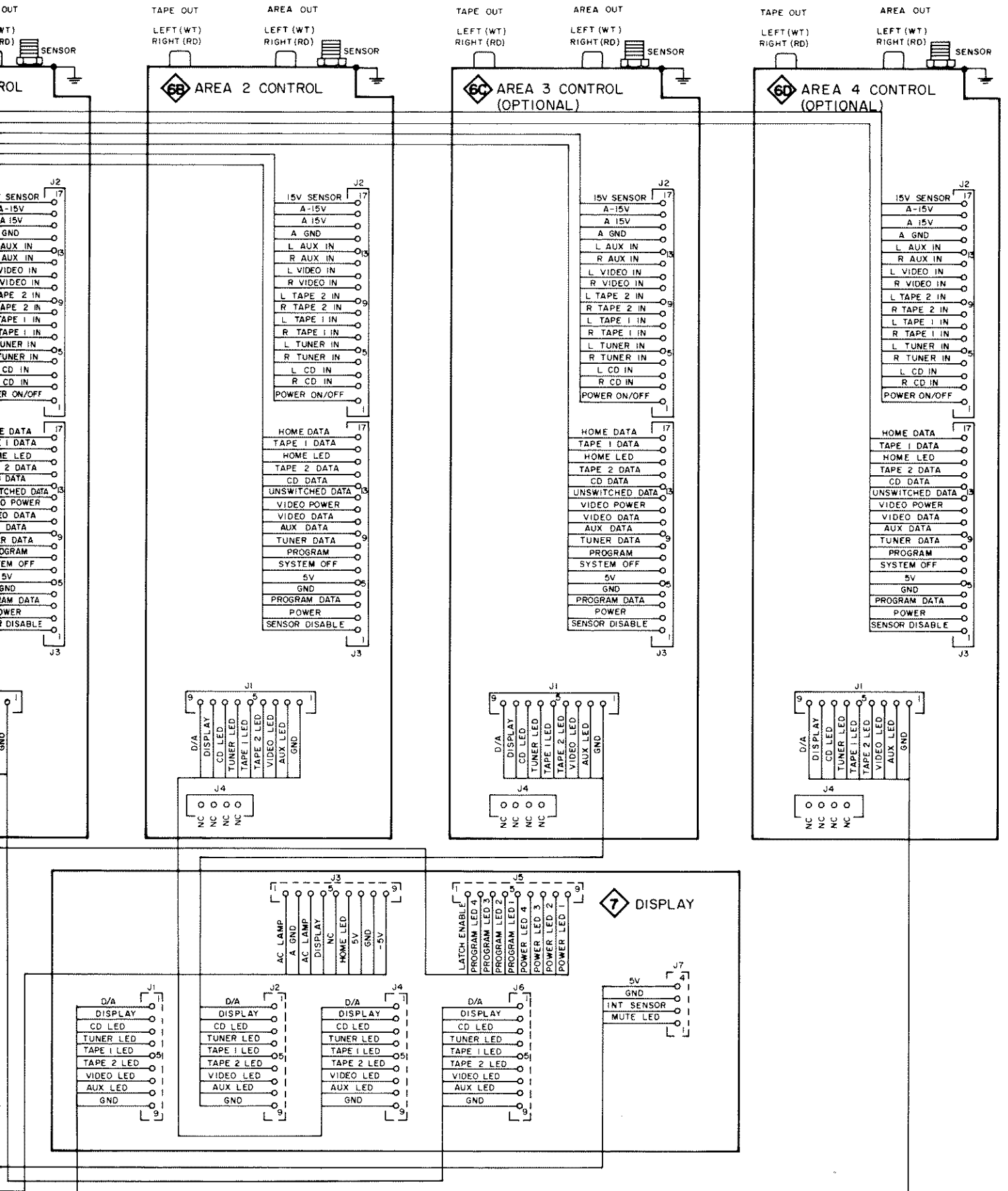
- 1 L AUX IN
- 2 L TAPE 2 IN
- 3 L TAPE 1 IN
- 4 L TAPE 1 IN
- 5 L TUNER IN
- 6 L CD IN
- 7 A GND (ANALOG)
- 8 GND
- 9 TUNER DATA
- 10 VIDEO DATA
- 11 CD DATA
- 12 TAPE 1 DATA
- 13 VIDEO POWER
- 14 R AUX IN
- 15 R VIDEO IN
- 16 R TAPE 2
- 17 R TAPE 1
- 18 R TUNER IN
- 19 R CD IN
- 20 SYSTEM OF
- 21 ACCSRY (SY
- 22 AUX DATA
- 23 UNSWITCHED
- 24 TAPE 2 DATA
- 25 HOME DATA

- 1 L AUX OUT
- 2 L VIDEO OUT
- 3 L TAPE 2 OUT
- 4 L TAPE 1 OUT
- 5 L TUNER OUT
- 6 L CD OUT
- 7 A GND (ANALOG)
- 8 GND
- 9 TUNER DATA
- 10 VIDEO DATA
- 11 CD DATA
- 12 TAPE 1 DATA
- 13 VIDEO POWER
- 14 R AUX OUT
- 15 R VIDEO OUT
- 16 R TAPE 2 OUT
- 17 R TAPE 1 OUT
- 18 R TUNER OUT
- 19 R CD OUT
- 20 SYSTEM OFF
- 21 ACCSRY (SYS ON)
- 22 AUX DATA
- 23 UNSWITCHED DATA
- 24 TAPE 2 DATA
- 25 HOME DATA
- 1 STATION 7
- 2 STATION 5
- 3 STATION 3
- 4 STATION 1
- 5 STATION 8
- 6 SCAN ▽
- 7 SEARCH
- 8 FM
- 9 STATION 6
- 10 STATION 4
- 11 STATION 2
- 12 GND
- 13 NC
- 14 SCAN Δ
- 15 AM
- 1 BACK
- 2 STOP
- 3 PLAY
- 4 NEXT
- 5 NC
- 6 NC
- 7 GND
- 1 POWER 3
- 2 POWER MAIN
- 3 ACCSRY (SYS ON)
- 4 POWER 2
- 5 VIDEO POWER
- 6 POWER 4
- 7 GND

- TAPE OUT
- AREA OUT
- LEFT (WT)
- RIGHT (RD)
- SENSOR



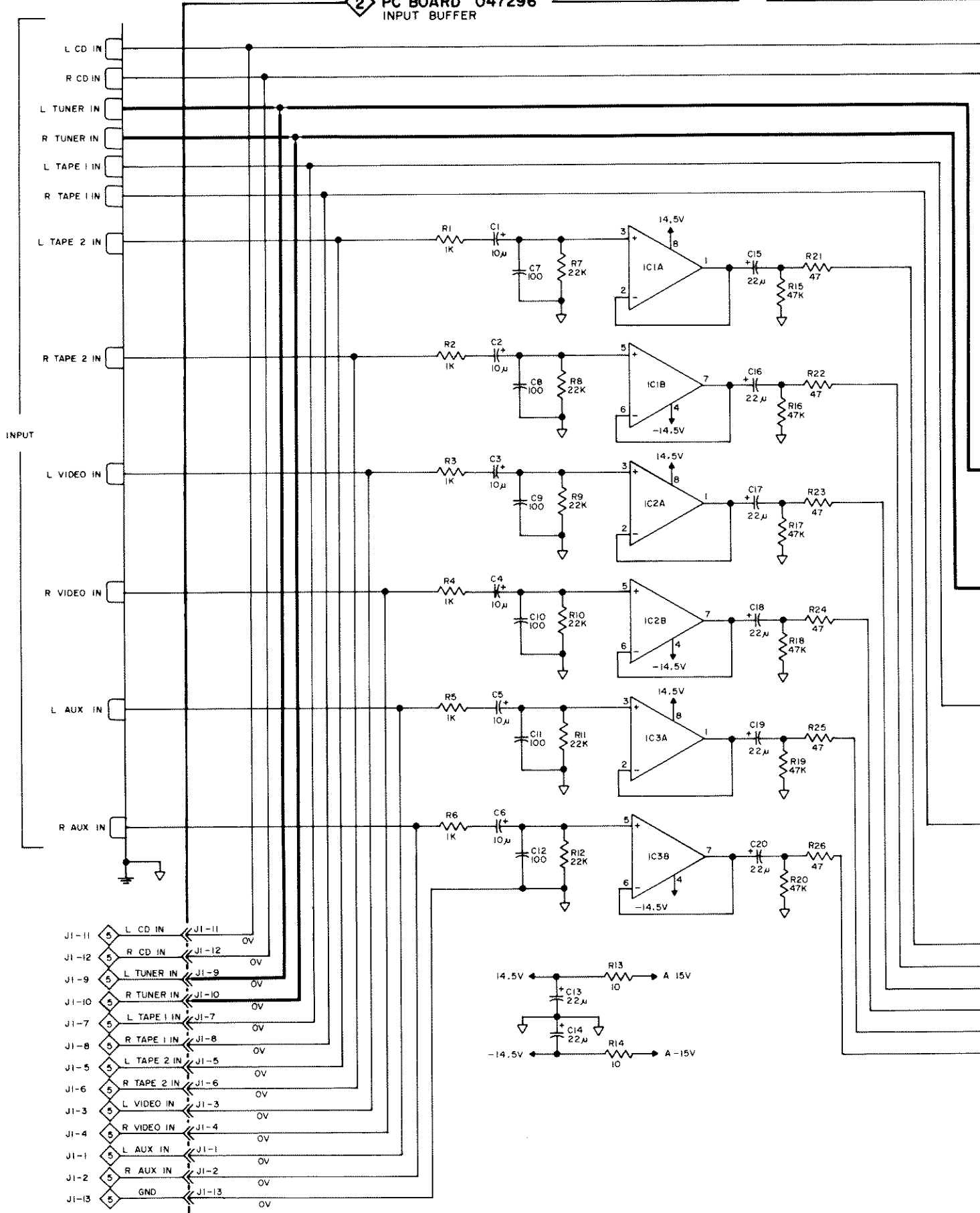


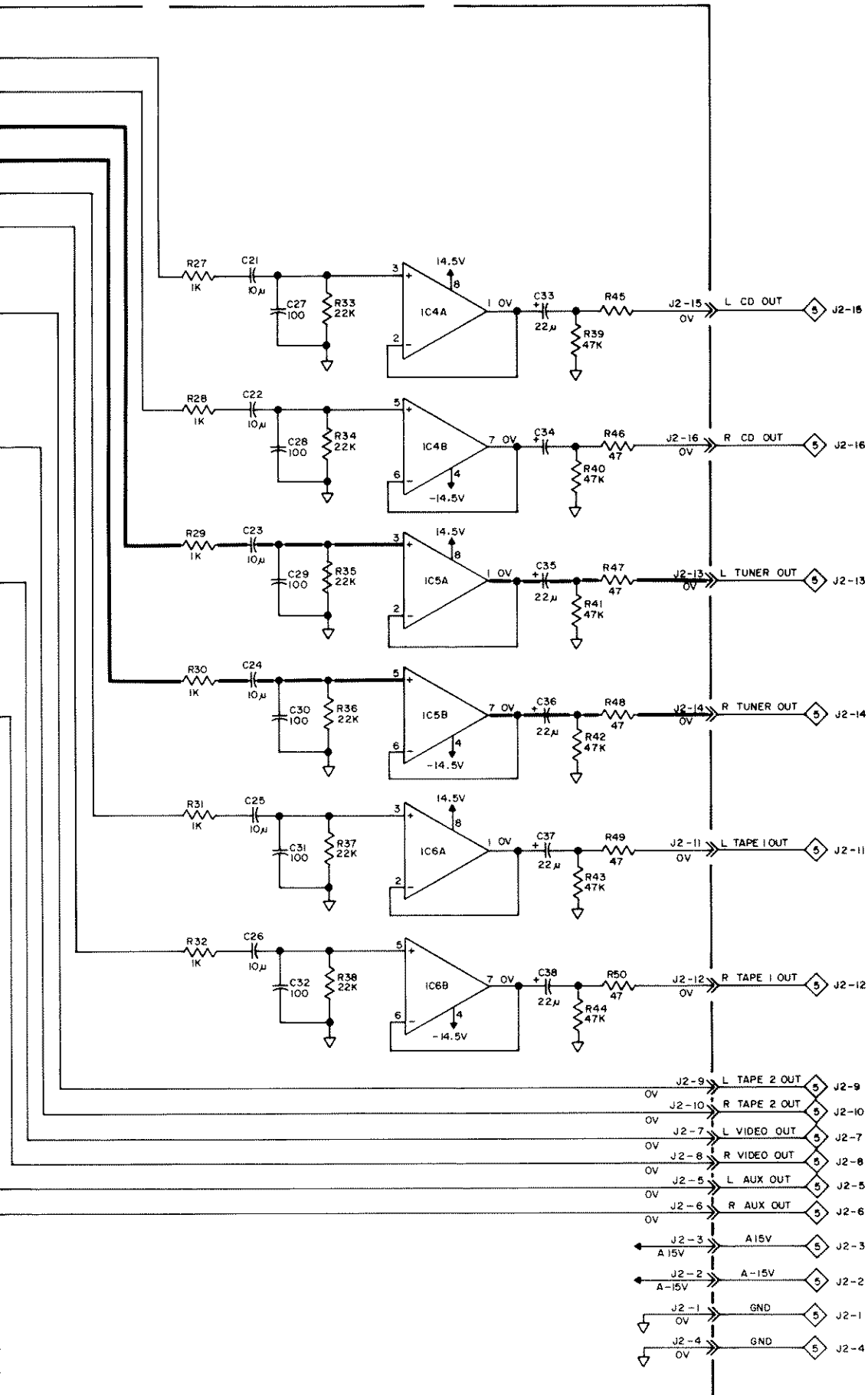


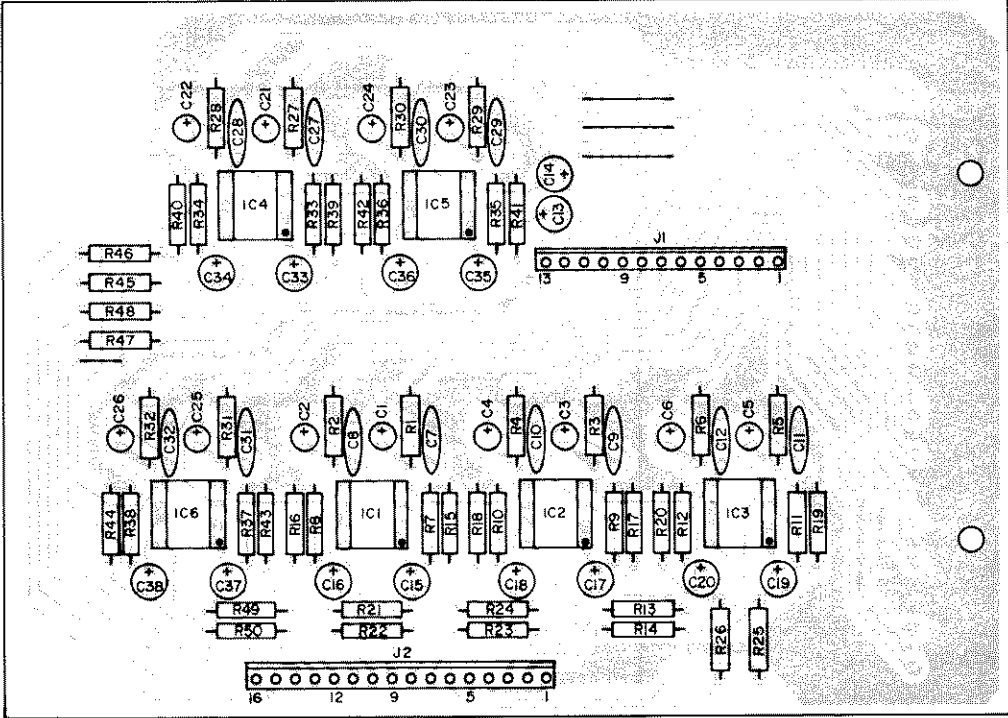
# 2

## Input Buffer

PC BOARD 047296  
INPUT BUFFER



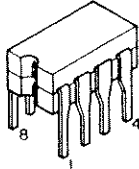




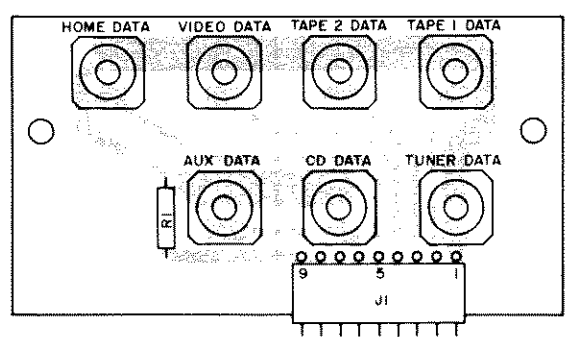
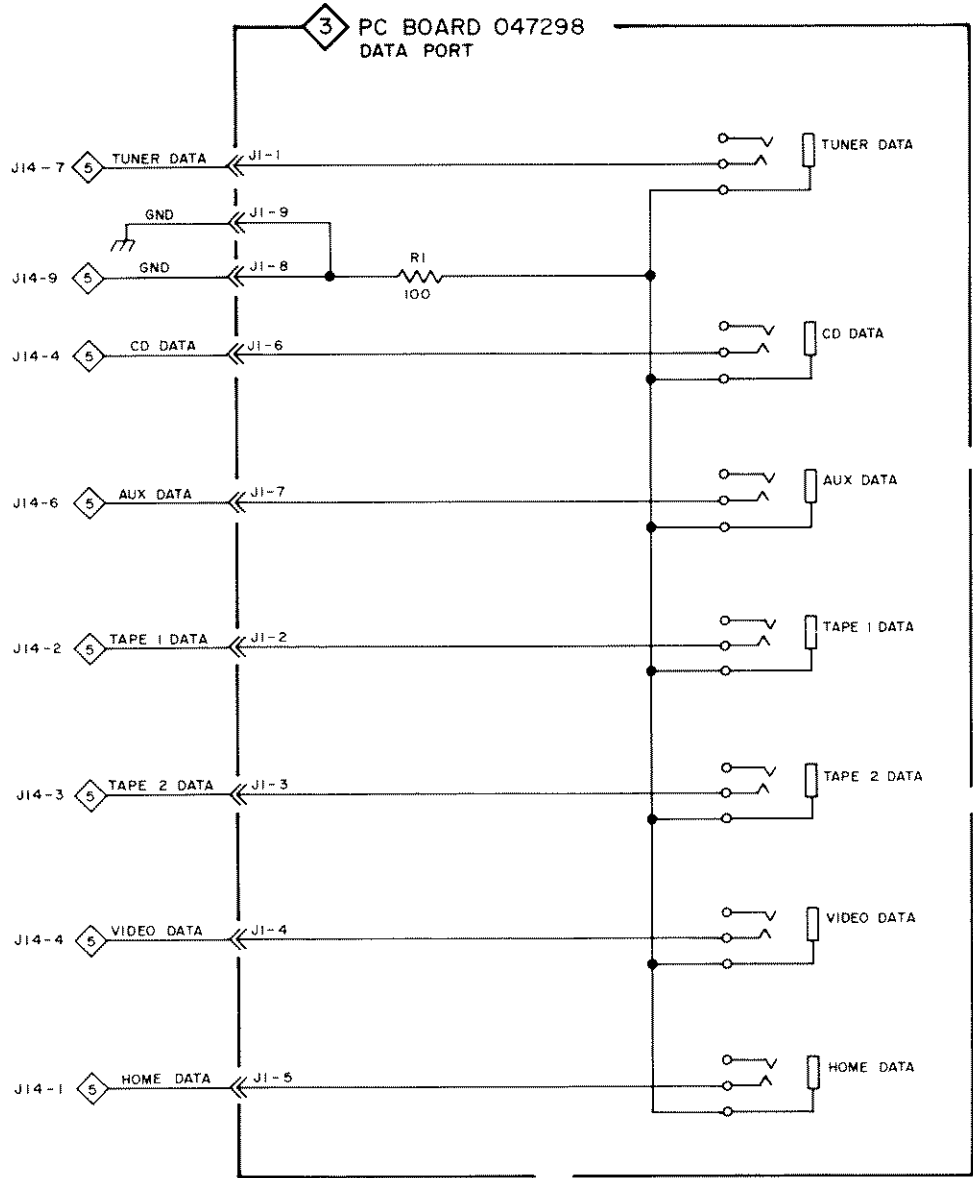
INPUT BUFFER PCB 047296

**INPUT BUFFER PARTS LIST**

Symbol	Part	Description
<b>INTEGRATED CIRCUITS</b>		
IC1-IC6	133189	Dual Operational Amp, MC33178P



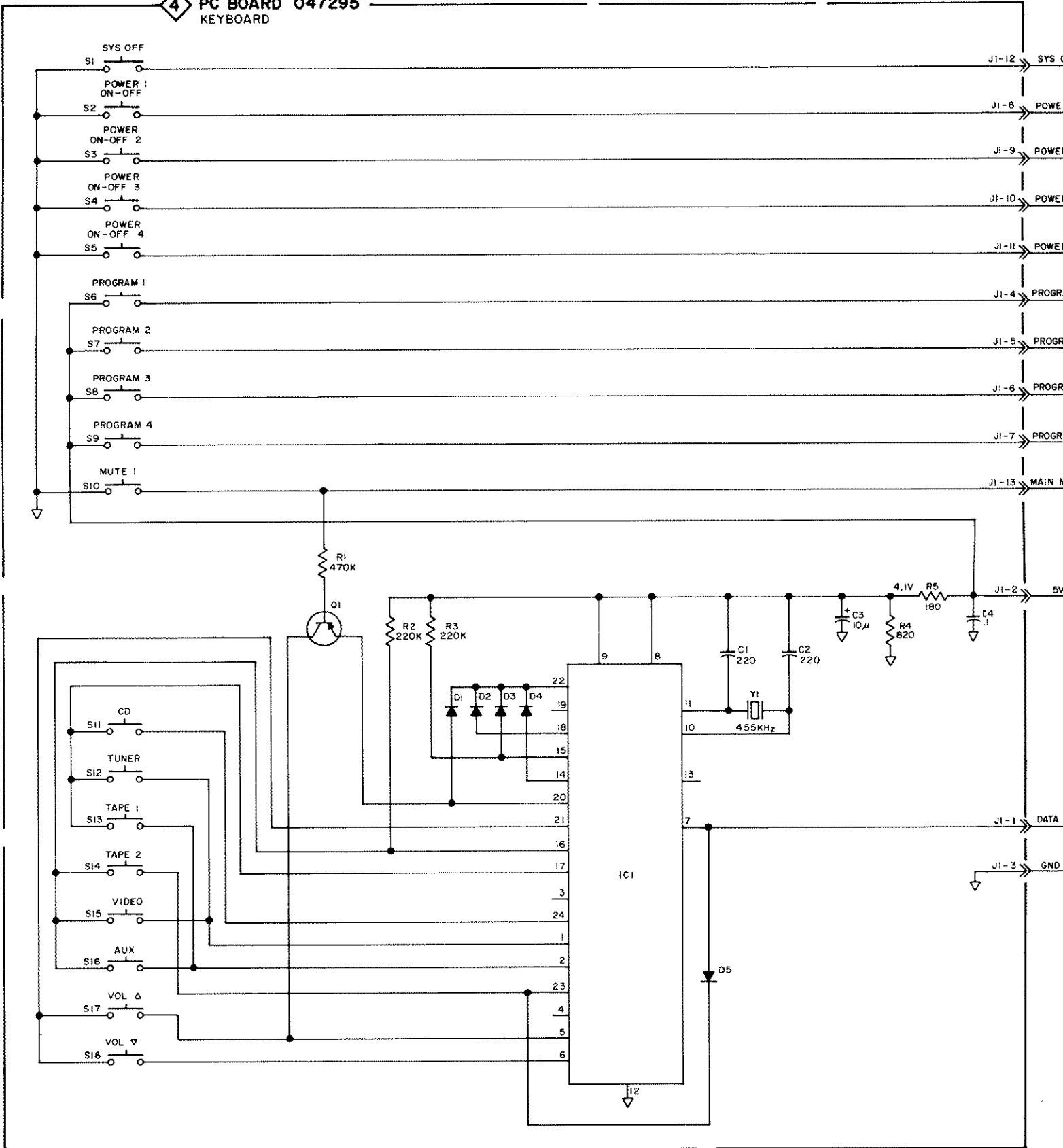
IC1-IC6

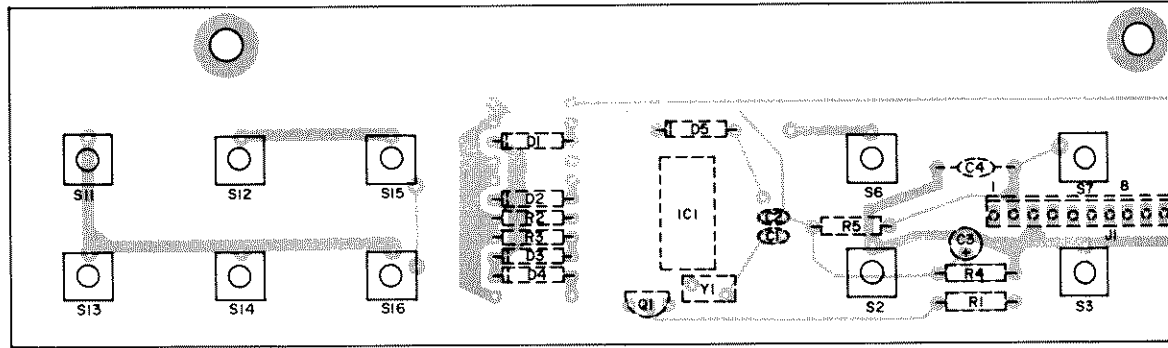
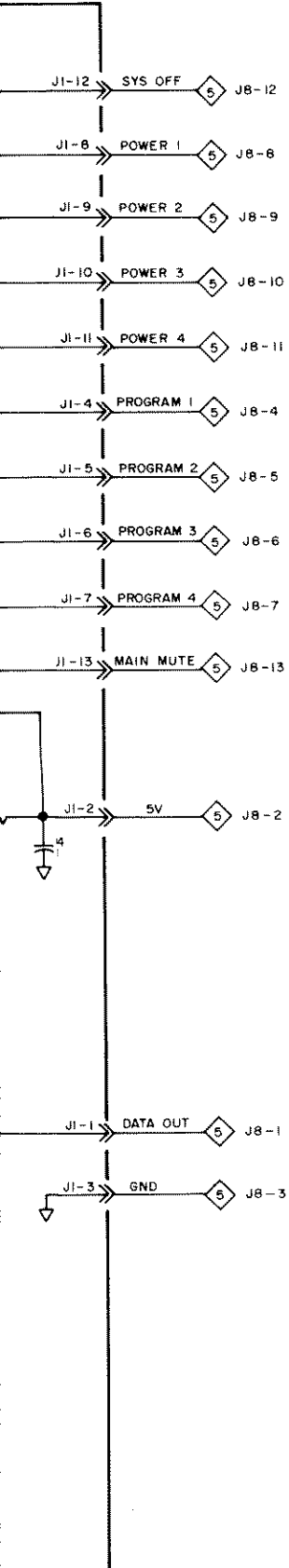


DATA PORT PCB 047298

# Keyboard 4

## 4 PC BOARD 047295 KEYBOARD

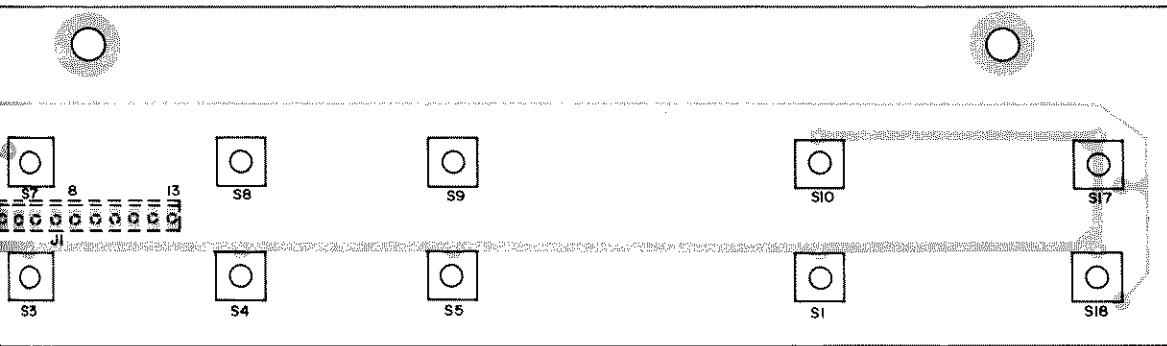




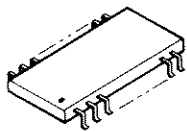
KEYBOARD PCB C

**KEYBOARD PARTS LIST**

Symbol	Part	Description
<b>DIODES</b>		
D1-D5	070047	SIG, 75V, 150mA, 1N4148
<b>INTEGRATED CIRCUITS</b>		
IC1	133188	Transmitter, uPD61226-001
<b>TRANSISTORS</b>		
Q1	132224	PNP, MPS4126
<b>MISC</b>		
Y1	180031	Ceramic Resonator, 455kHz, ±5%



RD PCB 047295



IC1



Q1

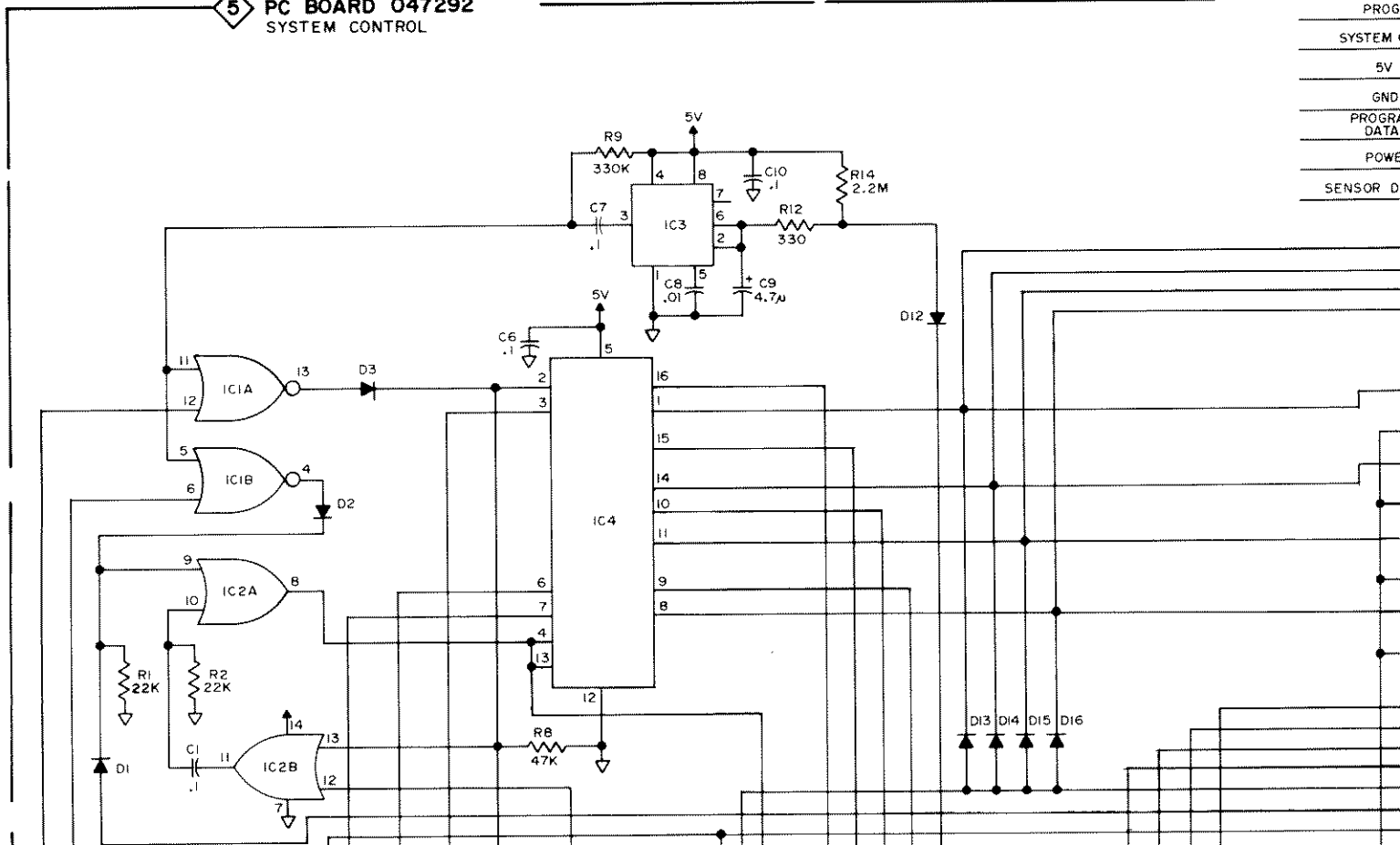


# 5

# System Control

J2-1	2	A GND	J2-1	15V SENS
J2-2	2	A -15V	J2-2	A -15V
J2-3	2	A 15V	J2-3	A 15V
J2-4	2	A GND	J2-4	A GND
J2-5	2	L AUX OUT	J2-5	L AUX I
J2-6	2	R AUX OUT	J2-6	R AUX I
J2-7	2	L VIDEO OUT	J2-7	L VIDEO
J2-8	2	R VIDEO OUT	J2-8	R VIDEO
J2-9	2	L TAPE 2 OUT	J2-9	L TAPE
J2-10	2	R TAPE 2 OUT	J2-10	R TAPE
J2-11	2	L TAPE 1 OUT	J2-11	L TAPE
J2-12	2	R TAPE 1 OUT	J2-12	R TAPE
J2-13	2	L TUNER OUT	J2-13	L TUNER
J2-14	2	R TUNER OUT	J2-14	R TUNER
J2-15	2	L CD OUT	J2-15	L CD IN
J2-16	2	R CD OUT	J2-16	R CD IN
				POWER ON/OFF

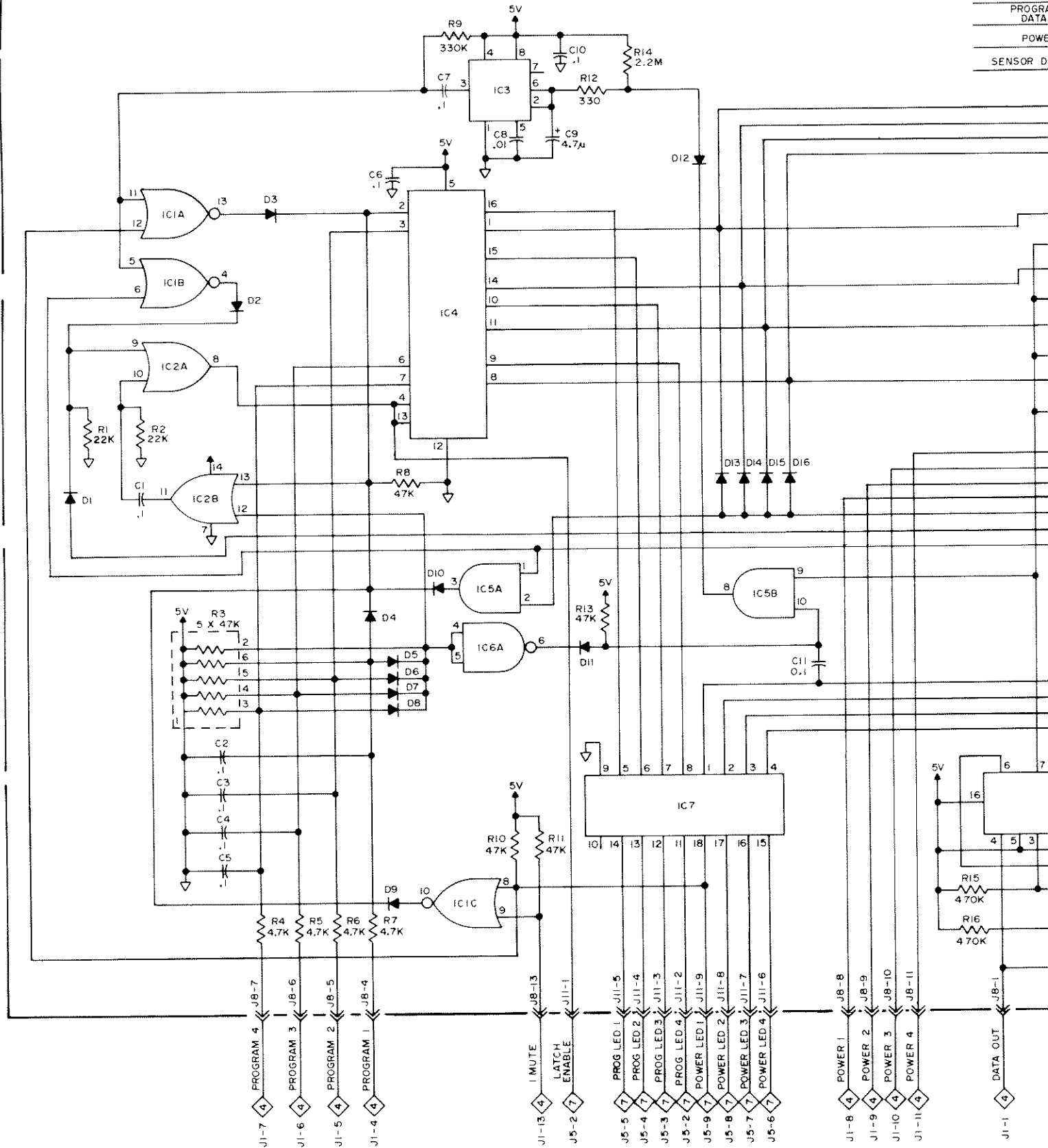
## PC BOARD 047292 SYSTEM CONTROL

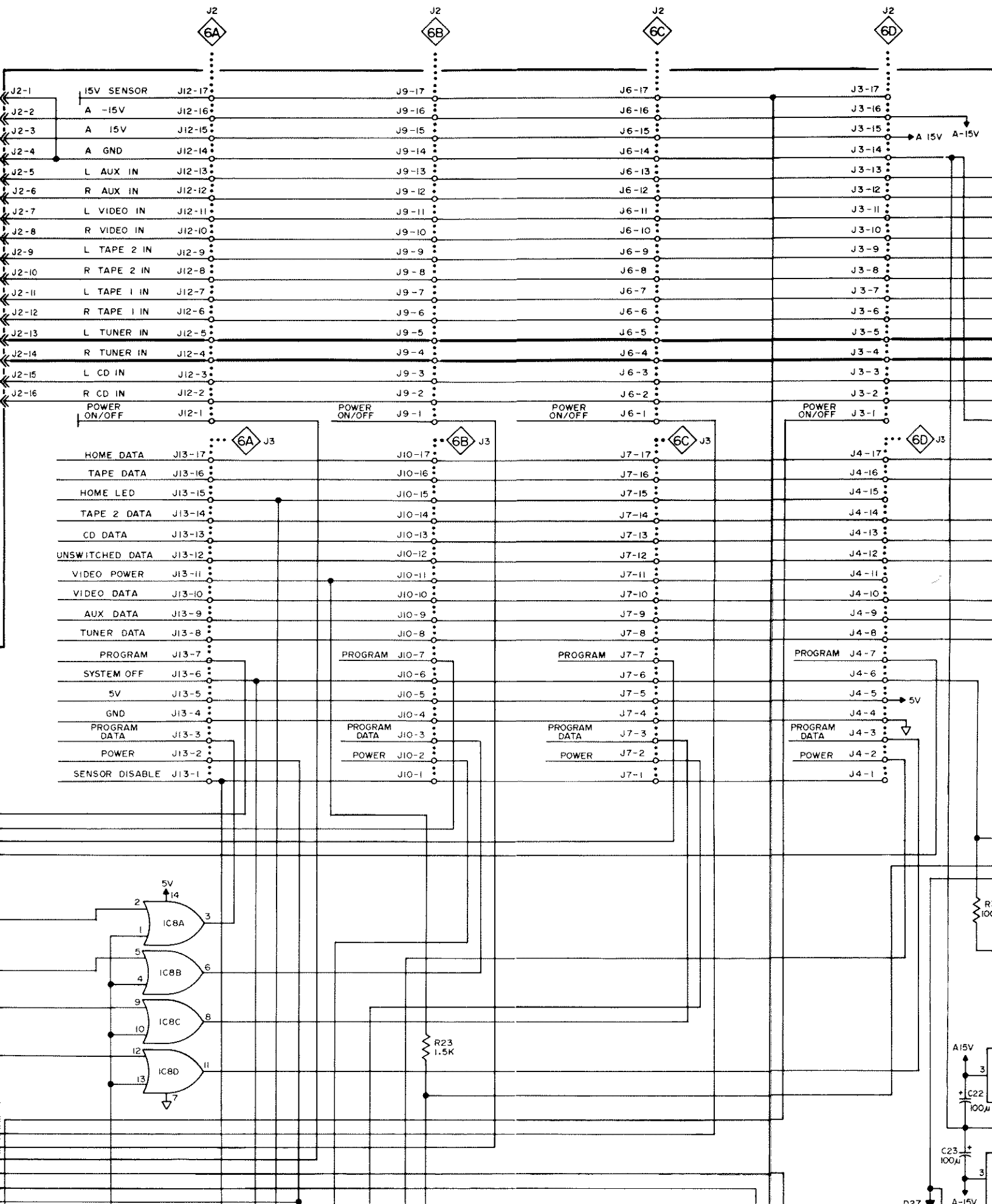


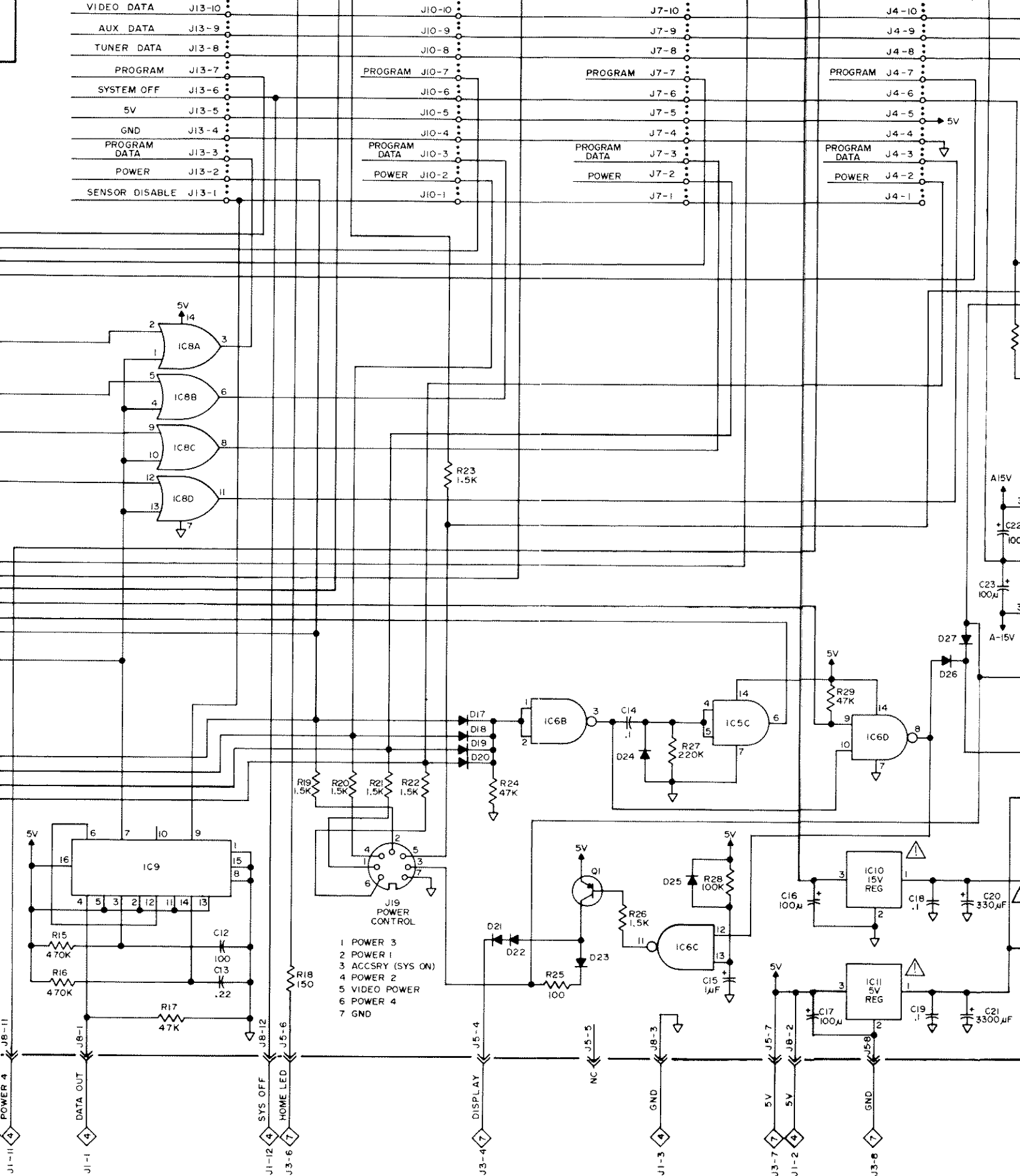
- HOME DATA
- TAPE DATA
- HOME LE
- TAPE 2
- CD DATA
- UNSWITCHED
- VIDEO POW
- VIDEO DATA
- AUX DATA
- TUNER DATA
- PROGRAM
- SYSTEM
- 5V
- GND
- PROGRAM
- DATA
- POWER
- SENSOR DATA

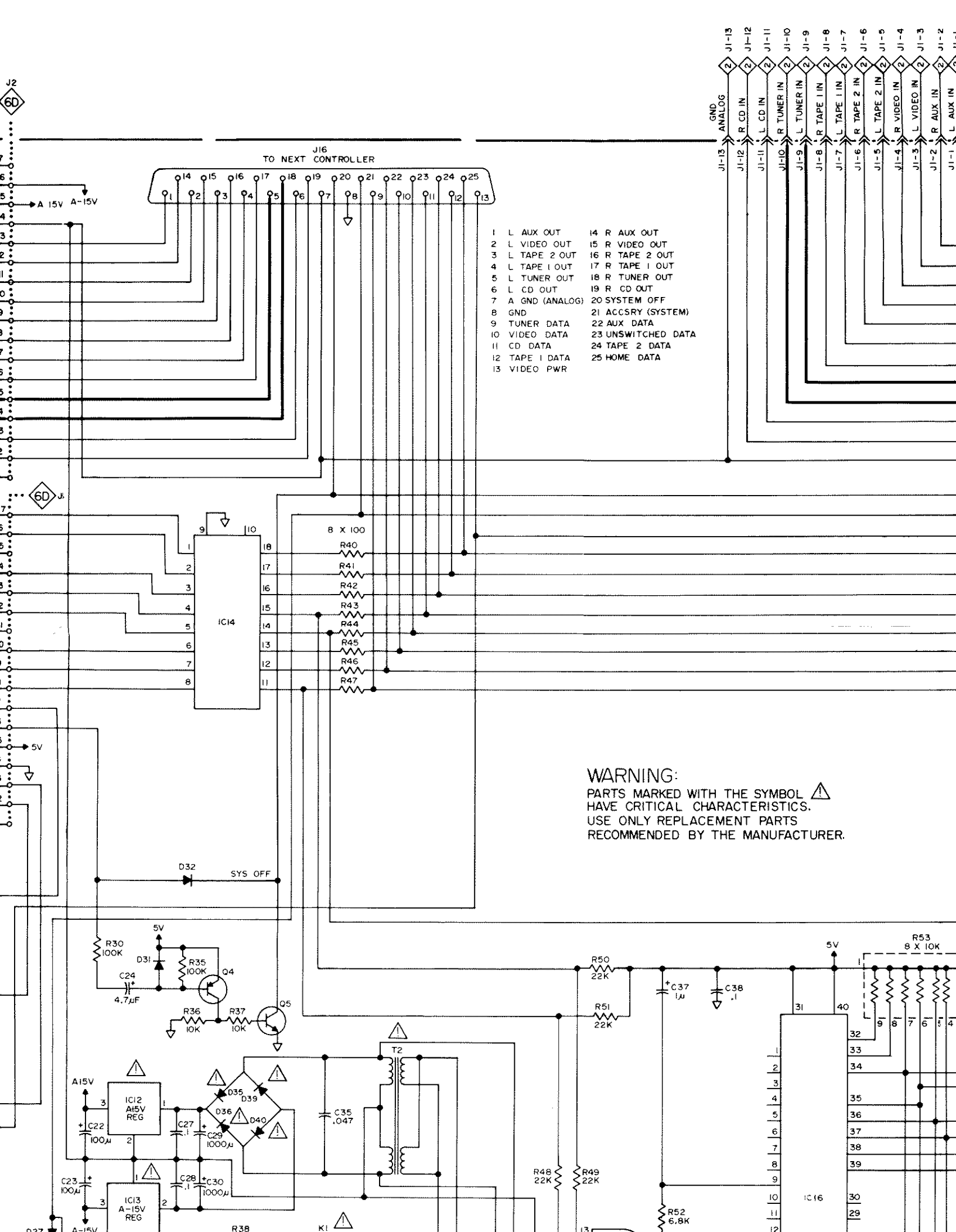
**5 PC BOARD 047292**  
SYSTEM CONTROL

VIDEO DATA
AUX DATA
TUNER DATA
PROGRAM DATA
SYSTEM DATA
5V
GND
PROGRAM DATA
POWER DATA
SENSOR DATA






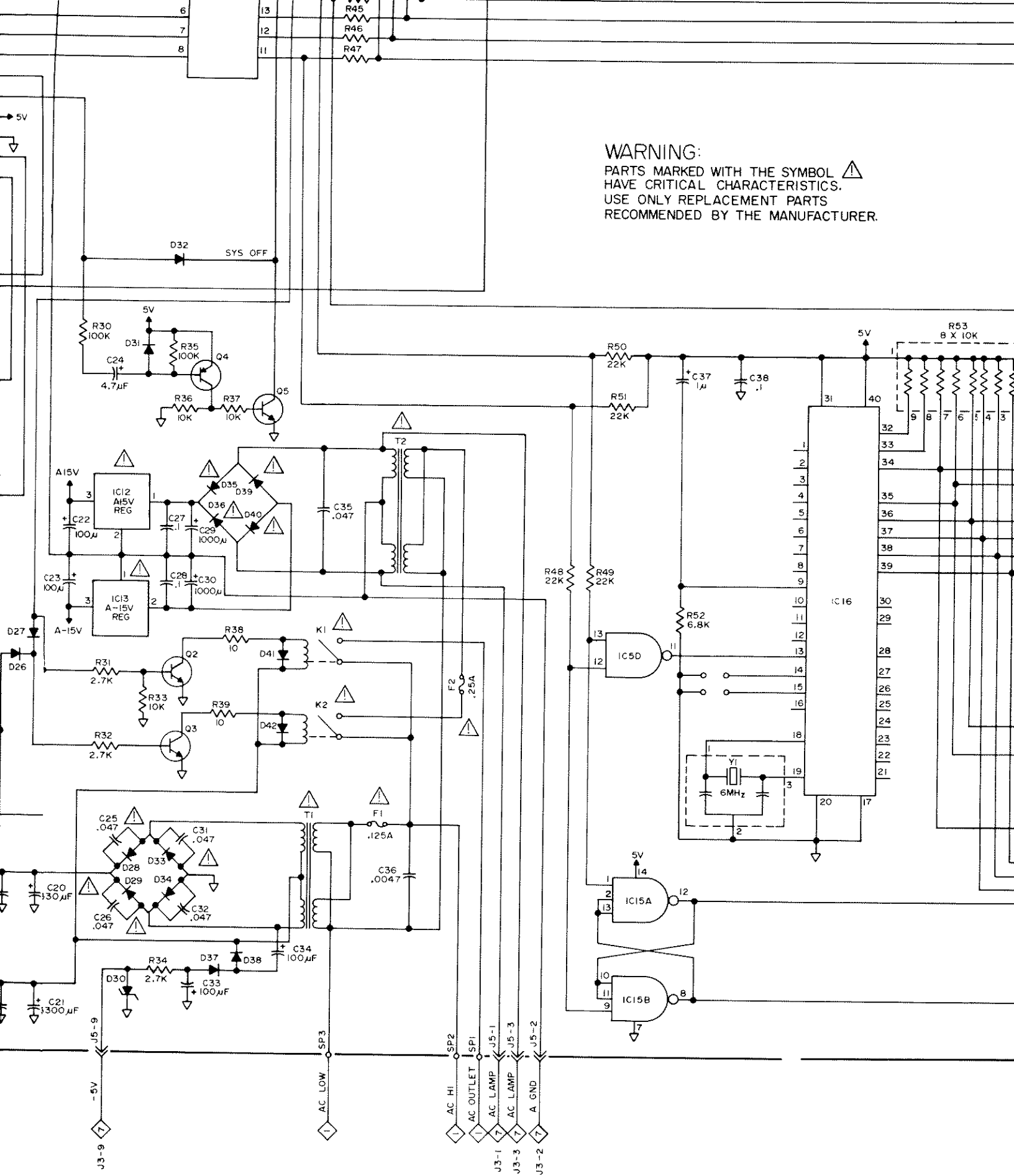


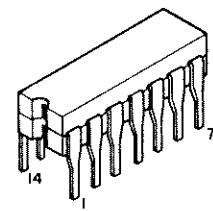
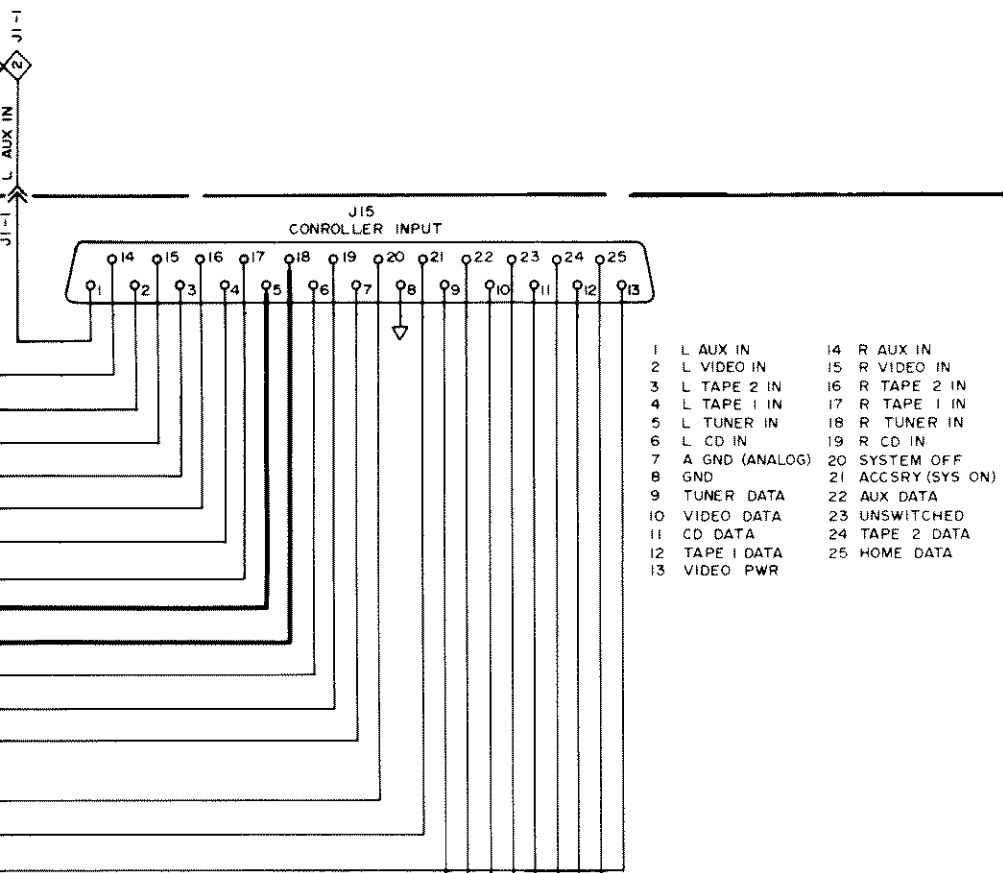


- J16  
TO NEXT CONTROLLER
- |                  |                    |
|------------------|--------------------|
| 1 L AUX OUT      | 14 R AUX OUT       |
| 2 L VIDEO OUT    | 15 R VIDEO OUT     |
| 3 L TAPE 2 OUT   | 16 R TAPE 2 OUT    |
| 4 L TAPE 1 OUT   | 17 R TAPE 1 OUT    |
| 5 L TUNER OUT    | 18 R TUNER OUT     |
| 6 L CD OUT       | 19 R CD OUT        |
| 7 A GND (ANALOG) | 20 SYSTEM OFF      |
| 8 GND            | 21 ACCSRV (SYSTEM) |
| 9 TUNER DATA     | 22 AUX DATA        |
| 10 VIDEO DATA    | 23 UNSWITCHED DATA |
| 11 CD DATA       | 24 TAPE 2 DATA     |
| 12 TAPE 1 DATA   | 25 HOME DATA       |
| 13 VIDEO PWR     |                    |

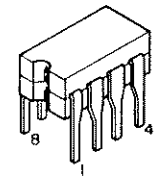
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PARTS MARKED WITH THE SYMBOL  $\Delta$   
HAVE CRITICAL CHARACTERISTICS.  
USE ONLY REPLACEMENT PARTS  
RECOMMENDED BY THE MANUFACTURER.

**WARNING:**  
 PARTS MARKED WITH THE SYMBOL   
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 USE ONLY REPLACEMENT PARTS  
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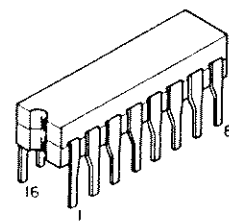




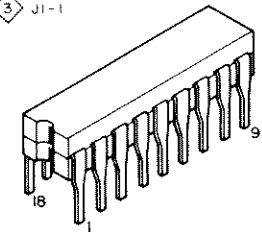
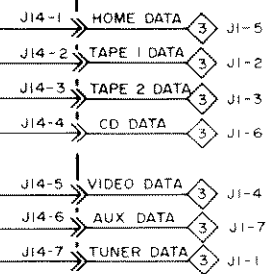
IC1, IC2, IC5, IC6 & IC15



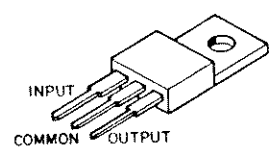
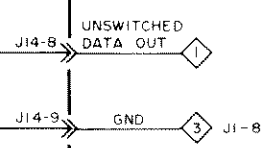
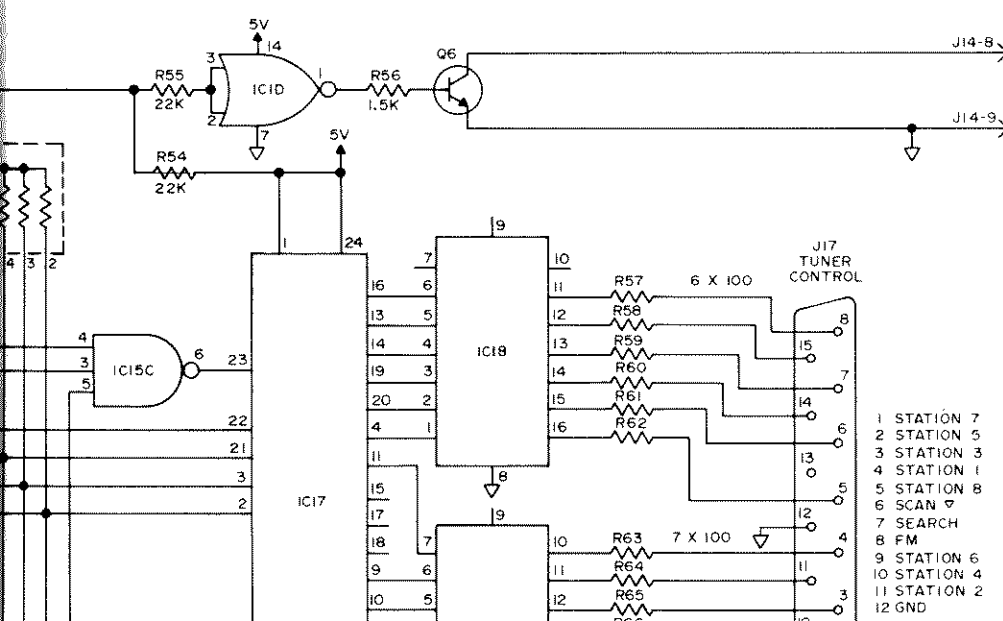
IC3



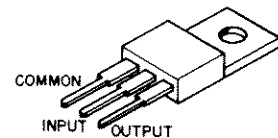
IC4, IC8, IC9, IC18 & IC19

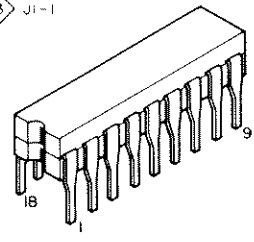
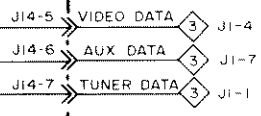


IC7, IC14, IC20

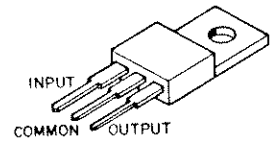
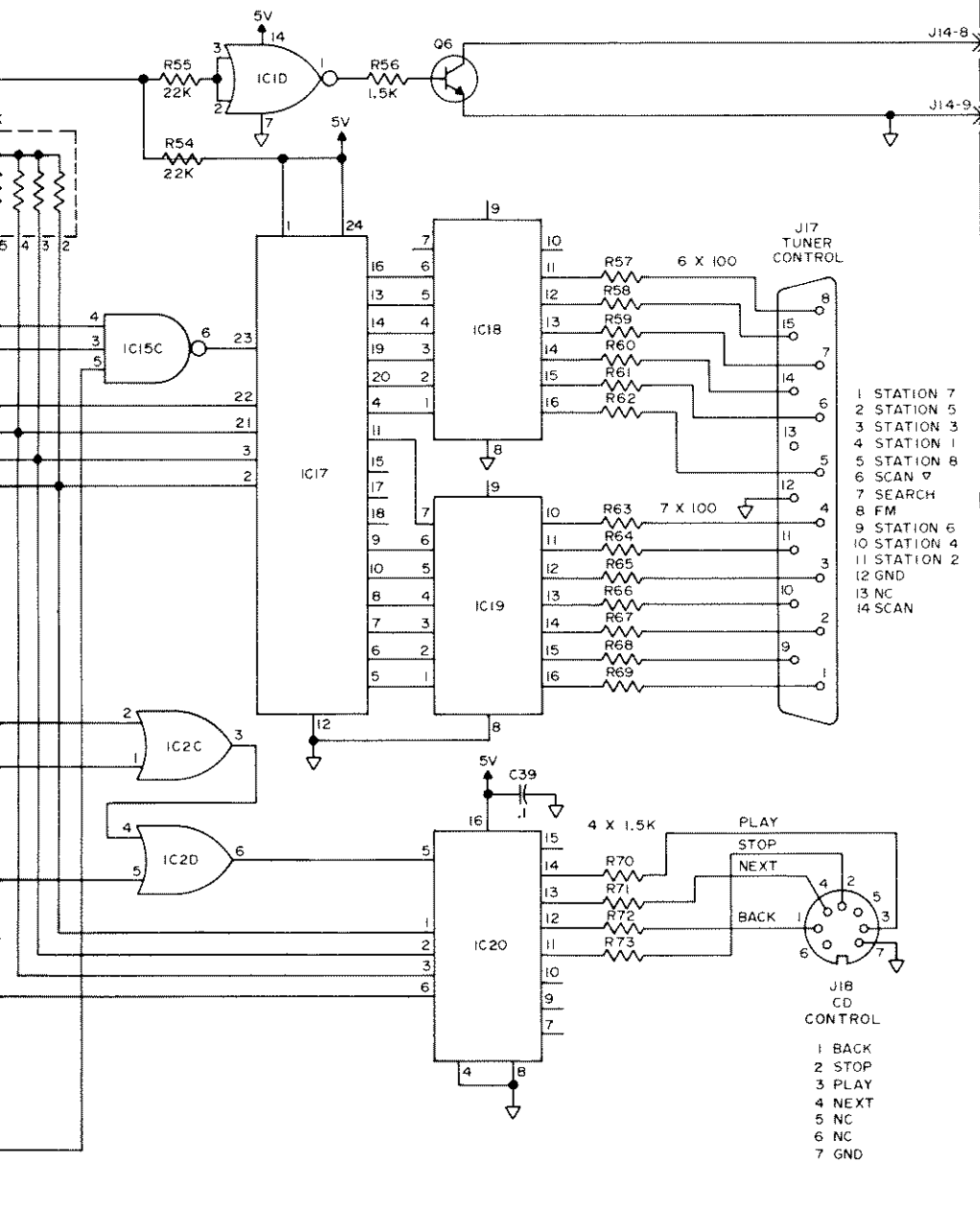


IC10, IC11, IC12

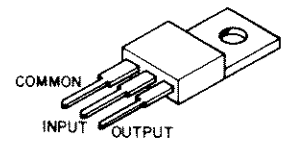




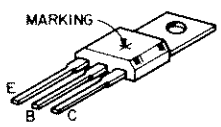
IC7, IC14, IC20



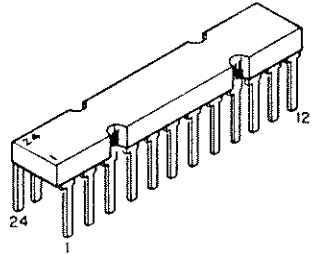
IC10, IC11, IC12



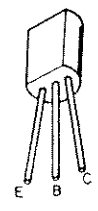
IC13



IC16



IC17



Q1-Q6

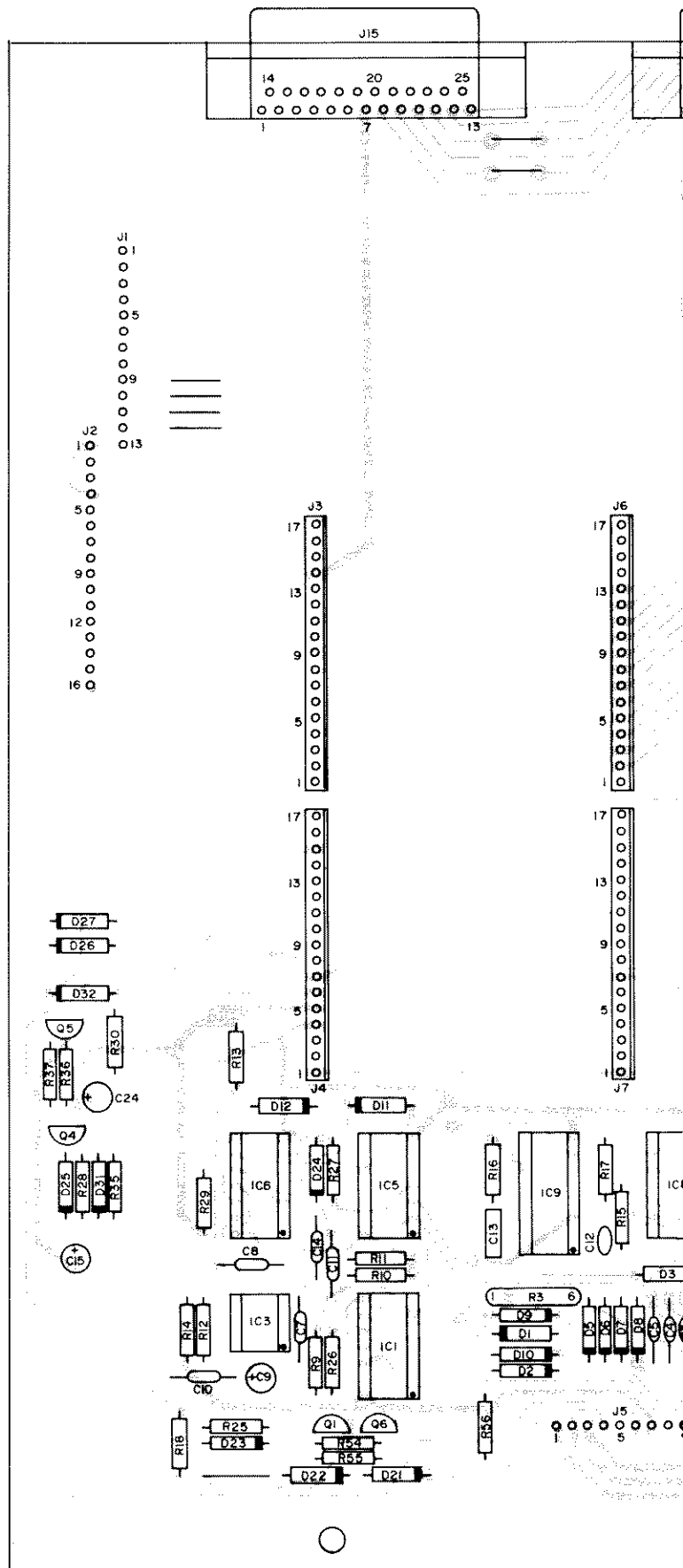


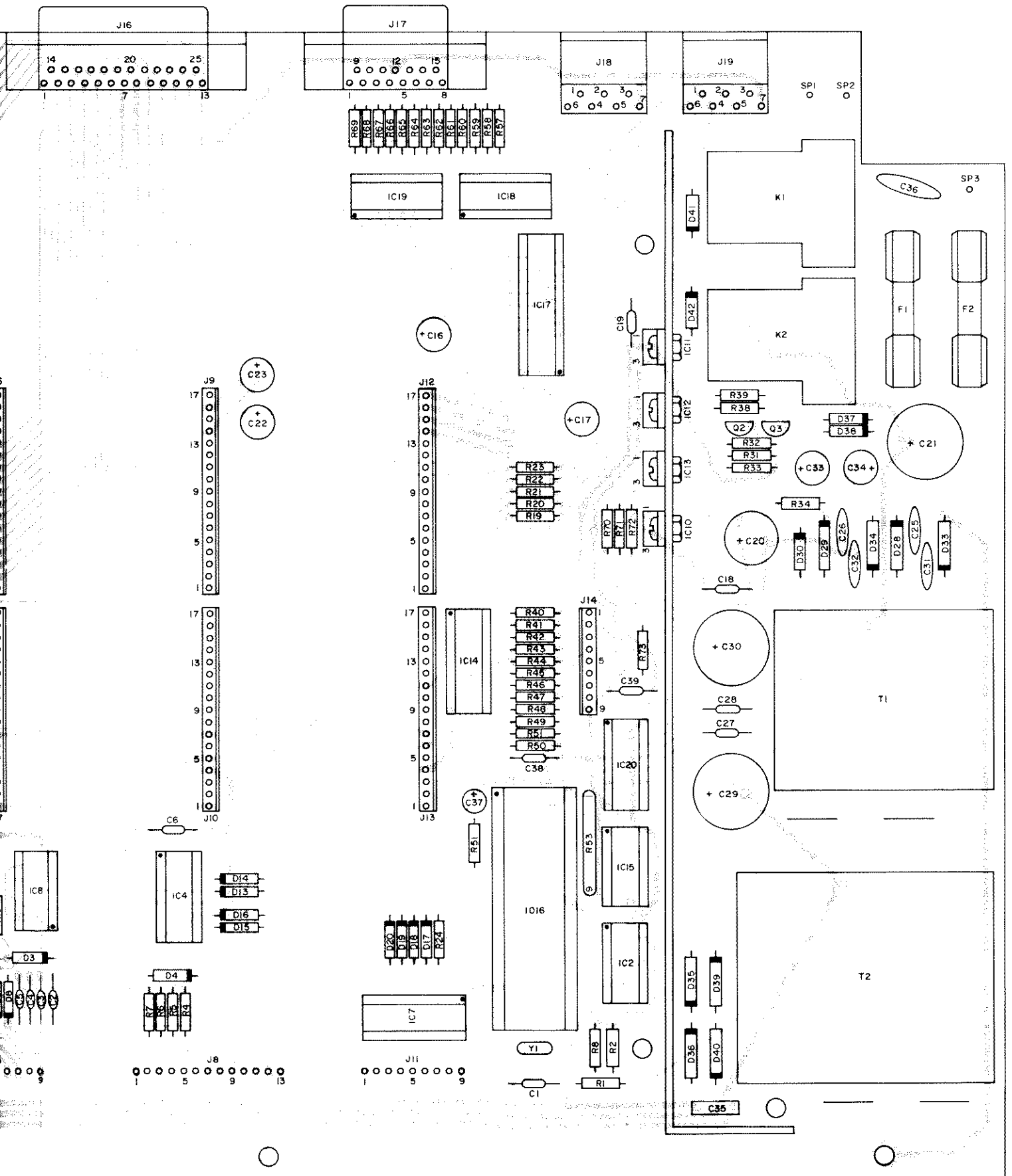
# System Control

# 5

## SYSTEM CONTROL PARTS LIST

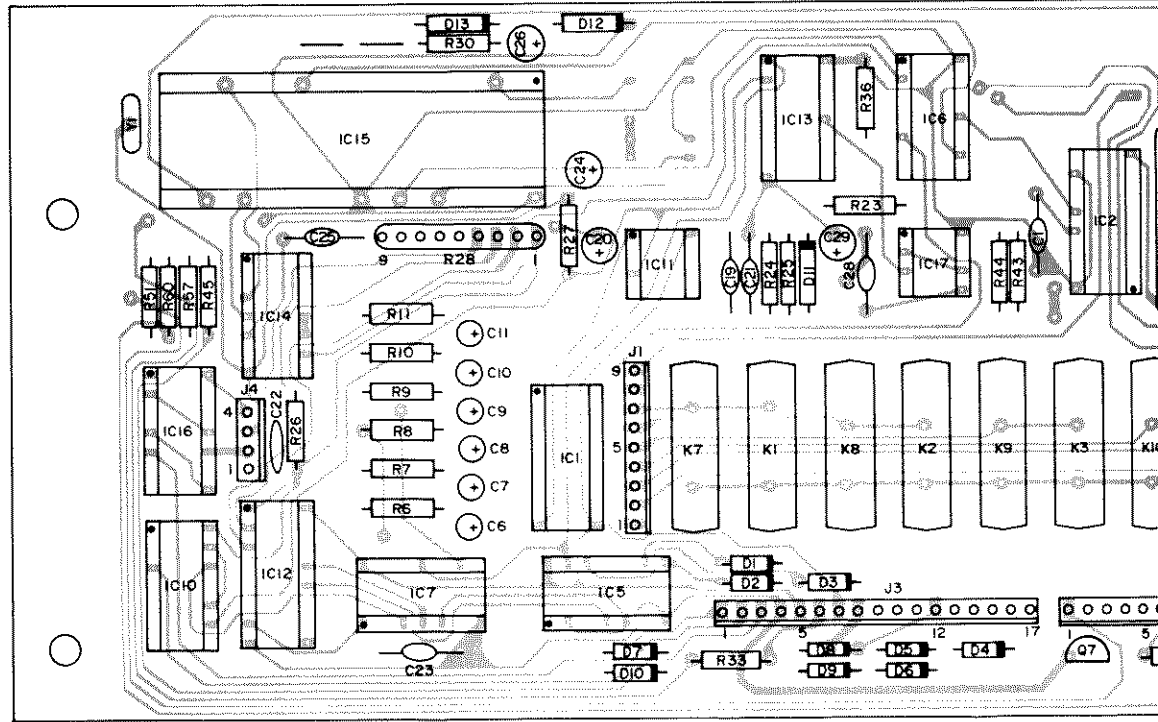
Symbol	Part	Description
<b>DIODES</b>		
D1-D20	070047	SIG, 75V, 150mA, 1N4148
D21,D22	070131	RECT, 400V, 1A, 1N4004
D23	070132	ZN, 5V, 5% 500mW, 1N5231B
D24-D27	070047	SIG, 75V, 150mA, 1N4148
D28,D29	070131	RECT, 400V, 1A, 1N4004
D30	070132	ZN, 5V, 5%, 500mW, 1N5231B
D31,D32	070047	SIG, 75V, 150mA, 1N4148
D33-D36	070131	RECT, 400V, 1A, 1N4004
D37,D38	070098	SIG, 175V, 500mW, FDH400
D39,D40	070131	RECT, 400V, 1A, 1N4004
<b>FUSES</b>		
F1	089044	Fuse, SB, .125A, 250V
F2	089048	Fuse, SB, .25A, 250V
<b>RELAYS</b>		
K1,K2	087054	SPST, 12VDC, JT1AE-DC12V
<b>INTEGRATED CIRCUITS</b>		
IC1	133176	CMOS, Quad 2-input NOR Gate MC74HC02AN
IC2	133167	CMOS, Quad 2-input OR Gate MC74HC32AN
IC3	133141	TIMER, NE555N
IC4	133183	CMOS, Dual 2-Bit Latch, MC74HC75N
IC5	133175	CMOS, Quad 2-input AND Gate, MC74HC08AN
IC6	133161	CMOS, Quad, 2-input NAND Gate, 74HC00N
IC7	133180	8 LINE DRIVER, LB1720
IC8	133183	CMOS, Dual 2-Bit Latch, MC74HC75N
IC9	133182	CMOS, Dual Monostable Multivibrator, MC74HC4538N
IC10	133086	+ 15V Regulator, MC7815CT
IC11		
IC12	133086	+ 15V Regulator, MC7815CT
IC13	133087	-15V Regulator, MC7915CT
IC14	133180	8 LINE DRIVER, LB1720
IC15	133179	CMOS, Triple 3-input NAND Gate, MC74HC10N
IC16	133177	Microcontroller, SC80C51BCCN40
IC17	133184	CMOS, 1 of 16 Decoder/Latch MC74HC4514N
IC18,IC19	133181	7 LINE DRIVER, MC1413P
IC20	133170	CMOS, 1 of 8 Decoder/Latch, MC74HC237N
<b>TRANSISTORS</b>		
Q1	132224	PNP, MPS4126
Q2,Q3	132223	NPN, MPS4124
Q4	132224	NPN, MPS4126
Q5,Q6	132223	NPN, MPS4124
<b>TRANSFORMERS</b>		
T1	159221	POWER TRANSFORMERS
T2	159220	POWER TRANSFORMERS
<b>MISC</b>		
Y1	180039	Ceramic Resonator, 6MHz





# 6

# Area Control



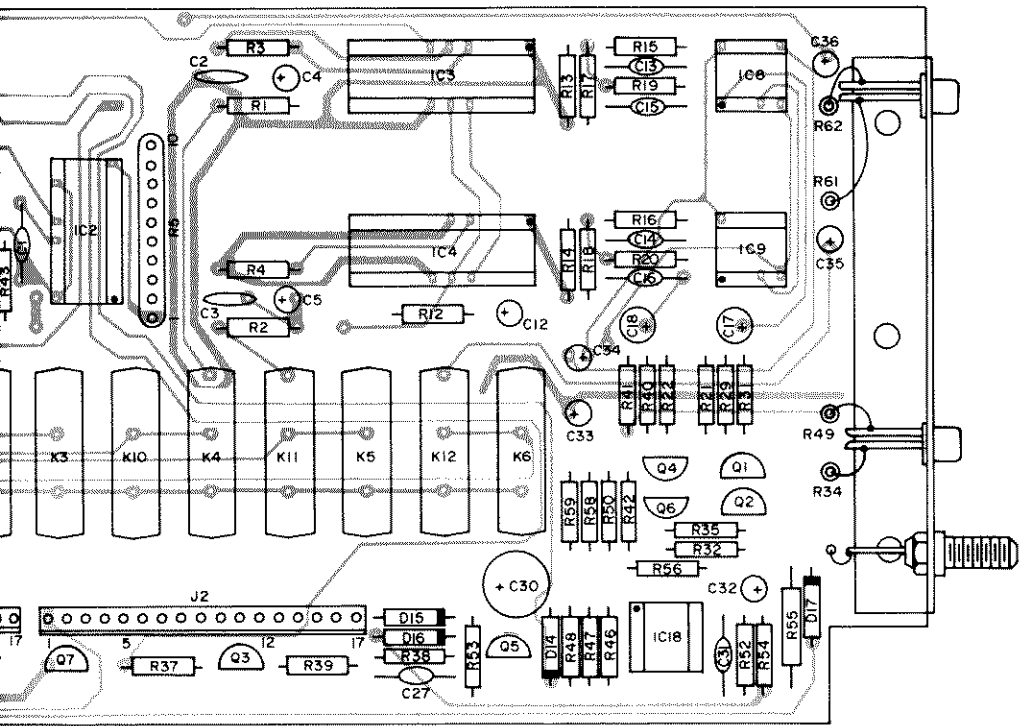
AREA CONTROL PCB 04

## AREA CONTROL PARTS LIST

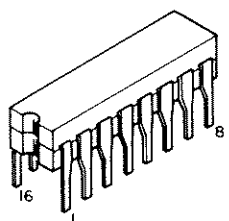
Symbol	Part	Description
<b>DIODES</b>		
D1-D17	070074	SIG, 75V 10mA, 1N4148
<b>INTEGRATED CIRCUITS</b>		
IC1	133181	7 LINE DRIVER, MC1413P
IC2	133186	CMOS, 8-Bit Shift Register, MC74HC595AN
IC3,IC4	133187	Attenuator, MP7529BJN
IC5	133185	CMOS, Triple 3-input AND Gate, MC74HC11N
IC6	133193	CMOS, Hex Inverter, MC74HC04AN
IC7	133185	CMOS, Triple 3-input AND Gate, MC74HC11N
IC8,IC9	133094	Dual OP-Amp, NE5532N
IC10	133175	CMOS, Quad 2-input AND Gate, MC74HC08AN
IC11	133141	TIMER, NE555N
IC12	133170	CMOS, 1 of 8 Decoder/Latch, MC74HC237N
IC13	133176	CMOS, Quad 2-input NOR Gate, MC74HC02AN
IC14	133167	CMOS, Quad 2-input OR Gate, MC74HC32AN
IC15	133177	Microcontroller, SC80C51BCCN40
IC16	133161	CMOS, Quad 2-input NAND Gate, 74HC00N
IC17	133141	TIMER, NE555N
IC18	133066	OP Amp, NE5534N
<b>TRANSISTORS</b>		
Q1,Q2	132257	NPN, 2SC3792
Q3	132223	NPN, MPS4124
Q4	132257	NPN, 2SC2792
Q5	132172	PNP, MPSA55
Q6	132257	NPN, 2SC3792
Q7	132223	NPN, MPS4124
<b>MISC</b>		
Y1	180039	Ceramic Resonator, 6MHz



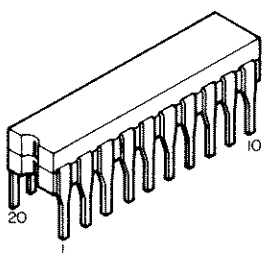
IC1 & IC2



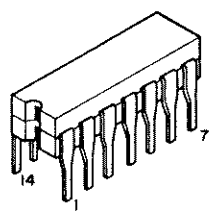
OL PCB 047294



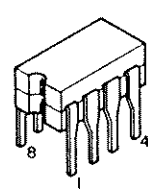
IC1 & IC2



IC3 & IC4



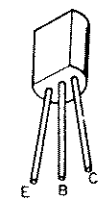
IC5-IC7, IC10,  
IC13, IC14 & IC16



IC8, IC9, IC11,  
IC17 & IC18

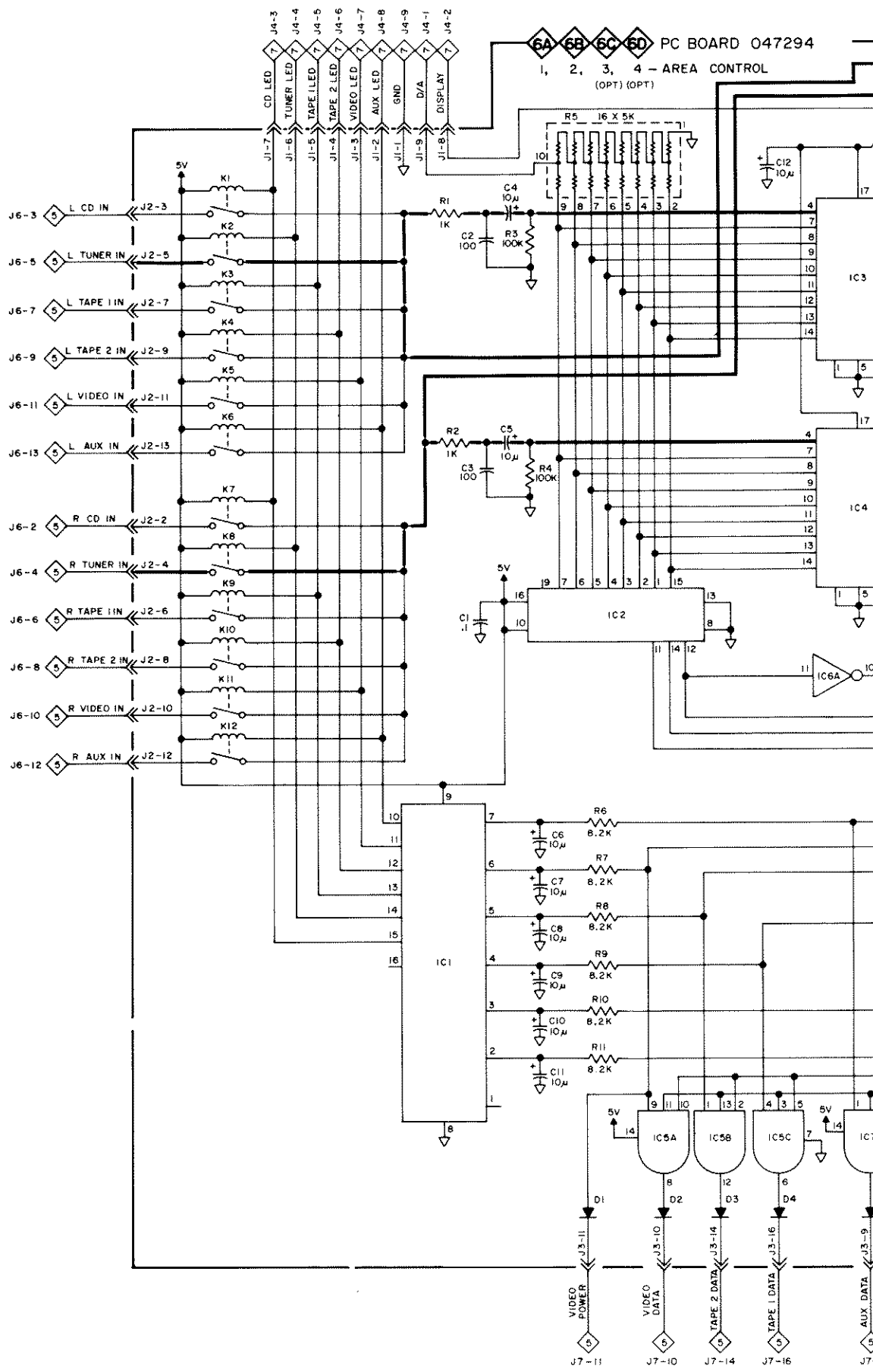


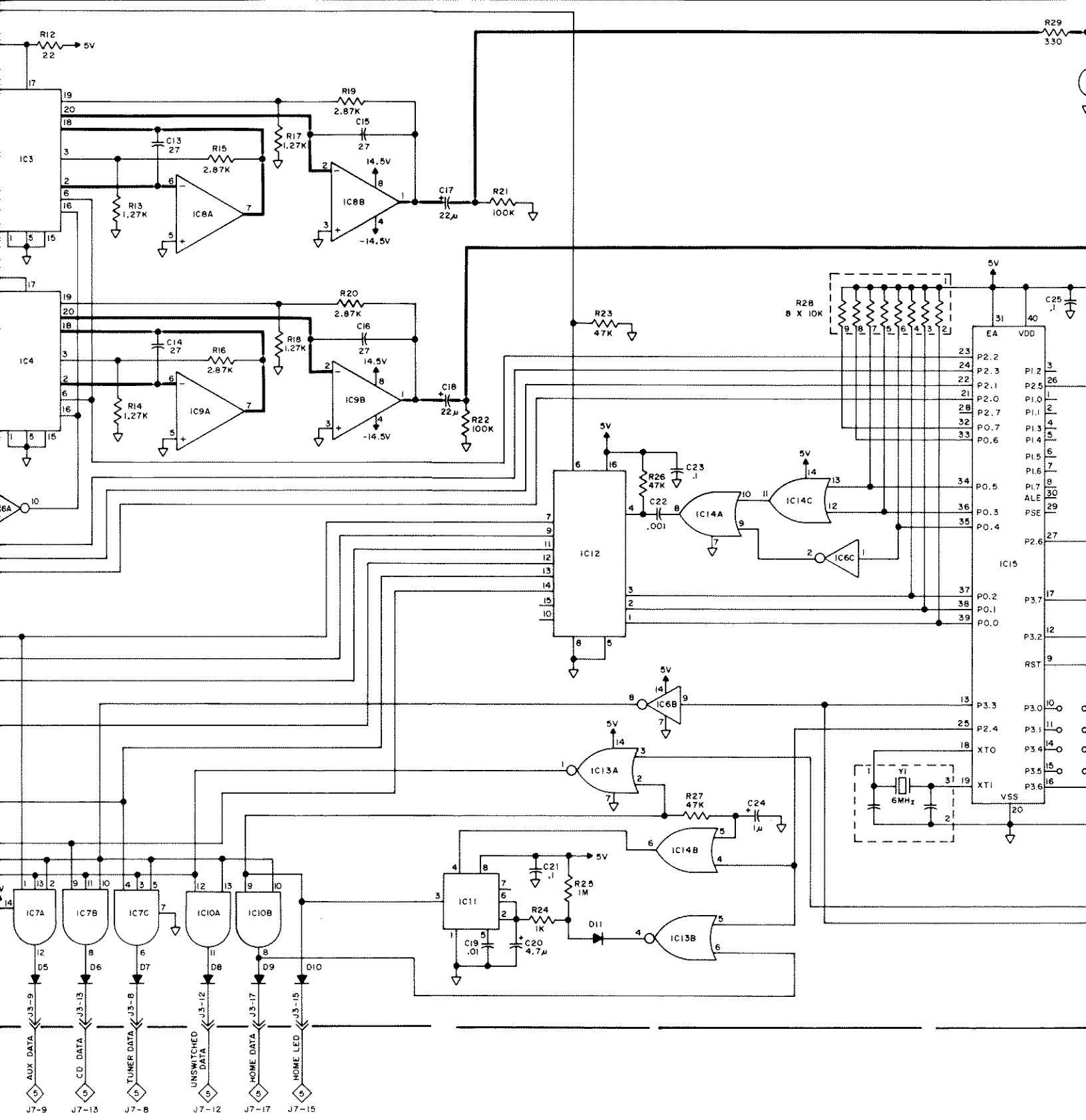
Q1, Q2, Q4 &  
Q6

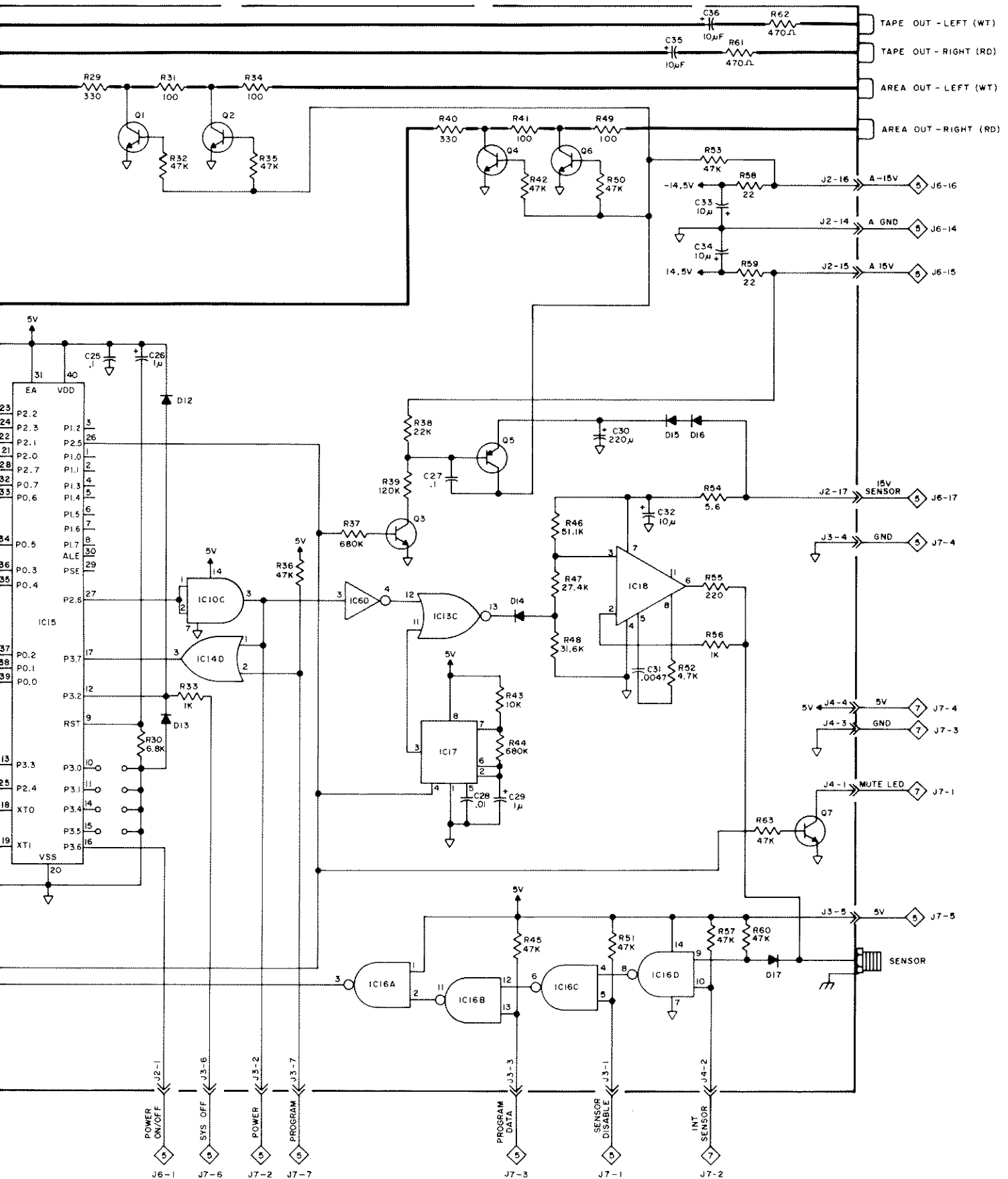


Q3, Q5 & Q7

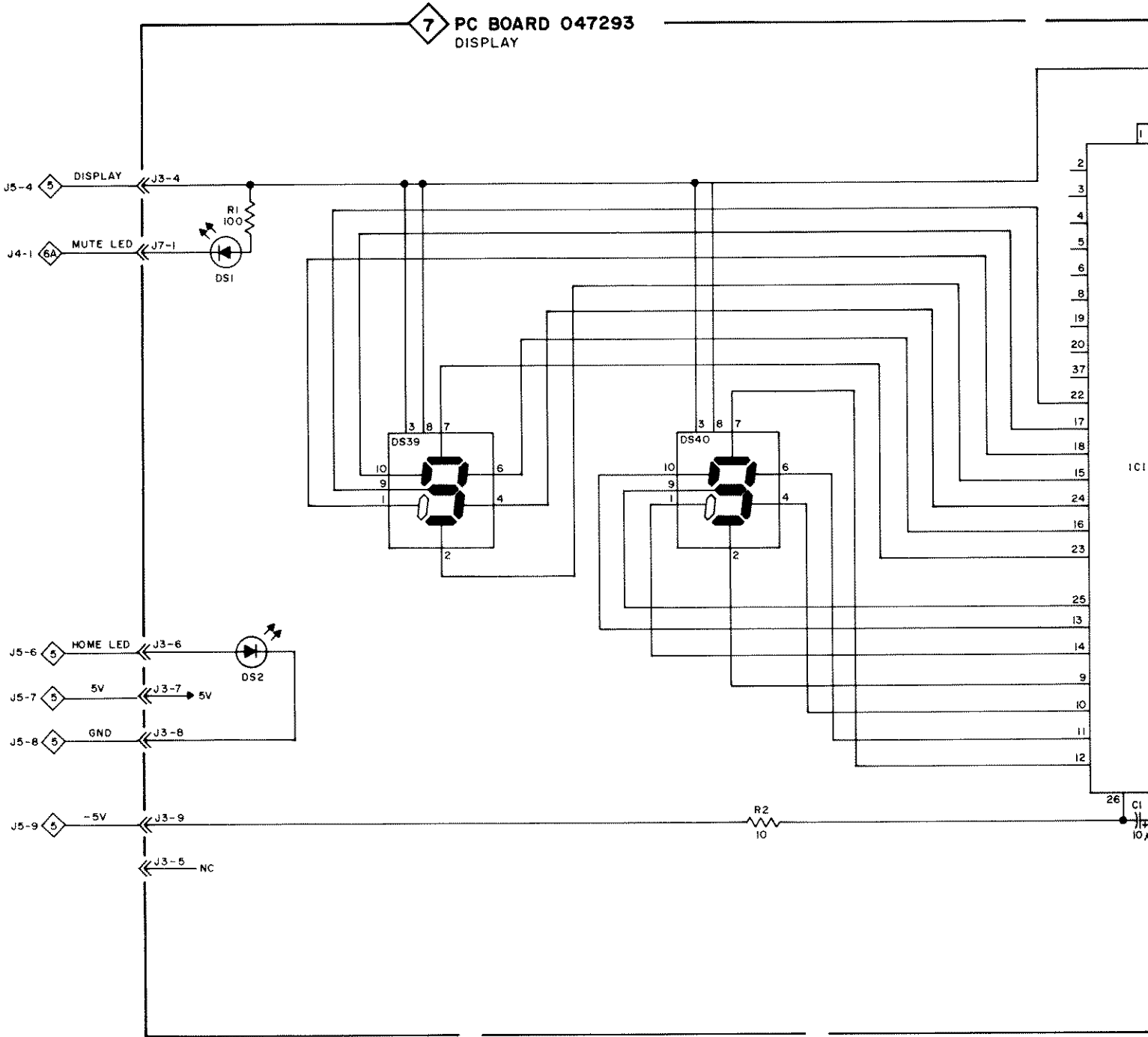
# Area Control



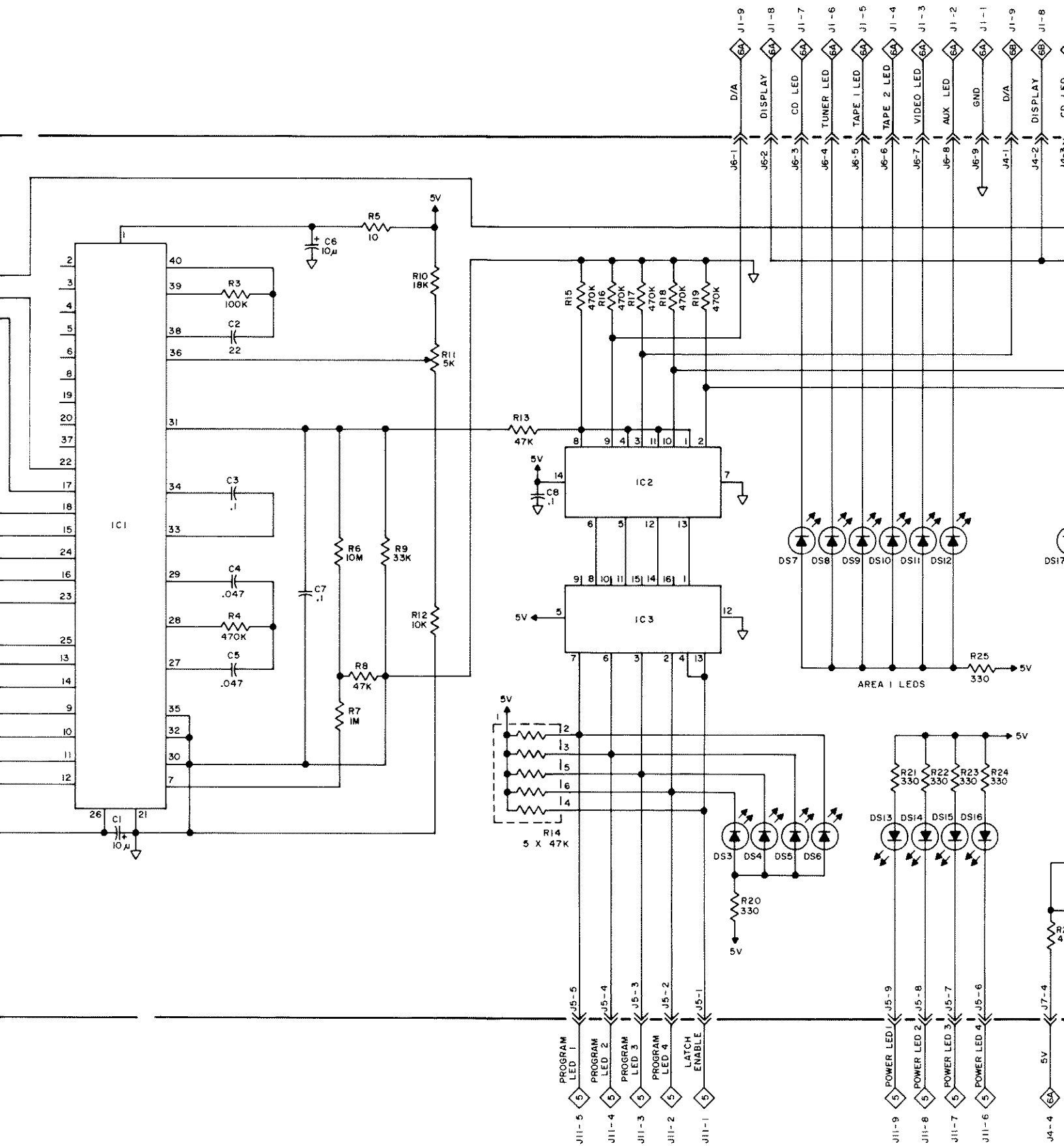


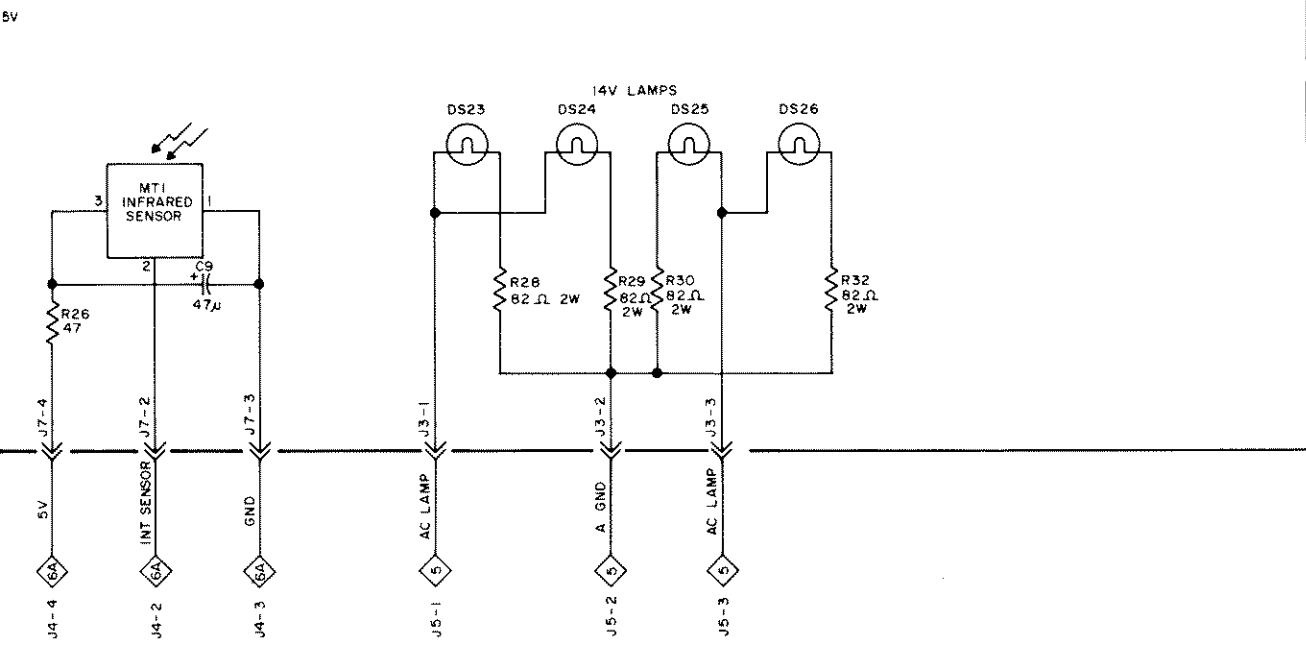
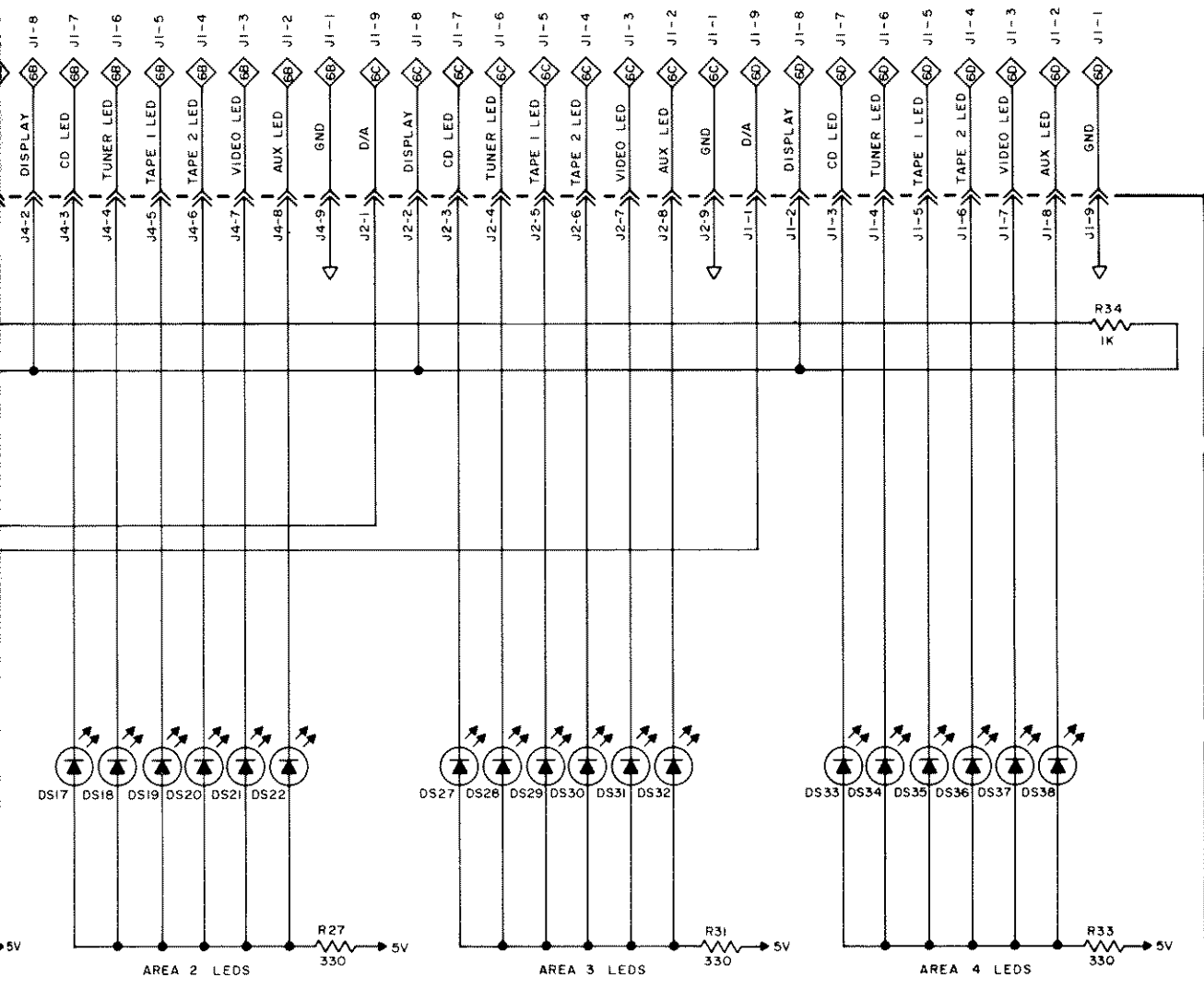


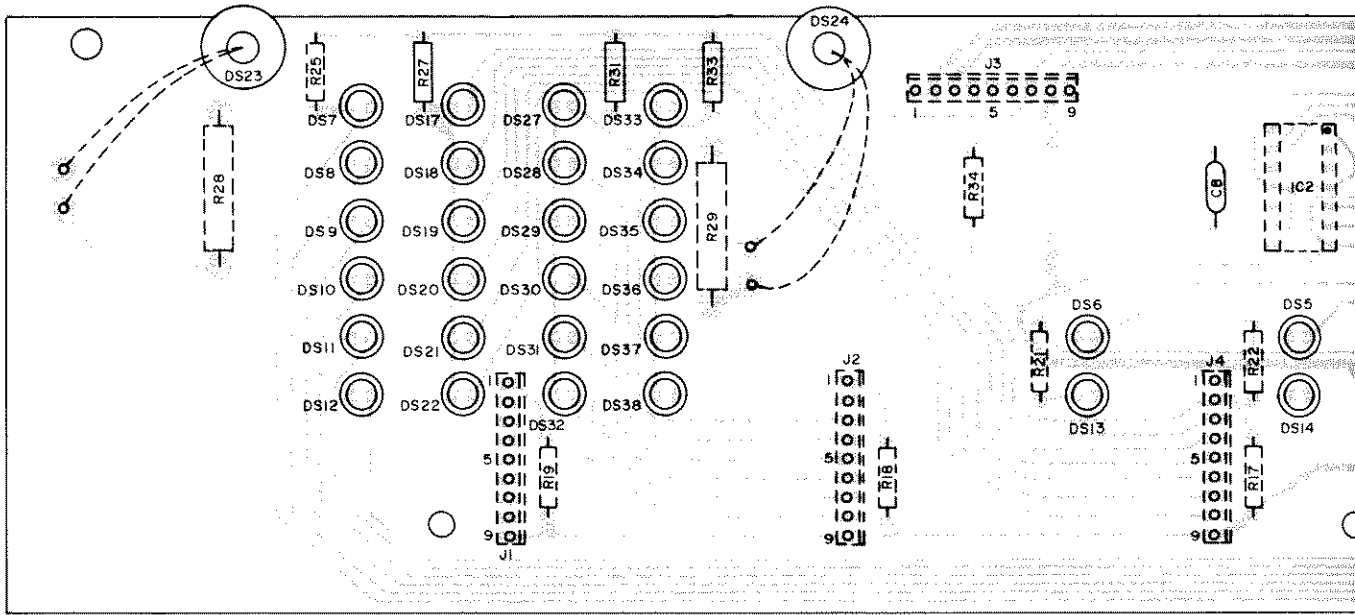
# 7 Display







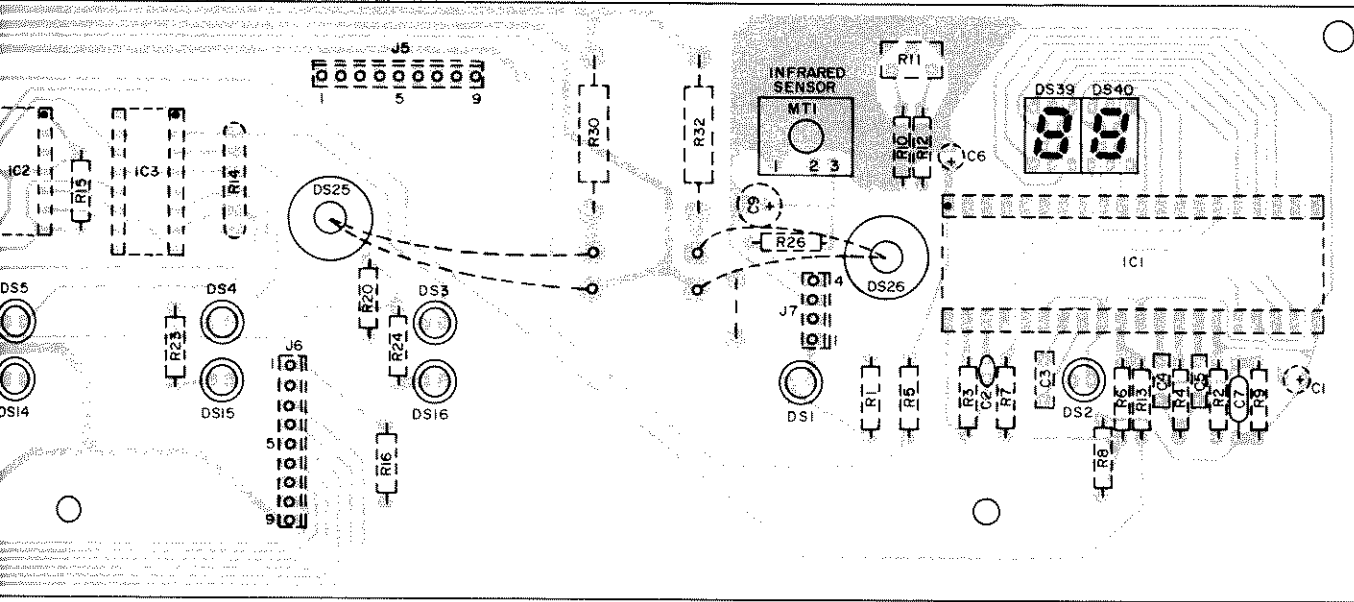




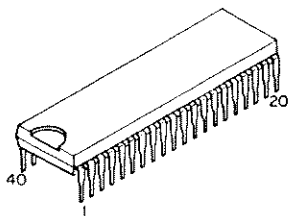
DISPLAY P

### DISPLAY PARTS LIST

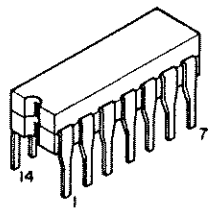
Symbol	Part	Description
<b>INTEGRATED CIRCUITS</b>		
IC1	133152	3.5 Digit A/D Converter TSC7107CPL
IC2	133117	CMOS, Quad Analog Switch, MC14066B
IC3	133183	CMOS, Dual 2-Bit Latch, MC74HC75N
<b>LIGHTING DEVICES</b>		
DS1-DS22	070093	LED, RED
DS23-DS26	058042	INC, 14V, .08A, Blue Leads
DS27-DS38	070093	LED, RED
DS39, DS40	058093	LED, 7-Segment Display
<b>SENSORS</b>		
MT1	121022	SENSOR, IR



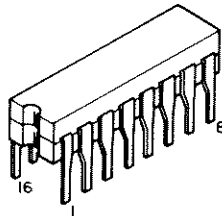
LAYER PCB 047293



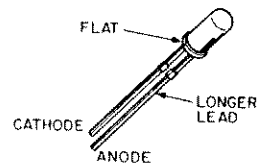
IC1



IC2



IC3



DS1-DS22,  
DS27-DS38



DS39 & DS40

# Repacking Instructions

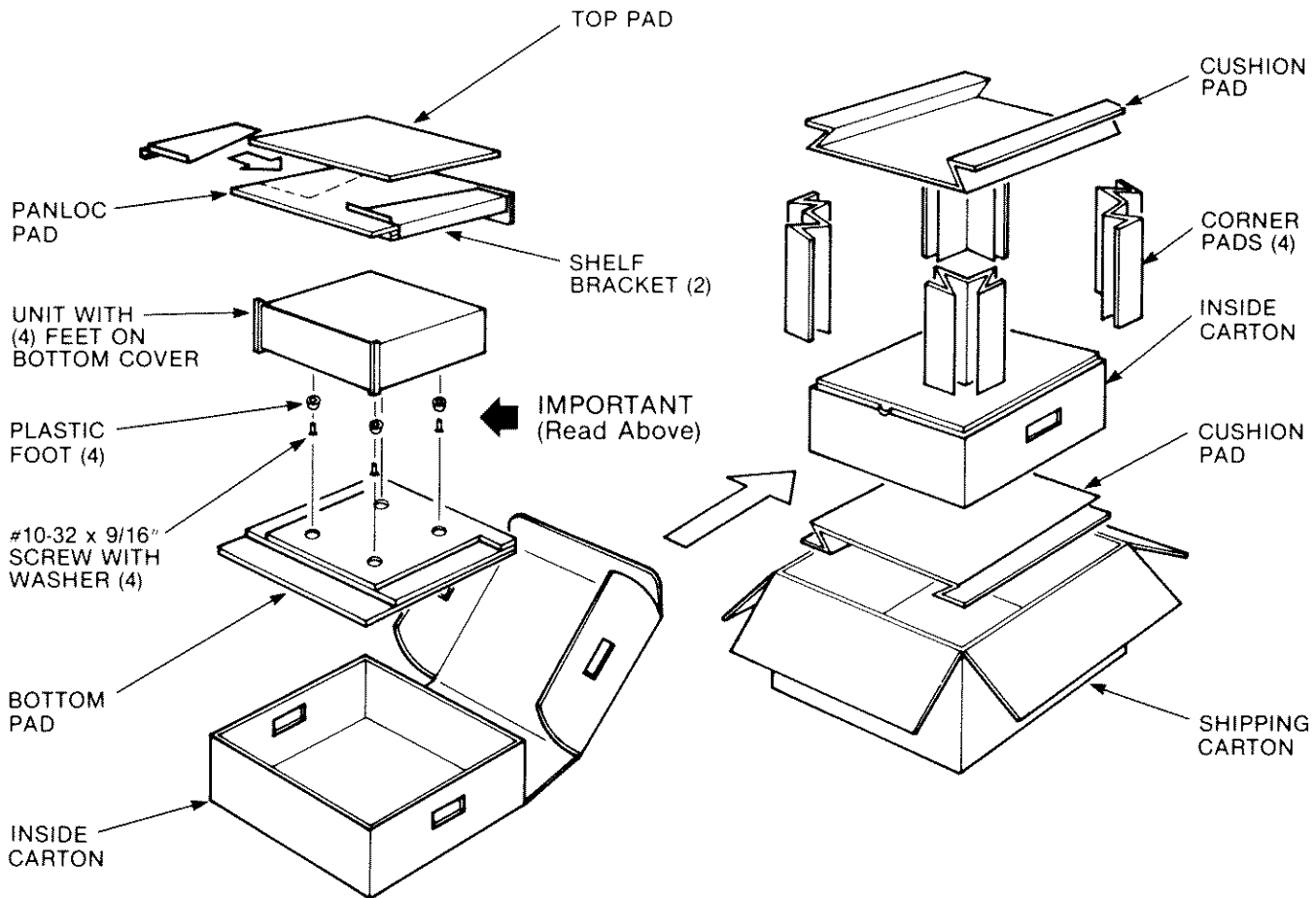
In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below. The shelf brackets do not have to be included in the carton for the unit to be packed properly, but their position in the carton is indicated.

**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	033613	Shipping carton only
2	033611	Cushion pad
4	033333	Corner pad
1	033608	Inside carton only
1	033610	Top pad
1	033609	Panloc pad
1	033612	Bottom pad
4	017218	Plastic foot, 1" high held with 100159 screw.
4	100159	#10-32 x 3/4" Machine screw
4	104080	#10 Flat washer
1	047438	Shipping carton complete with all the above parts.



# McIntosh<sup>®</sup>

## CR10 REMOTE CONTROL SYSTEM

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Part No. 039748

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