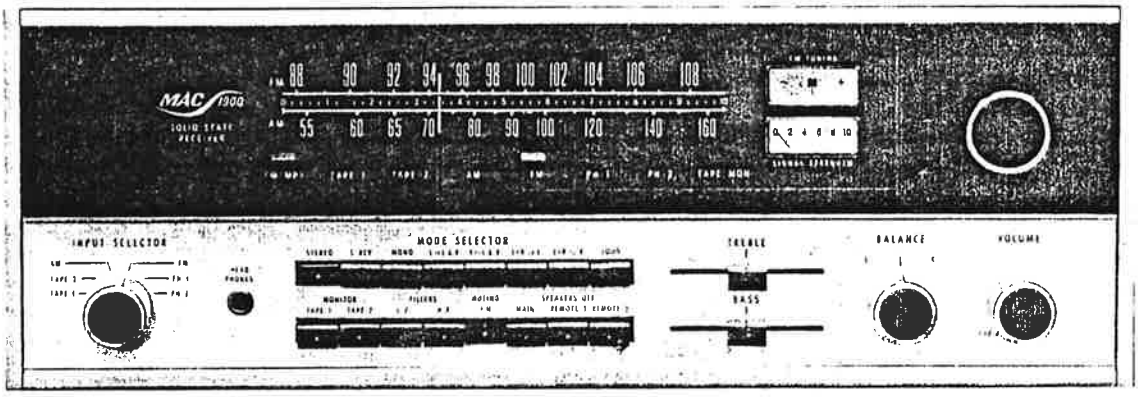
# McIntosh

# MAC 1900

## AM/FM SOLID STATE STEREO RECEIVER




# SERVICE INFORMATION

STARTING WITH SERIAL NO. 1X001

McINTOSH AUDIO DIVISION, 2 CHAMBERS STREET BINGHAMTON, NEW YORK

MAC 1900

MAC 1900

# PERFORMANCE LIMITS

## AM TUNER SECTION

SENSITIVITY

75µV IHF (external ant.)

SIGNAL TO NOISE RATIO

45dB IHF minimum; 55dB at 100% modulation.

HARMONIC DISTORTION

Does not exceed 1% at 30% modulation.

ADJACENT CHANNEL SELECTIVITY

30dB minimum IHF.

IMAGE REJECTION

65dB minimum, 540kHz - 1600kHz.

## FM TUNER SECTION

USEABLE SENSITIVITY

2.5 microvolts at 100% modulation (±75kHz deviation) for 3% total noise and harmonic distortion IHF.

SIGNAL TO NOISE RATIO

70dB below 100% modulation.

HARMONIC DISTORTION

Mono: Does not exceed 0.3% at 100% modulation ±75kHz deviation.

Stereo: Does not exceed 0.7%.

AUDIO FREQUENCY RESPONSE

±1dB 20Hz to 15,000Hz with standard de-emphasis (75µsec.) and 19,000Hz pilot filter.

SELECTIVITY

55dB alternate channel selectivity IHF minimum.

SPURIOUS REJECTION

90dB IHF minimum.

IMAGE REJECTION

80dB minimum.

STEREO SEPARATION

35dB at 1,000Hz.

SCA FILTER

50dB rejection from 67kHz to 74kHz. 275dB per octave slope.

## PREAMPLIFIER AND POWER AMPLIFIER SECTION

POWER OUTPUT

55 RMS watts continuous per channel into 4 or 8 ohms both channels operating.

30 RMS watts continuous per channel into 16 ohms both channels operating.

HARMONIC DISTORTION

Does not exceed 0.20% at rated power output from 20Hz to 20,000Hz with both channels operating. Typical performance is less than 0.1% at rated power. Distortion decreases as output power is reduced.

INTERMODULATION DISTORTION

Does not exceed 0.20% if instantaneous peak power output is twice rated power or less per channel with both channels operating for any combination of frequencies 20Hz to 20,000Hz.

DAMPING FACTOR

50 with 8 ohm load.

FREQUENCY RESPONSE

±0.5dB 20Hz through 20,000Hz.

INPUT SENSITIVITY AND IMPEDANCE

Phono 1 and Phono 2: 2.0mV, 47k ohms.
Tape 1 and Tape 2: 250mV, 250k ohms.
Power Amplifier: 2.5 volts, 100k ohms.

TOTAL NOISE

Phono Input: 76dB below 10mV input.
Tape Input: 90dB below rated output.
Power Amplifier: 95dB below rated output.

TAPE OUTPUT

Tuner: 1.0 volt.
Tape: 250mV with rated input from low level inputs.
Phono: 1.2 volts with 10mV input at 1,000Hz.

BASS CONTROLS

±16dB at 20Hz.

TREBLE CONTROLS

±16dB at 20,000Hz.

L.F. FILTER

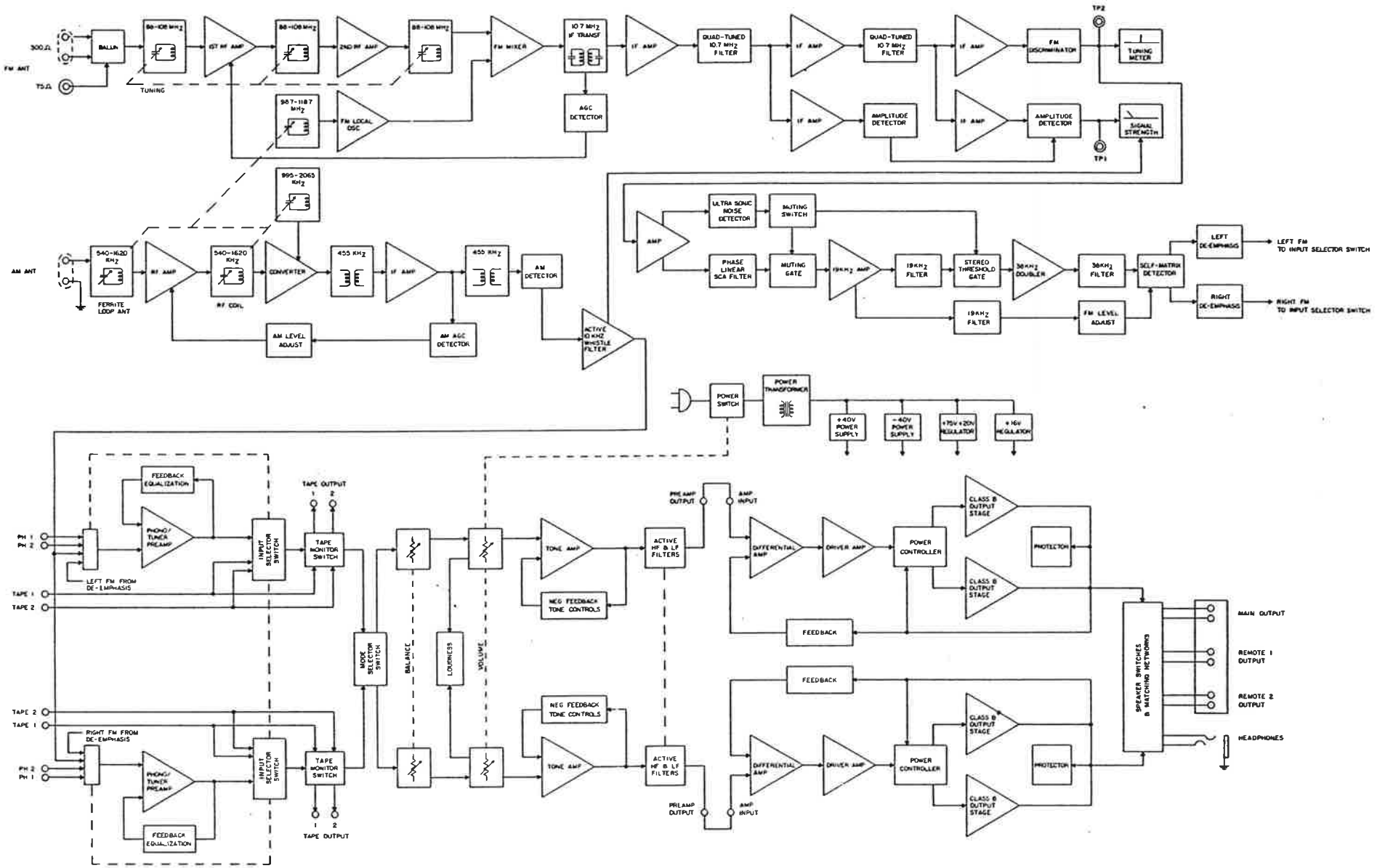
Active filter, 12dB per octave roll off below 50Hz, down 18dB at 20Hz.

H.F. FILTER

Active filter, 12dB per octave roll off above 7,000Hz, down 18dB at 20,000Hz.

POWER REQUIREMENT

120 volts, 50-60Hz, AC, 40 watts at zero signal output - 300 watts at rated power output.




MAC 1900 BLOCK DIAGRAM

# SCHEMATIC NOTES

1. Printed circuit board components are outlined on the schematics by dotted lines. The circled numbers on the dotted lines correspond to the numbers on the printed circuit board layouts.
2. The heavy lines on the schematics denote the primary signal path.
3. The terminal numbering of rotary switches is for reference only.
4. A dot on the rotor of a rotary switch indicates that there is an electrical connection between the front and rear rotor section.
5. Unless otherwise specified: Resistance values in the AM, FM & MPX, and Preamp sections are in ohms, 1/4 watt, and 10% tolerance; resistance values in the Power Output and Power Supply sections are in ohms, 1/2 watt, 10% tolerance; capacitance values smaller than 1 are in microfarads (μF); capacitance values greater than 1 are in picofarads (pF); inductors are in microhenries (μH).
6. All voltages indicated on the schematics are measured under the following conditions:

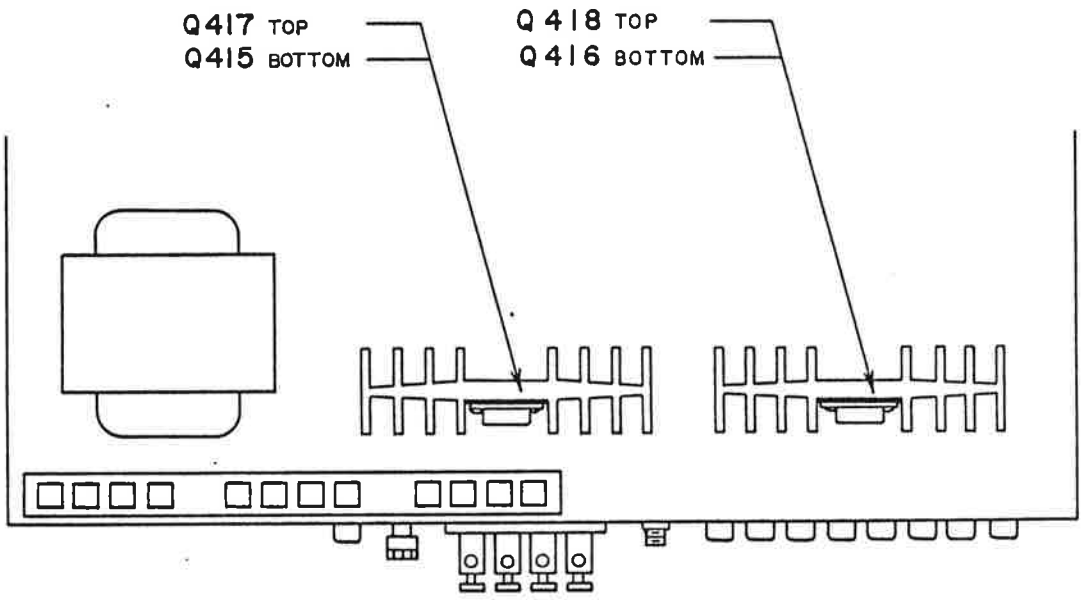
   Use of an 11 megohm input impedance VTVM. — All voltages ±10% with respect to ground.

   No signal at antenna or other input terminals. — AC input at 120 volts, 50/60 Hz.

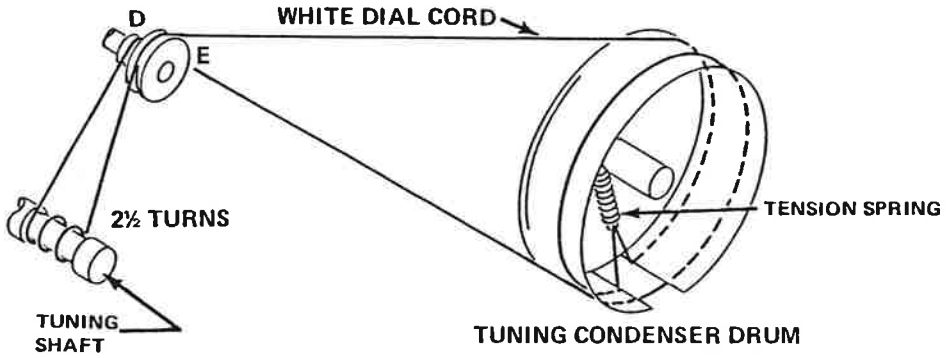
   Front panel controls at:

| | | | |
|---|---|---|---|
| Stereo switch | In | Muting | Out |
| Speaker switches | Out | Filters | Out |
| Volume control | Max | Loudness | Out |
| Balance control | Zero | Tape Monitors | Out |
| Tone controls | Flat | Tuning Indicator | 100MHz (no signal) |
| Input selector | FM (to measure FM section)<br>AM (to measure AM section) | | |

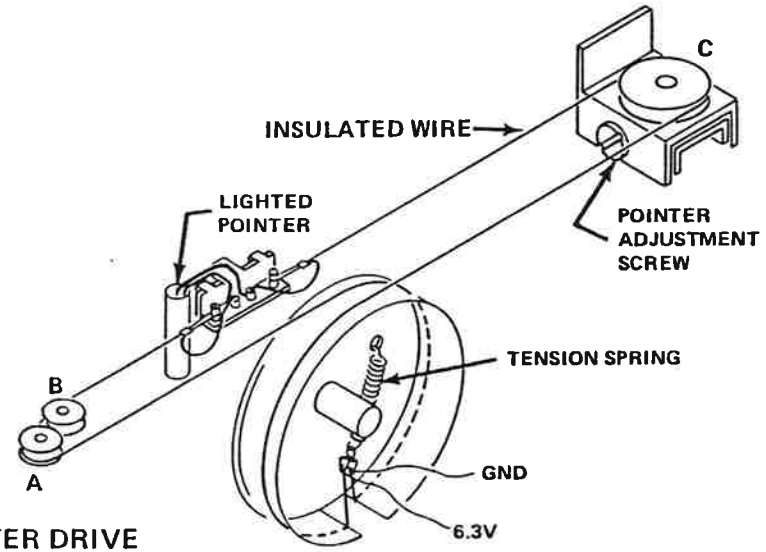
7. In units with Serial No.'s below 1X050, R230 is not used.
8. In units with Serial No.'s below 1X168: R143, R144, R225 are used; and C108 is 100μF 25V.
9. In units with Serial No.'s below 1X177, R516 is not used.
10. In units with Serial No.'s below 1X365, R145 is 47k.
11. In units with Serial No.'s below 1X285: R115 and R116 are 10k; R114 is used, and R116 is connected as shown by dotted line.




LOCATION OF TRANSISTORS NOT ON PC BOARD




## TUNING CONDENSER DRIVE



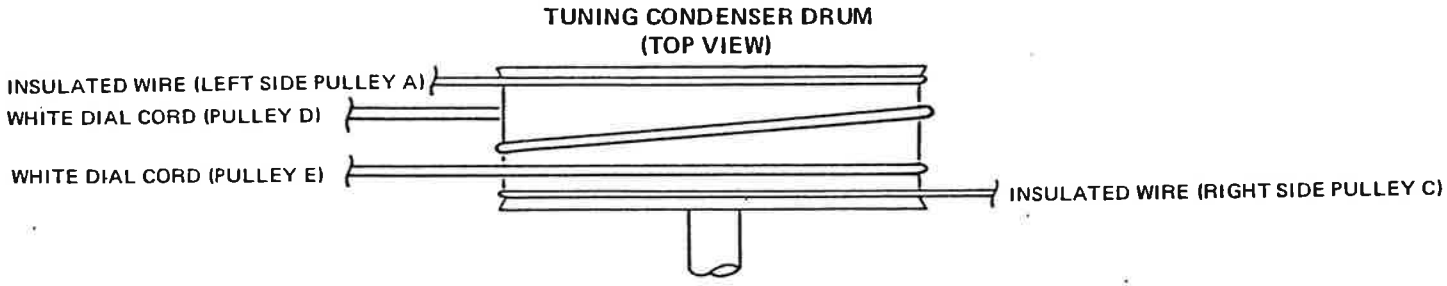

## POINTER DRIVE

Step 1 Before stringing unit, turn pointer adjustment screw until pulley "C" is in the center of its travel.

Step 2 String unit as shown.

Step 3 After stringing unit, turn tuning shaft until pointer is as far to the left as it will go. Turn the pointer adjustment screw until the pointer coincides with the zero bar of the logging scale.

Step 4 Turn the tuning knob making the pointer move back and forth from one end of the dial scale to the other. Return pointer to the far left and, if necessary, re-adjust pointer position.

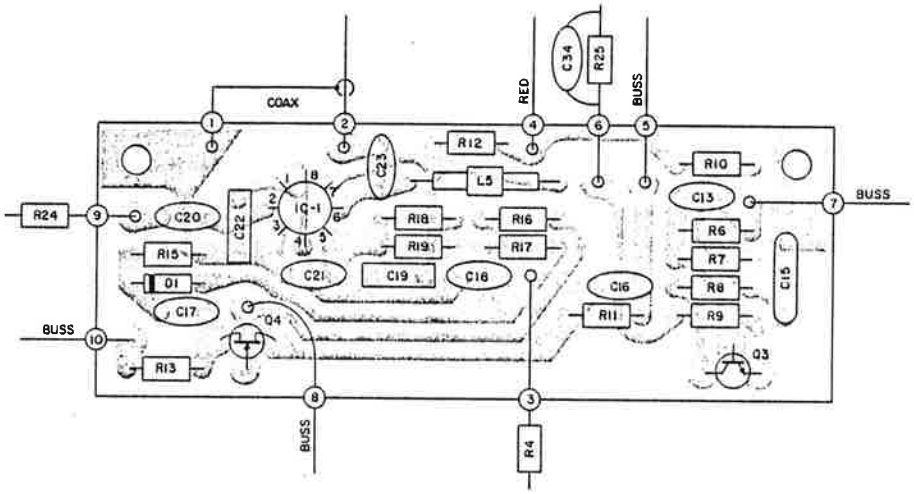



## DIAL CORD SEQUENCE

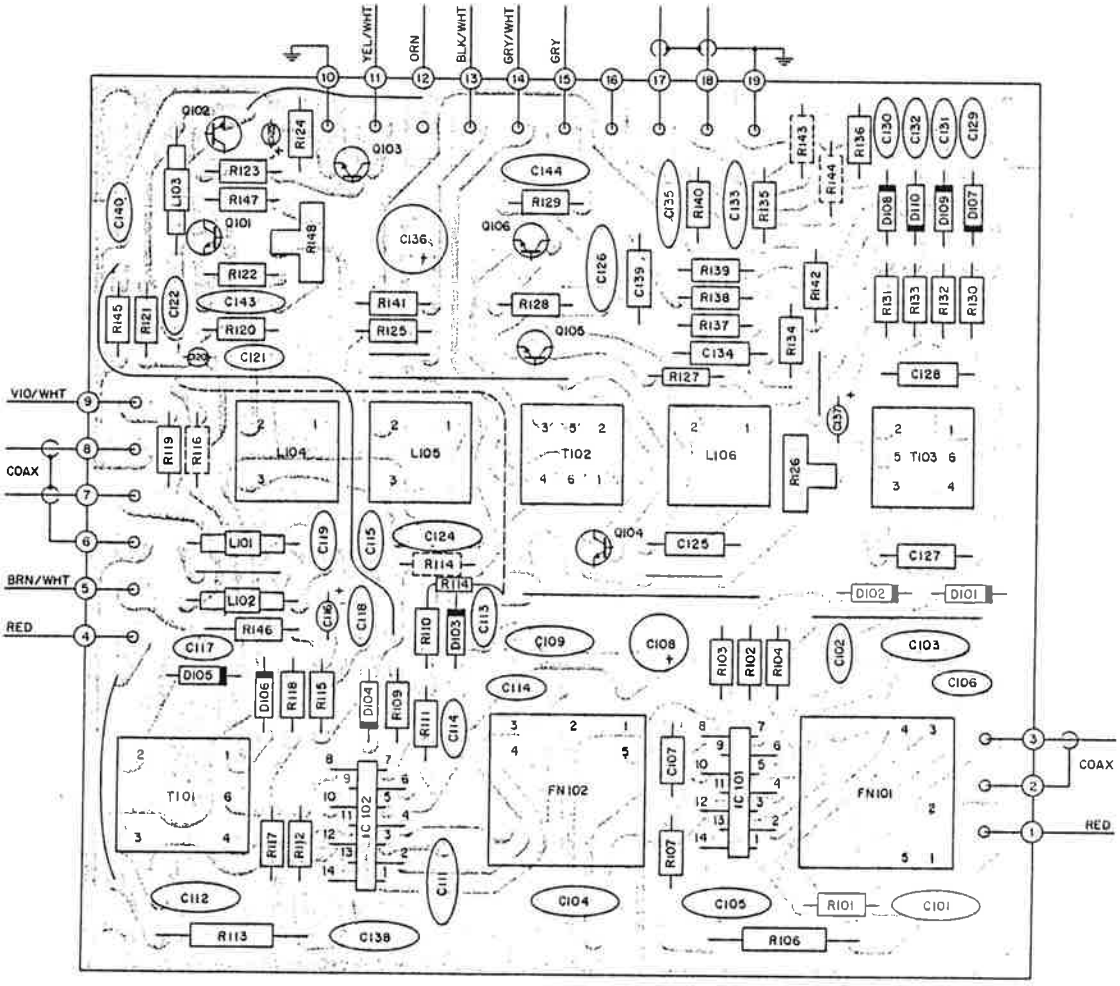
# DIAL STRINGING

MAC 1900

## MIXER & L.O. PC BOARD 044-184

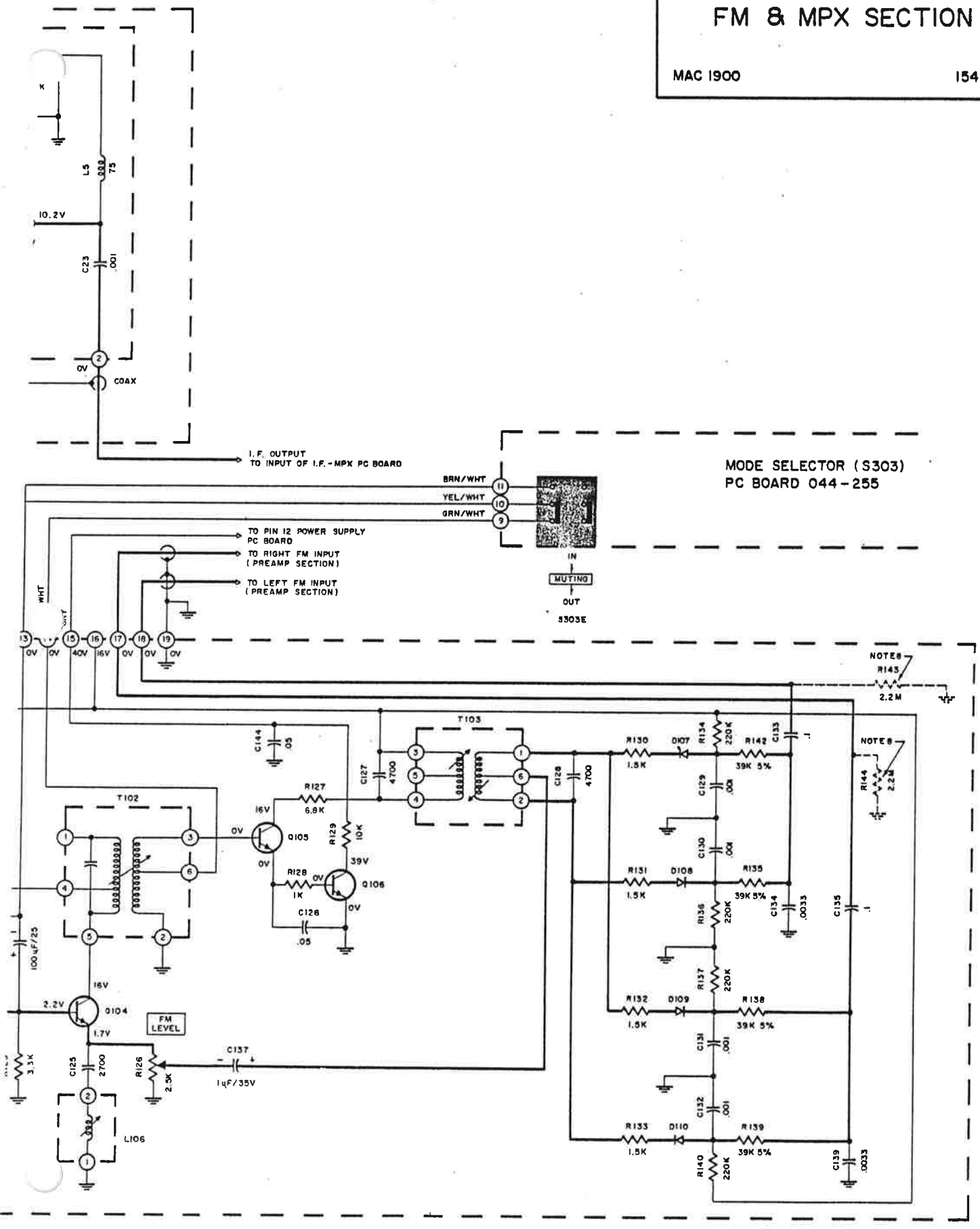


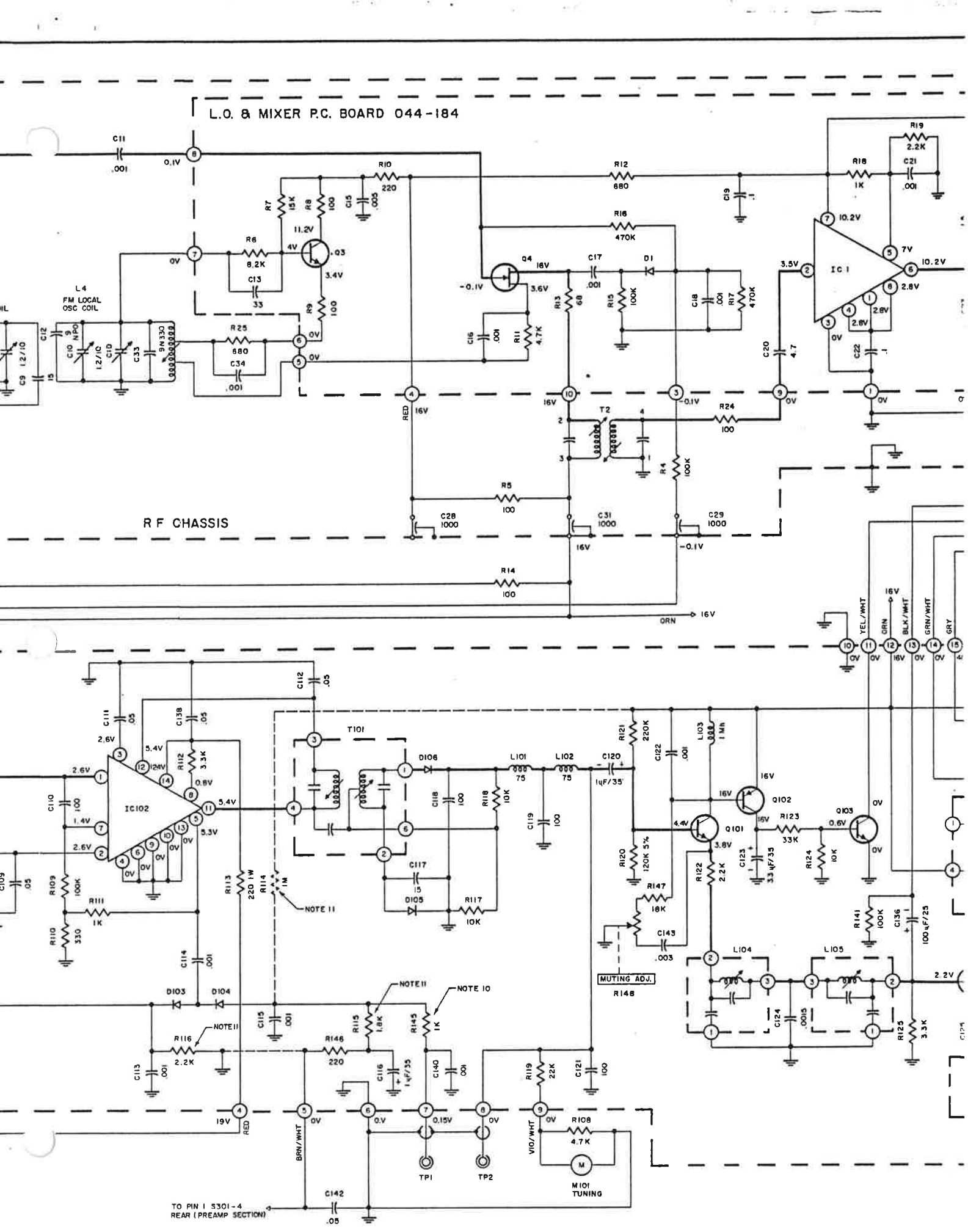

## IF & MPX PC BOARD 044-185

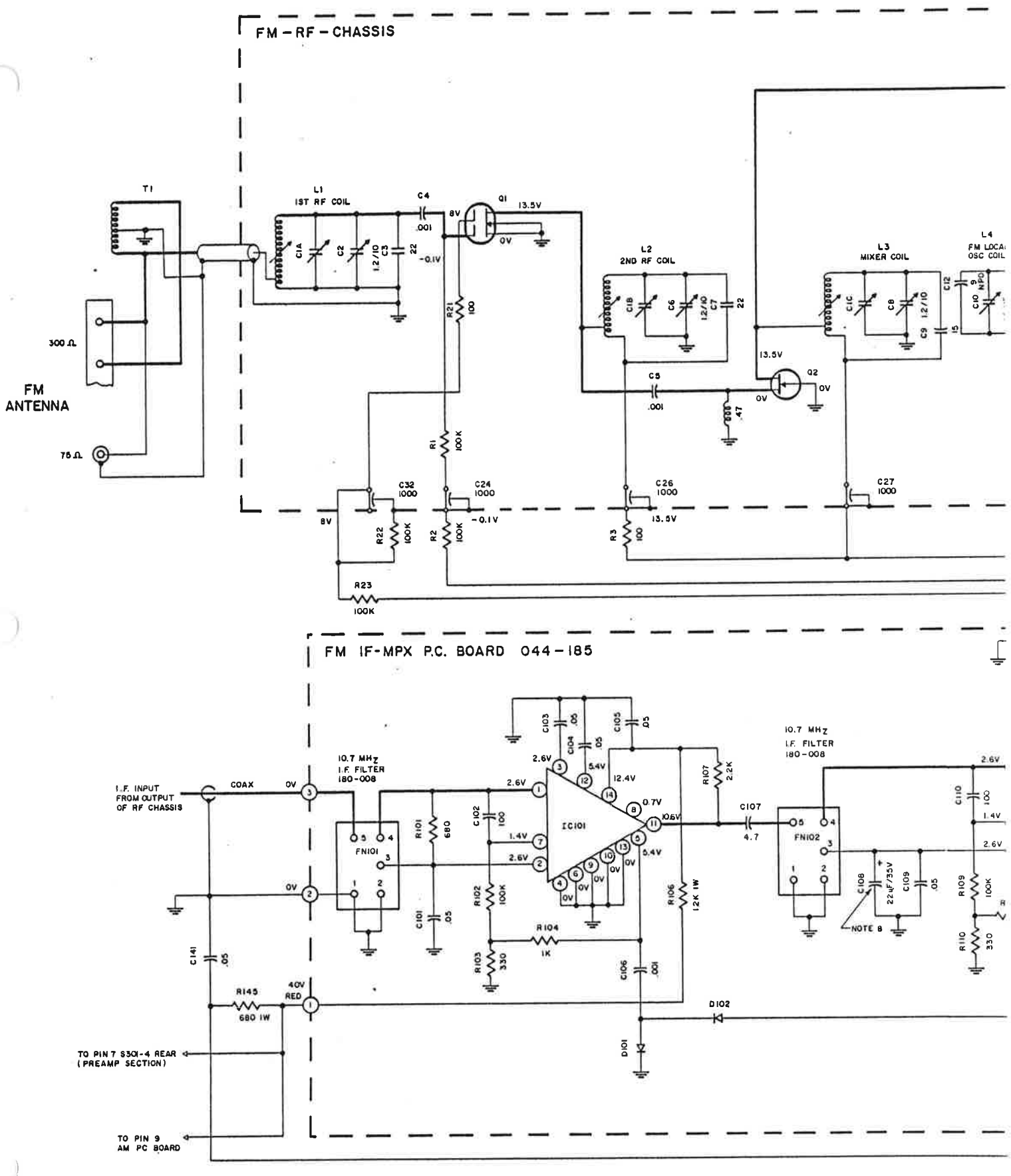


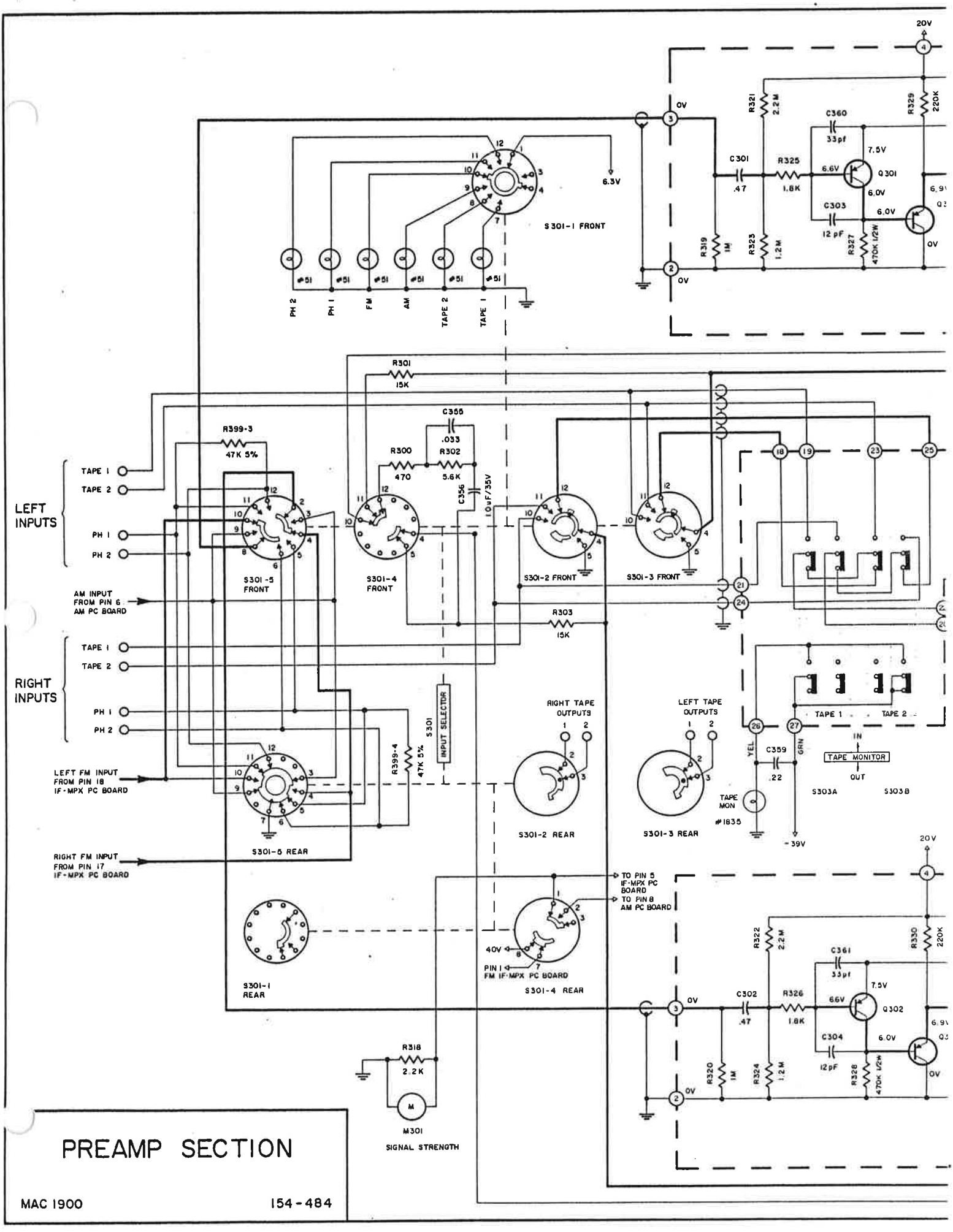
# FM & MPX SECTION

MAC 1900 154-485




L.O. & MIXER P.C. BOARD 044-184
R F CHASSIS
L4
FM LOCAL
OSC COIL
IC 1
IC102
Q1
Q2
Q3
Q4
Q101
Q102
Q103
T2
T101
D1
D103
D104
D105
D106
TP1
TP2
M101
TUNING
MUTING ADJ.
R148
NOTE 10
NOTE 11
TO PIN 1 S301-4
REAR (PREAMP SECTION)
YEL/WHT
ORN
BLK/WHT
GRN/WHT
GRY
BRN/WHT
VIO/WHT
RED

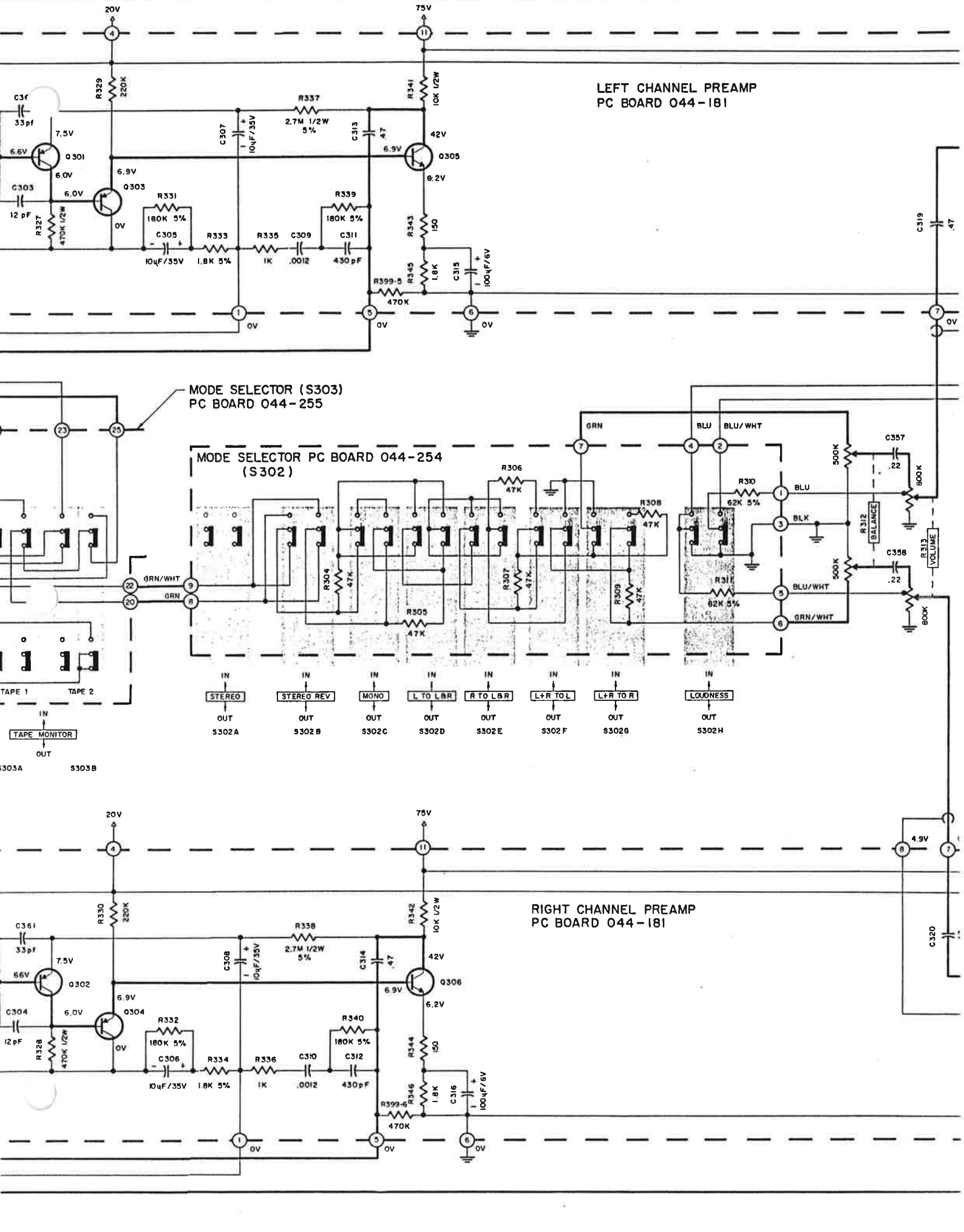

FM – RF – CHASSIS
T1
300 Ω
FM ANTENNA
75 Ω
L1
1ST RF COIL
C1A
C2
1.2/10
C3
22
C4
.001
-0.1V
8V
Q1
13.5V
0V
R21
100
R1
100K
L2
2ND RF COIL
C1B
C6
1.2/10
C7
22
C5
.001
.47
L3
MIXER COIL
C1C
C8
1.2/10
C9
15
C12
9
NPO
C10
L4
FM LOCA
OSC COIL
13.5V
Q2
0V
C32
1000
C24
1000
C26
1000
C27
1000
8V
-0.1V
13.5V
R22
100K
R2
100K
R3
100
R23
100K
FM IF-MPX P.C. BOARD 044-185
10.7 MHz
I.F. FILTER
180-008
I.F. INPUT
FROM OUTPUT
OF RF CHASSIS
COAX
0V
FN101
R101
680
C102
100
C101
.05
R102
100K
R103
330
R104
1K
C106
.001
IC101
2.6V
5.4V
12.4V
0.7V
10.6V
1.4V
R107
2.2K
R106
1.2K 1W
C107
4.7
FN102
10.7 MHz
I.F. FILTER
180-008
C110
100
C108
22μF/35V
C109
.05
R109
100K
R110
330
NOTE 8
C103
.05
C104
.05
C105
.05
C141
.05
R145
680 1W
40V
RED
D102
D101
TO PIN 7 S301-4 REAR
(PREAMP SECTION)
TO PIN 9
AM PC BOARD

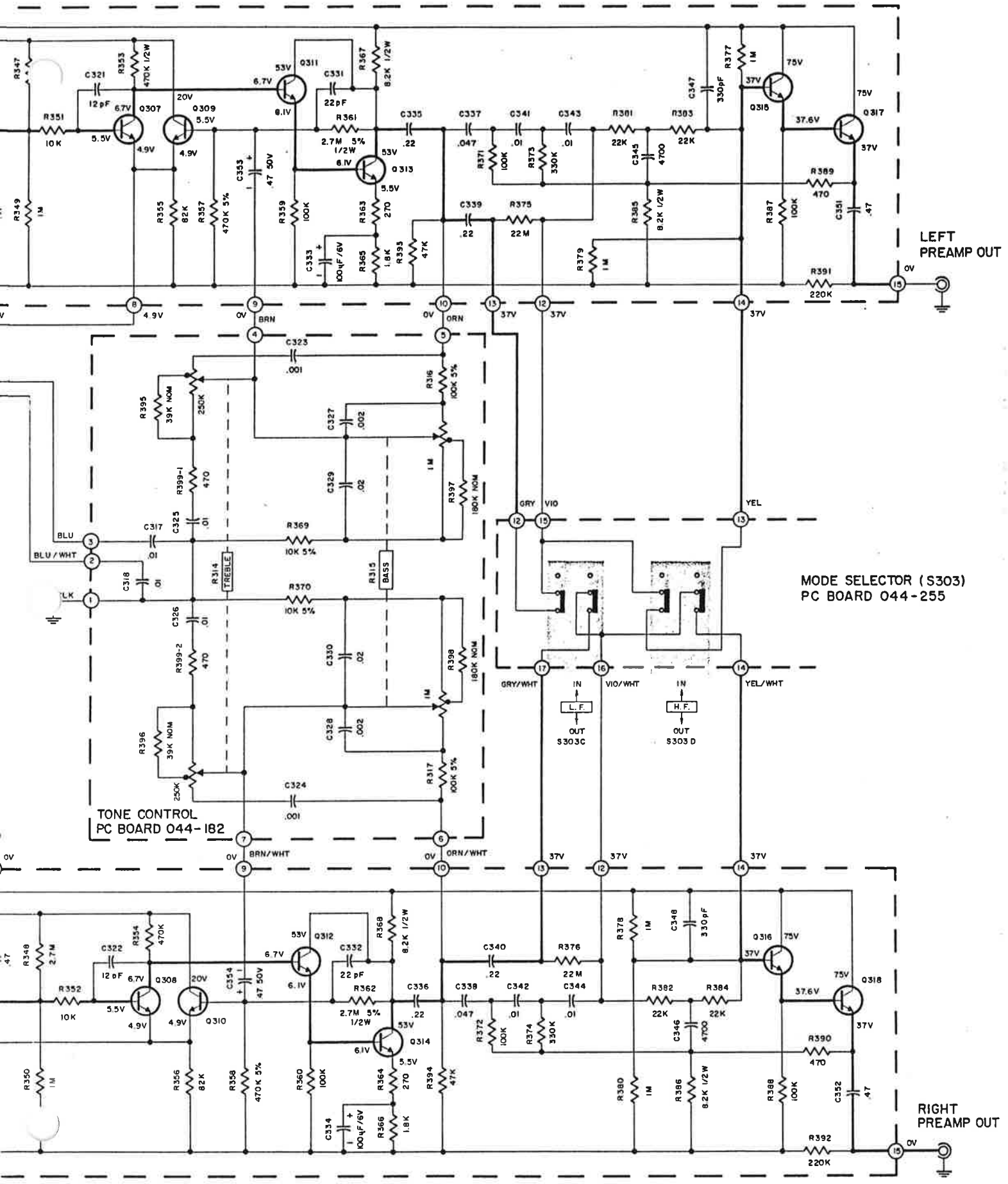



# PREAMP SECTION

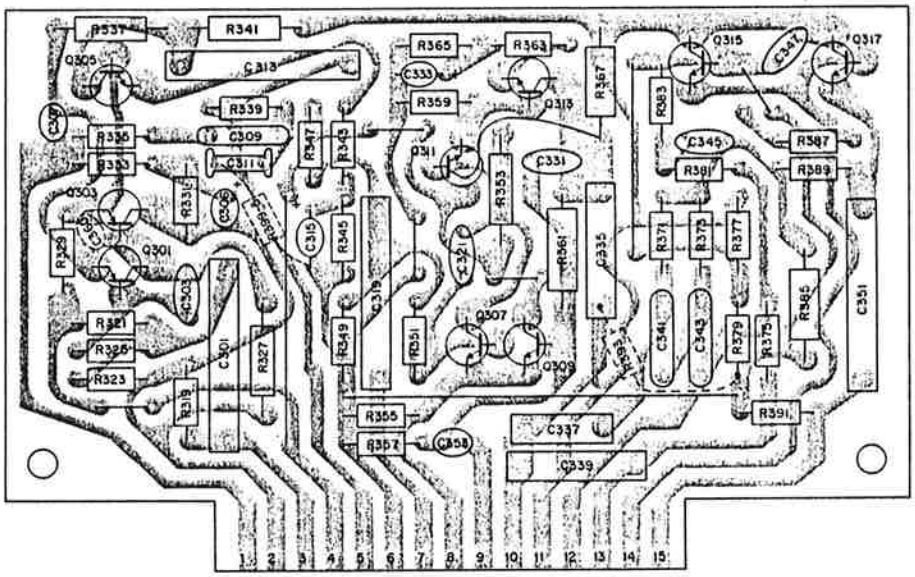
MAC 1900

154-484

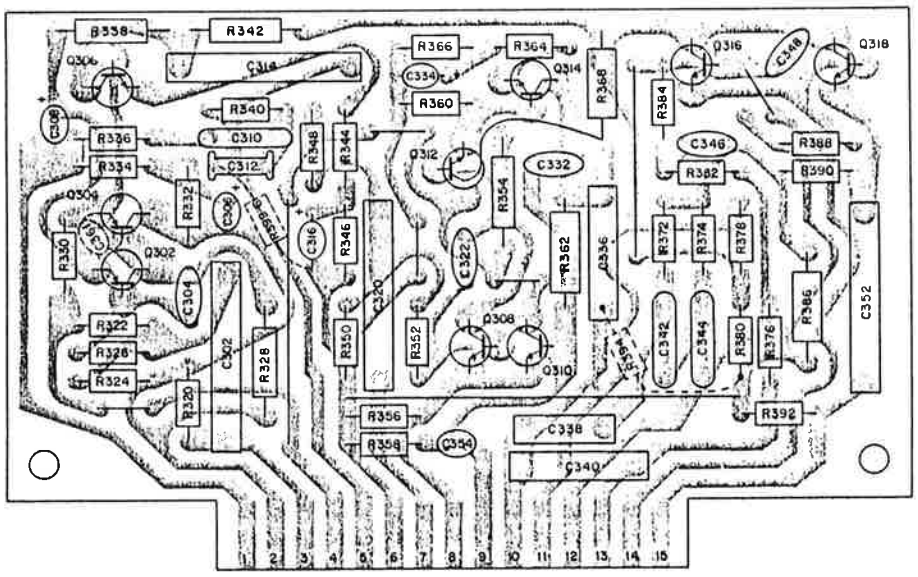

LEFT CHANNEL PREAMP
PC BOARD 044-181
MODE SELECTOR (S303)
PC BOARD 044-255
MODE SELECTOR PC BOARD 044-254
(S302)
RIGHT CHANNEL PREAMP
PC BOARD 044-181
20V
75V
0V
GRN
BLU
BLU/WHT
GRN/WHT
BLK
TAPE 1
TAPE 2
TAPE MONITOR
STEREO
STEREO REV
MONO
L TO L&R
R TO L&R
L+R TO L
L+R TO R
LOUDNESS
S302A
S302B
S302C
S302D
S302E
S302F
S302G
S302H
S303A
S303B
BALANCE
VOLUME

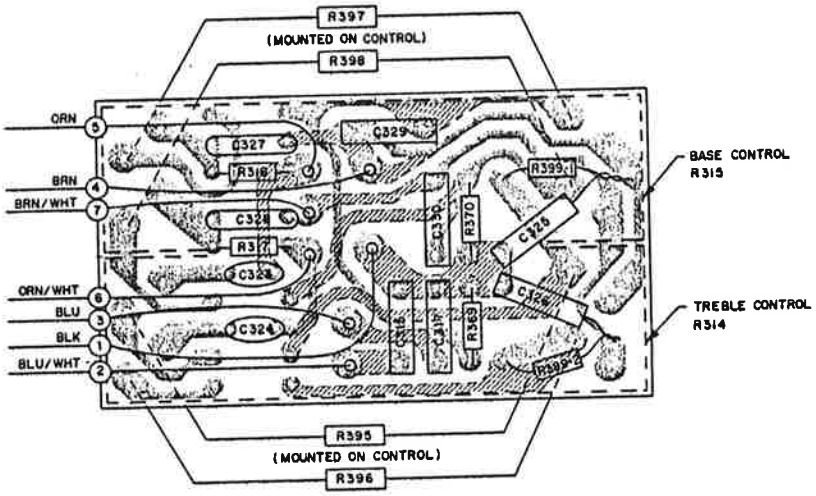

LEFT PREAMP OUT
RIGHT PREAMP OUT
MODE SELECTOR (S303)
PC BOARD 044-255
TONE CONTROL
PC BOARD 044-182
TREBLE
BASS
BLU
BLU/WHT
BRN
BRN/WHT
ORN
ORN/WHT
GRY
VIO
YEL
GRY/WHT
VIO/WHT
YEL/WHT
IN
L.F.
H.F.
OUT
S303C
S303D
Q307
Q308
Q309
Q310
Q311
Q312
Q313
Q314
Q316
Q317
Q318
R347
R348
R349
R350
R351
R352
R353
R354
R355
R356
R357
R358
R359
R360
R361
R362
R363
R364
R365
R366
R367
R368
R369
R370
R371
R372
R373
R374
R375
R376
R377
R378
R379
R380
R381
R382
R383
R384
R385
R386
R387
R388
R389
R390
R391
R392
R393
R394
R395
R396
R397
R398
R399-1
R399-2
C317
C318
C321
C322
C323
C324
C325
C326
C327
C328
C329
C330
C331
C332
C333
C334
C335
C336
C337
C338
C339
C340
C341
C342
C343
C344
C345
C346
C347
C348
C351
C352
C353
C354
4.9V
5.5V
6.1V
6.7V
20V
37V
37.6V
75V
0V

LEFT CHANNEL PREAMP PC BOARD 044-181

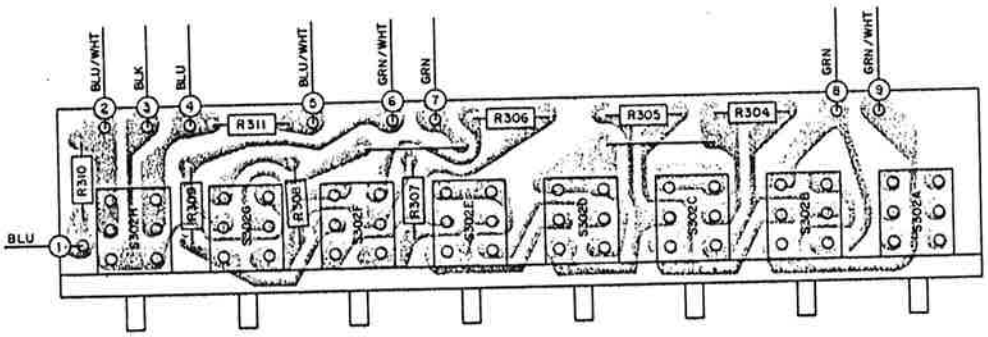



RIGHT CHANNEL PREAMP PC BOARD 044-181

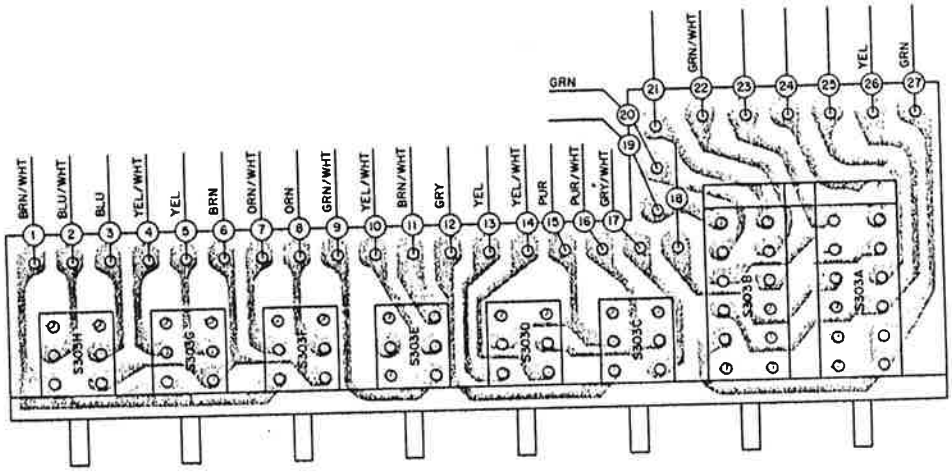




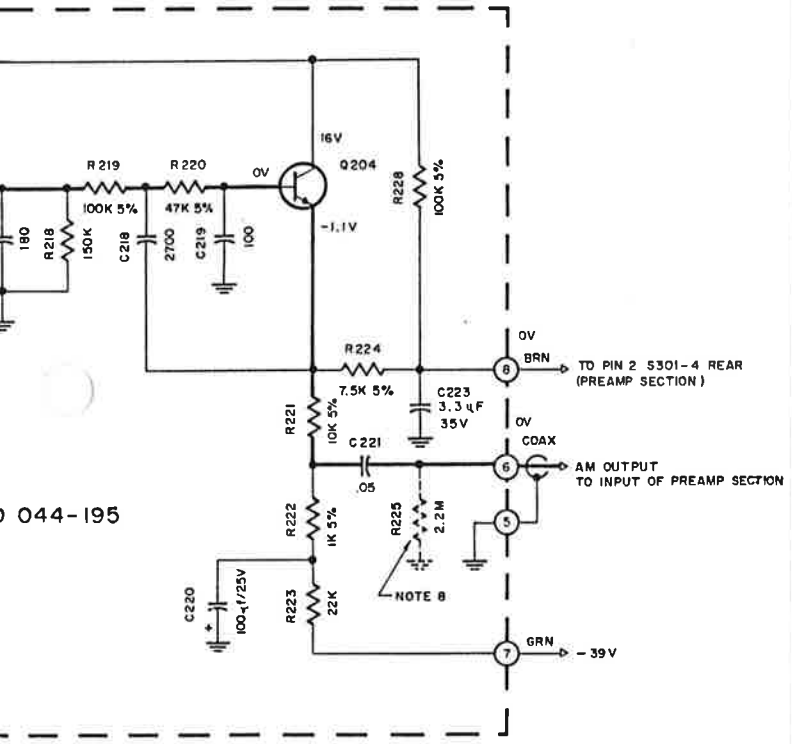

TONE CONTROL PC BOARD 044-182



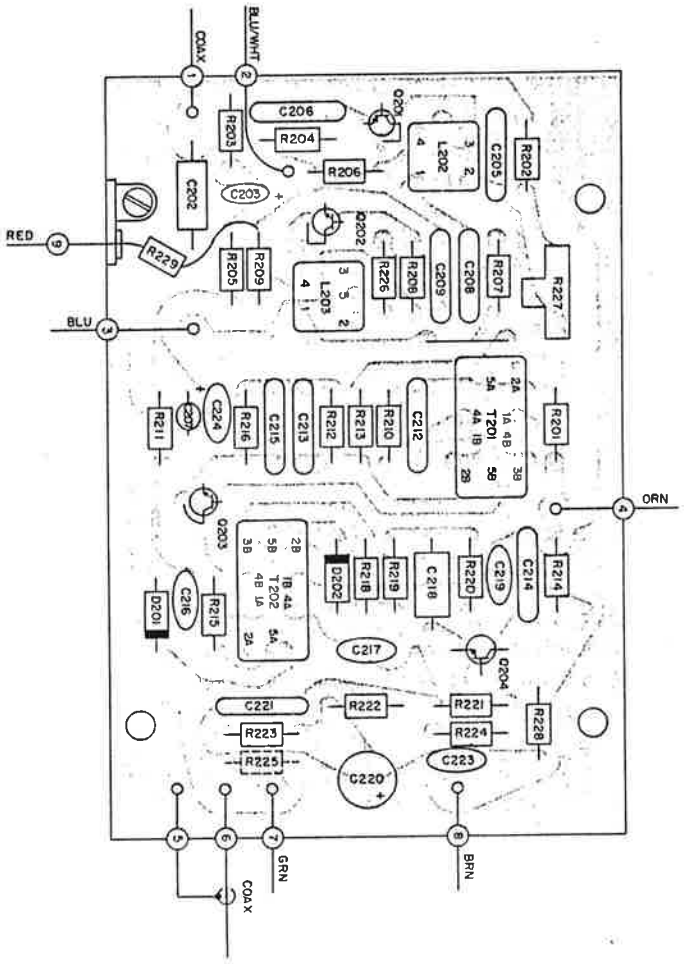

MODE SELECTOR (S302) PC BOARD 044-254




MODE SELECTOR (S303) PC BOARD 044-255

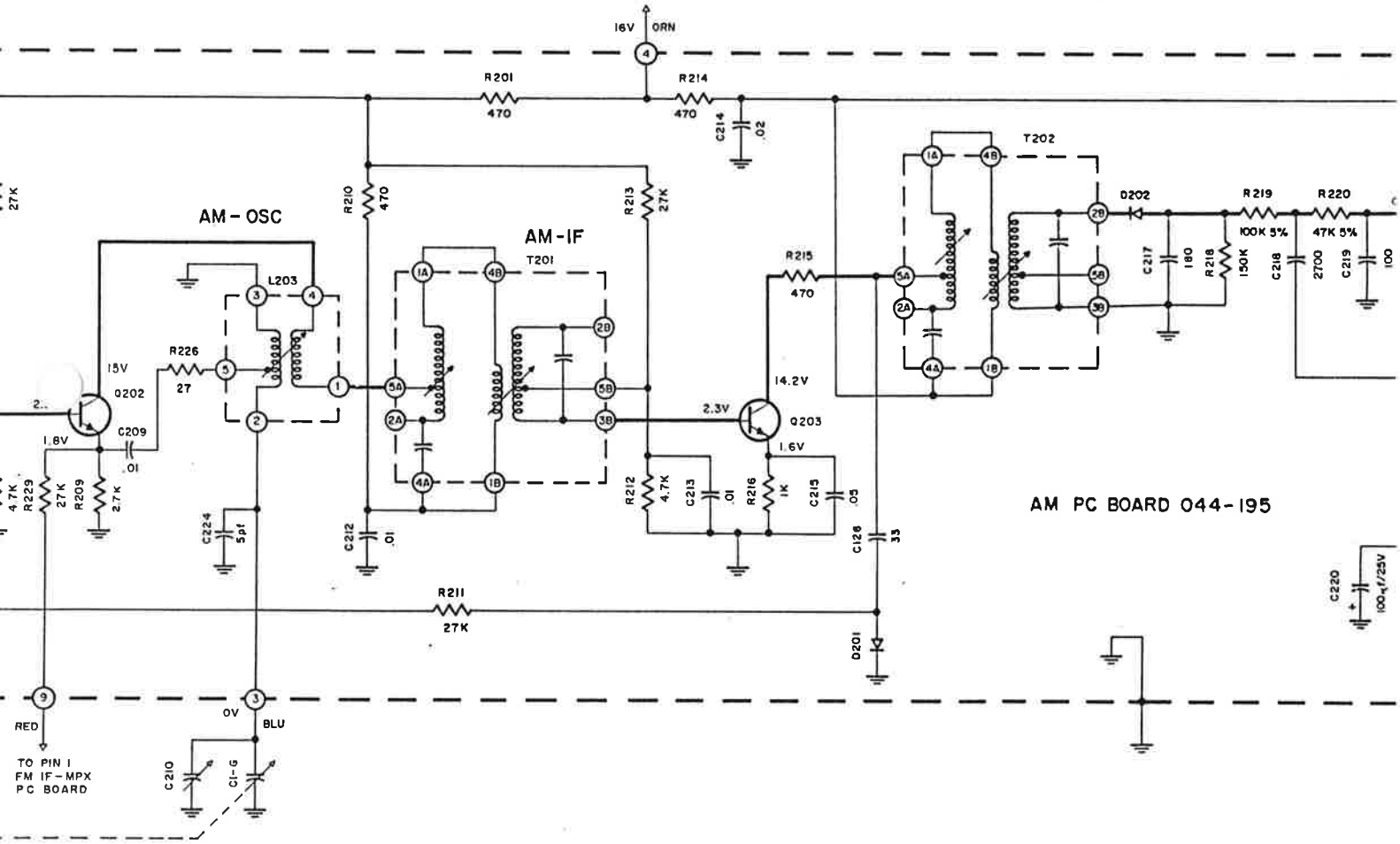


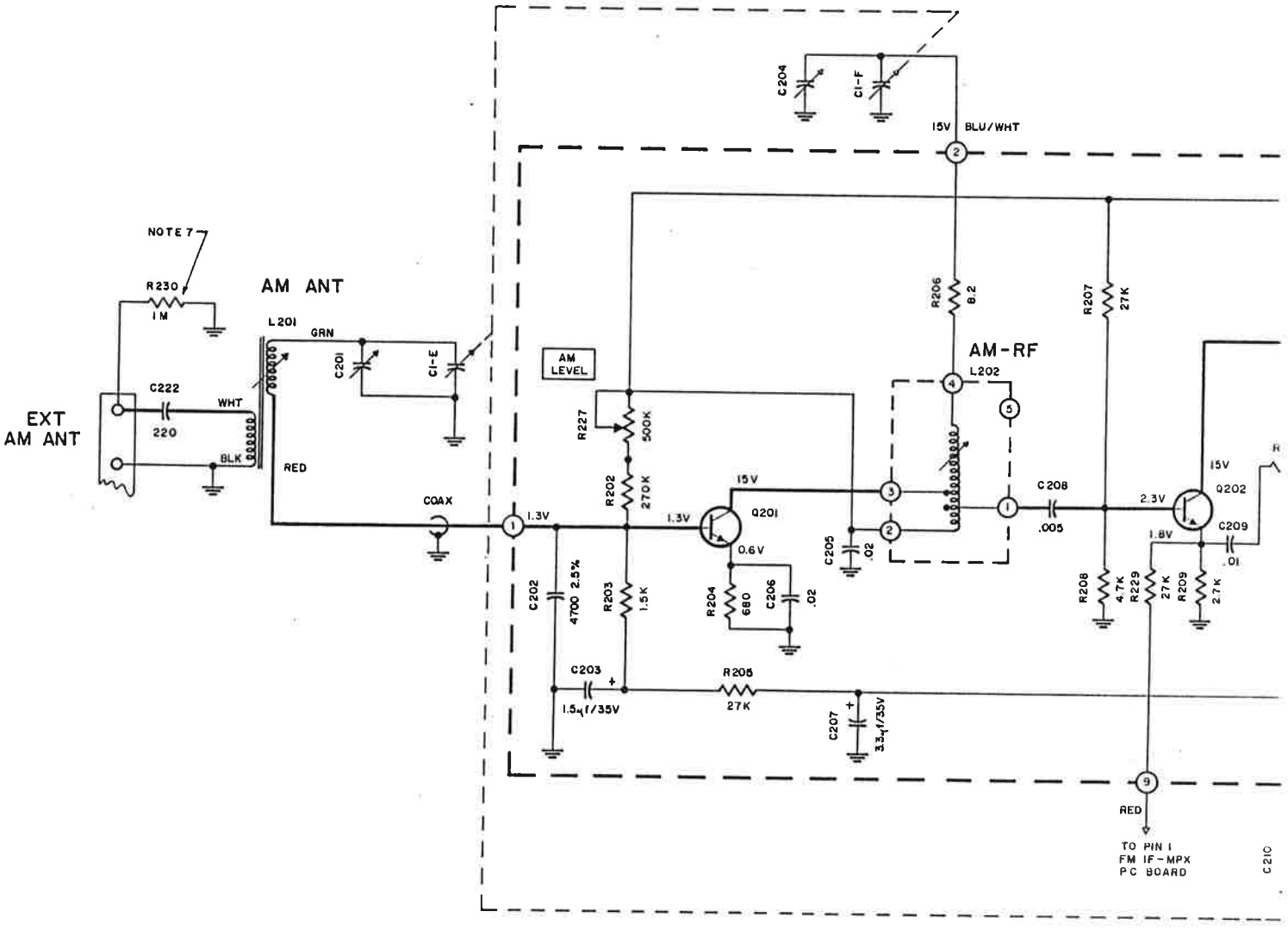

AM PC BOARD 044-195

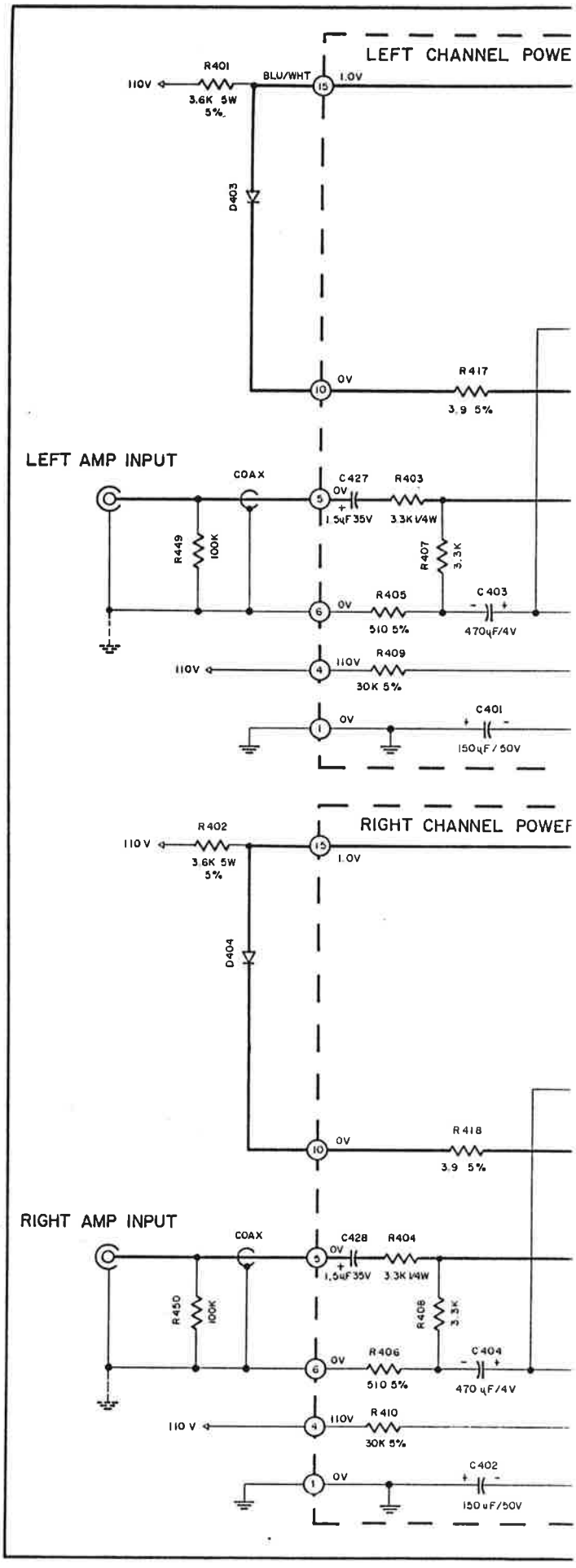



# AM SECTION

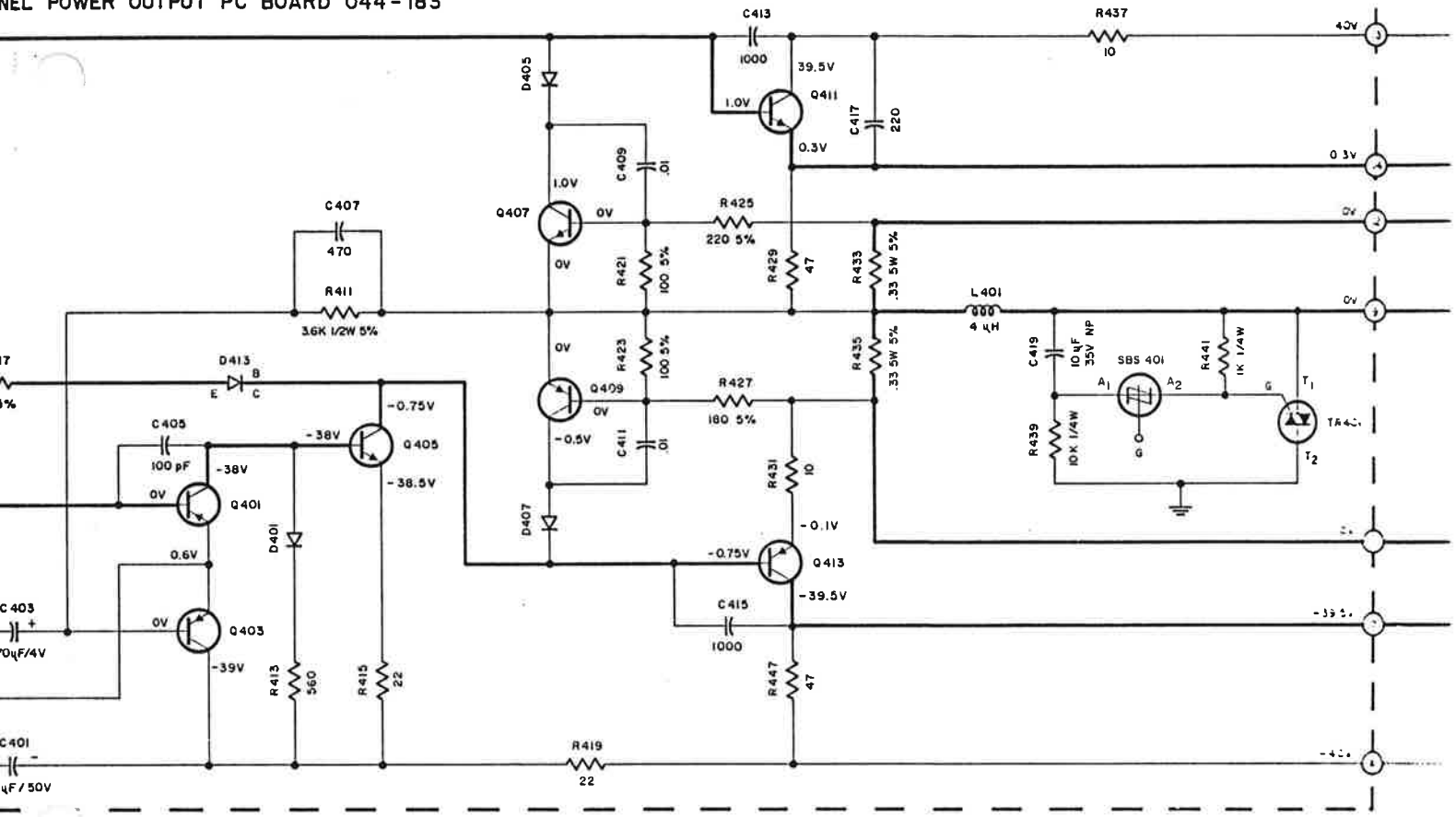
MAC 1900 154-483


16V ORN
4
R201
470
R214
470
C214
.02
T202
1A
4B
5A
2A
4A
1B
2B
5B
3B
3A
5B
3B
Q202
R219
100K 5%
R220
47K 5%
C217
180
R218
150K
C218
2700
C219
100
AM - OSC
AM - IF
T201
L203
R210
470
R213
27K
R215
470
15V
R226
27
Q202
14.2V
2.3V
Q203
1.6V
C209
.01
1.8V
R229
47K
R209
27K
2.7K
C224
5pf
C212
.01
R212
4.7K
C213
.01
R216
1K
C215
.05
C126
33
AM PC BOARD 044-195
C220
100μf/25V
R211
27K
D201
9
RED
TO PIN 1
FM IF-MPX
PC BOARD
3
0V
BLU
C210
C1-G

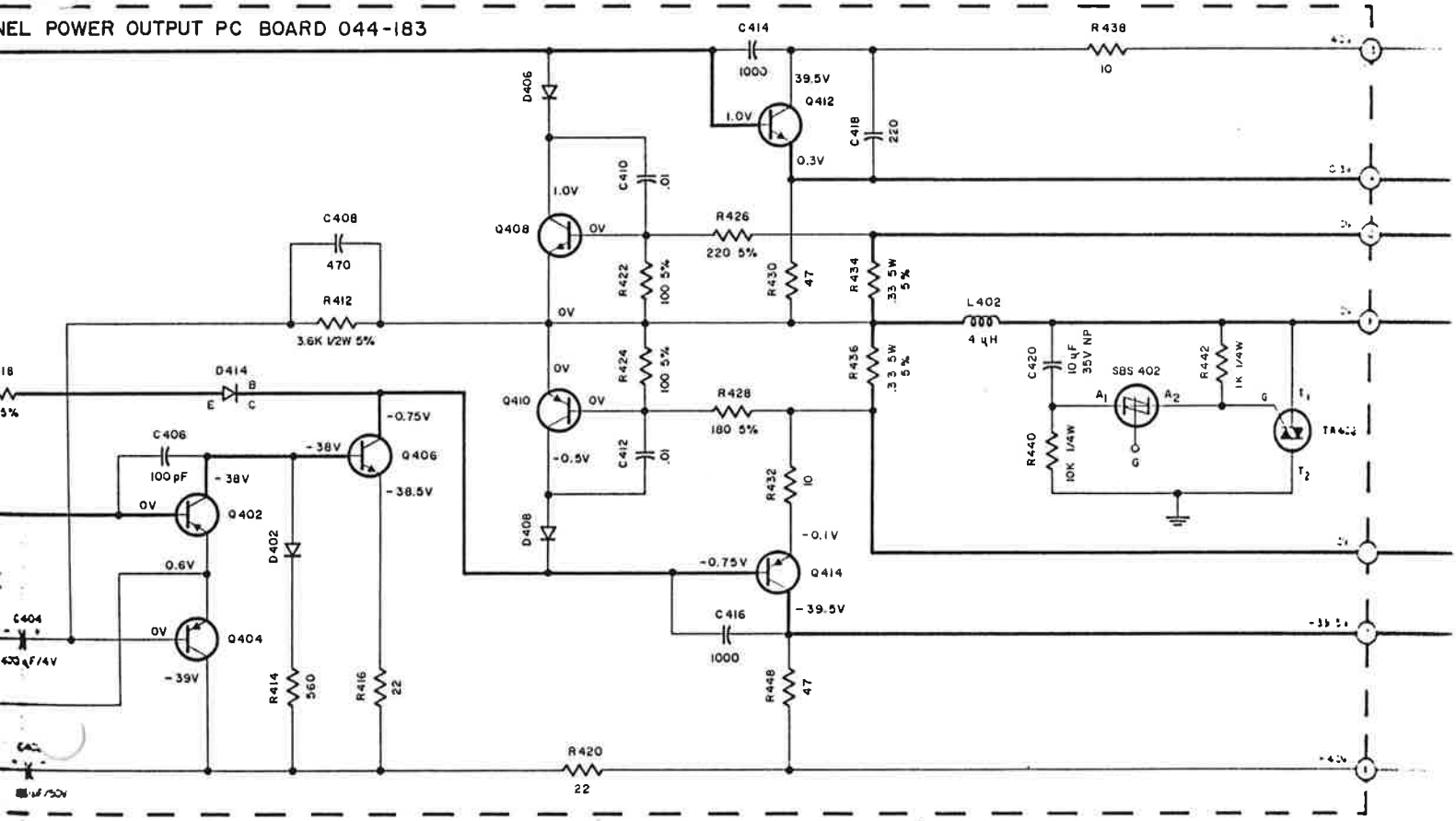

C204
C1-F
15V BLU/WHT
NOTE 7
R230
1M
AM ANT
L201
GRN
C201
C1-E
EXT
AM ANT
C222
220
WHT
BLK
RED
COAX
AM LEVEL
R227
500K
R202
270K
1.3V
Q201
15V
0.6V
R204
680
C206
.02
C205
.02
C202
4700 2.5%
R203
1.5K
C203
1.5µf/35V
R205
27K
C207
3.3µf/35V
R206
8.2
AM-RF
L202
R207
27K
C208
.005
2.3V
Q202
15V
1.8V
C209
.01
R208
4.7K
R229
27K
R209
2.7K
RED
TO PIN 1
FM IF-MPX
P.C. BOARD
C210

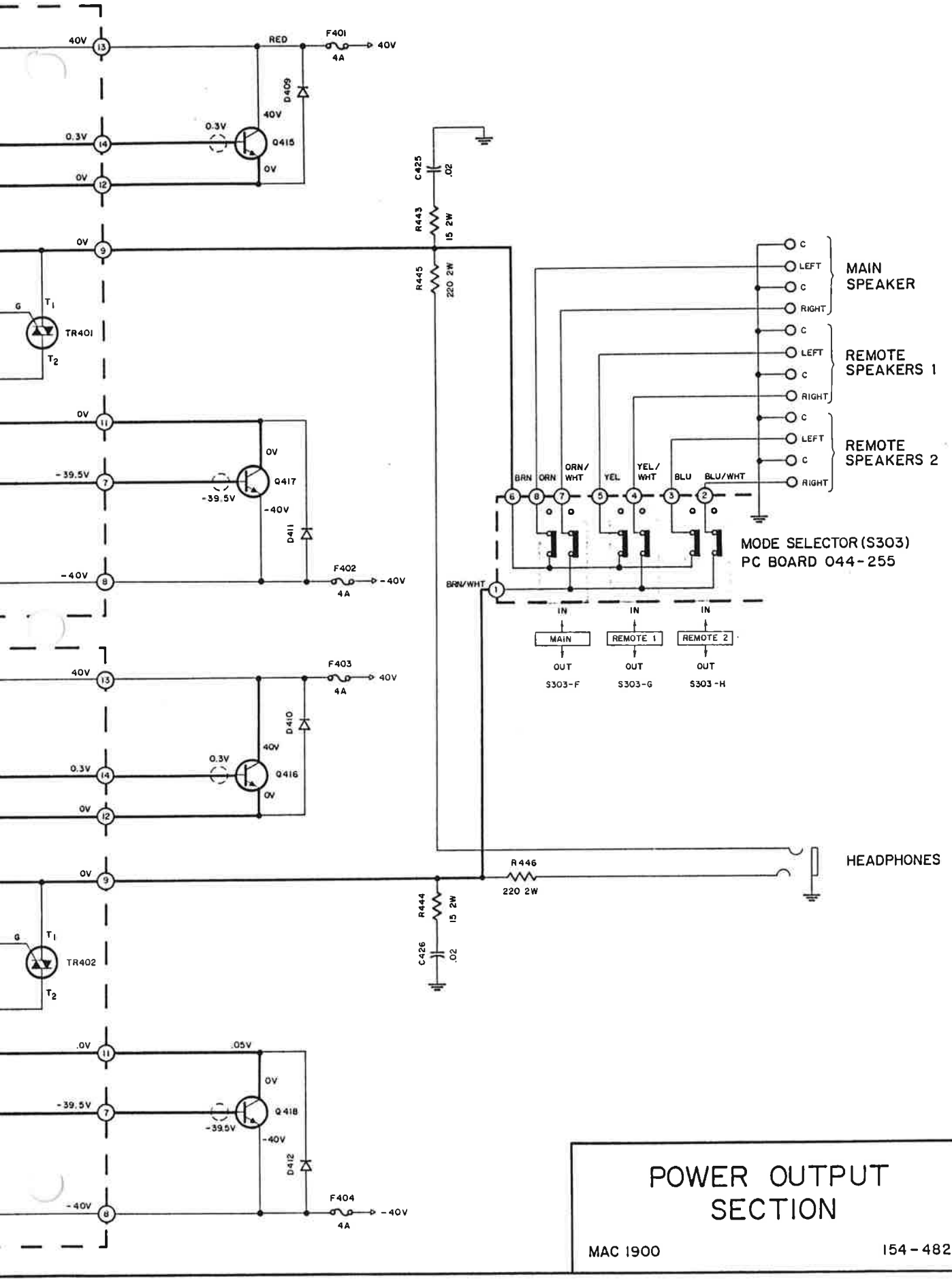

LEFT CHANNEL POWE
R401
110V
3.6K 5W
5%
BLU/WHT
15
1.0V
D403
10
0V
R417
3.9 5%
LEFT AMP INPUT
COAX
C427
R403
5
0V
1.5µF 35V
3.3K 1/4W
R449
100K
R407
3.3K
6
0V
R405
510 5%
C403
470µF/4V
110V
4
110V
R409
30K 5%
1
0V
C401
150µF/50V
RIGHT CHANNEL POWEF
R402
110V
3.6K 5W
5%
15
1.0V
D404
10
0V
R418
3.9 5%
RIGHT AMP INPUT
COAX
C428
R404
5
0V
1.5µF 35V
3.3K 1/4W
R450
100K
R408
3.3K
6
0V
R406
510 5%
C404
470 µF/4V
110 V
4
110V
R410
30K 5%
1
0V
C402
150 uF/50V

NEL POWER OUTPUT PC BOARD 044-183




NEL POWER OUTPUT PC BOARD 044-183

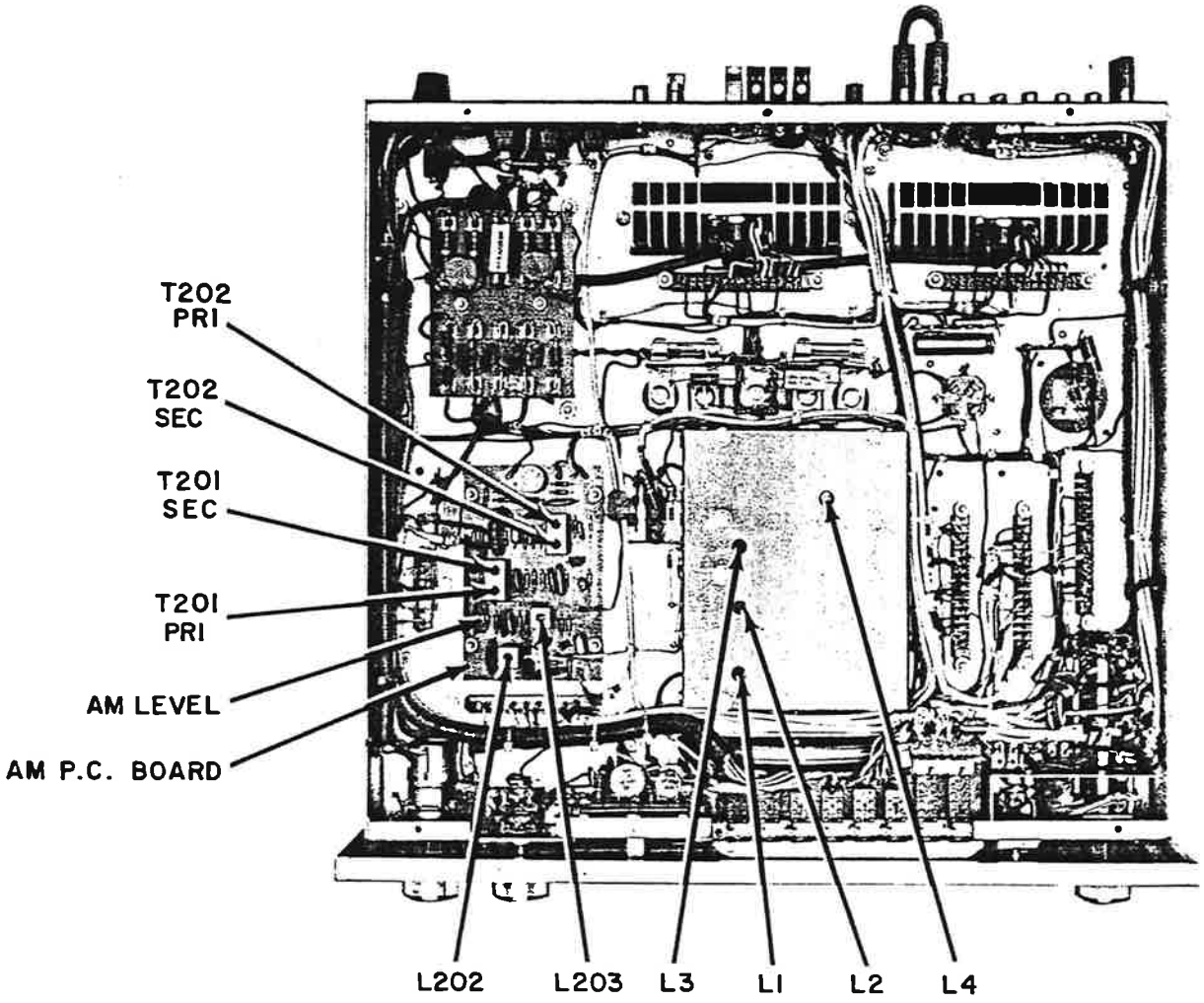


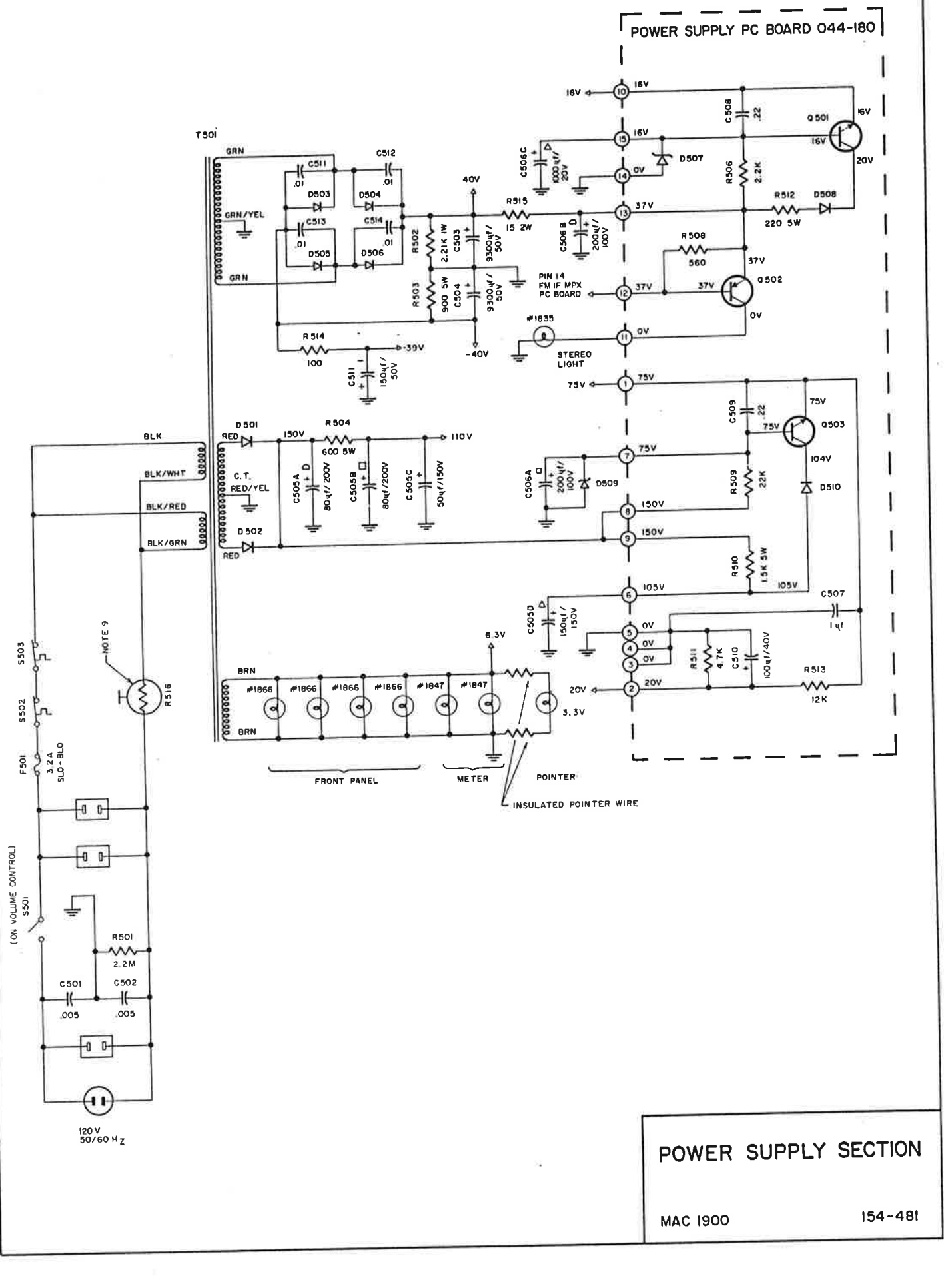



# POWER OUTPUT SECTION

MAC 1900

154-482

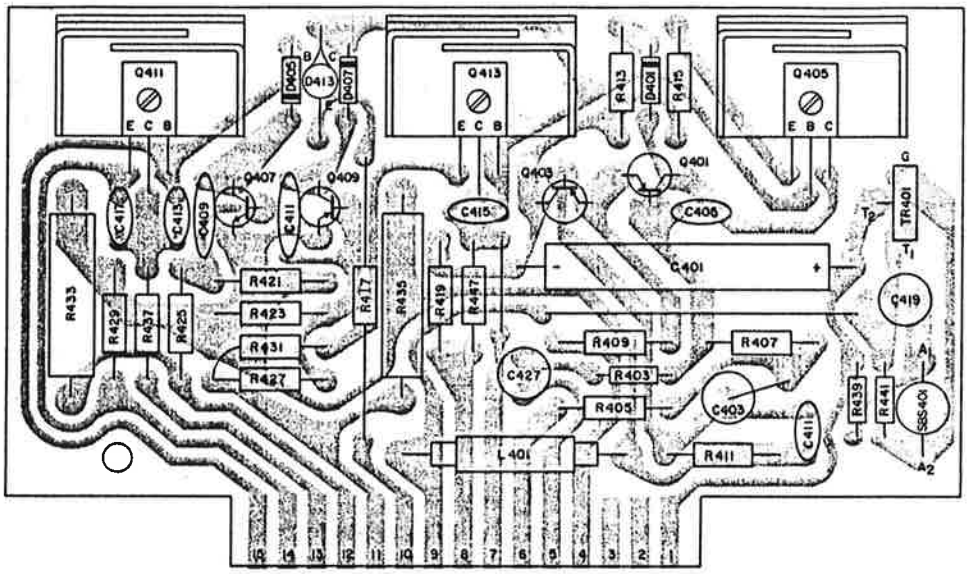

T202
PRI
T202
SEC
T201
SEC
T201
PRI
AM LEVEL
AM P.C. BOARD
L202
L203
L3
L1
L2
L4



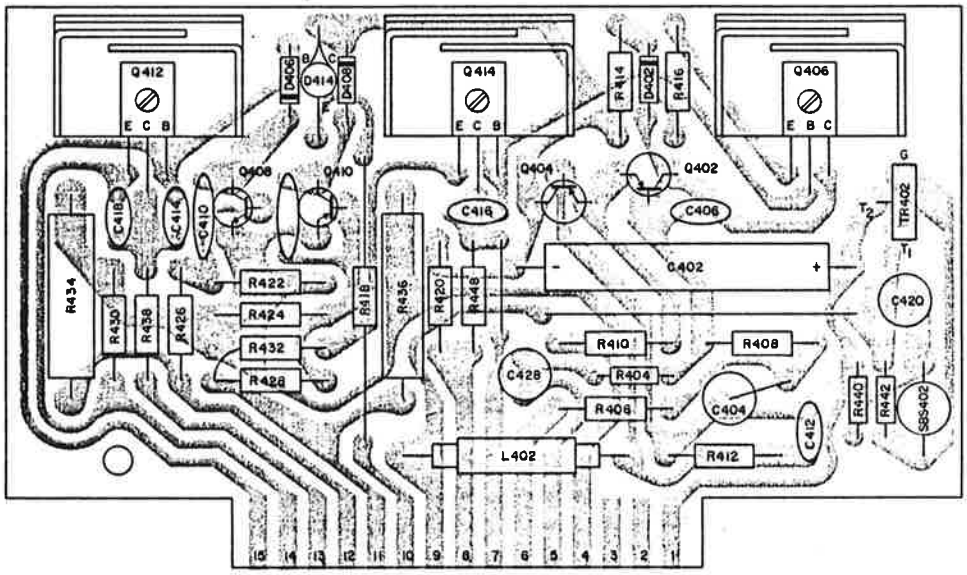

# POWER SUPPLY SECTION

MAC 1900

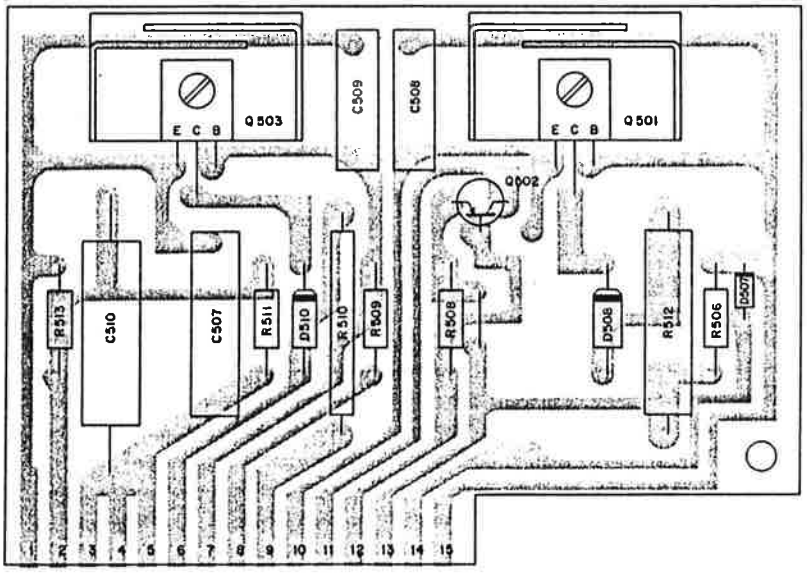
154-481



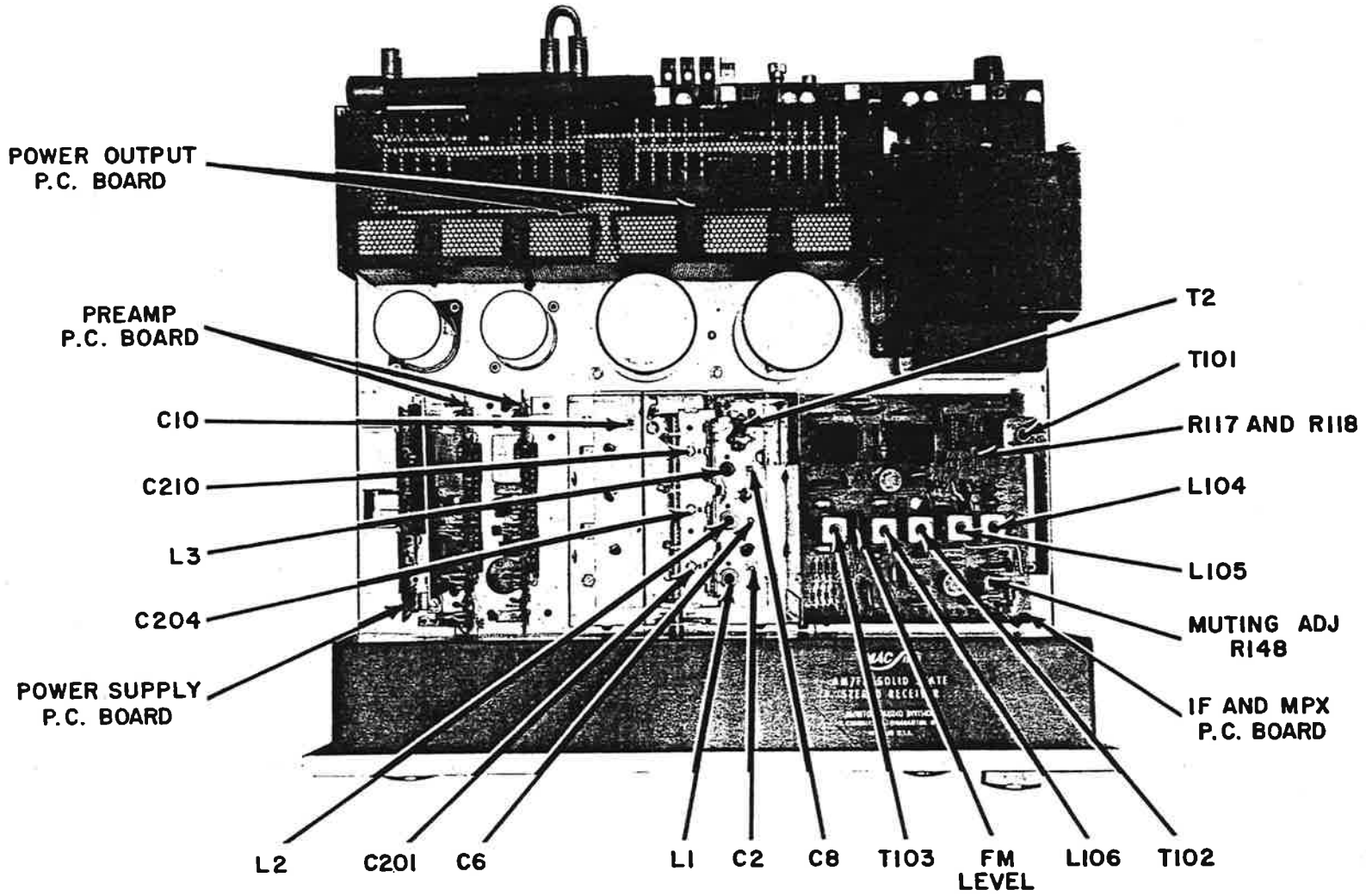

LEFT CHANNEL
POWER OUTPUT
PC BOARD 044-1




RIGHT CHANNEL
POWER OUTPUT
PC BOARD 044-1E3

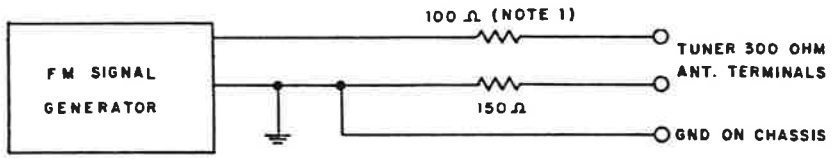



POWER SUPPLY
PC BOARD
044-180


POWER OUTPUT P.C. BOARD
PREAMP P.C. BOARD
C10
C210
L3
C204
POWER SUPPLY P.C. BOARD
T2
T101
R117 AND R118
L104
L105
MUTING ADJ R148
IF AND MPX P.C. BOARD
L2
C201
C6
L1
C2
C8
T103
FM LEVEL
L106
T102

# MULTIPLEX DECODER ALIGNMENT

| STEP | TUNER DIAL SETTING | SIGNAL GENERATOR | | | INDICATOR | | ADJUST | TEST LIMITS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | FREQ. | COUPLING | MODULATION | TYPE | CONNECTED TO | | | |
| 1 | 100MHz | 100MHz | 300Ω antenna terminals w/ approx. 1000 microvolts signal w/* matching network. | 75kHz deviation @ 67kHz. | AC-VTVM or oscilloscope w/very low cap. probe. | Pin 13 on MPX/IF PC Board. | L104 and L105 (SCA adj.) | Minimum output @ L or R output jack. | Adjust for minimum 67kHz output. |
| 2 | Same | Same | Same | 19kHz stereo pilot. | Same | Pin 14 on MPX/IF PC Board | L106 (19kHz phase adj.) & T102 (19 kHz transformer.) | Adjust for maximum AC voltage. | Decrease pilot level, if necessary, so that 19kHz circuits do not limit or saturate. |
| 3 | Same | Same | Same | Same | Same | T103, Pin 1 or 2. | T103 top (Pri.) & bottom(Sec.) tuning cores | Adj. for maximum AC voltage. | Decrease pilot level so that 19kHz and 38kHz circuits do not limit. Mode switch must be in stereo position. |
| 4 | Same | Same | Same | 1kHz (100% modulation) L or R only, pilot level normal and on. | AC-VTVM | L or R output jack. | T103, Bottom (Sec.) tuning cores. | 35dB separation or more. | Modulate left channel and measure right channel output. Adjust bottom tuning core (Sec.) for minimum right channel output (maximum separation). Then, reverse channels and measure left channel separation. For this adjustment and measurement, no test lead should be connected to TP #2. |
| 5 | Same | Same | Same | Same | Same | Same | | Less than 15mV of residual. | Adjust "FM Level" control (R126) for 1 volt of audio output at tape output jacks. Then, turn off the modulation and measure the residual of the 19kHz and 38kHz frequencies. |




Note 1: If signal generator has other than 50 ohm internal impedance, use a resistor of 150 ohms less internal generator impedance.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | | | | | | | | will correspond to 1.0 volt audio output for a 100% modulated signal.<br>2. With a 1mV input signal, harmonic distortion, whistle filter attenuation at 10kHz modulating frequency and signal to noise ratio may be measured.<br>3. IHFM sensitivity of 75 microvolts for 20dB signal to noise ratio. (This measurement is only possible in the absence of man-made interference, as fluorescent lamps, etc.) |

# FM ALIGNMENT

| STEP | TUNER DIAL SETTING | SIGNAL GENERATOR | | | INDICATOR | | ADJUST | TEST LIMITS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | FREQ. | COUPLING | MODULATION | TYPE | CONNECTED TO | | | |
| 1 | Point of no interference or signal | 10.7MHz | Through external .01µF capacitor to Pin #3 of FM-IF-MPX PC Board. | CW | VTVM | TP #2. | Top (Sec.) Core of T101. | Adjust for zero volt. | Turn muting off for alignment tests. |
| 2 | Same | Same | Same | Same | Same | Junction of R117-118. | Bottom (Pri.) core of T101. | Maximum possible negative voltage. | If a distortion analyzer is available, omit this step. Adjust T102 Primary after Step 5. At that time, use a 1mV signal from an FM generator, modulate 100% @ 400Hz. Adjust primary of T102 for minimum distortion. Should be less than 0.3%. |
| 3 | 105MHz | 105MHz | 300Ω antenna terminals w/* matching network. | 100% @ 400Hz. | VTVM connected to TP#1 and oscilloscope connected to L or R tape output. | | Oscillator trimmer C10. | Maximum negative voltage at TP#1. | As TP#1 voltage increases, reduce output of signal generator to keep TP#1 voltage at a low level (less than -.75 volt). |
| 4 | 90MHz | 90MHz | Same | Same | Same | | Oscillator Coil L4. | Same | Repeat Steps 3 and 4 until dial calibration is accurate. |
| 5 | Same | Same | Same | FM ±300kHz sweep at 60Hz rate. | Oscilloscope. | TP #1. | Top (Pri.) and Bottom (Sec.) cores of T2. | Optimum symmetry about 10.7 MHz. | Connect scope for overall response display. Hold the signal generator output to a low level such that the DC voltage at TP #1 is less than -0.5 volt. |
| 6 | 105MHz | 105MHz | Same | 100% @ 400Hz. | VTVM connected to TP #1 and scope connected to L or R tape output. | | Mixer, RF-2, RF-1 trimmers C8-6-2. | Maximum negative voltage at TP#1. | Same as Step 3. |
| 7 | 90MHz | 90MHz | Same | Same | Same | | Mixer, RF-2, and RF-1; coils L3, 2,1. | Same | Same as Step 3. Then repeat Steps 6 and 7 until TP#1 voltage is as high as possible for the least signal input at both alignment frequencies. |
| 8 | Same | Same | Same | Same | VTVM connected to TP#1 and a harmonic distortion analyzer to L or R output. | | | | This step is an overall sensitivity check. Reduce input signal to the point where total noise and distortion reads 3% (-30dB). The input signal will then be the usable sensitivity and should be less than 2.5µV. |

# MAC 1900 ALIGNMENT INSTRUCTIONS

All McIntosh receivers are carefully aligned and tested at the factory using the finest available test equipment. All McIntosh receivers will meet their published specifications when shipped from the factory.

After extensive operation, or servicing, it may be desirable to realign the receiver circuits for best performance. The charts below give complete information on the circuit realignment procedure for the MAC 1900.

The test equipment listed (or its equivalent) is necessary to properly align an MAC 1900. The accuracy of the alignment will be directly related to the accuracy and calibration of the test equipment used.

If the necessary test equipment is not available, alignment should not be attempted. For additional information, contact Customer Service Department, McIntosh Laboratory, Inc., 2 Chambers Street, Binghamton, New York 13903 (telephone 607-723-3512).

Alignment should be done in the following order: AM-FM-MPX.

## TEST EQUIPMENT REQUIRED

1. FM Signal Generator (Measurement 188 or Sound Technology 1000A).
2. VTVM (RCA WV96C).
3. Multiplex Generator (Radiometer SMG1) or Sound Technology 1000A.
4. 10.7MHz Generator (preferably crystal controlled).
5. Oscilloscope (Hewlett-Packard 120B or equivalent).
6. Harmonic Distortion Analyzer (Hewlett-Packard 333A or equivalent).

## AM ALIGNMENT

| STEP | TUNER DIAL SETTING | SIGNAL GENERATOR | | | INDICATOR | | ADJUST | TEST LIMITS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | FREQ. | COUPLING | MODULATION | TYPE | CONNECTED TO | | | |
| 1 | Point of no interference or signal. | 455kHz | Through external .01μF capacitor to Pin 2 on AM circuit board | CW | Signal strength meter. | Normal. | Pri. & Sec. cores of T201 & T202. | Maximum possible indication. | As the tuner output increases, attenuate generator output to keep meter indication below 4. |
| 2 | 600kHz | 600kHz | Through a 200pF capacitor to ant. terminals. | Same | Same | Same | L203 (oscillator coil.) | Same | Same as Step 1. |
| 3 | 1400kHz | 1400kHz | Same | Same | Same | Same | C210 (oscillator trimmer) | Same | Repeat Steps 2 & 3 until dial calibration is accurate. |
| 4 | 600kHz | 600kHz | Same | Same | Same | Same | L201 (AM antenna rod) & L202 (AM-RF) | Same | Same as Step 1 except adjust generator so that output signal is just above the noise level. Position antenna rod away from chassis and nearby objects. |
| 5 | 1400kHz | 1400kHz | Same | Same | Same | Same | C201 (AM antenna trimmer) & C204 (AM-RF trimmer). | Same | Repeat Steps 4 & 5 until output is as high as possible. |
| | 1000kHz | 1000kHz | Same | 30% @ 400Hz | Distortion Analyzer. | L or R output. | | With a distortion analyzer, the following measurements can be performed:<br>1. With a 10mV input signal adjust "AM Level" control for 0.3 volts of audio output at tape-outputs. This will correspond to 1.0 volt audio output for a 100% modulated signal. | |

# REPLACEMENT PARTS

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

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

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

## CAPACITORS

| Symbol Number | Description | | | Part Number |
|---|---|---|---|---|
| C19 | Mylar | 0.1μF | 100V | 064-098 |
| C22 | Mylar | 0.1μF | 100V | 064-098 |
| C108 | Elect. | 22μF | 35V | 066-179 |
| C116 | Ta. Elect. | 1μF | 35V | 066-147 |
| C120 | Ta. Elect. | 1μF | 35V | 066-147 |
| C123 | Ta. Elect. | 3.3μF | 35V | 066-170 |
| C125 | Polystyrene | 2700pF | 63V | 064-093 |
| C127,128 | Polystyrene | 4700pF | 63V | 064-091 |
| C134 | Polystyrene | 3300pF | | 064-090 |
| C136 | Elect. | 100μF | 25V | 066-161 |
| C137 | Ta. Elect. | 1μF | 35V | 066-147 |
| C139 | Polystyrene | 3300pF | | 064-090 |
| C202 | Polystyrene | 4700pF | 63V | 064-091 |
| C203 | Ta. Elect. | 1.5μF | 35V | 066-158 |
| C207 | Ta. Elect. | 3.3μF | 35V | 066-170 |
| C218 | Polystyrene | 2700pF | 63V | 064-093 |
| C220 | Elect. | 100μF | 25V | 066-161 |
| C301,302 | Mylar | 0.47μF | 250V | 064-069 |
| C305,306 | Ta. Elect. | 10μF | 20V | 066-149 |
| C307,308 | Ta. Elect. | 10μF | 20V | 066-149 |
| C313,314 | Mylar | 0.47μF | 250V | 064-069 |
| C315,316 | Ta. Elect. | 100μF | 10V | 066-165 |
| C317,318 | Polyester | 0.01μF | 250V | 064-101 |
| C319,320 | Mylar | 0.47μF | 250V | 064-069 |
| C325,326 | Polyester | 0.01μF | 250V | 064-101 |
| C329,330 | Polyester | 0.022μF | 250V | 064-102 |
| C333,334 | Ta. Elect. | 100μF | 10V | 066-165 |
| C335,336 | Mylar | 0.22μF | | 064-068 |
| C337,338 | Mylar | 0.047μF | | 064-066 |
| C339,340 | Mylar | 0.22μF | | 064-068 |
| C341,342 | Mylar | 0.01μF | 250V | 064-040 |
| C343,344 | Mylar | 0.01μF | 250V | 064-040 |
| C351,352 | Mylar | 0.47μF | 250V | 064-069 |
| C353,354 | Ta. Elect. | 0.47μF | 50V | 066-174 |
| C356 | Ta. Elect. | 1μF | 35V | 066-147 |
| C357,358 | Mylar | 0.22μF | 250V | 064-043 |
| C359,360 | Mylar | 0.22μF | 250V | 064-043 |
| C401,402 | Elect. | 150μF | 50V | 066-152 |
| C403,404 | Elect. | 470μF | 4V | 066-136 |
| C419,420 | Elect. | 10μF | 35V | 066-173 |
| C427,428 | Ta. Elect. | 1.5μF | 35V | 066-158 |
| C503,504 | Elect. | 9300μF | 50V | 066-162 |
| C505 | Elect. | 80/80/50/150μF 200/200/150/150V | | 066-095 |
| C506 | Elect. | 200/200/1000μF 100/100/20V | | 066-172 |
| C507 | Mylar | 1μF | 250V | 064-088 |
| C508,509 | Mylar | 0.22μF | | 064-096 |
| C510 | Elect. | 100μF | 40V | 066-176 |
| C511 | Elect. | 150μF | 50V | 066-152 |

use 066205

## DIODES

| | | |
|---|---|---|
| D1 | Ge. signal diode | 070-003 |
| D101,102 | Ge. signal diode | 070-003 |
| D103,104 | Ge. signal diode | 070-003 |
| D105,106 | Si. signal diode | 070-022 |
| D107,108 | Si. signal diode | 070-022 |
| D109,110 | Si. signal diode | 070-022 |
| D201 | Si. signal diode | 070-022 |
| D202 | Ge. signal diode | 070-003 |
| D401,402 | Si. signal diode | 070-022 |
| D403,404 | Si. diode | 070-046 |
| D405,406 | Si. signal diode | 070-022 |
| D407,408 | Si. signal diode | 070-022 |
| D409,410 | Si. diode | 070-031 |
| D411,412 | Si. diode | 070-031 |
| D413,414 | Ge. PNP transistor | 132-010 |
| D501,502 | Si. diode | 070-031 |
| D503,504 | Si. diode | 070-041 |
| D505,506 | Si. diode | 070-041 |
| D507 | Zener diode 16V | 070-048 |
| D508 | Si. diode | 070-031 |
| D509 | Zener diode 75V | 070-025 |
| D510 | Si. diode | 070-031 |

## CHOKE & COILS

| | | |
|---|---|---|
| L1 | 1st RF coil | 122-109 |
| L2 | 2nd RF coil | 122-108 |
| L3 | Mixer coil | 122-107 |
| L4 | Oscillator coil | 122-106 |

| | | | |
|---|---|---|---|
| L5 | Choke | 75µH | 122-013 |
| L8 | Choke | 0.47µH | 122-010 |
| L101,102 | Choke | 75µH | 122-013 |
| L103 | Choke | 1MH | 122-092 |
| L104,105 | Filter coil (SCA) | | 122-093 |
| L106 | Filter coil (19kHz) | | 122-094 |
| L201 | AM antenna | | 122-110 |
| L202 | AM RF coil | | 122-086 |
| L203 | AM oscillator coil | | 122-085 |
| L401,402 | Choke | 4µH | 122-105 |

TRANSISTORS

| | | |
|---|---|---|
| Q1 | Si. M.O.S. F.E.T. | 132-088 |
| Q2 | Si. Junction F.E.T. | 132-084 |
| Q3 | Si. NPN transistor | 132-015 |
| Q101 | Si. NPN transistor | 132-077 |
| Q102 | Si. PNP transistor | 132-074 |
| Q103,104 | Si. NPN transistor | 132-077 |
| Q105 | Si. NPN transistor | 132-077 |
| Q106 | Si. NPN transistor | 132-075 |
| Q201,202 | Si. NPN transistor | 132-082 |
| Q203 | Si. NPN transistor | 132-082 |
| Q204 | Si. NPN transistor | 132-090 |
| Q301,302 | Si. PNP transistor | 132-056 |
| Q303,304 | Si. PNP transistor | 132-056 |
| Q305,306 | Si. NPN transistor | 132-069 |
| Q307,308 | Si. NPN transistor | 132-041 |
| Q309,310 | Si. NPN transistor | 132-041 |
| Q311,312 | Si. NPN transistor | 132-069 |
| Q313,314 | Si. NPN transistor | 132-069 |
| Q315,316 | Si. NPN transistor | 132-069 |
| Q317,318 | Si. NPN transistor | 132-069 |
| Q401,402 | Si. PNP transistor | 132-056 |
| Q403,404 | Si. PNP transistor | 132-056 |
| Q405,406 | Si. NPN transistor | 132-081 |
| Q407,408 | Si. NPN transistor | 132-021 |
| Q409,410 | Si. PNP transistor | 132-032 |
| Q411,412 | Si. NPN transistor | 132-080 |
| Q413,414 | Si. PNP transistor | 132-079 |
| Q415,416 | Si. NPN transistor | 132-070 |
| Q417,418 | Si. NPN transistor | 132-070 |
| Q501 | Si. NPN transistor | 132-072 |
| Q502 | Si. PNP transistor | 132-032 |
| Q503 | Si. NPN transistor | 132-078 |

FUSES

| | | | |
|---|---|---|---|
| F401,402 | Fuse | 4A | 089-022 |
| F403,404 | Fuse | 4A | 089-022 |
| F501 | Fuse | 3.2A slo-blo | 089-006 |

146

POTENTIOMETERS

| | | |
|---|---|---|
| R312 | Balance control | 134-230 |
| R313 | Volume control | 134-229 |
| R314 | Treble control | 044-270 |
| R315 | Bass control | 044-269 |

RESISTORS

| | | | | |
|---|---|---|---|---|
| R401,402 | Wirewound | 3.6k | 5W | 139-065 |
| R433,434 | Wirewound | 0.33Ω | 5W | 139-080 |
| R435,436 | Wirewound | 0.33Ω | 5W | 139-080 |
| R503 | Wirewound | 900Ω | 5W | 139-012 |
| R504 | Wirewound | 600Ω | 5W | 139-043 |
| R510 | Wirewound | 1.5k | 5W | 139-079 |
| R512 | Wirewound | 220Ω | 5W | 139-009 |
| R513 | Thermistor | | | 144-012 |

SWITCHES

| | | |
|---|---|---|
| S301 | Input selector switch | 146-149 |
| S302 | Mode selector switch | 150-008 |
| S303 | Mode selector switch | 150-007 |
| S502,503 | Thermo cut-out switch | 153-007 |

TRANSFORMERS

| | | |
|---|---|---|
| T1 | Balun | 043-226 |
| T2 | FM IF input | 162-057 |
| T101 | Discriminator | 162-036 |
| T102 | RF (19kHz) | 162-055 |
| T103 | RF (38kHz) | 162-054 |
| T201,202 | AM IF transformer | 162-050 |
| T501 | Power transformer | 159-093 |

THYRISTORS & TRIGGERS

| | | |
|---|---|---|
| TR401,402 | Triac | 131-005 |
| SBS401,402 | Bilateral switch | 131-004 |

METERS

| | | |
|---|---|---|
| M101 | Signal strength meter | 124-017 |
| M301 | Tuning meter | 124-016 |

| | | |
|---|---|---|
| | **INTEGRATED CIRCUITS** | |
| IC1 | Integrated circuit | 133-005 |
| IC101,102 | Integrated circuit | 133-002 |
| | **FILTERS** | |
| FN101,102 | IF filter (10.7MHz) | 180-008 |
| | **LAMPS** | |
| | #51 (Inputs) | 058-021 |
| | #1835 (Tape mon) (Stereo) | 058-037 |
| | #1866 (Front panel) | 058-014 (4) |
| | #1847 (Meter) | 058-008 (3) |
| | **FRONT PANEL & TRIM** | |
| | Front panel | 044-197 |
| | Dial glass | 044-284 |
| | Tuning knob | 044-199 |
| | Volume knob | 044-200 |
| | Balance knob | 044-200 |
| | Input selector knob | 044-200 |
| | Bass knob | 017-153 |
| | Treble knob | 017-153 |
| | Pushbutton | 090-105 |
| | Pushbutton w/blue dot | 090-107 |
| | Pushbutton w/orn dot | 090-108 |
| | Pushbutton w/grn dot | 090-109 |
| | Pushbutton w/yel dot | 090-110 |
| | Pushbutton w/red dot | 090-111 |
| | Pushbutton w/wht dot | 090-112 |
| | **MISCELLANEOUS ITEMS** | |
| | Plastic feet | 017-041 |
| | Tuning shaft | 021-075 |
| | Shipping carton | 033-162 |
| | Push terminal (antenna) | 074-032 |
| | Push terminal (speaker connections) | 074-030 |
| | Owners manual | 038-445 |
| | Mounting template #200 | 038-180 |
| | Shelf template #250 | 038-504 |
| | Dial cord | 044-286 |
| | Dial pointer | 044-285 |
| | Shorting plug | 127-021 |
| | AC line cord | 170-021 |
| | FM dipole antenna | 170-033 |
| | Fuse holder | 178-~~001~~ 122 |
| | Hardware package | 044-257 |
| | Jumper cable | 170-066 |
| | Pointer | 044-311 |

15C0920S7-M1571