McIntosh

McIntosh Laboratory Inc. 2 Chambers Street Binghamton, NY 13903-2699

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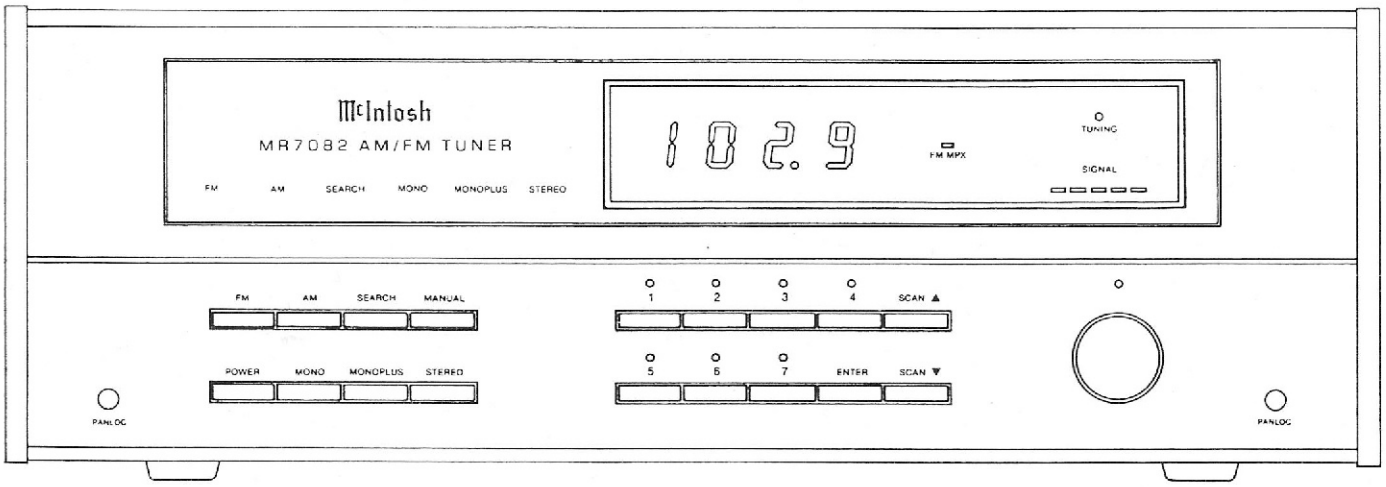
MR 7082

AM/FM TUNER



CONTENTS

McIntosh® **Service Manual**

Performance Specifications

FM Section

USABLE SENSITIVITY
13dBF which is 1.22 μV across 75 ohms

50dB QUIETING SENSITIVITY
Mono — 18dBF which is 2.2 μV across 75 ohms
Stereo — 37dBF which is 20 μV across 75 ohms

SIGNAL TO NOISE RATIO
Mono — 80dB
Stereo — 75dB

FREQUENCY RESPONSE
Mono — +0, -1dB from 20 to 15,000Hz
Stereo — +0, -1dB from 20 to 15,000Hz

HARMONIC DISTORTION
Mono — 0.08% at 100Hz
0.08% at 1000Hz
0.08% at 10,000Hz
Stereo — 0.08% at 100Hz
0.08% at 1000Hz
0.08% at 10,000Hz*

INTERMODULATION DISTORTION
Mono — 0.08%
Stereo — 0.08%

CAPTURE RATIO
1.5dB

ALTERNATE CHANNEL SELECTIVITY
55dB

SPURIOUS RESPONSE
100dB

IMAGE RESPONSE
90dB

AM SUPPRESSION
60dB

AM Section

SENSITIVITY
35 μV IHF (50 ohm antenna input)

SIGNAL TO NOISE RATIO
55dB at 30% modulation
65dB at 100% modulation

HARMONIC DISTORTION
0.3% maximum at 30% modulation

FREQUENCY RESPONSE
+0 -6dB 20Hz to 4500Hz

ADJACENT CHANNEL SELECTIVITY
40dB minimum IHF

IMAGE REJECTION
60dB minimum

General Information

AUDIO OUTPUT at 1kHz, 100% modulation
Fixed 1 VRMS
Variable 1 mV to 1 VRMS

SEMICONDUCTOR COMPLEMENT

Transistors	24
Integrated Circuits	21
Varactors	7
LEDs	15
Diodes	50

POWER REQUIREMENT
120V 50/60Hz 10 watts

MECHANICAL INFORMATION
WEIGHT:
15 pounds (6.8 kg) net, 27 pounds (12.2 kg) in shipping carton

*Spectrum analyzer required for measurement

Top and Front Views

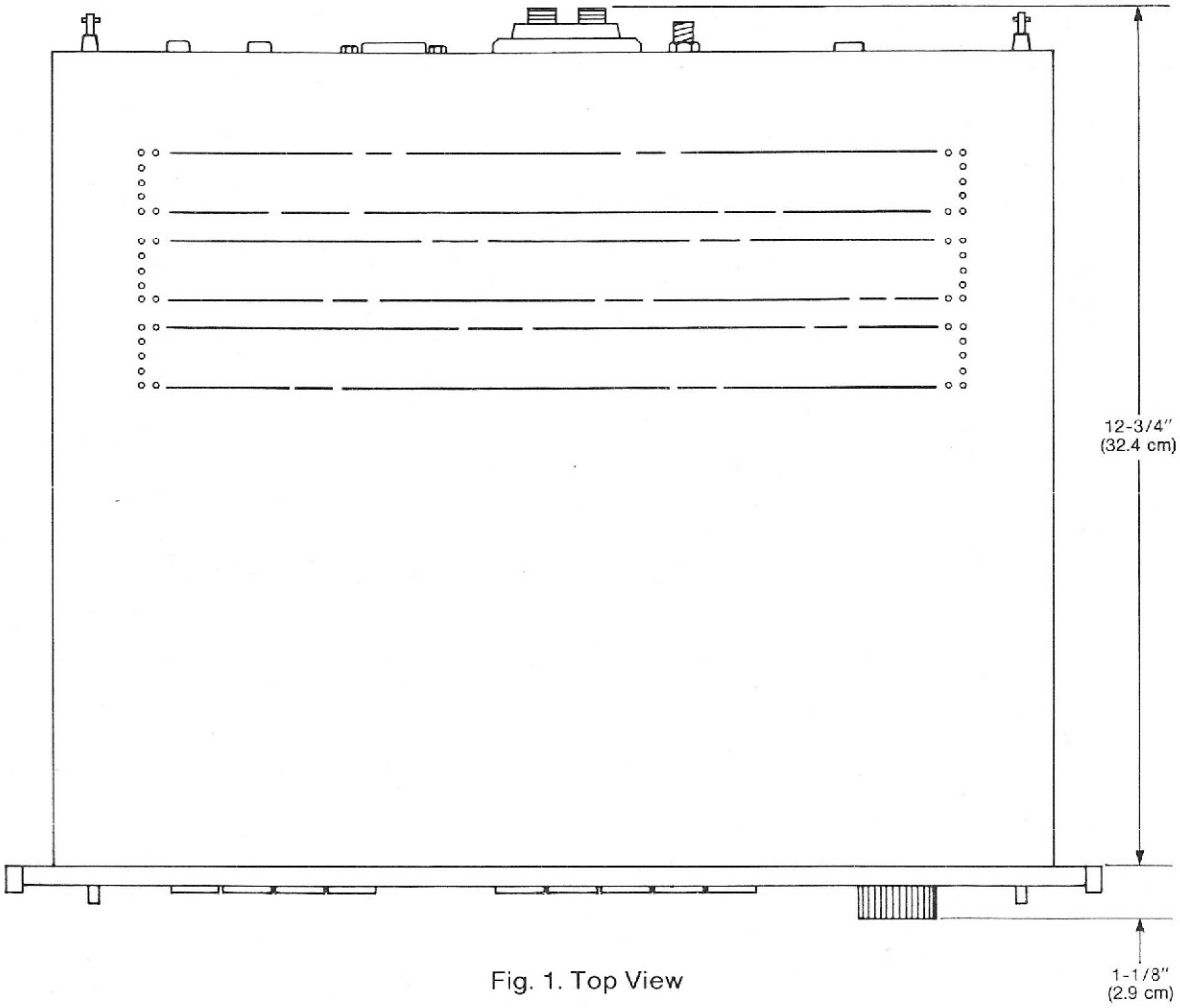


Fig. 1. Top View

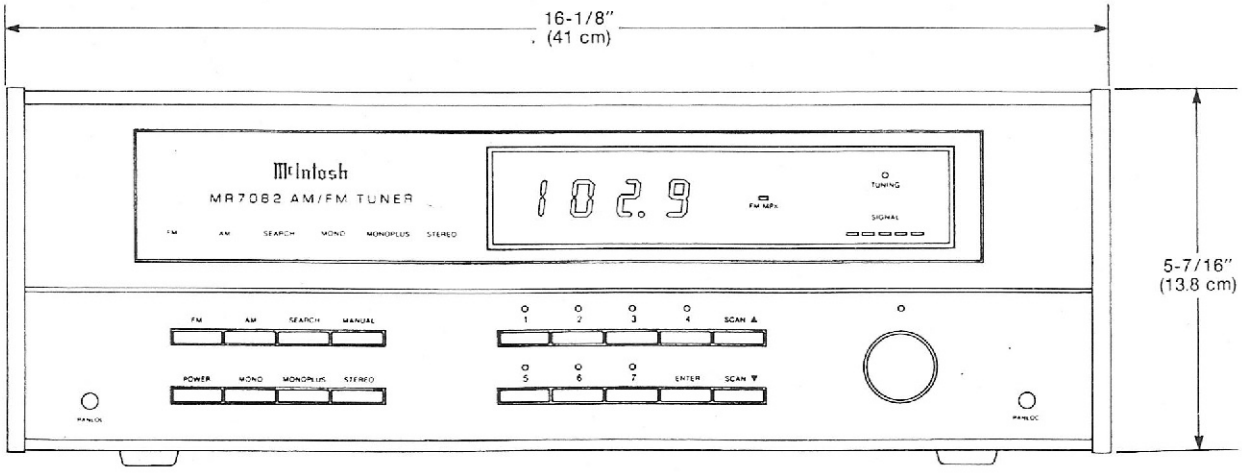
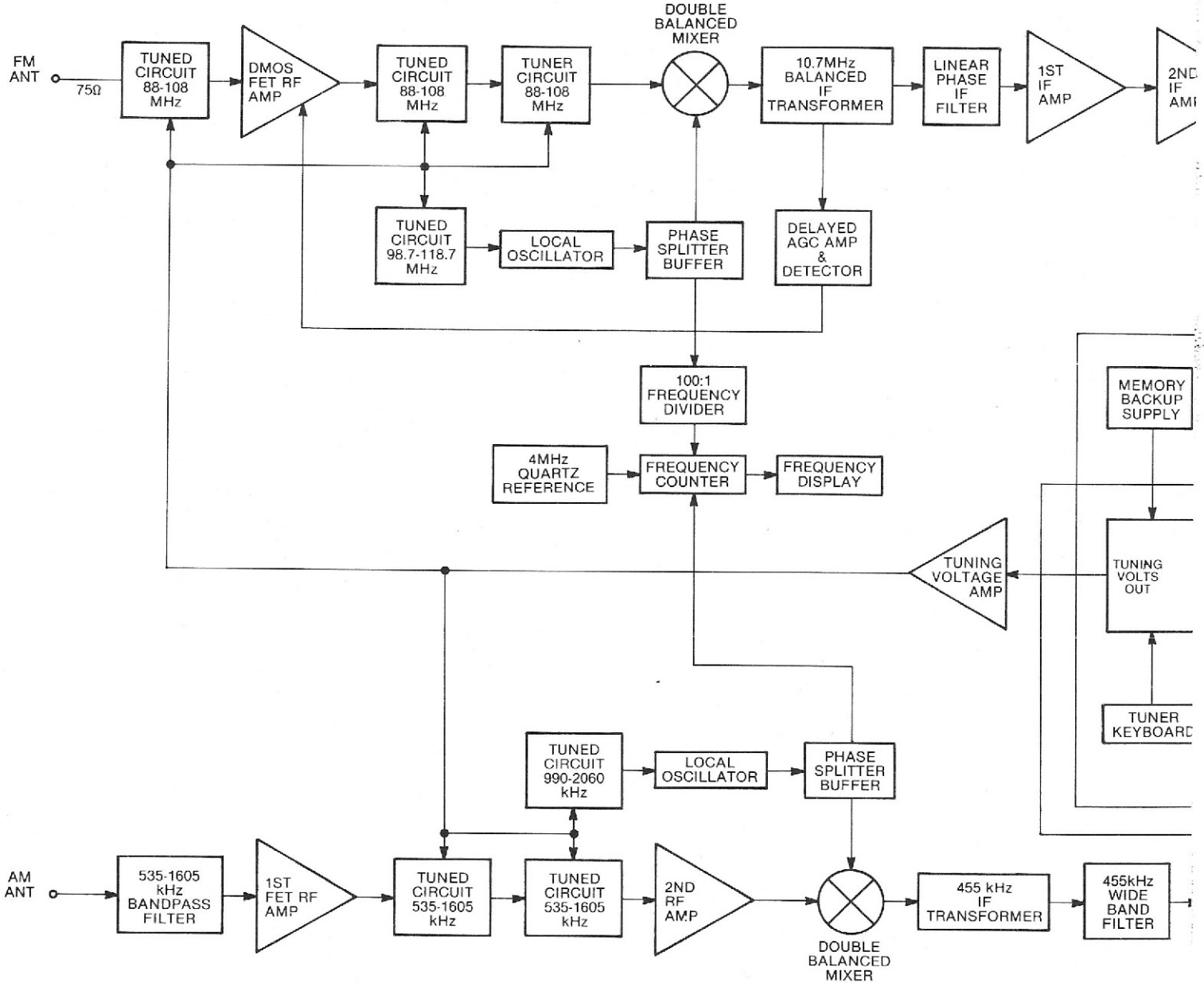
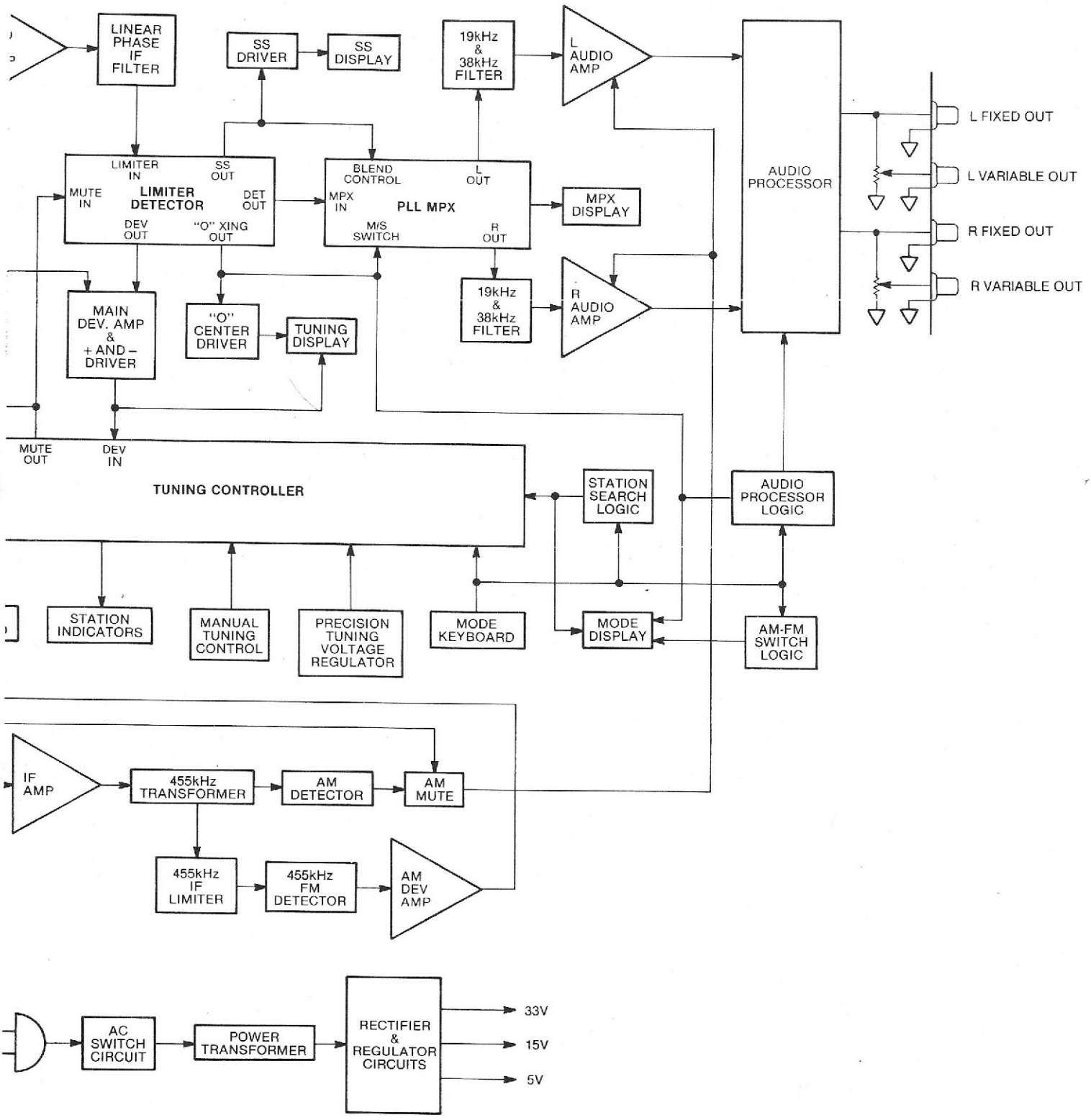


Fig. 2. Front View

Block Diagram



120 VAC
50/60 Hz


LINEAR PHASE IF FILTER
SS DRIVER
SS DISPLAY
19kHz & 38kHz FILTER
L AUDIO AMP
AUDIO PROCESSOR
L FIXED OUT
L VARIABLE OUT
R FIXED OUT
R VARIABLE OUT
LIMITER IN
SS OUT
MUTE IN
LIMITER DETECTOR
DET OUT
DEV OUT
"O" XING OUT
BLEND CONTROL
L OUT
MPX IN
PLL MPX
M/S SWITCH
R OUT
MPX DISPLAY
MAIN DEV. AMP & + AND – DRIVER
"O" CENTER DRIVER
TUNING DISPLAY
19kHz & 38kHz FILTER
R AUDIO AMP
MUTE OUT
DEV IN
TUNING CONTROLLER
STATION SEARCH LOGIC
AUDIO PROCESSOR LOGIC
STATION INDICATORS
MANUAL TUNING CONTROL
PRECISION TUNING VOLTAGE REGULATOR
MODE KEYBOARD
MODE DISPLAY
AM-FM SWITCH LOGIC
IF AMP
455kHz TRANSFORMER
AM DETECTOR
AM MUTE
455kHz IF LIMITER
455kHz FM DETECTOR
AM DEV AMP
AC SWITCH CIRCUIT
POWER TRANSFORMER
RECTIFIER & REGULATOR CIRCUITS
33V
15V
5V

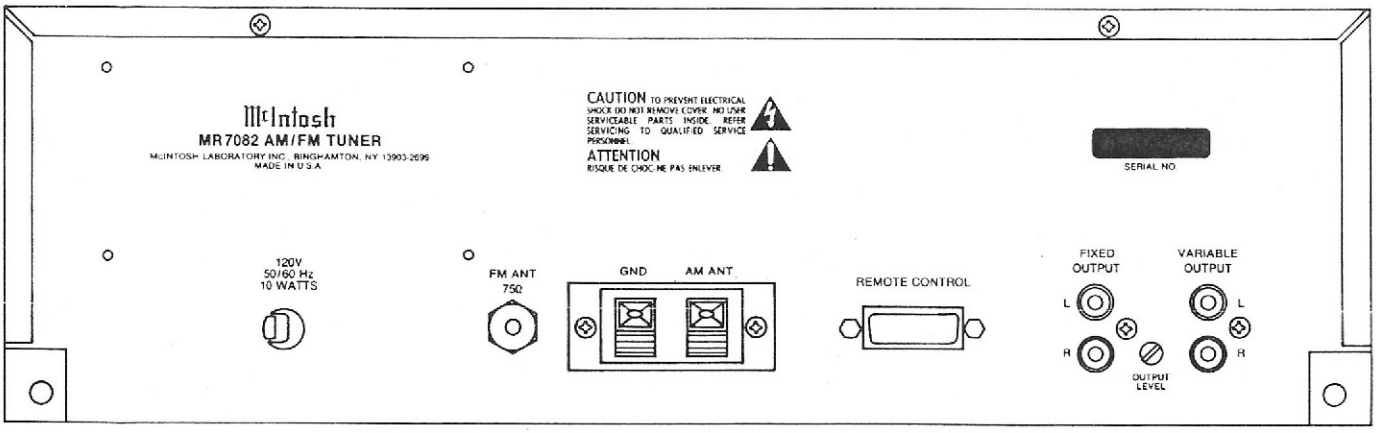


Fig. 3. Rear Panel

General 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 ±10% with respect to ground. A high impedance (10 megohm) voltmeter must be used.

2. Unless otherwise specified:
   a. Resister values are in ohms.
   b. Capacitor values smaller than 1 are microfarads (μF), and capacitor values greater than 1 are in picofarads (pF).
   c. Inductor values are in microhenries (μH).

Section Locations

Fig. 4. Top View With Cover Removed

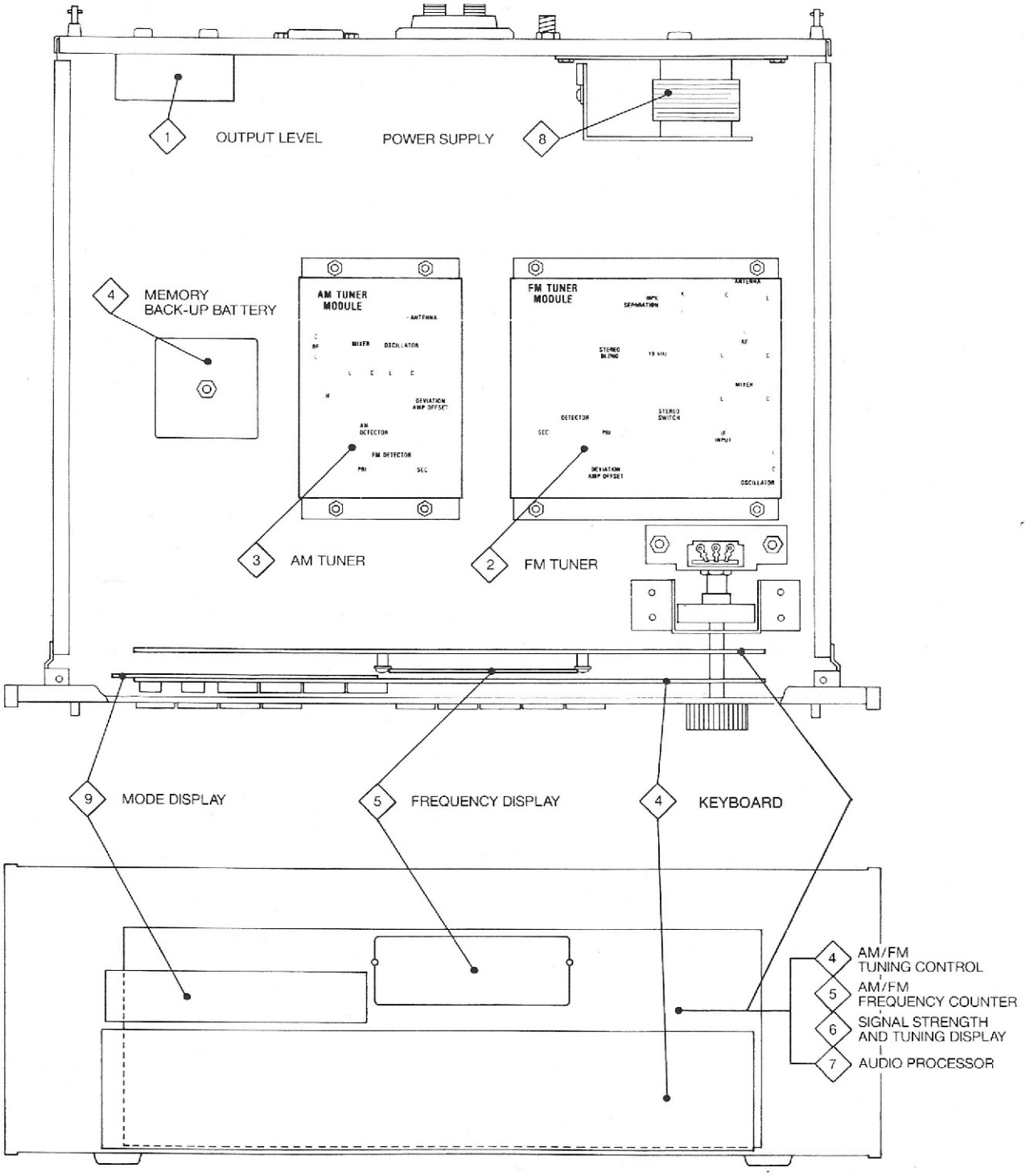
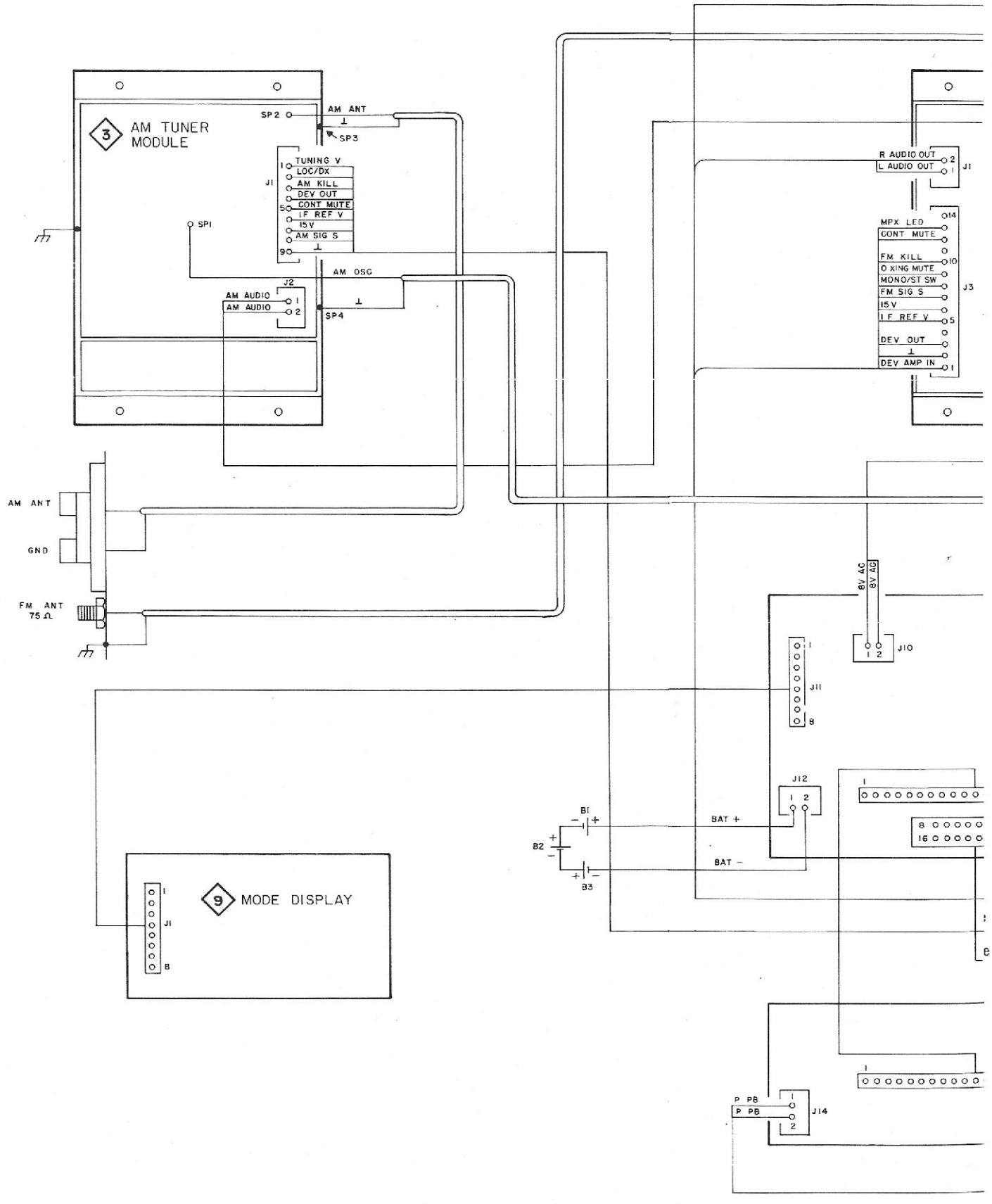
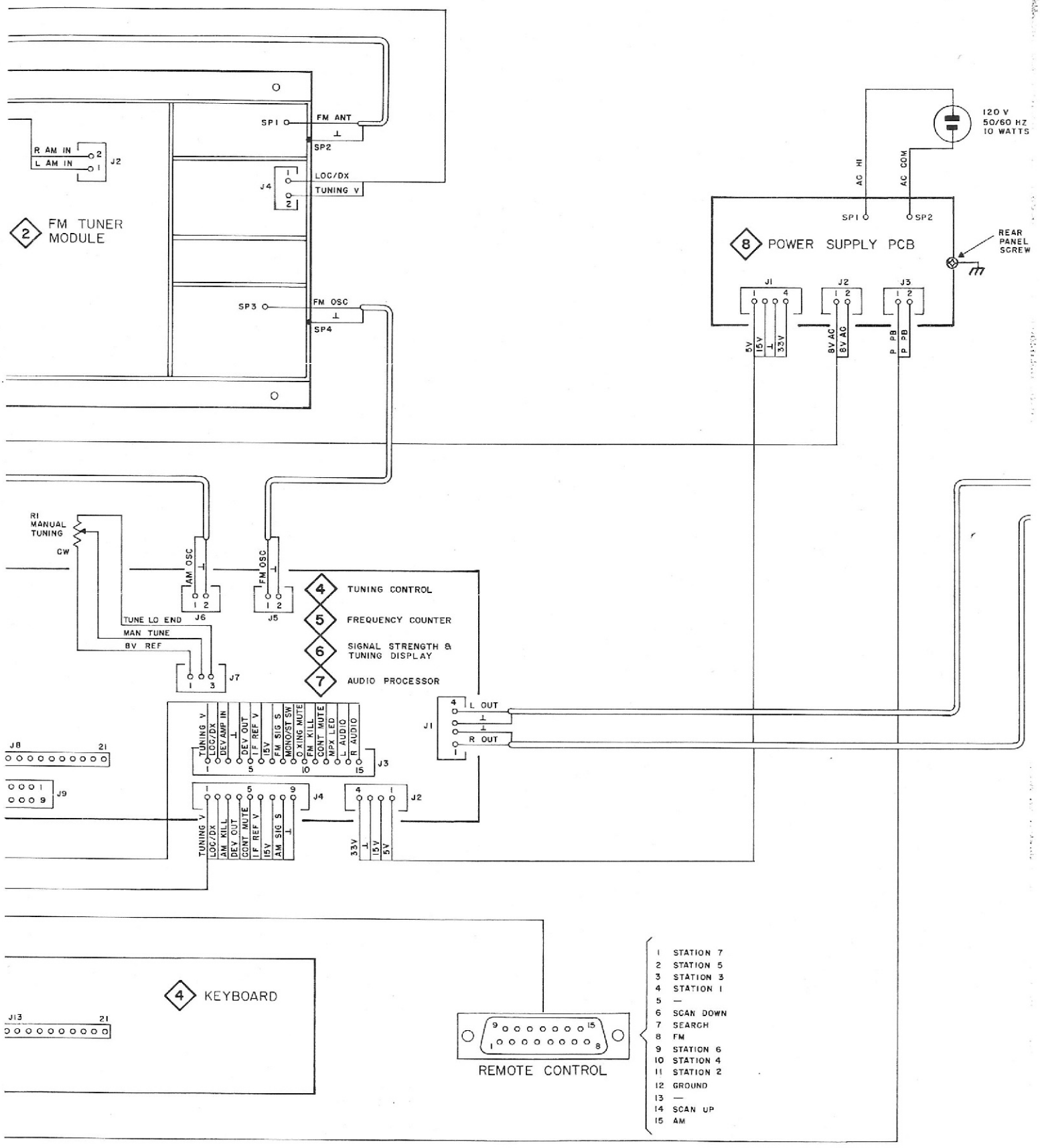
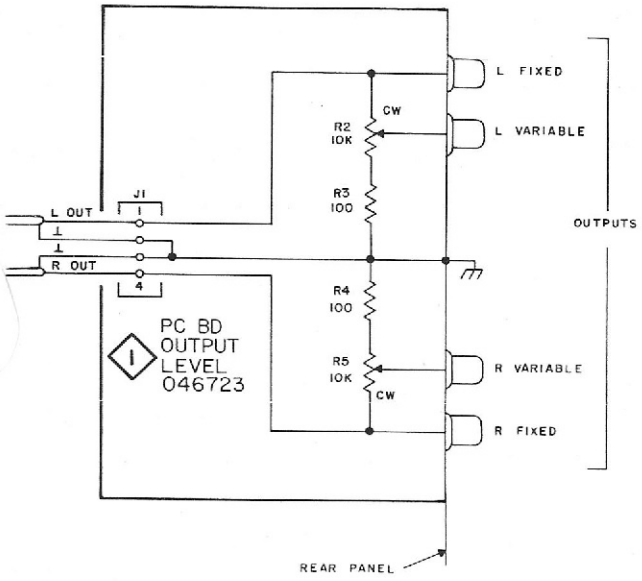


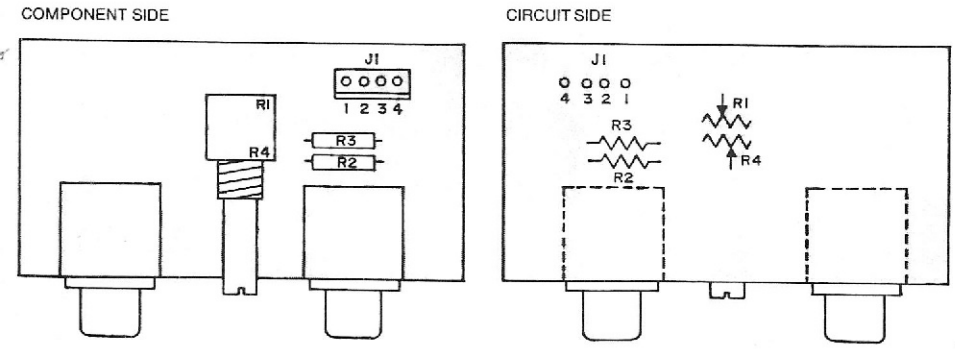
Fig. 5. Front View

1 Interconnection Diagram




R AM IN
L AM IN
J2
2 FM TUNER MODULE
SP1
FM ANT
SP2
J4
LOC/DX
TUNING V
SP3
FM OSC
SP4
120 V
50/60 HZ
10 WATTS
AC HI
AC COM
SP1
SP2
8 POWER SUPPLY PCB
REAR PANEL SCREW
J1
J2
J3
5V
15V
33V
8V AC
8V AG
P PB
P PB
R1
MANUAL TUNING
CW
AM OSC
FM OSC
J6
J5
TUNE LO END
MAN TUNE
8V REF
J7
4 TUNING CONTROL
5 FREQUENCY COUNTER
6 SIGNAL STRENGTH & TUNING DISPLAY
7 AUDIO PROCESSOR
J1
L OUT
R OUT
J8
21
J9
TUNING V
LOC/DX
DEV AMP IN
DEV OUT
I F REF V
15V
FM SIG S
MONO/ST SW
D XING MUTE
FM KILL
CONT MUTE
MPX LED
L AUDIO
R AUDIO
J3
J4
J2
TUNING V
LOC/DX
AM KILL
DEV OUT
CONT MUTE
I F REF V
15V
AM SIG S
33V
15V
5V
4 KEYBOARD
J13
21
REMOTE CONTROL
1 STATION 7
2 STATION 5
3 STATION 3
4 STATION 1
5 —
6 SCAN DOWN
7 SEARCH
8 FM
9 STATION 6
10 STATION 4
11 STATION 2
12 GROUND
13 —
14 SCAN UP
15 AM





OUTPUT LEVEL PCB 046723

INTERCONNECTION PARTS LIST

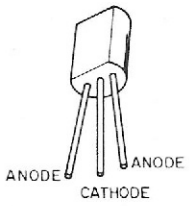
Symbol No.	Part No.	Description
BATTERIES		
B1-B3	086006	Battery, NICAD, AA
RESISTORS		
R1	134427	POT, Tuning
R2, R5	134431	POT, Output Level

FRONT PANEL AND TRIM PARTS LIST

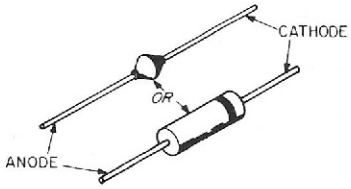
Symbol No.	Part No.	Description
	046607	Front Panel, Glass
	018239	Front Panel, Top Extrusion
	018350	Front Panel, Bottom Extrusion
	018232	Front Panel, End Cap
	046608	Front Panel, Complete
	046642	Tuning Knob
	017340	Pushbutton, Power (red)
	017341	Pushbutton, Functions (black)

INSTALLATION HARDWARE PARTS LIST

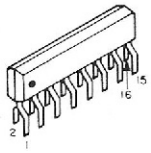
Symbol No.	Part No.	Description
	260590	Mounting Template
	043401	Mounting Strips
	046605	Hardware Package
	017156	Plastic Foot, Secure w/101106 Screws
	046574	Panloc Shelf Bracket, Right, Complete
	046575	Panloc Shelf Bracket, Left, Complete
	114090	Panloc Receptacle Only
	101106	Sheetmetal Screw, #8 x ½, to Secure Plastic Feet



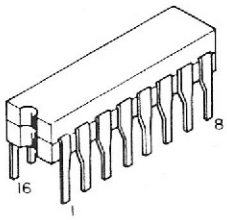
D1, D5-D7



D2-D4, D8-D14



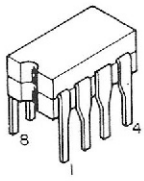
IC1



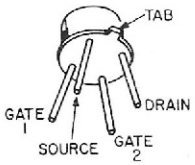
IC2, IC4

FM TUNER PARTS LIST

Symbol No.	Part No.	Description
CAPACITORS		
C1, C13, C18	060027	Trimmer, 2-10 pF
C19	060028	Trimmer, 4-20 pF
DIODES		
D1, D5-D7	070122	VAC, Matched, Selected SVC211
D2, D3	070003	Ge, SIG, 45V, 10mA, IN541
D4, D8, D10-D14	070047	SIG, 75V, 10mA, IN4148
D9	070130	ZN, 8.2V, 5%, 500mW, 1N5237B
FILTERS		
FN1, FN2	180030	Filter, CER, 10.7 MHz
FN3, FN4	180028	Filter, LC, Low Pass, Multiplex
INTEGRATED CIRCUITS		
IC1	133129	RF Mixer, IF, LA1170
IC2	133056	MPX-PLL Demodulator, TCA4500A
IC3	133028	Dual Hi-Speed Operational Amp, MC4558CP1
IC4	133110	FM-IF System, LA1235
IC5	133131	Operational Amp, MC34081P
TRANSISTORS		
Q1	132205	N, MOSFET Dual Gate, MFE521
Q2	132223	NPN, MPS4124
Q3	132181	NPN, MPSH10
Q4	132224	PNP, MPS4126



IC3, IC5



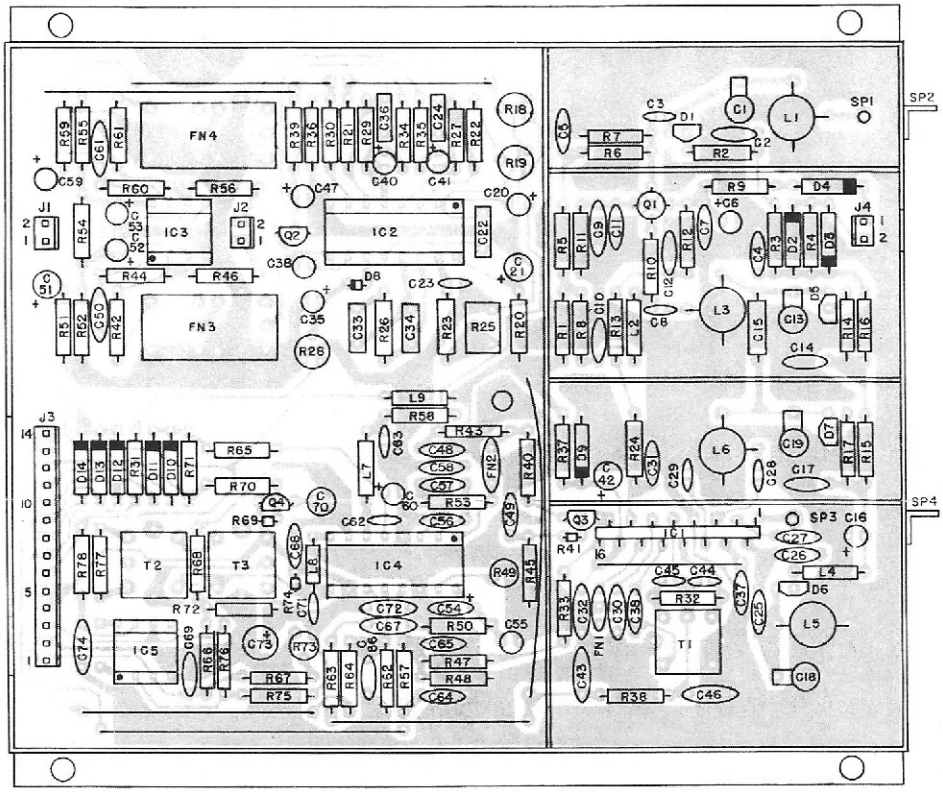
Q1

Q2, Q4

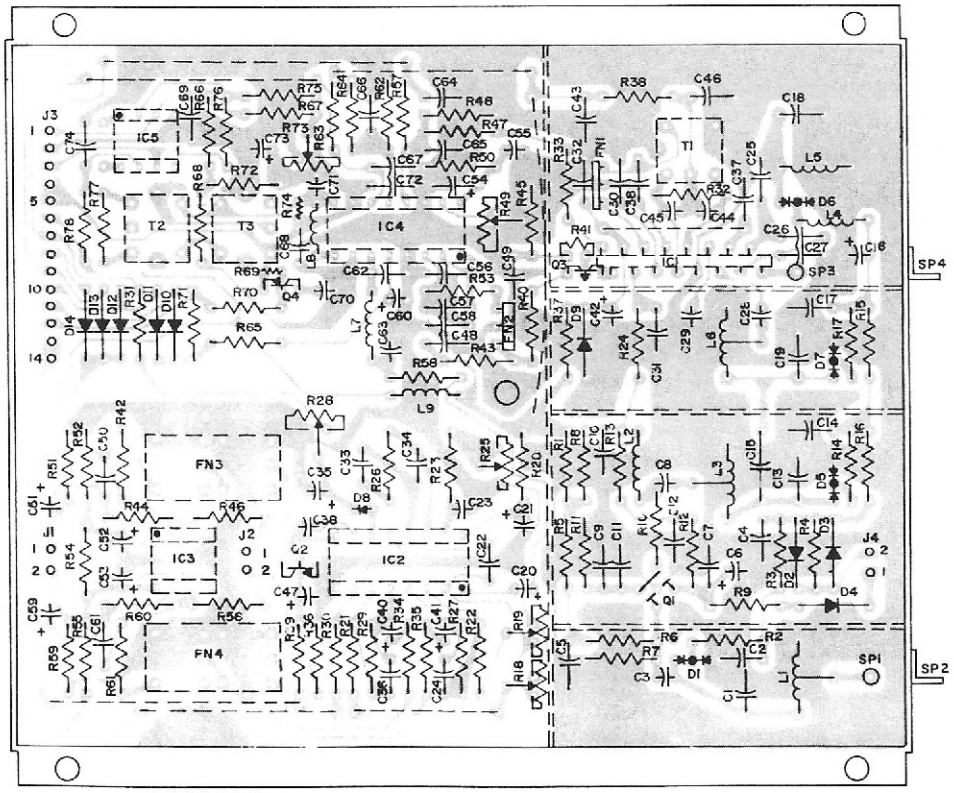
Q3

2 FM Tuner

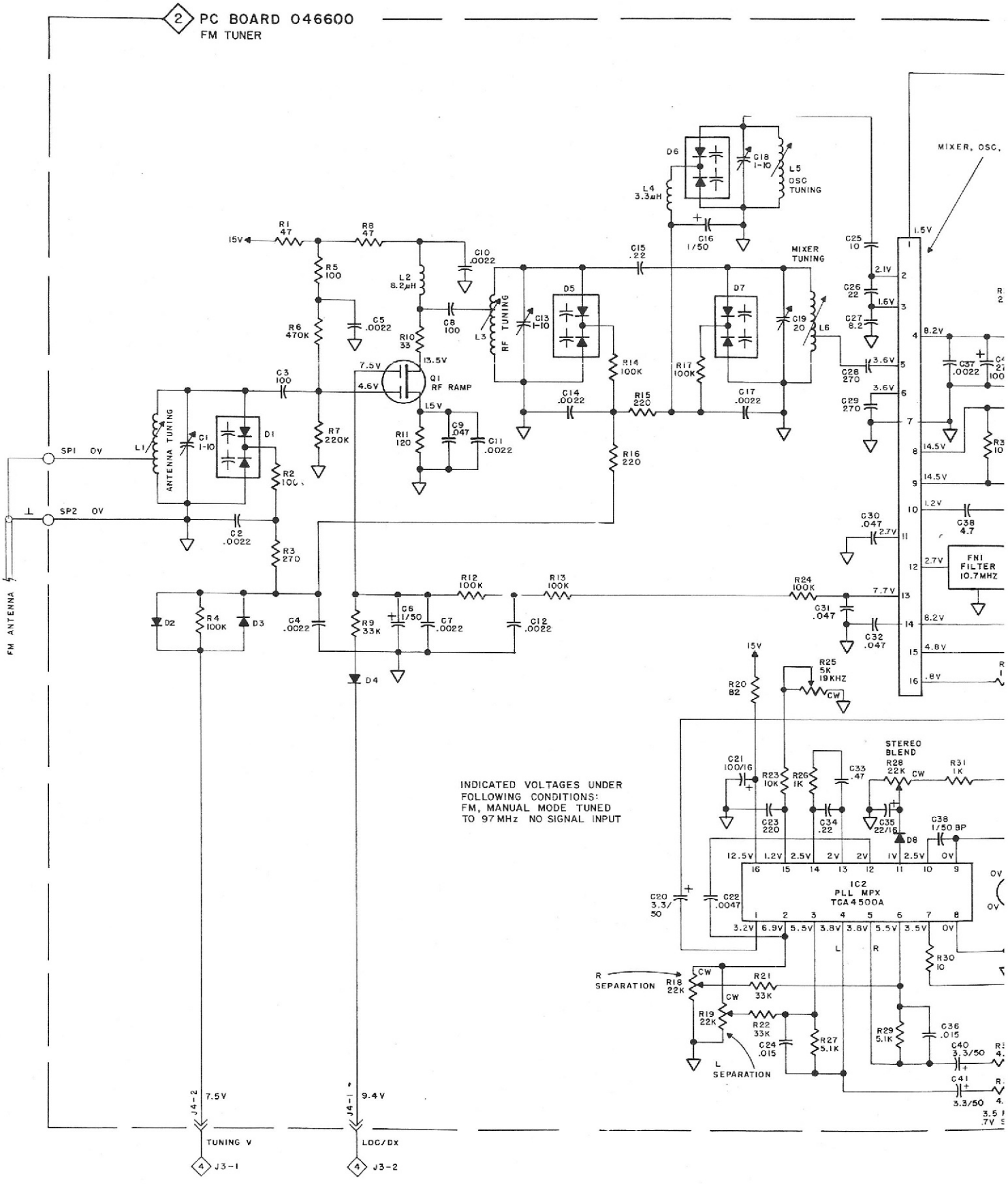
COMPONENT SIDE

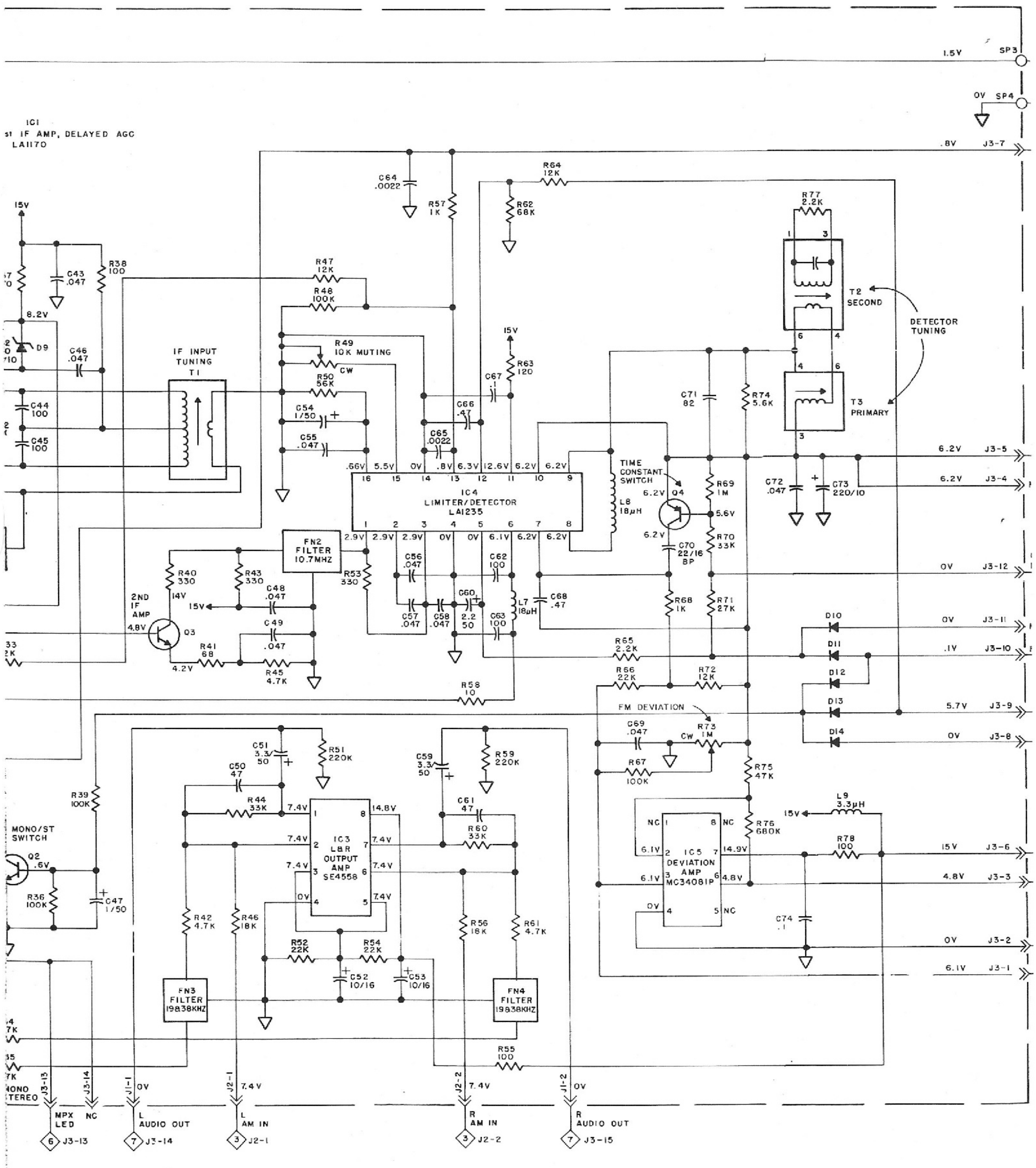


FM TUNER PCB 046600



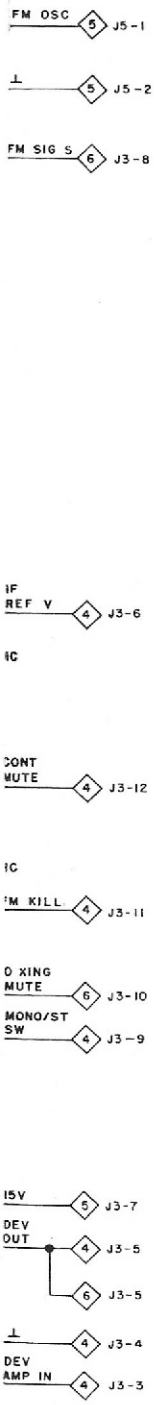
CIRCUIT SIDE


2 PC BOARD 046600
FM TUNER
FM ANTENNA
SP1 0V
SP2 0V
ANTENNA TUNING
RF TUNING
MIXER TUNING
MIXER, OSC,
Q1 RF RAMP
IC2 PLL MPX TCA4500A
FNI FILTER 10.7MHZ
STEREO BLEND
R SEPARATION
L SEPARATION
INDICATED VOLTAGES UNDER FOLLOWING CONDITIONS:
FM, MANUAL MODE TUNED TO 97 MHz NO SIGNAL INPUT
TUNING V
LOC/DX
4 J3-1
4 J3-2
J4-2 7.5V
J4-1 9.4V

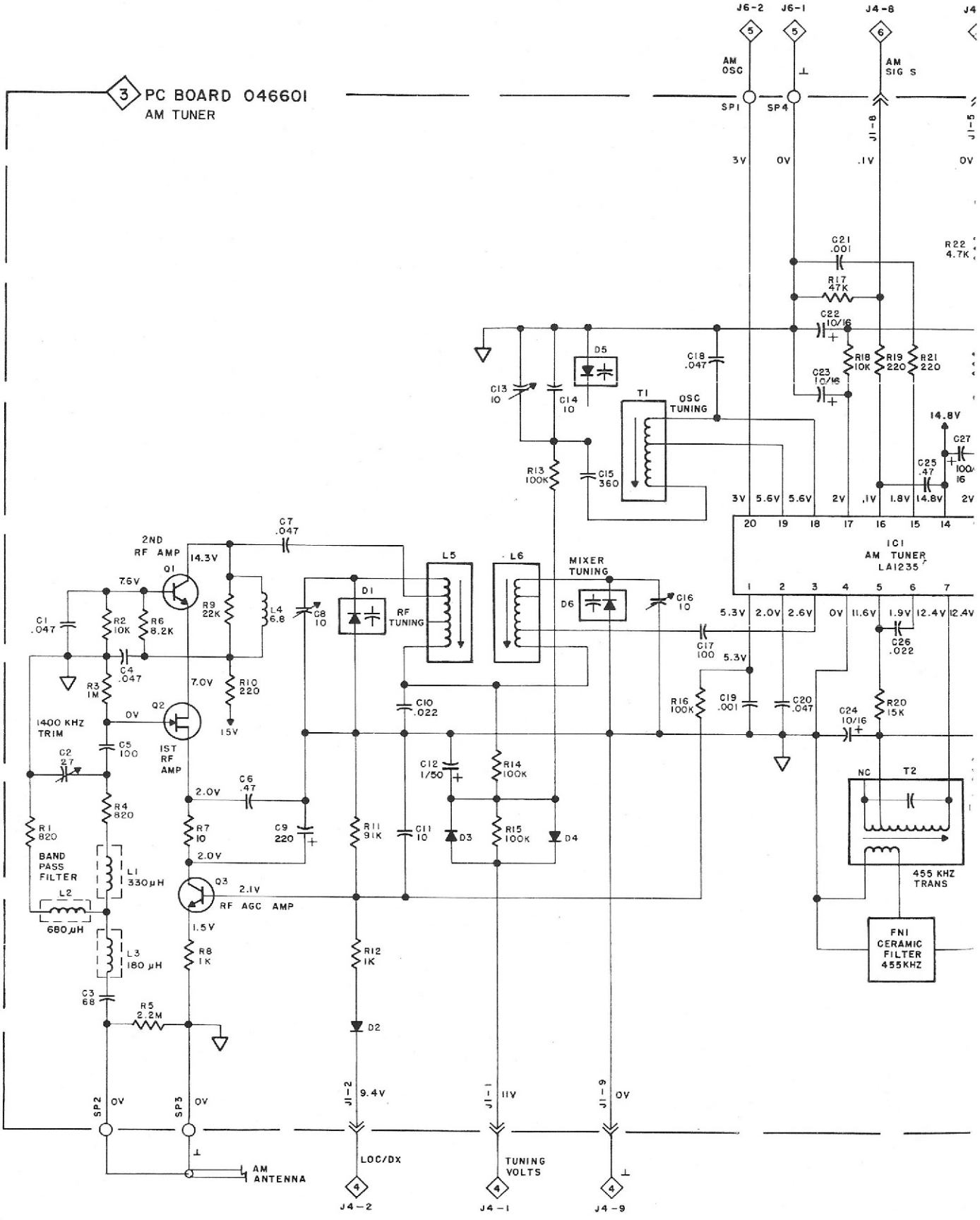

IC1
1st IF AMP, DELAYED AGC
LA1170
IF INPUT TUNING
T1
2ND IF AMP
FN2 FILTER 10.7MHZ
IC4
LIMITER/DETECTOR
LA1235
R49 10K MUTING
TIME CONSTANT SWITCH
T2 SECOND
T3 PRIMARY
DETECTOR TUNING
FM DEVIATION
IC5 DEVIATION AMP MC34081P
IC3 L&R OUTPUT AMP SE4558
FN3 FILTER 19838KHZ
FN4 FILTER 19838KHZ
MONO/ST SWITCH
MPX LED
L AUDIO OUT
L AM IN
R AM IN
R AUDIO OUT
J3-13
J3-14
J2-1
J2-2
J3-15

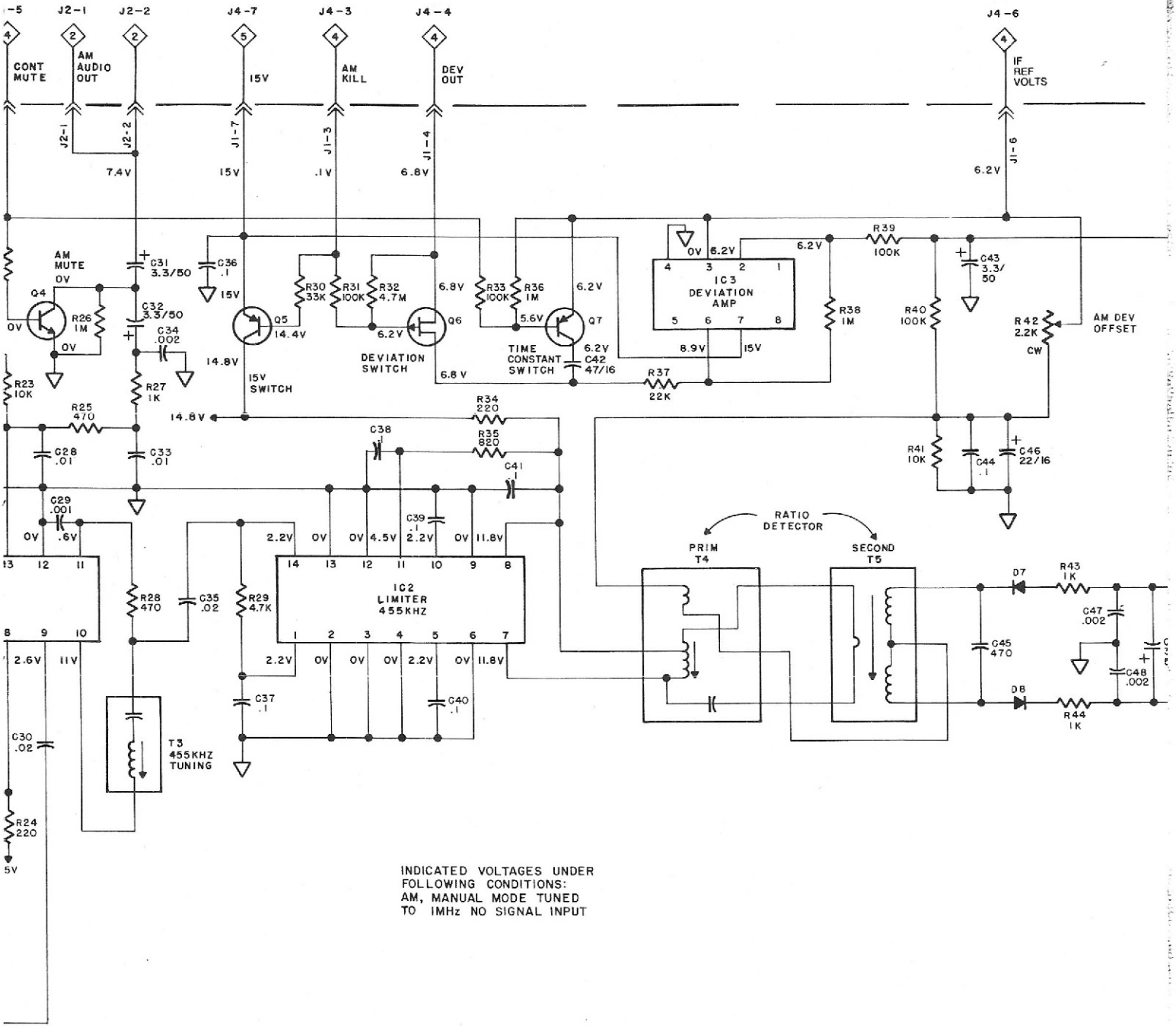
FM ALIGNMENT PROCEDURE

1. Connect FM Signal Generator to Antenna Input.
2. Connect Distortion Analyzer to Tuner Output.
3. Remove Top Cover and turn power switch ON.
4. Put tuner into FM manual mode and turn Tuning Control maximum CCW (87.5 MHz).
5. Adjust the Tuning Voltage Reference pot (R2, section 5) for 8V at the CW end of the manual tuning control (R1, section 1).
6. Adjust the tuning Lo End Adjust pot (R29, section 5) for a tuning voltage of 3.5V at connector J4-2, section 2. R29 is located next to the manual tuning control connector (J7, section 5) on the Frequency Counter PC board.
7. Adjust the FM Oscillator coil (L5) for a frequency display of 87.5 MHz.
8. Turn tuning control to maximum CW and adjust FM Oscillator trimmer capacitor (C18) for a frequency display of 108.5 MHz.
9. Repeat Steps 7 and 8 as necessary for a tuning range of 87.5 to 108.5 MHz.
10. Tune signal generator and tuner to 90 MHz and adjust Mixer (L6), RF (L3), and Antenna (L1) coils for best sensitivity.
11. Tune generator and tuner to 104 MHz and adjust Mixer (C19), RF (C13) and Antenna (C1) trimmer capacitors for best sensitivity.
12. Repeat Steps 10 and 11 until no improvement in sensitivity is noted.
13. With the tuner tuned to 90 MHz and no RF input, adjust the Detector Primary (T3) for the same voltage on pin 7 of the LA1235 (IC4) as the reference voltage on pin 10.
14. Adjust the FM Deviation pot (R73) for 4.75V on pin 6 of the MC34081 Deviation Amp (IC5).
15. Tune generator to 90 MHz with 1000 μV output. Tune the tuner to the center of the carrier using the voltage on pin 7 of the LA1235 (IC4). You are center-tuned when the voltage on pin 7 is the same as the voltage on pin 10. Adjust the Detector Secondary (T2) for lowest distortion. Use generator with 100% modulation at 1000 Hz.
16. Reduce generator output to minimum and detune generator so the tuner picks up only noise, then recheck the voltage on pin 7 of the LA1235 (IC4). If it is not the same as pin 10, repeat step 13. If there is interference from a station on this frequency, tune the tuner to a near-by frequency free from interference for this measurement.
17. Retune the generator and tune to 90 MHz with 1000 μV generator output. Switch the generator to stereo, left only, and adjust the 1F Input Transformer (T1) for lowest distortion at the left tuner output.
18. Switch the distortion analyzer to the right tuner output and adjust the Right Separation pot (R18) for best separation (minimum output).
19. Switch the generator to the right channel and the analyzer to the left. Adjust the Left Separation pot (R19) for best separation.
20. Reduce the generator output to 50 μV and adjust the Blend pot (R28) for 30 dB separation.
21. Reduce the generator output to 2.5 μV and adjust the Muting/Stereo Threshold pot (R49) so the MPX light just comes on.
22. Remove the generator and connect the antenna. Tune to a station of known frequency and check for proper frequency display. If necessary, adjust the FM Display pot (R32, section 5) for the correct frequency reading.

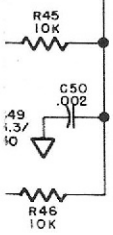


3 AM Tuner


3 PC BOARD 046601
AM TUNER
J6-2
J6-1
J4-8
AM OSC
AM SIG S
SP1
SP4
3V
0V
.1V
0V
C21 .001
R22 4.7K
R17 47K
C22 10/16
R18 10K
R19 220
R21 220
C23 10/16
D5
C18 .047
C13 10
C14 10
T1
OSC TUNING
R13 100K
C15 360
14.8V
C27 100/16
C25 .47
3V 5.6V 5.6V 2V .1V 1.8V 14.8V 2V
20 19 18 17 16 15 14
IC1 AM TUNER LA1235
1 2 3 4 5 6 7
5.3V 2.0V 2.6V 0V 11.6V 1.9V 12.4V 12.4V
C26 .022
C17 100
5.3V
C7 .047
2ND RF AMP
Q1
14.3V
7.6V
R9 22K
L4 6.8
C8 10
D1
RF TUNING
L5
L6
MIXER TUNING
D6
C16 10
C1 .047
R2 10K
R6 8.2K
C4 .047
R3 1M
7.0V
R10 220
15V
Q2
0V
1400 KHZ TRIM
C5 100
IST RF AMP
C2 27
C10 .022
C12 1/50
R14 100K
C6 .47
2.0V
R4 820
R7 10
C9 220
R11 91K
C11 10
D3
R15 100K
D4
R16 100K
C19 .001
C20 .047
C24 10/16
R20 15K
NC
T2
R1 820
BAND PASS FILTER
L1 330µH
L2 680µH
2.0V
Q3
2.1V
RF AGC AMP
455 KHZ TRANS
FN1 CERAMIC FILTER 455KHZ
1.5V
R8 1K
R12 1K
L3 180 µH
C3 68
R5 2.2M
D2
SP2 0V
SP3 0V
J1-2 9.4V
J1-1 11V
J1-9 0V
AM ANTENNA
LOC/DX
TUNING VOLTS
J4-2
J4-1
J4-9



INDICATED VOLTAGES UNDER FOLLOWING CONDITIONS:
AM, MANUAL MODE TUNED TO 1MHz NO SIGNAL INPUT

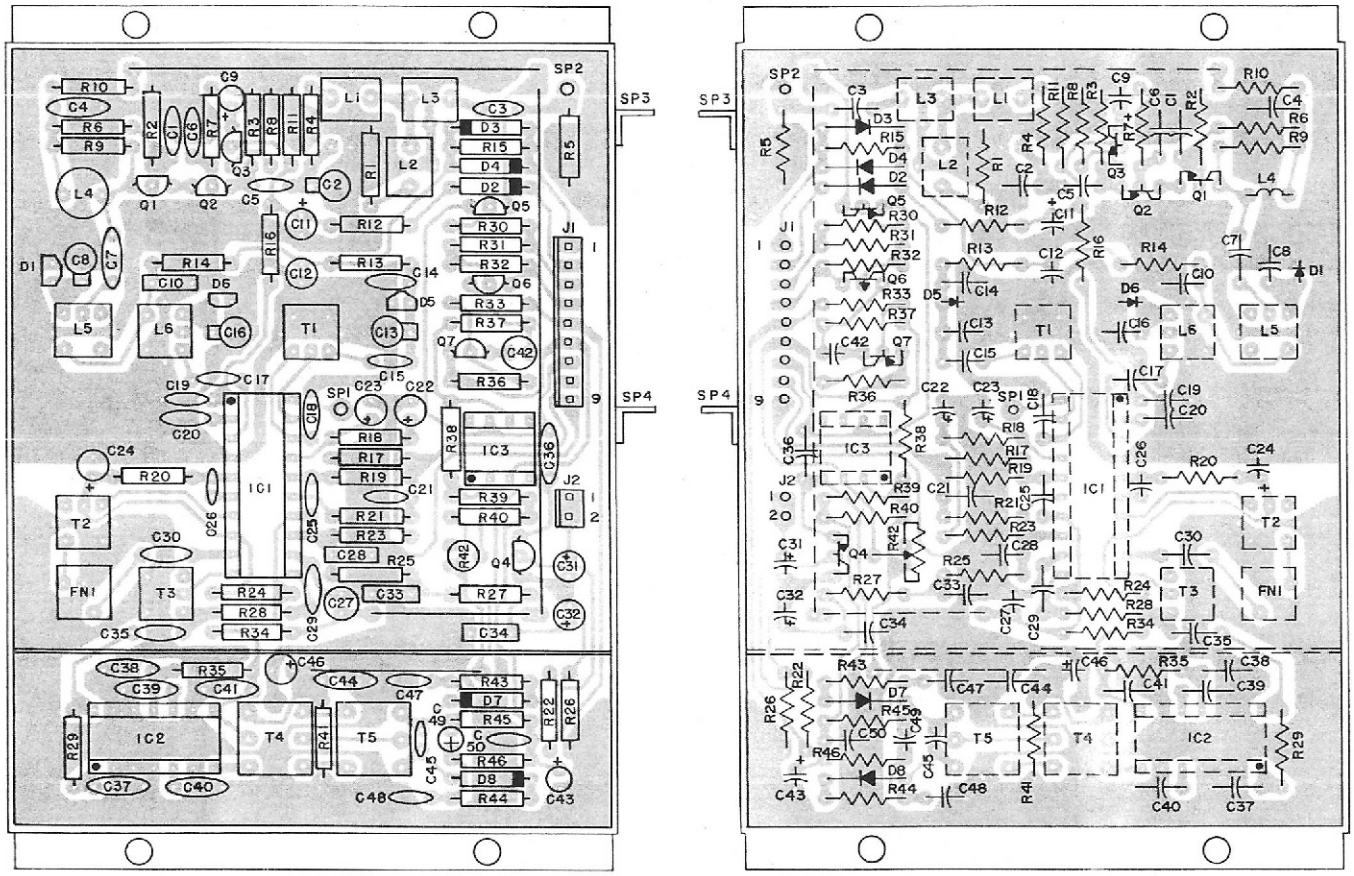


AM ALIGNMENT PROCEDURE (Note: FM alignment must be done before starting AM alignment)

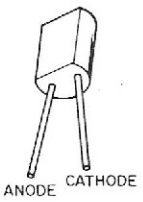
1. Connect AM Signal Generator to Antenna Input.
2. Put tuner into AM manual mode.
3. Turn the manual tuning control to maximum CCW and adjust AM Oscillator coil (T1) for a frequency display of 535 kHz.
4. Turn the tuning control to maximum CW and adjust AM Oscillator trimmer capacitor C13) for a frequency display of 1605 kHz.
5. Repeat Step 3 and Step 4 as necessary for tuning range of 535 kHz to 1605 kHz.
6. Tune signal generator and tuner to 600 kHz and adjust RF (L5) and Mixer (L6) coils for best sensitivity.
7. Tune generator and tuner to 1400 kHz and adjust RF (C8), Mixer (C16) and Antenna (C2) trimmer capacitors for best sensitivity.
8. Repeat Step 6 and Step 7 until no further improvement in sensitivity is noted.
9. Tune generator to 455 kHz and increase its output until a low level signal can be seen on the analyzer. Use generator with 30% modulation at 1000 Hz. Adjust 1F Input Transformer (T2) and Detector Transformer (T3) for maximum output.
10. Connect a DC voltmeter negative lead to the junction of R41 and R40, the positive lead to the junction of R44 and R46, then peak the Ratio Detector primary (T4) for maximum DC volts.
11. Move the voltmeter positive lead to the junction of R45 and R46, then adjust the Ratio Detector secondary (T5) for zero volts.
12. Move the voltmeter negative lead to ground and the positive lead to pin 6 of the FM Deviation Amp MC34081P (IC3). Adjust AM Deviation Offset pot (R42) for 4.75 volts.
13. Remove generator and connect an antenna. Tune to a station of known frequency and check for proper frequency display. If necessary, adjust AM Display pot (R31, section 5) for the correct frequency reading.

COMPONENT SIDE

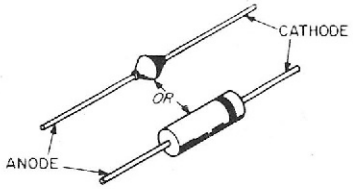
CIRCUIT SIDE



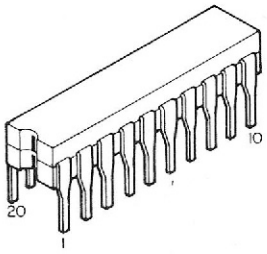
AM/FM TUNER PCB 046601



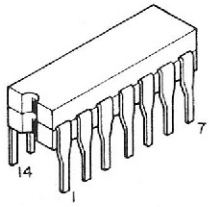
D1, D5, D6



D2-D4, D7, D8



IC1

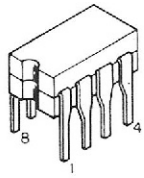


IC2

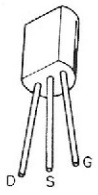
AM TUNER PARTS LIST

Symbol No.	Part No.	Description
CAPACITORS		
C2	060029	Trimmer, 3-27 pF
C8, C13, C16	060027	Trimmer, 2-10 pF
DIODES		
D1, D5, D6	070125	VAC, AM, SVC
D2	070047	SIG, 75V, 10mA, IN4148
D3, D4, D7, D8	070003	Ge, SIG, 75V, 10mA, IN541
FILTERS		
FN1	180035	Filter, CER, 455 KHz
INTEGRATED CIRCUITS		
IC1	133111	AM, Receiver, LA1245
IC2	133036	455KHz Limiter, MC1355P
IC3	133131	Operational Amp, MC34081P
TRANSISTORS		
Q1, Q3, Q4	132223	NPN, MPS4124
Q2	132178	N, JFET, Selected J-310
Q5, Q7	132224	PNP, MPS4126
Q6	132220	P, FET, J176
TRANSFORMERS & COILS		
T1	162108	AM Oscillator
T2	162113	AM-IF Matching
T3	162106	AM-IF
T4	162105	455KHz Ratio Detector (Primary)
T5	162109	455KHz Ratio Detector (Secondary)
L5, L6	122236	RF and Mixer Coils

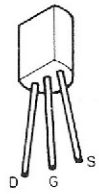
IC3



Q1, Q3-Q5, Q7

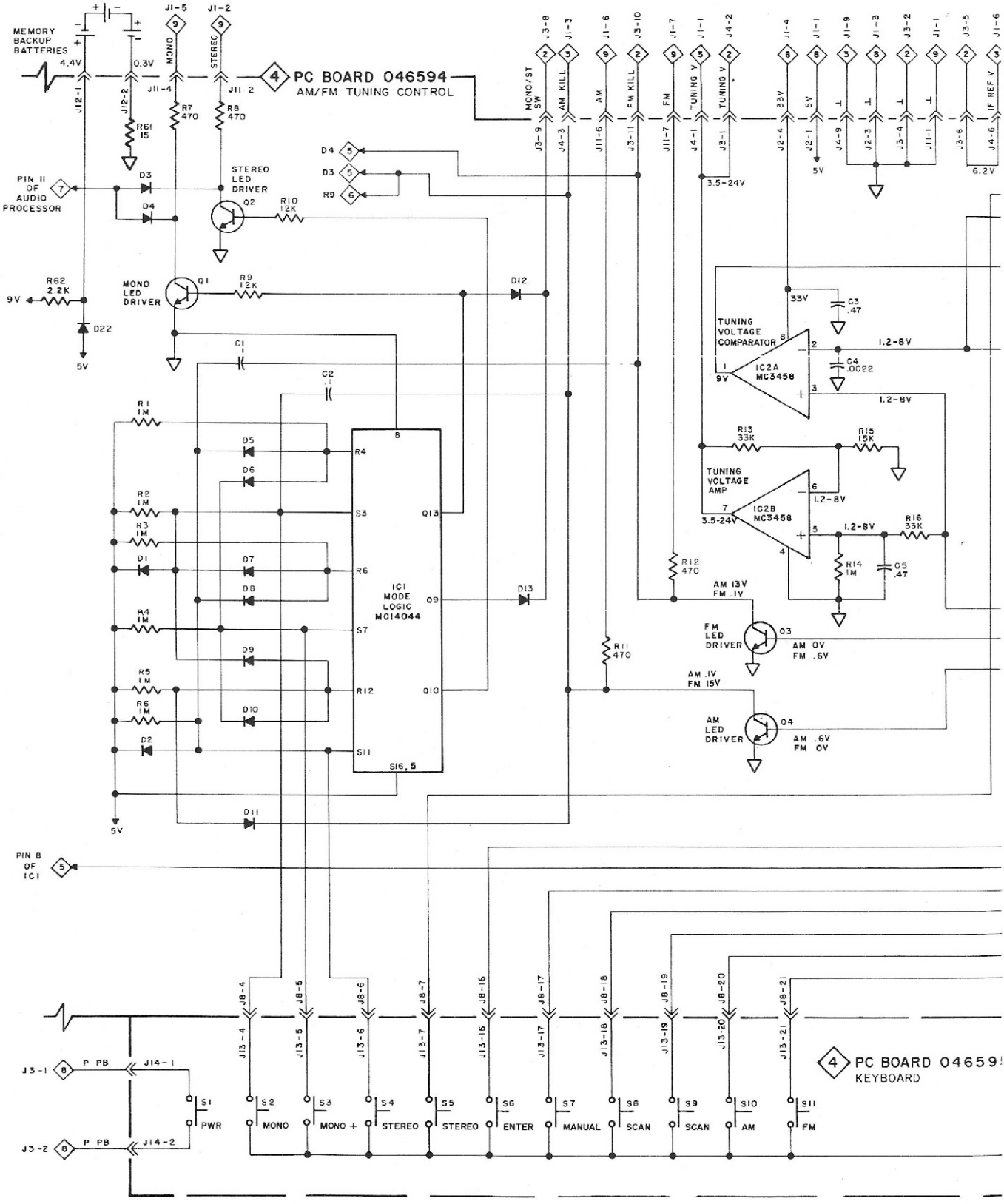


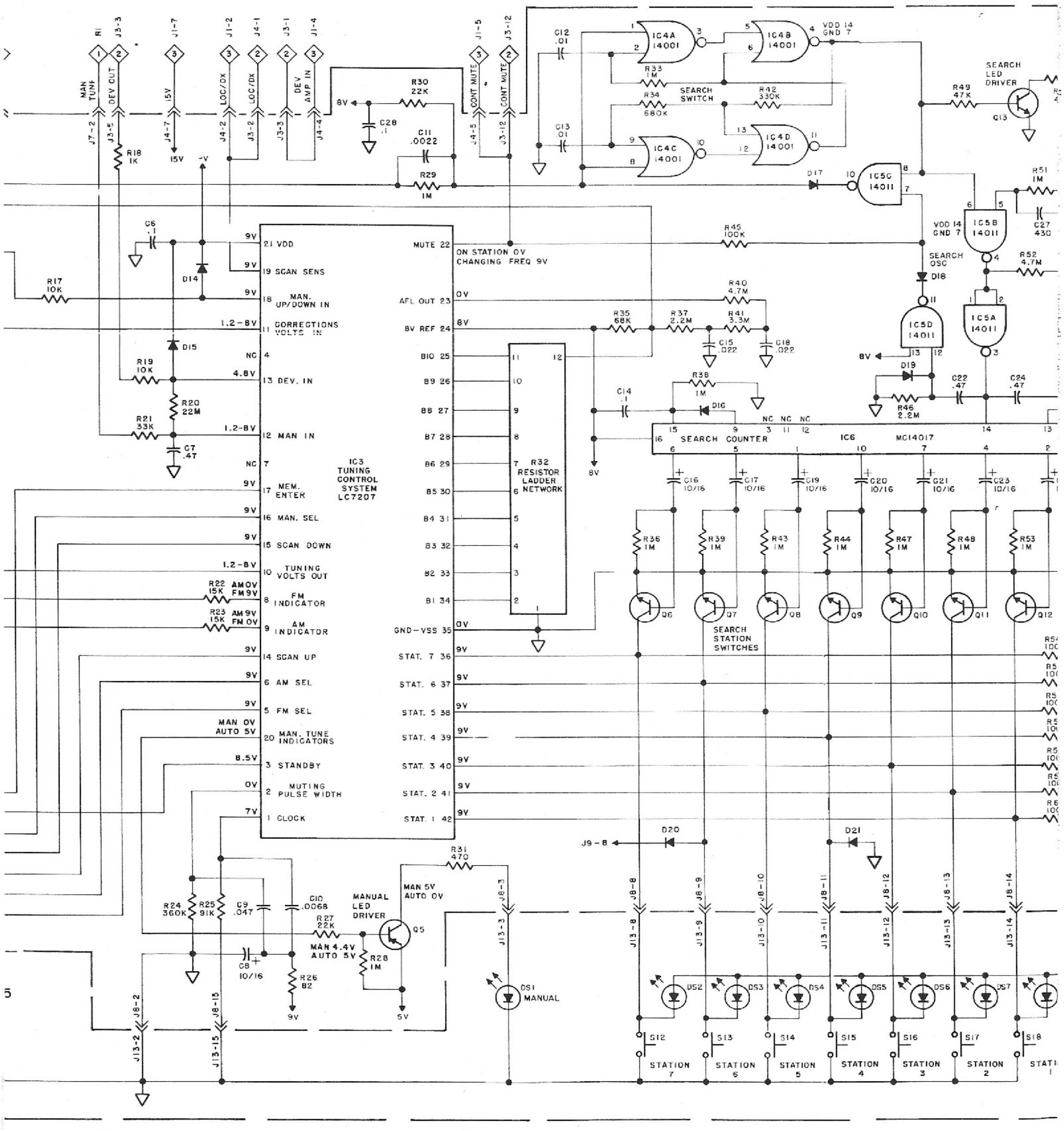
Q2

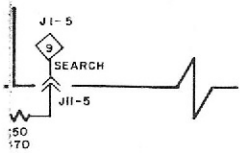


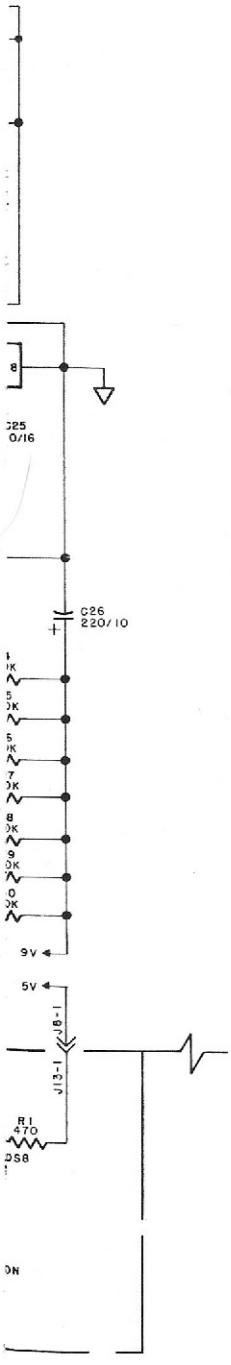
Q6

4 AM/FM Tuning Control



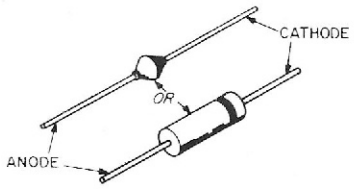

IC3
TUNING
CONTROL
SYSTEM
LC7207
R32
RESISTOR
LADDER
NETWORK
SEARCH COUNTER
IC6
MC14017
IC4A 14001
IC4B 14001
IC4C 14001
IC4D 14001
IC5A 14011
IC5B 14011
IC5C 14011
IC5D 14011
SEARCH SWITCH
SEARCH LED DRIVER
SEARCH OSC
SEARCH STATION SWITCHES
MANUAL LED DRIVER
DS1 MANUAL
MAN TUNE
DEV OUT
15V
LOC/DX
DEV AMP IN
CONT MUTE
21 VDD
19 SCAN SENS
18 MAN. UP/DOWN IN
11 CORRECTIONS VOLTS IN
13 DEV. IN
12 MAN IN
17 MEM. ENTER
16 MAN. SEL
15 SCAN DOWN
10 TUNING VOLTS OUT
8 FM INDICATOR
9 AM INDICATOR
14 SCAN UP
6 AM SEL
5 FM SEL
20 MAN. TUNE INDICATORS
3 STANDBY
2 MUTING PULSE WIDTH
1 CLOCK
MUTE 22
ON STATION 0V
CHANGING FREQ 9V
AFL OUT 23
8V REF 24
B10 25
B9 26
B8 27
B7 28
B6 29
B5 30
B4 31
B3 32
B2 33
B1 34
GND-VSS 35
STAT. 7 36
STAT. 6 37
STAT. 5 38
STAT. 4 39
STAT. 3 40
STAT. 2 41
STAT. 1 42
MAN 0V AUTO 5V
MAN 5V AUTO 0V
MAN 4.4V AUTO 5V
STATION 7
STATION 6
STATION 5
STATION 4
STATION 3
STATION 2
VDD 14 GND 7



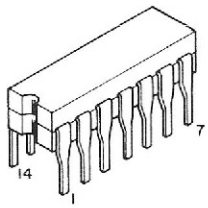


AM/FM TUNING CONTROL PARTS LIST

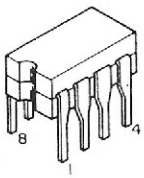
Symbol No.	Part No.	Description
DIODES		
D1-D19, D20	070047	SIG, 75V, 10mA, 1N4148
D21, D22	070131	RECT, 400V, 1A, 1N4004
LIGHTING DEVICES		
DS1-DS8	058077	LED, Green, SLP244B
INTEGRATED CIRCUITS		
IC1	133130	CMOS, Quad NAND R/S Latch, MC14044B
IC2	133105	Dual Hi-Speed Operational Amp, MC3458P1
IC3	133103	Tuning Control, LC7207
IC4	133064	CMOS, Quad 2-Input NOR Gate, MC14001B
IC5	133063	CMOS, Quad 2-Input NAND Gate, MC14011B
IC6	133084	CMOS, Johnson Decade Counter, MC14017B
TRANSISTORS		
Q1-Q4, Q6-Q12, Q5	132224	PNP, MPS4126
Q13	132090	NPN, DAR, Selected MPSA14
RESISTORS		
R32	144180	Resistor Network



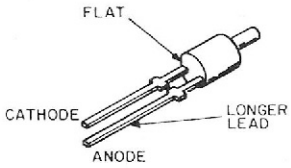
D1-D21



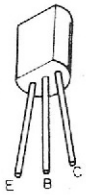
IC4, IC5



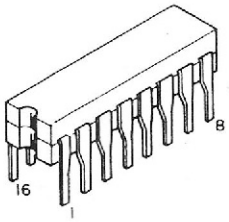
IC2



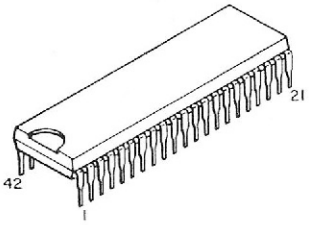
DS1-DS8



Q1-Q14

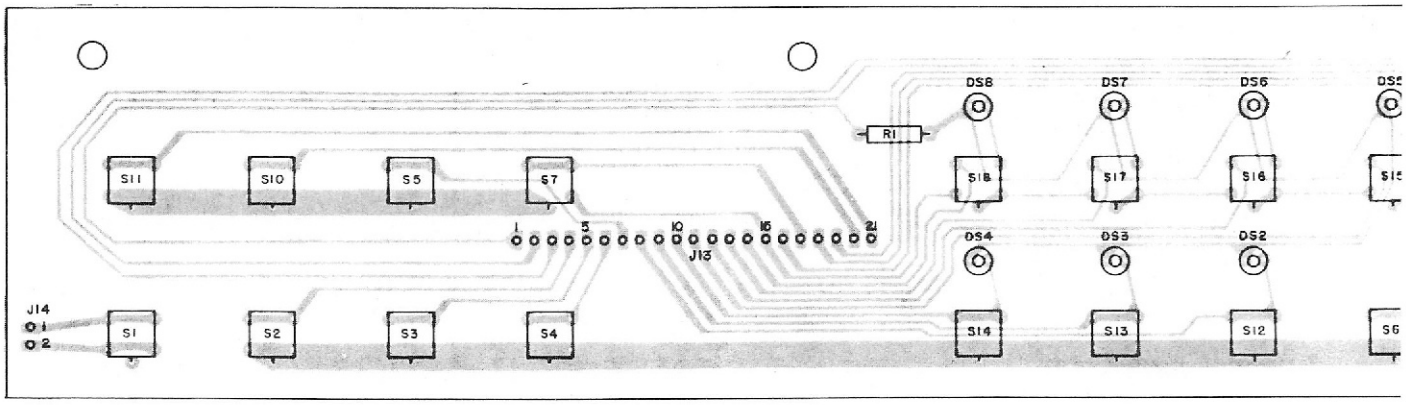


IC1, IC6

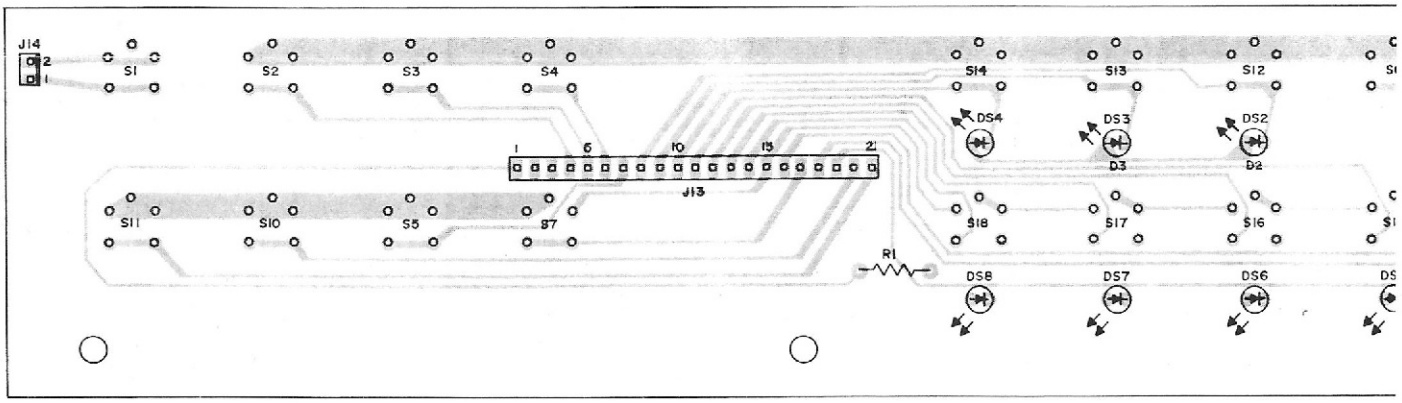


IC3

COMPONENT SIDE



KEYBOARD PCB 046595



CIRCUIT SIDE

SEARCH LOGIC CHART

IC4 SEARCH SWITCH
MC14001, QUAD 2-INPUT NOR GATE
8V SUPPLY

Pin	Function	Search On	Search Off
1	G1 In	1 (0 momentary)	1 (0 momentary)
2	G1 In	0	1
3	G1 Out	0	0
4	G2 Out	1	0
5	G2 In	0	0
6	G2 In	0	1
7	VSS	0	0
8	G3 In	1	1
9	G3 In	1	0
10	G3 Out	0	0
11	G4 Out	0	1
12	G4 In	0	0
13	G4 In	1	0
14	VDD	1	1

Q13 SEARCH LED DRIVER

	Search On	Search Off
E	0V	0V
B	0.6V	0V
C	0.1V	15V

IC5 SEARCH OSCILLATOR
MC14011, QUAD 2-INPUT NAND GATE
8V SUPPLY

Pin	Function	Search On	Search Off
1	G1 In	1-0 alternate 3 sec each	1
2	G2 In	1-0 alternate 3 sec each	1
3	G1 Out	1-0 alternate 3 sec each	0
4	G2 Out	1-0 alternate 3 sec each	1
5	G1 In	1-0 alternate 3 sec each	1
6	G1 In	1	0
7	VSS	0	0
8	G3 In	1	0
9	G3 In	0	0
10	G3 Out	1	1
11	G4 Out	0 for 2 sec, 1 for 4 sec	1
12	G4 In	Pulse every 6 sec	0
13	G4 In	1	1
14	VDD	1	1

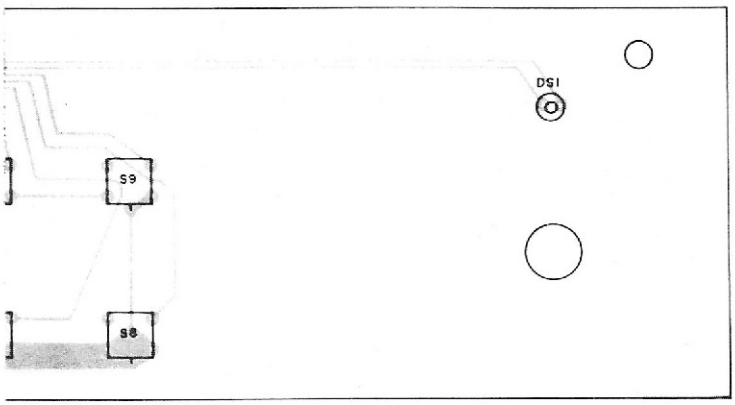
IC6 SEARCH COUNTER
MC14017, DECADE COUNTER
8V SUPPLY

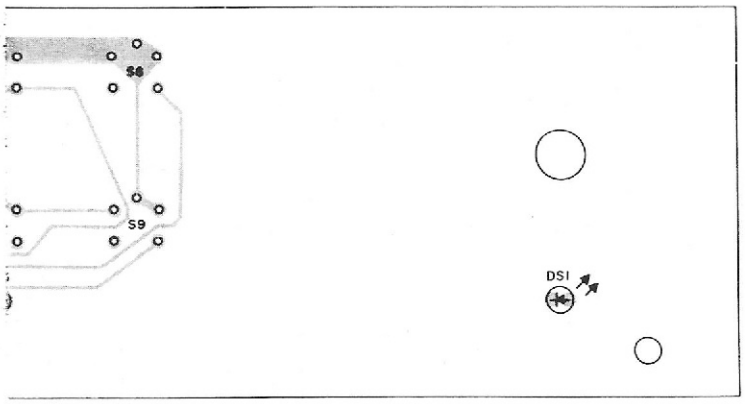
Pin	Function	Search On	Search Off
1	Q5 Out	1 on 6th OSC pulse	0
2	Q1 Out	1 on 2nd OSC pulse	0
4	Q2 Out	1 on 3rd OSC pulse	0
5	Q6 Out	1 on 7th OSC pulse	0
6	Q7 Out	1 on 8th OSC pulse	0
7	Q3 Out	1 on 4th OSC pulse	0
8	VSS	0	0
9	Q8 Out	1 on 9th OSC pulse, Reset	0
10	Q4 Out	1 on 5th OSC pulse	0
13	Enable	0	0
14	Clock In	1-0 alternate 3 sec each	0
15	Reset	1 on 9th OSC pulse, Reset	0*
16	VDD	1	1

*A reset pulse also occurs at power turn on.

SEARCH STATION SWITCHES

Transistors Q6 through Q12 are the electronic station switches. Each transistor receives an input pulse from the SEARCH COUNTER in sequence and shorts the appropriate station select line to the ground. This activates the station memory and indicator for a period of 5 to 6 seconds, then moves on to the next.





IC1 MODE LOGIC
MC14044, QUAD RS LATCH,
MODE LOGIC
5V SUPPLY

*Momentary

Pin	Function	Mono	Mono Plus	Stereo
3	Set 0	0*	1	1
4	Reset 0	1	0*	0*
5	Enable	1	1	1
6	Reset 1	0*	1	1
7	Set 1	1	0*	0*
8	VSS	0	0	0
9	Q1 Out	0	1	0
10	Q2 Out	0	0	1
11	Set 2	1	1	0*
12	Reset 2	0*	0*	1
13	Q0 Out	1	0	0
16	VDD	1	1	1

Q1 MONO LED DRIVER

	Mono	Mono Plus	Stereo
E	0V	0V	0
B	0.6V	0V	0
C	0.1V	15V	15V

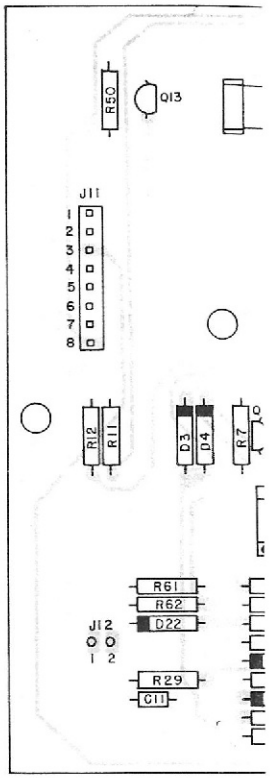
Q2 STEREO LED DRIVER

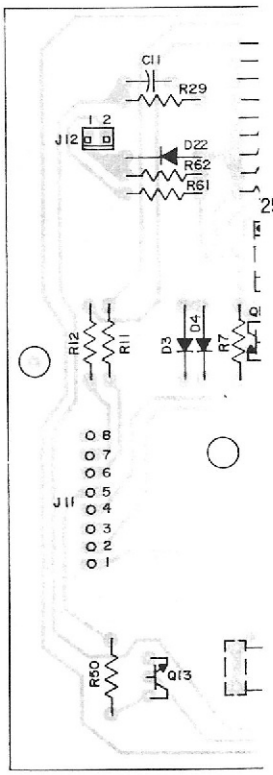
	Mono	Mono Plus	Stereo
E	0V	0V	0V
B	0V	0V	0.6V
C	15V	15V	0.1V

	Mono	Mono Plus	Stereo
Pin 11 of TDA3810	0.6V	14V	0.6V
Pin 4 of J11	9V	15V	15V
Pin 2 of J11	15V	15V	9V
Pin 9 of J3	4.6V	4.6V	0.5V

NOTE: A pulse through capacitor C1 automatically sets mode to MONO in AM, and through capacitor C2 to STEREO in FM.

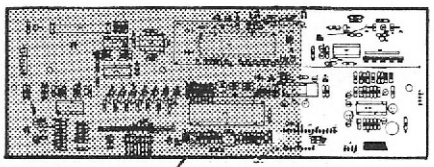
COMPONENT SIDE (Only Section 4



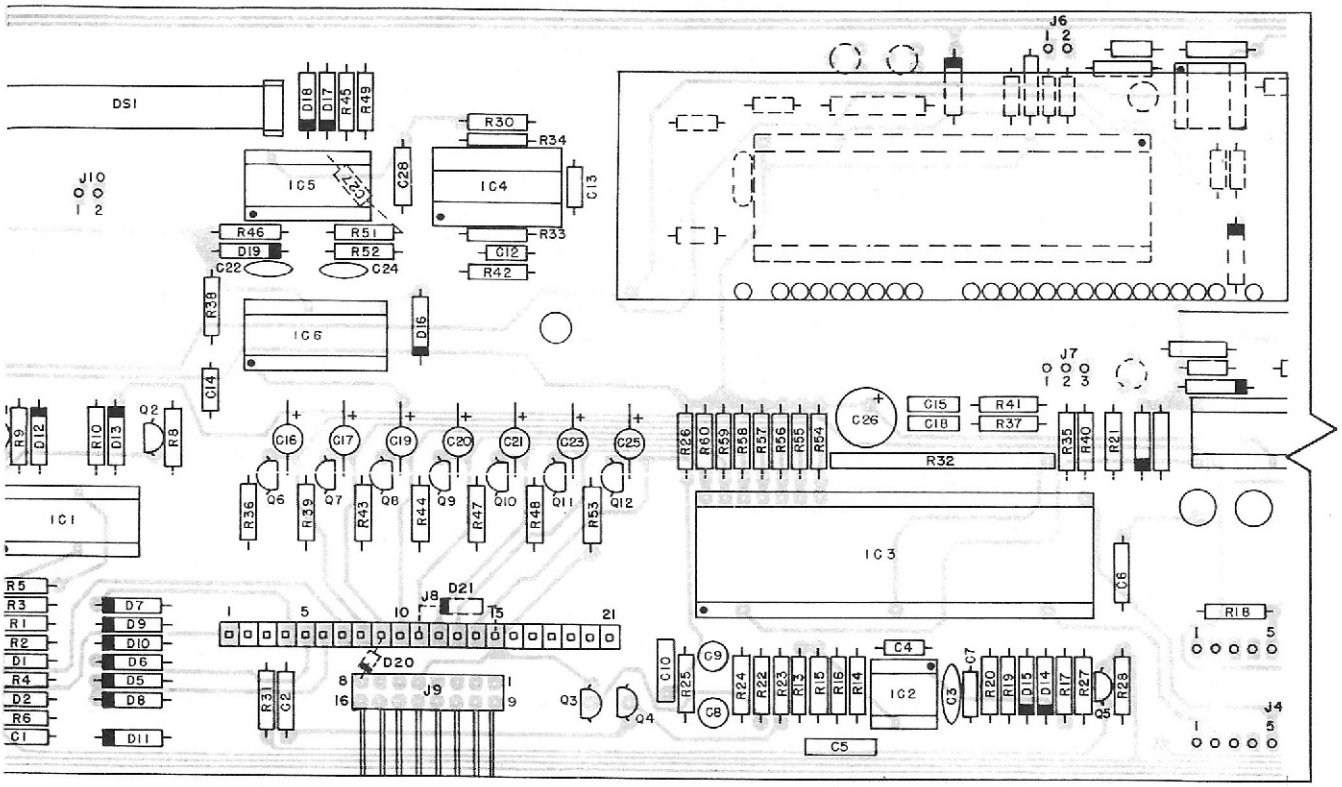


CIRCUIT SIDE (Only Section 4 Parts

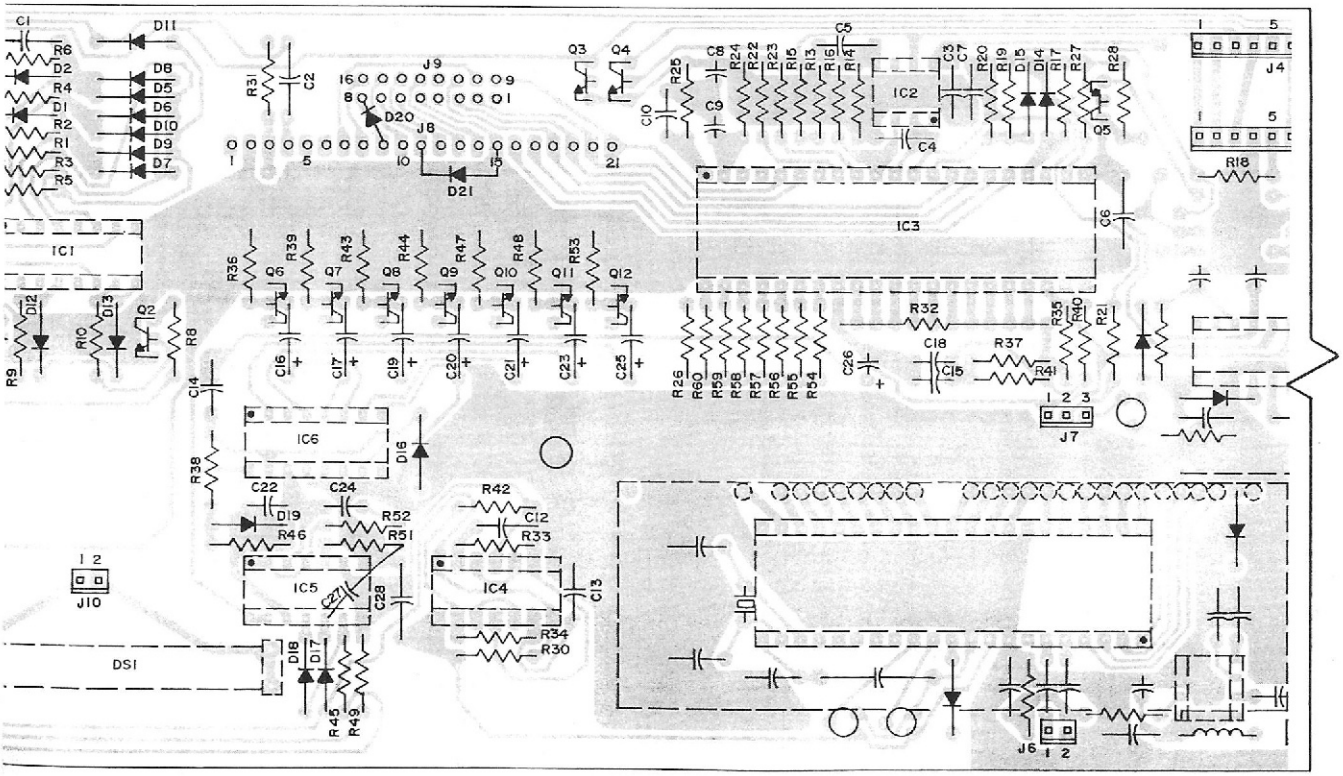
AM/FM TUNING CONTROL PORTION
OF PCB 046594



Parts Symbol numbered)

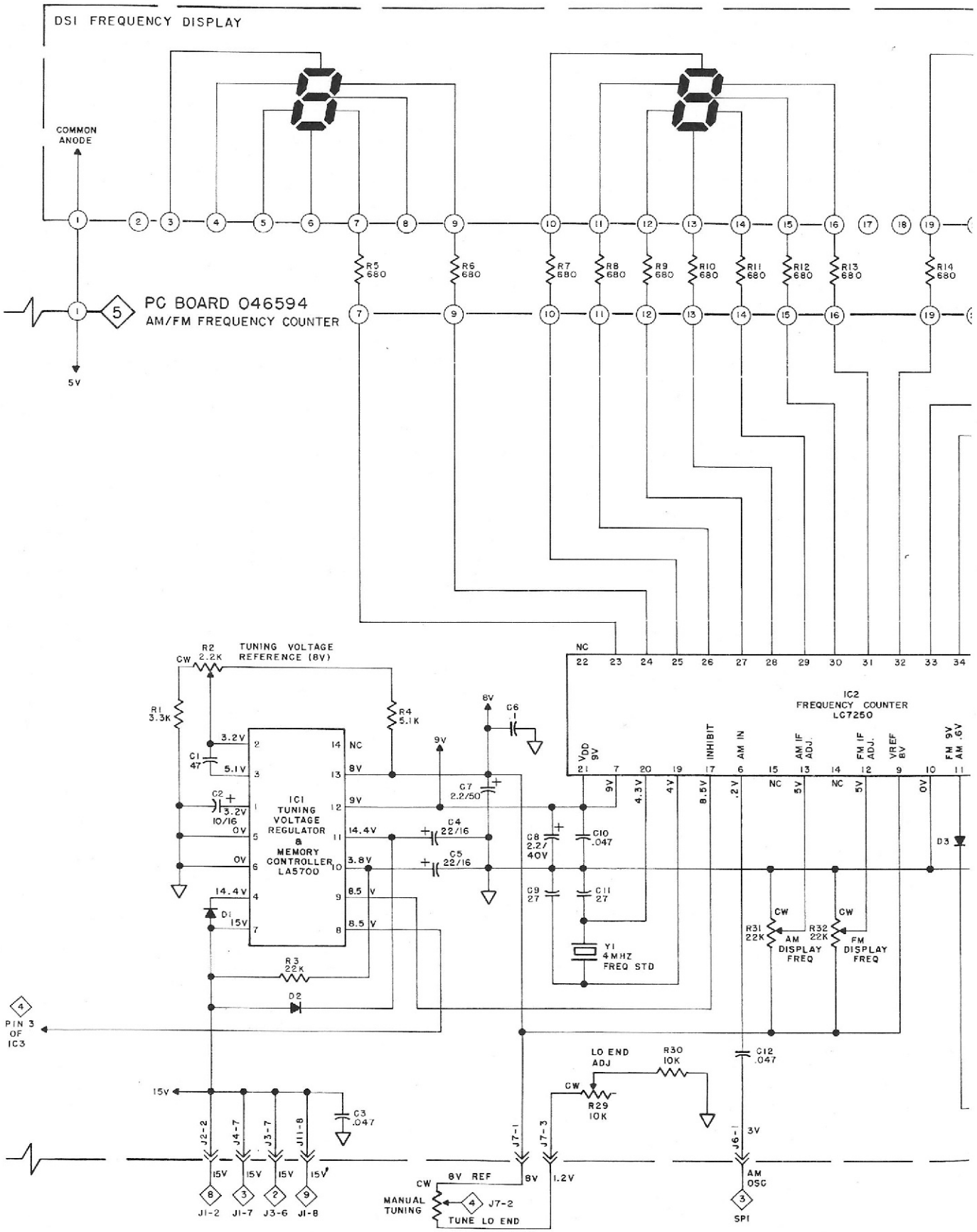


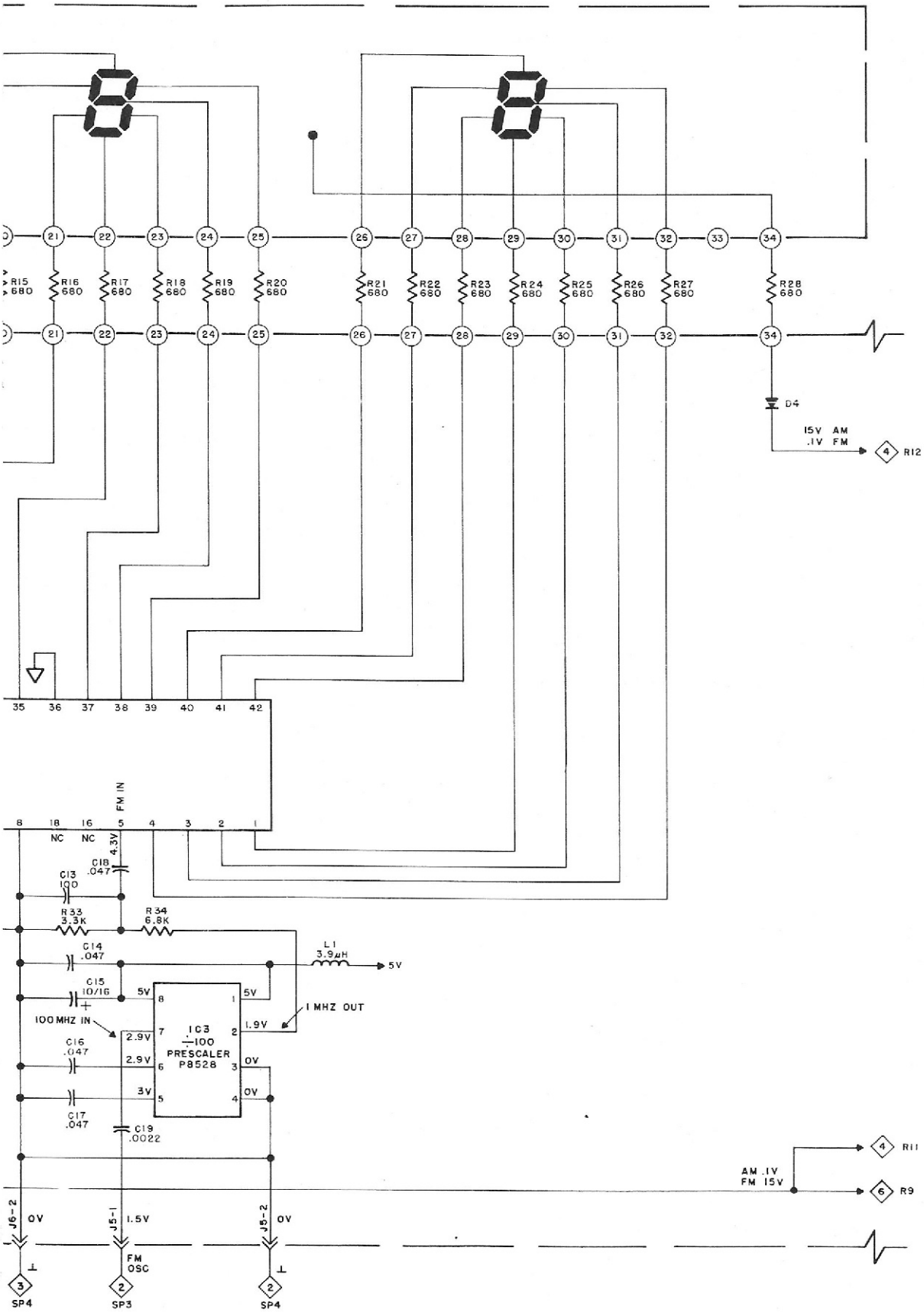
CONTROLLER/COUNTER PCB 046594



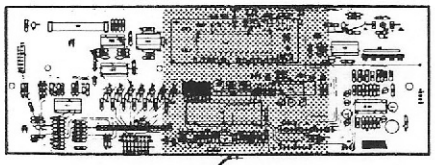
Symbol numbered)

5 AM/FM Frequency Counter

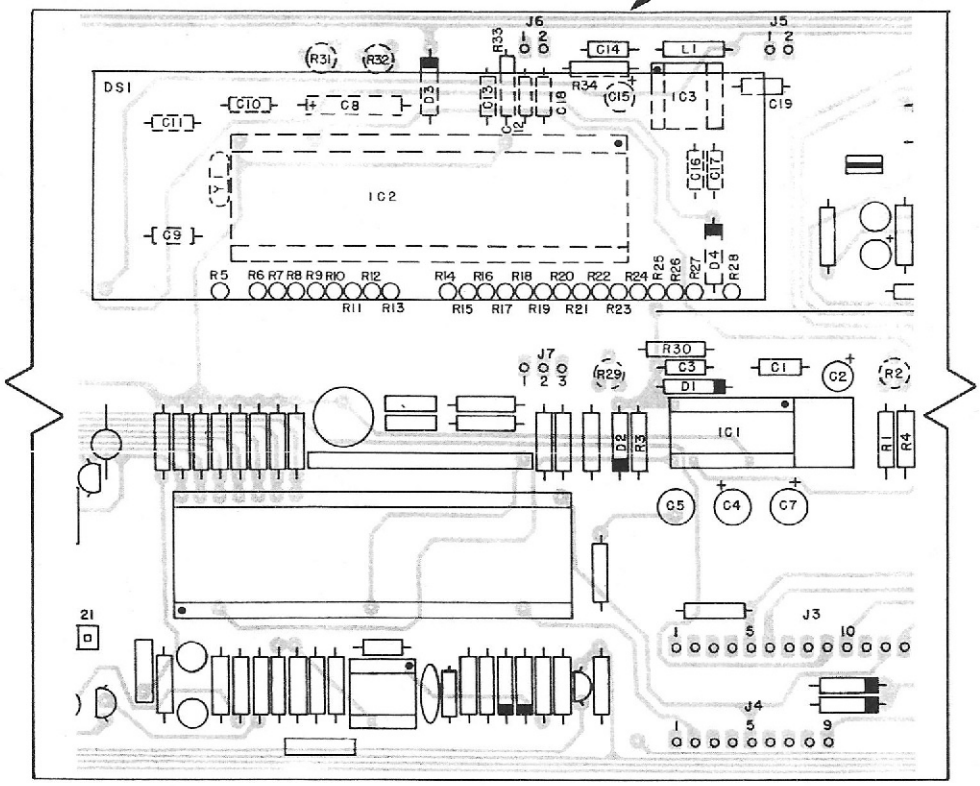



R15 680
R16 680
R17 680
R18 680
R19 680
R20 680
R21 680
R22 680
R23 680
R24 680
R25 680
R26 680
R27 680
R28 680
D4
15V AM
.1V FM
4 R12
FM IN
NC
NC
4.3V
C18 .047
C13 100
R33 3.3K
R34 6.8K
C14 .047
L1 3.9μH
5V
C15 10/16
100MHZ IN
IC3 ÷100 PRESCALER P8528
1 MHZ OUT
1.9V
C16 .047
C17 .047
C19 .0022
AM .1V
FM 15V
4 R11
6 R9
J6-2
J5-1
J5-2
1.5V
FM OSC
3 SP4
2 SP3
2 SP4

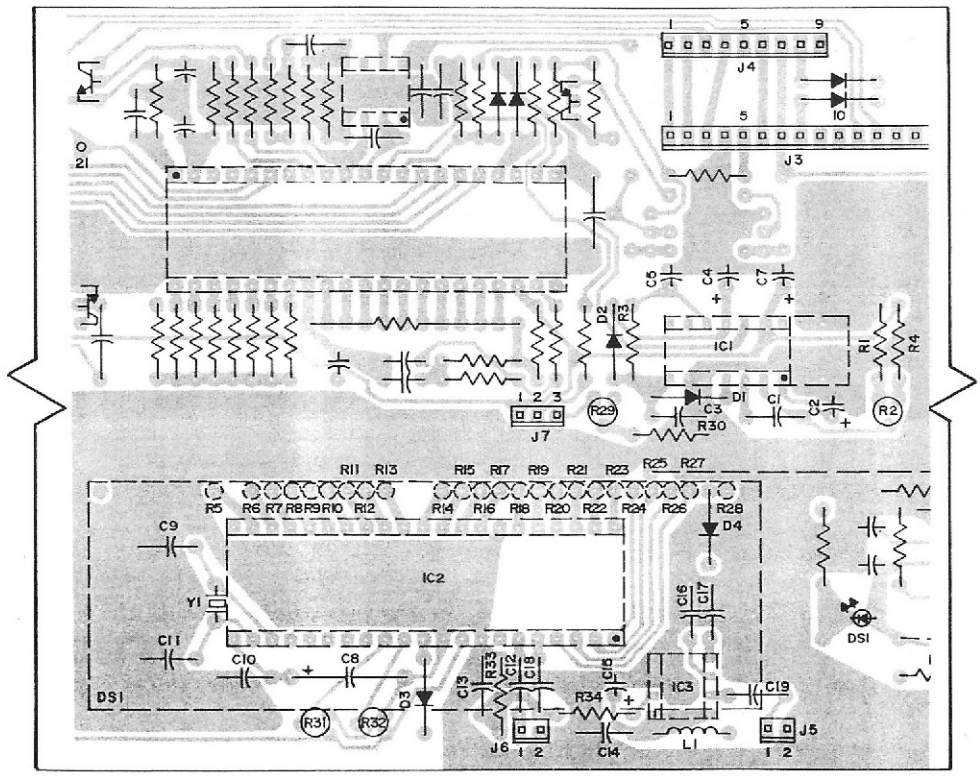
AM/FM FREQUENCY COUNTER PORTION OF PCB 046594



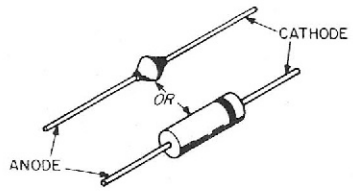
COMPONENT SIDE (Only Section 6 Parts Symbol numbered)



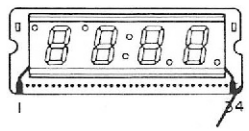
CONTROLLER/COUNTER PCB 046594



CIRCUIT SIDE (Only Section 6 Parts Symbol numbered)



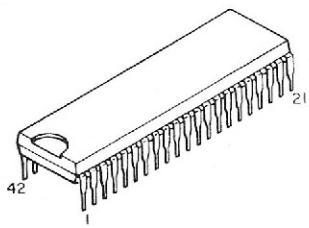
D1-D4



DS1

AM/FM FREQUENCY COUNTER PARTS LIST

Symbol No.	Part No.	Description
DIODES		
D1, D2	070131	RECT, 400V, 1A, 1N4004
D3, D4	070047	SIG, 75V, 10mA, IN4148
LIGHTING DEVICES		
DS1	058084	LED, 7-Segment/4 Digit Display, SL-1447
INTEGRATED CIRCUITS		
IC1	133106	Counter/Clock/7-Segment Driver, LC725B
CRYSTALS		
Y1	180029	Crystal, 4 mHz, ± .0025%

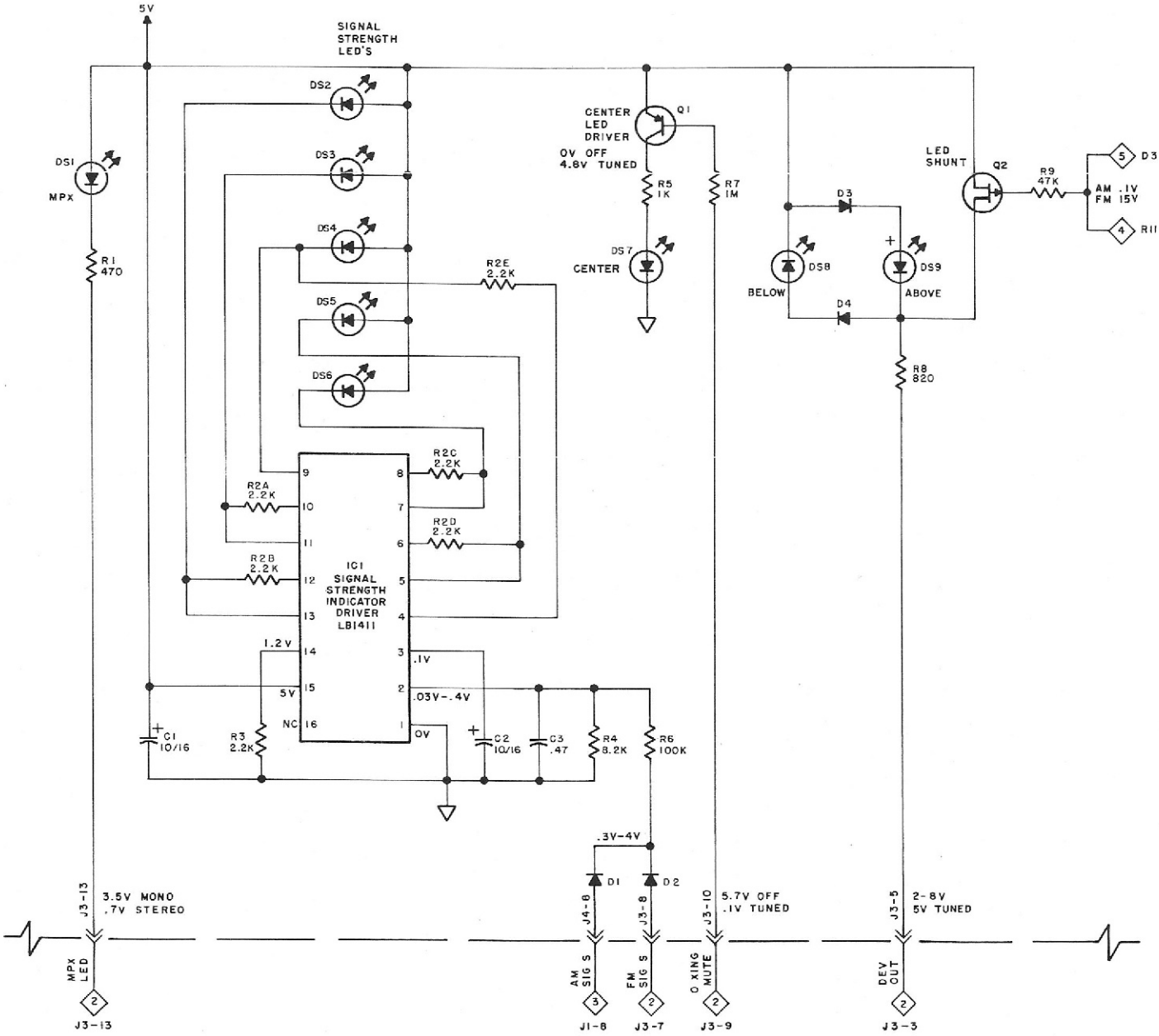


IC1

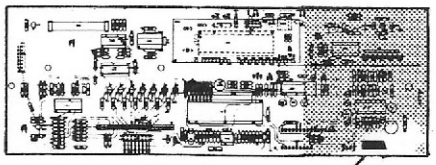
Signal Strength and Tuning Display

6

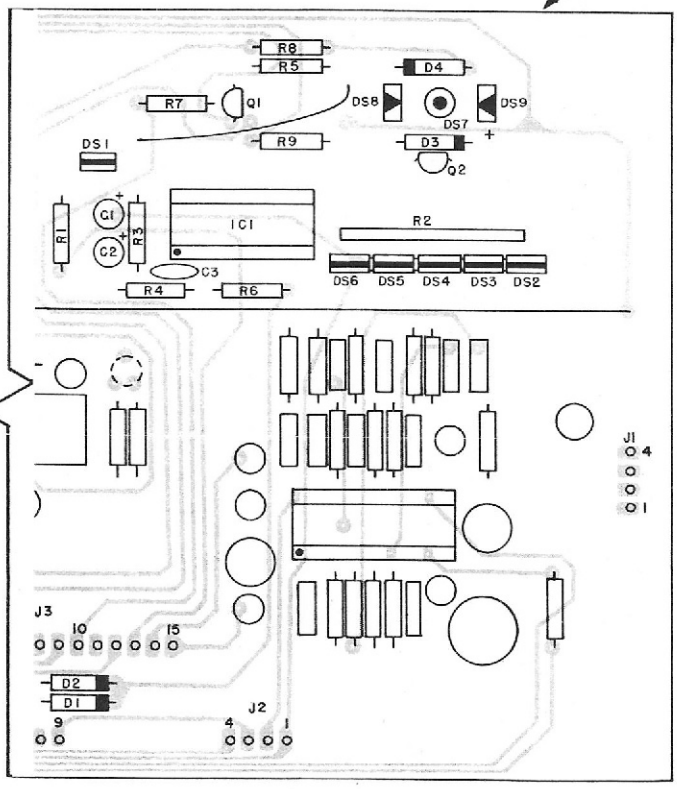
6 PC BOARD 046594
SIGNAL STRENGTH/TUNING DISPLAY



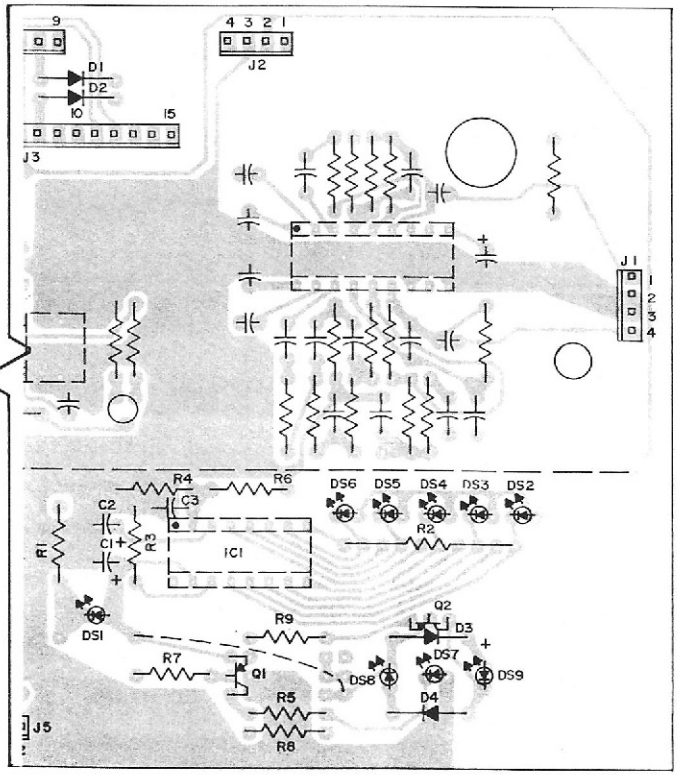
SIGNAL STRENGTH AND TUNING DISPLAY PORTION OF PCB 046594



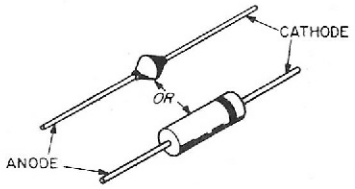
COMPONENT SIDE (Only Section 5 Parts Symbol numbered)



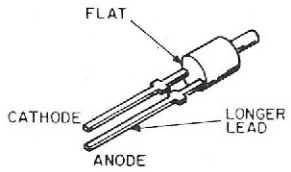
CONTROLLER/COUNTER PCB 046594



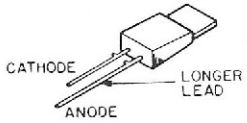
CIRCUIT SIDE (Only Section 5 Parts Symbol numbered)



D1-D4



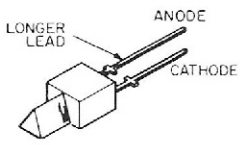
DS7



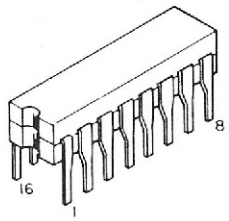
DS1

SIGNAL STRENGTH AND TUNING DISPLAY PARTS LIST

Symbol No.	Part No.	Description
DIODES		
D1-D4	070047	SIG, 75V, 10mA, 1N4148
LIGHTING DEVICES		
DS1	070115	LED, Red Bar, AND205R
DS2-DS6	058097	LED, Red, 5-Segment Bar, SLP152B
DS7	058078	LED, Red, SLP144B
DS8, DS9	058083	LED, Red Triangle, AND207R
INTEGRATED CIRCUITS		
IC1	133118	Level Display Driver, LB1411
TRANSISTORS		
Q1	132182	PNP, DAR, MPSA64
Q2	132226	P, JFET, J174
RESISTORS		
R2	144200	Resistor Network, 2.2k

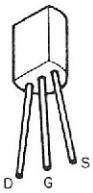


DS8, DS9



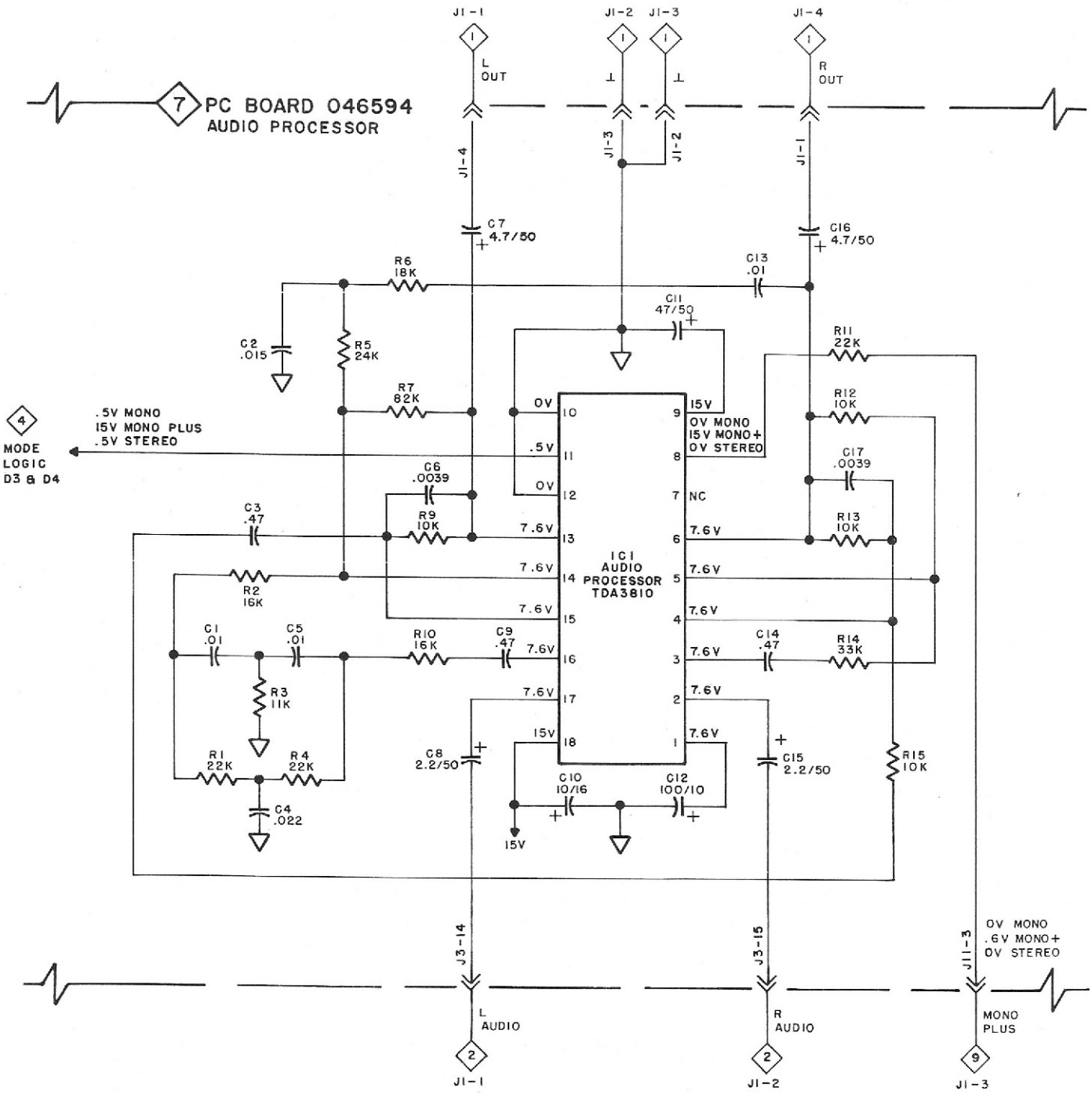
IC1

Q1

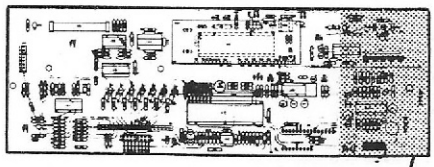


Q2

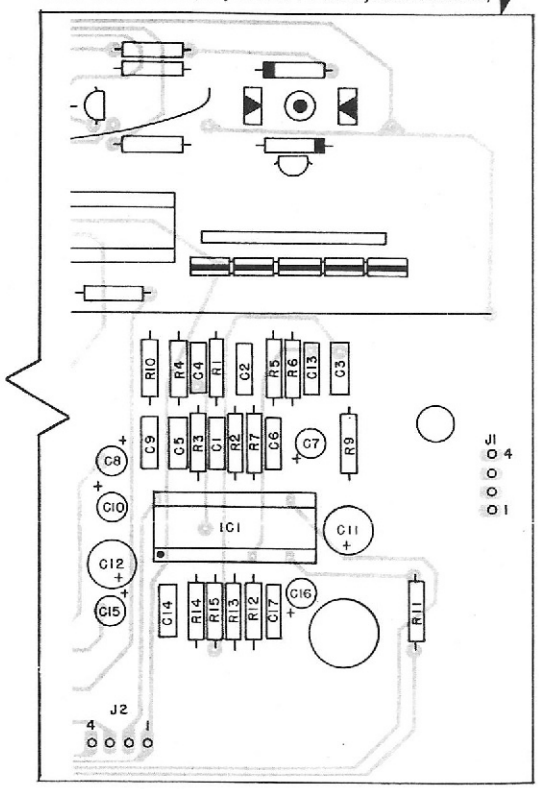
7 Audio Processor



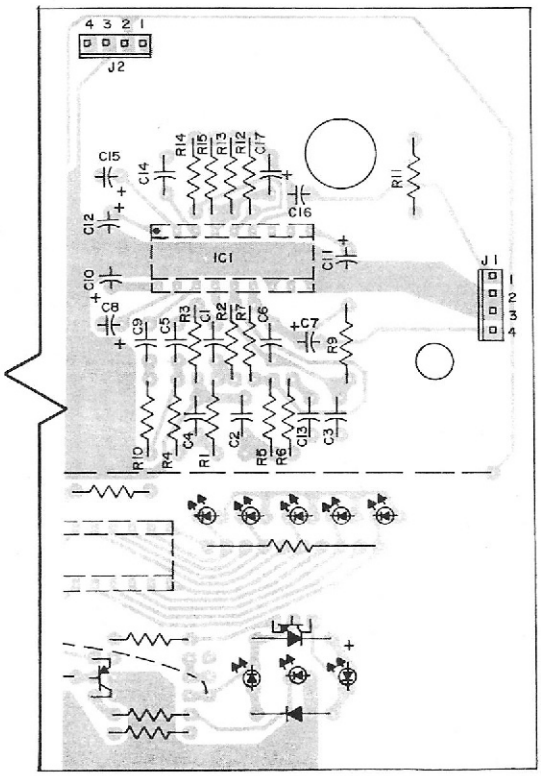
AUDIO PROCESSOR
PORTION OF
PCB 046594



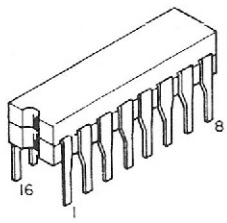
COMPONENT SIDE (Only Section 7 Parts Symbol numbered)



CONTROLLER COUNTER PCB 046594



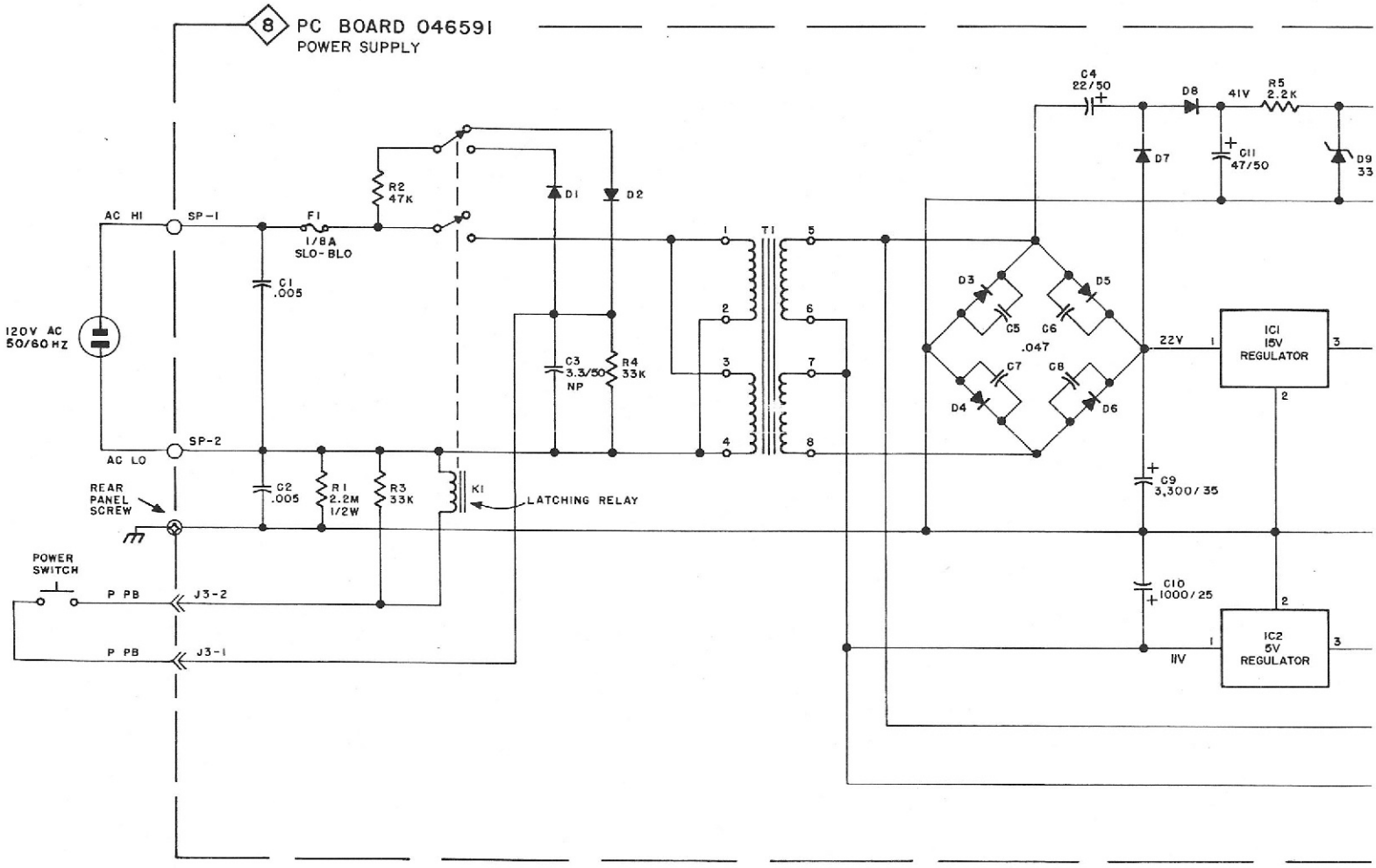
CIRCUIT SIDE (Only Section 7 Parts Symbol numbered)

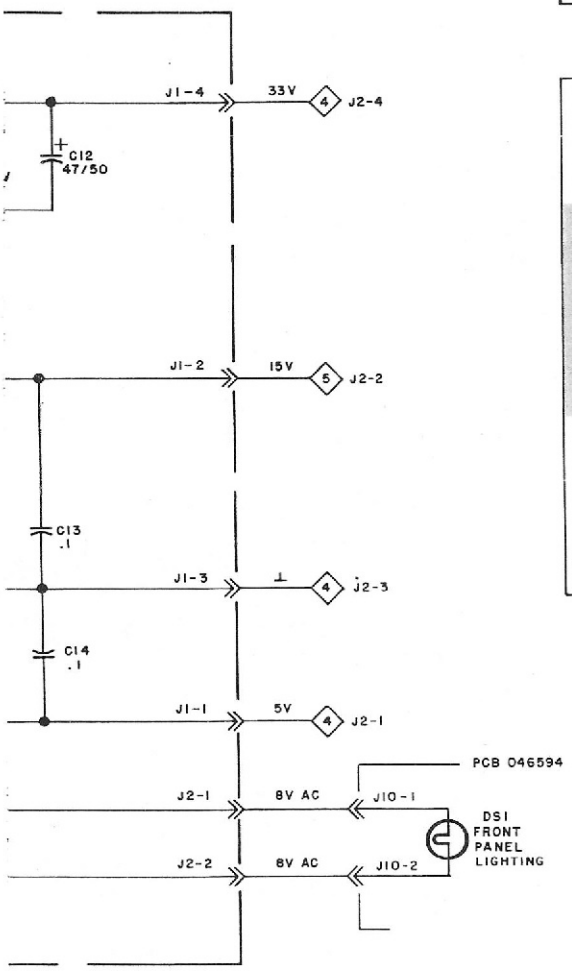


IC1

AUDIO PROCESSOR PARTS LIST

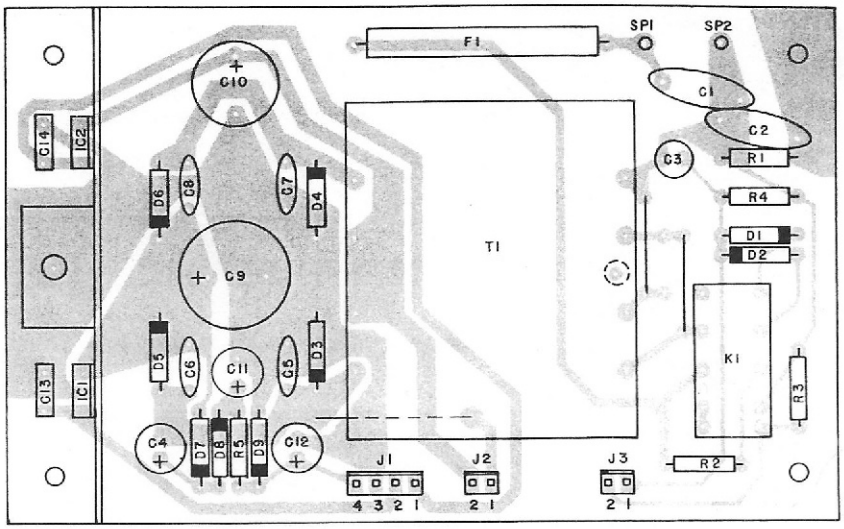
Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	133114	Audio Processor, TDA3810


8 PC BOARD 046591
POWER SUPPLY
120V AC 50/60 HZ
AC HI
AC LO
SP-1
SP-2
F1 1/8A SLO-BLO
C1 .005
R2 47K
D1
D2
T1
C3 3.3/50 NP
R4 33K
C2 .005
R1 2.2M 1/2W
R3 33K
K1
LATCHING RELAY
REAR PANEL SCREW
POWER SWITCH
P PB
J3-2
J3-1
C4 22/50
D8
41V
R5 2.2K
D7
C11 47/50
D9 33
D3
D5
C5
C6 .047
C7
C8
D4
D6
22V
IC1 15V REGULATOR
C9 3,300/35
C10 1000/25
11V
IC2 5V REGULATOR

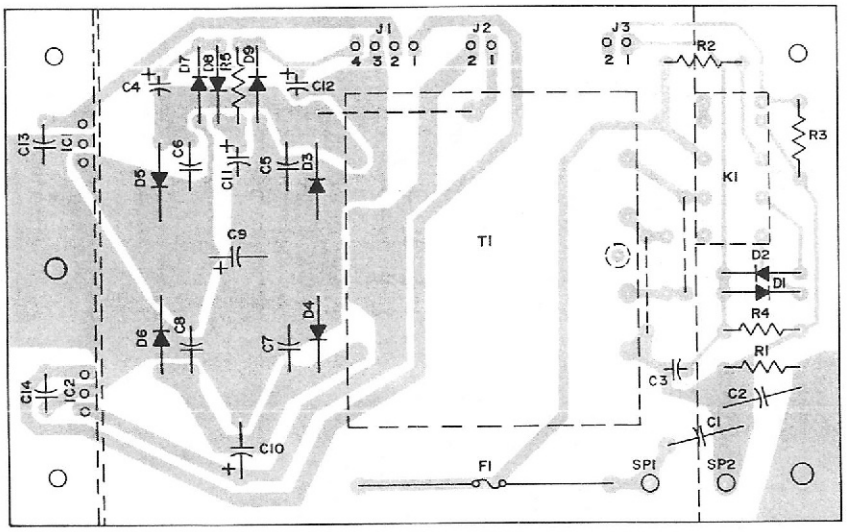


COMPONENT SIDE

TOP



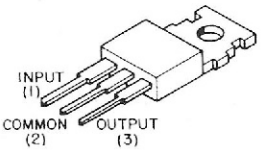
POWER SUPPLY PCB 046591



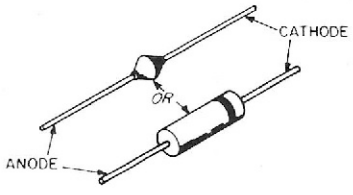
CIRCUIT SIDE

POWER SUPPLY PARTS LIST

Symbol No.	Part No.	Description
DIODES		
D1-D6	070131	RECT, 400V, 1A, 1N4004
D7-D8	070098	SIG, 175V, 500mW, FDH400
D9	070121	ZN, 33V, 5%, 500mW, IN5257B
FUSES		
F1	089046	Fuse, SB, ⅛A, 250V, Pigtail
INTEGRATED CIRCUITS		
IC1	133086	+15V Regulator, MC7815CT
IC2	133108	+5V Regulator, MC7805CT
RELAYS		
K1	087037	DPDT, 24VDC, Latching
TRANSFORMERS		
T1	159199	Power

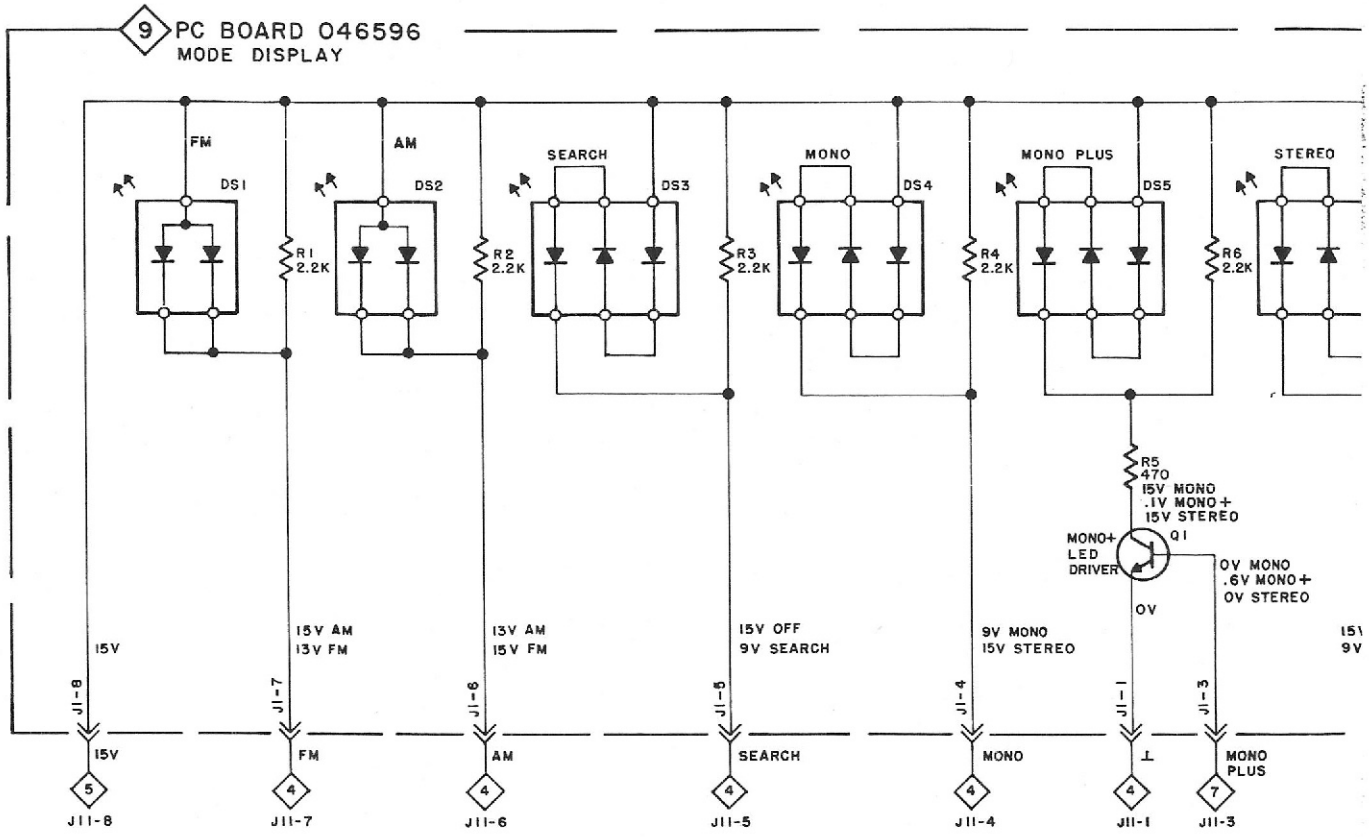


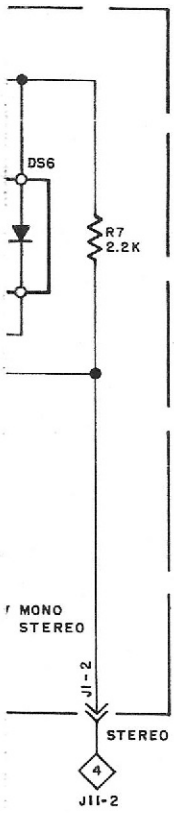
IC1, IC2



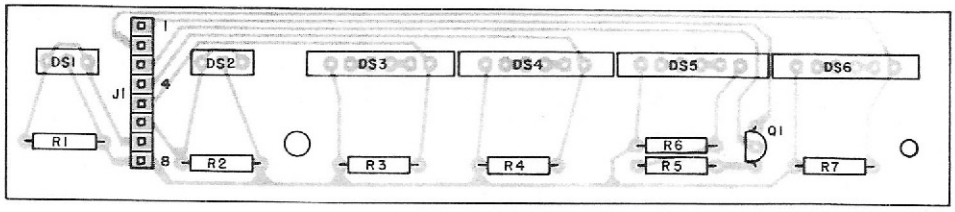
D1-D9

9 Mode Display

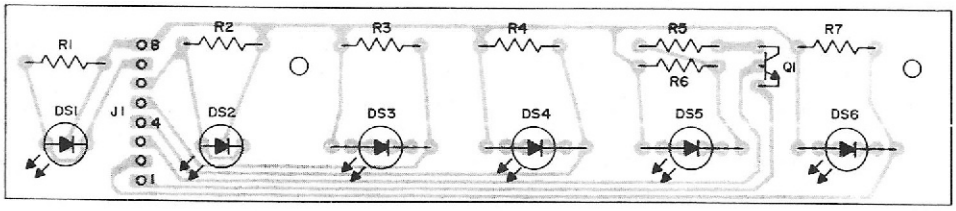




COMPONENT SIDE



MODE DISPLAY PCB 406596



CIRCUIT SIDE

MODE DISPLAY PARTS LIST

Symbol No.	Part No.	Description
LIGHTING DEVICES		
DS1, DS2	058103	LED, Green, Bar
DS3-DS6	058102	LED, Green, Bar
TRANSISTORS		
Q1	132223	NPN, MPS4124

Q1

Repacking Instructions

In the event it is necessary to return the MR7082 to McIntosh Laboratory for service, the unit must be packed exactly as shown below. It is not necessary to return the shelf brackets, although their position in the carton is shown.

The four plastic feet must be attached to the bottom of the MR7082 so they will locate in the four holes of the base pad.

If a shipping carton is needed, please call or write the Customer Service Department of McIntosh Laboratory.

Order using the part numbers on the accompanying list.

Use the original shipping carton only if all pads are in good serviceable condition.

QTY.	PART NO.	DESCRIPTION
1	033466	Shipping carton only
1	033331	Top pad
1	033330	Unit pad
1	033456	Base pad
1	033118	Inside carton
2	033332	Cushion pads
4	033333	Corner pads
4	017156	Plastic feet
1	046463	Shipping carton complete
4	101070	Screws for feet

SHIPPING CARTON ASSEMBLY