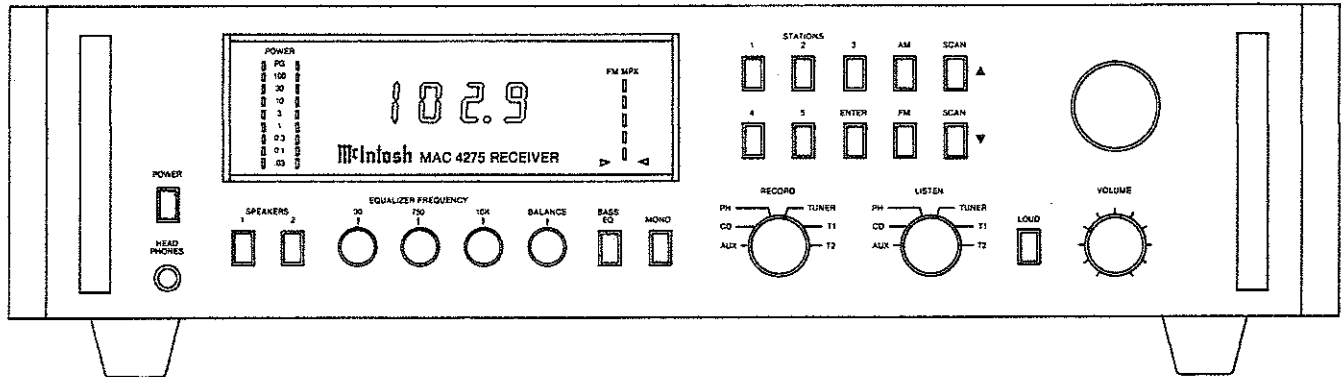


# MAC 4275

## AM/FM RECEIVER



### CONTENTS

|                                 |       |
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# Performance Specifications

## AMPLIFIER SECTION

### STEREO POWER OUTPUT

75 watts into 8 ohm loads or 100 watts into 4 ohm loads is the minimum sine wave continuous average power output per channel, from 20 to 20,000Hz, with both channels operating.

### POWER BANDWIDTH

20 to 20,000Hz

### TOTAL HARMONIC DISTORTION

0.03% maximum at any power level from 250 milliwatts to rated power per channel, 20 to 20,000Hz, both channels operating.

### INTERMODULATION DISTORTION

0.03% maximum at any power level from 250 milliwatts to rated power per channel, for any combination of frequencies from 20 to 20,000Hz, with both channels operating.

### FREQUENCY RESPONSE

+0, -0.5dB from 20 to 20,000Hz at rated power.

### INPUT SENSITIVITY

Phono(MC) 0.12mV  
Phono(MM) 2.5mV produces rated output  
Tape, Aux 250mV produces rated output  
Power Amp 1.5V produces rated output

### SIGNAL TO NOISE RATIO, A-WEIGHTED

Power Amp 100dB below rated output  
Tape, Aux 95dB below rated output  
Phono 90dB with 10mV input

### MAXIMUM INPUT SIGNAL

Phono(MC) 4.1mV  
Phono(MM) 80mV  
High level 8V

### INPUT IMPEDENCE

Phono(MC) 100 ohms  
Phono(MM) 47k ohms  
Tape, Aux 20k ohms  
Power Amp 18k ohm

### DAMPING FACTOR

Greater than 50 at 8 ohms

### TAPE OUTPUT

Phono 250mV with rated input  
Tape 250mV with rated input  
Tuner 1.0V at 100% modulation (FM)

### PROGRAM EQUALIZER

±12dB at 30, 750, and 10kHz

## FM SECTION

### USABLE SENSITIVITY

11.25dBF which is 1.0uV across 75 ohms

### 50dB QUIETING SENSITIVITY

Mono 15.2dBF which is 1.6uV across 75 ohms  
Stereo 27dBF which is 6uV across 75 ohms

### SIGNAL TO NOISE RATIO

Mono 80dB  
Stereo 75dB

### FREQUENCY RESPONSE

Mono +0.5, -0.5dB from 20 to 15kHz  
Stereo +0.5, -0.5dB from 20 to 15kHz

### HARMONIC DISTORTION

Mono 0.15% at 100Hz  
0.1% at 1k  
0.1% at 10k  
Stereo 0.1% at 100Hz  
0.1% at 1k  
0.25% at 10k

### INTERMODULATION DISTORTION

Mono 0.1%  
Stereo 0.2%

### CAPTURE RATIO

1.5dB

### ALTERNATE CHANNEL SELECTIVITY

60dB

### SPURIOUS RESPONSE

95dB

### IMAGE RESPONSE

90dB

### AM SUPPRESSION

60dB

### STEREO SEPARATION

35dB at 100Hz  
45dB at 1k  
40dB at 10k

### SCA REJECTION

65dB

## AM SECTION

### SENSITIVITY

25uV (External Antenna)

### SIGNAL TO NOISE RATIO

50dB at 30% modulation  
60dB at 100% modulation

### HARMONIC DISTORTION

1.0% maximum at 50% modulation  
(0.2% typical)

### FREQUENCY RESPONSE

+0, -6dB to 30Hz to 3.5KHz

### ADJACENT CHANNEL SELECTIVITY

50dB minimum IHF

### IMAGE REJECTION

50dB minimum

### IF REJECTION

55dB minimum

## GENERAL INFORMATION

### SEMICONDUCTOR COMPLEMENT

78 Silicon Diodes  
13 Tuning Devices  
24 Light Emitting Diodes  
4 Seven Segment LED Displays  
59 Bipolar Transistors  
3 Field Effect Transistors  
38 Integrated Circuits

### POWER REQUIREMENTS

120 volts, 50/60Hz, 60 to 575 watts

### WEIGHT

25 pounds (11.3kg) net, 32 pounds  
(14.5kg) in shipping carton.

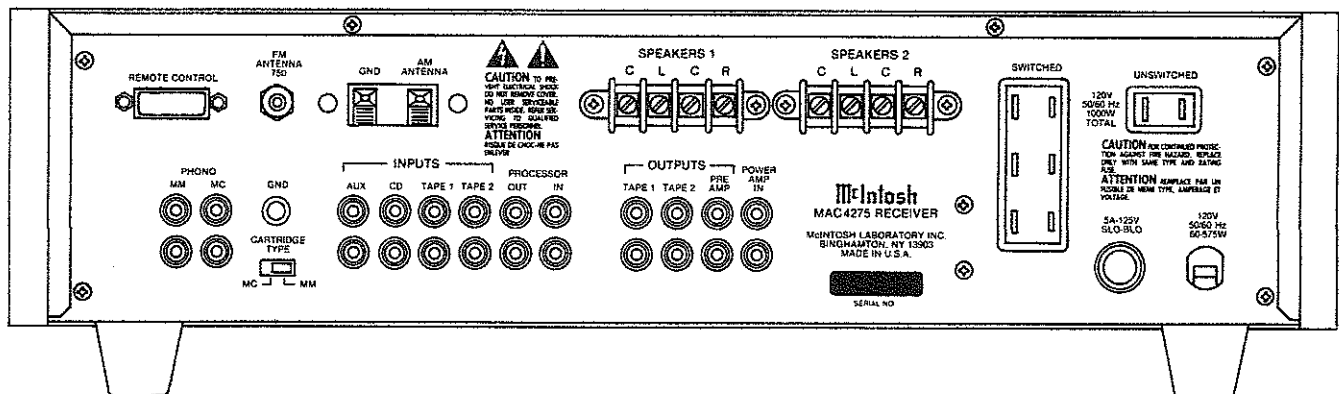


Fig. 1 Rear View

# Mechanical Views

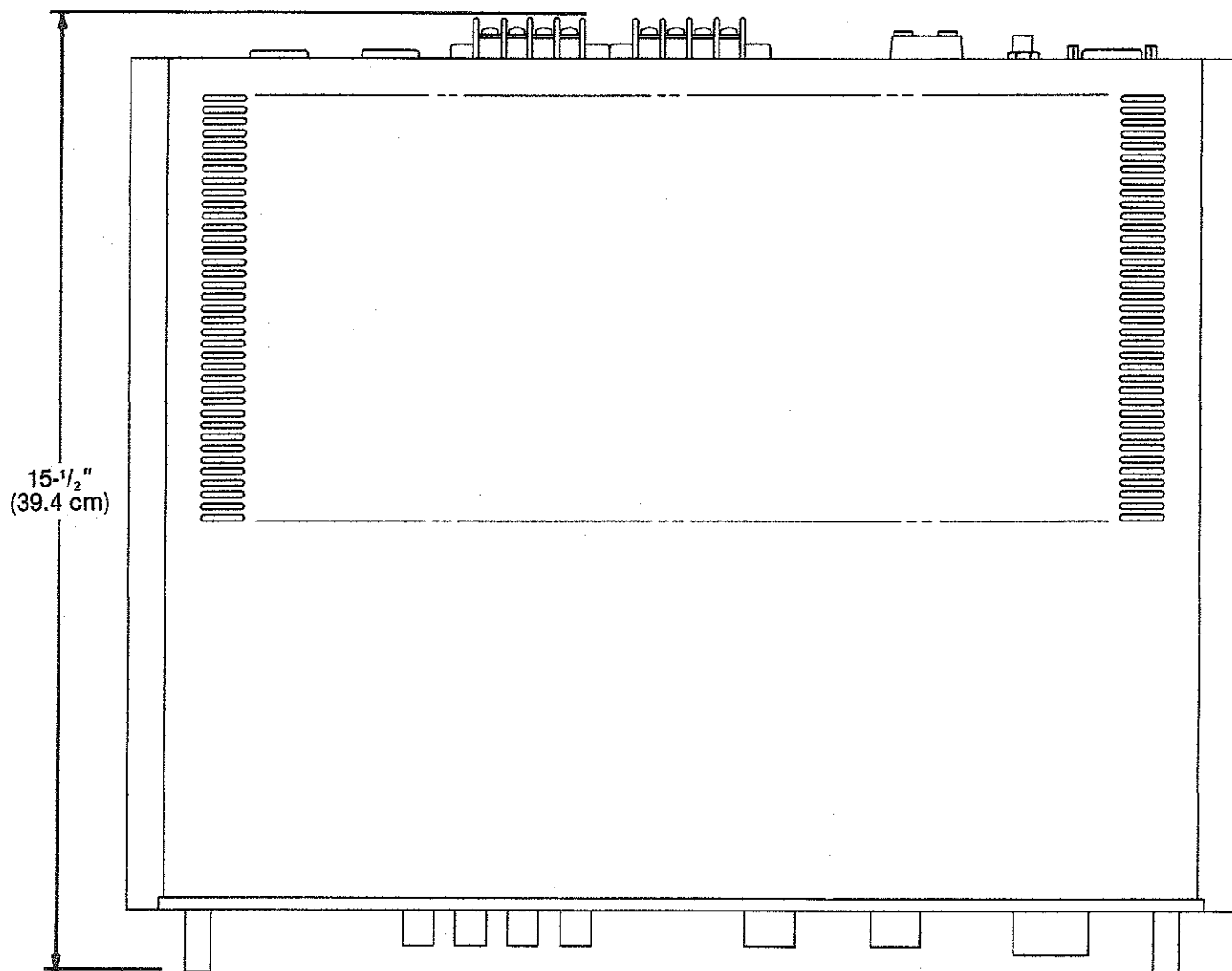


Fig. 2 Top View

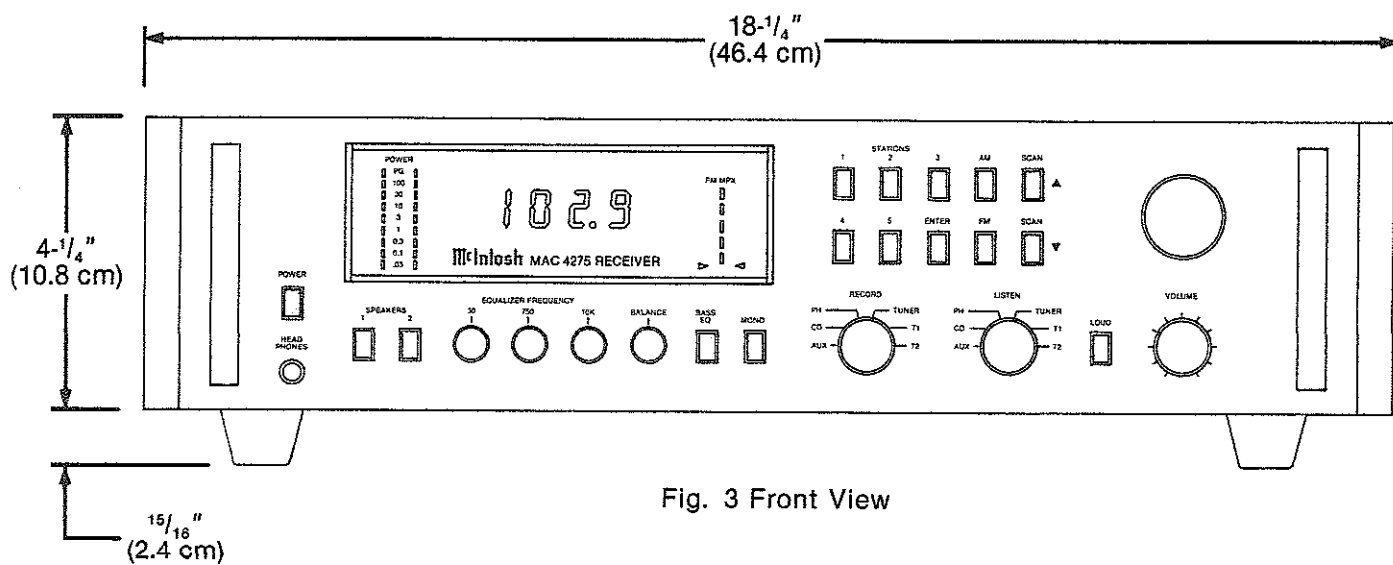
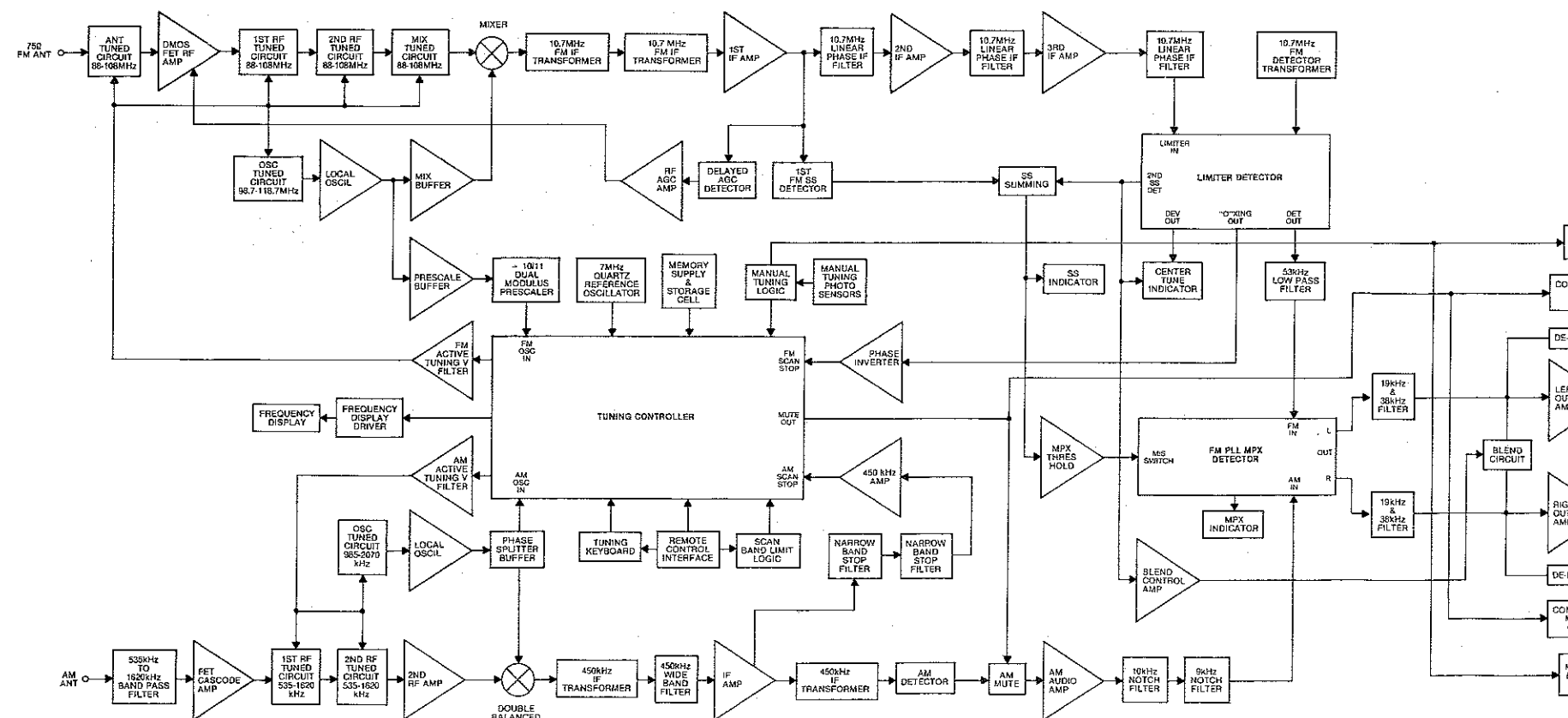


Fig. 3 Front View

### Audio Section

(Only Left Channel Shown)



| Part No. | Description                                         |
|----------|-----------------------------------------------------|
| 046845   | Front Panel                                         |
| 016227   | Glass, Display                                      |
| 310095   | Handle, Front Panel                                 |
| 310077   | Knob, Tuning                                        |
| 310078   | Knob, Control, Large                                |
| 310079   | Knob, Control, Small                                |
| 100119   | Mach Screw, #10 x 7/8, Phillips<br>(for wood sides) |
| 017246   | Pushbutton, Black                                   |
| 017268   | Pushbutton, Red                                     |
| 030241   | Wood Side, Left                                     |
| 030242   | Wood Side, Right                                    |
| 019045   | Knob Spring (for tuning knob)                       |

| Part No. | Description                 |
|----------|-----------------------------|
| 310048   | FM Dipole                   |
| 017218   | Plastic Feet (4)            |
| 100159   | Screw, #10 x 3/4 (for feet) |
| 039621   | MAC4275 Owners Manual       |

# Block Diagram

## Section Locations

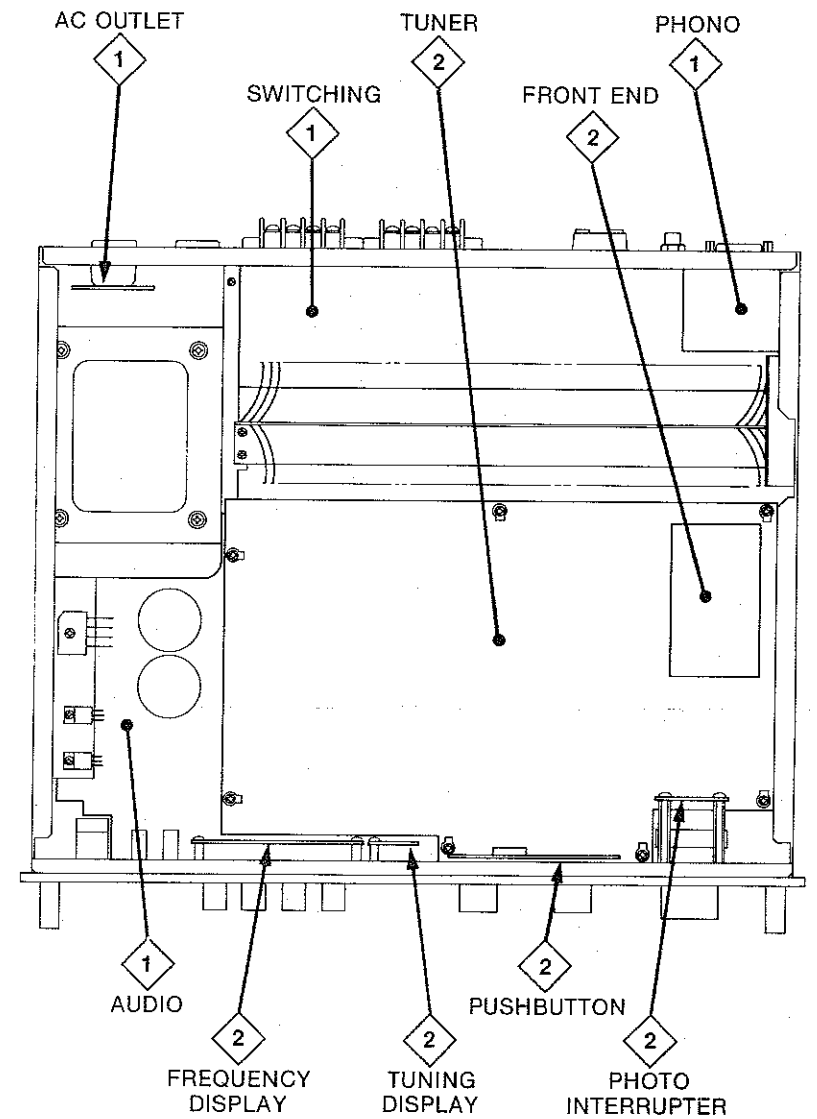
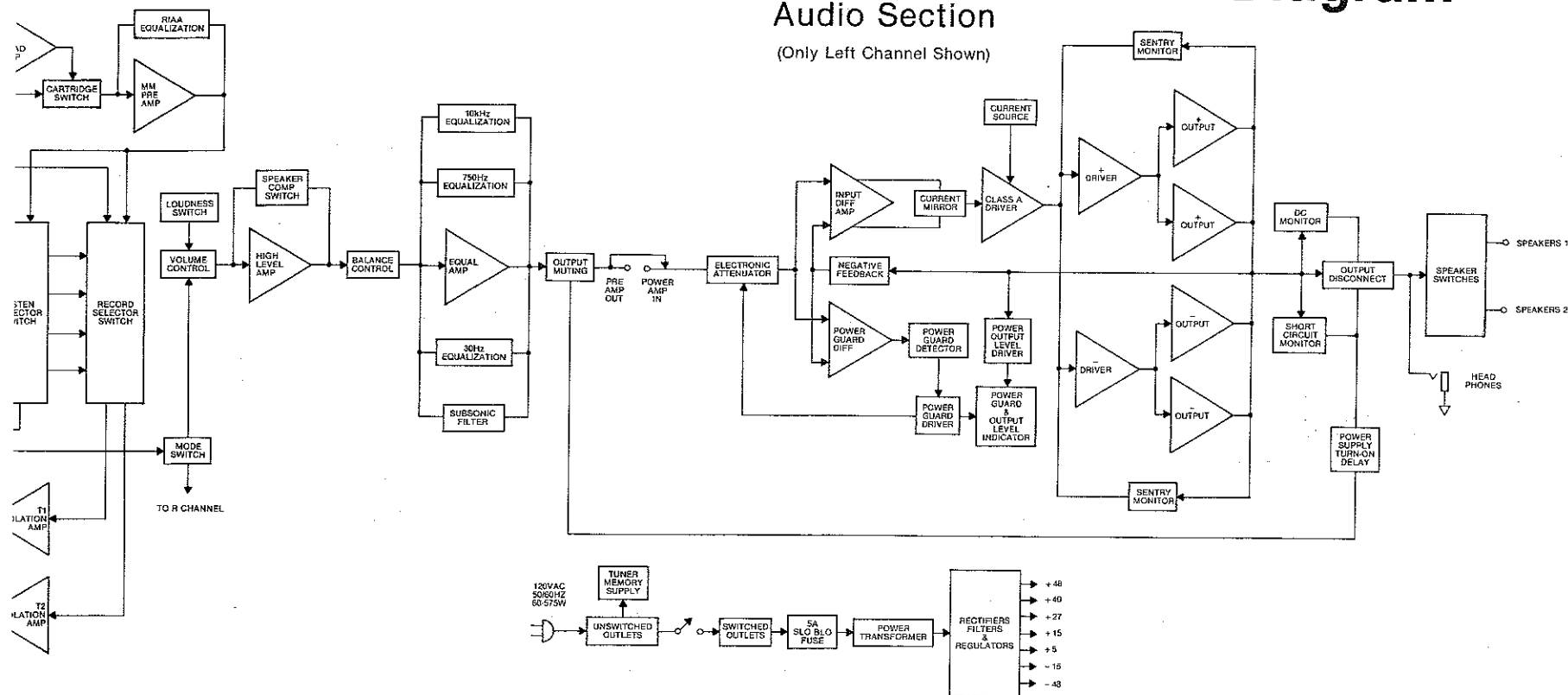
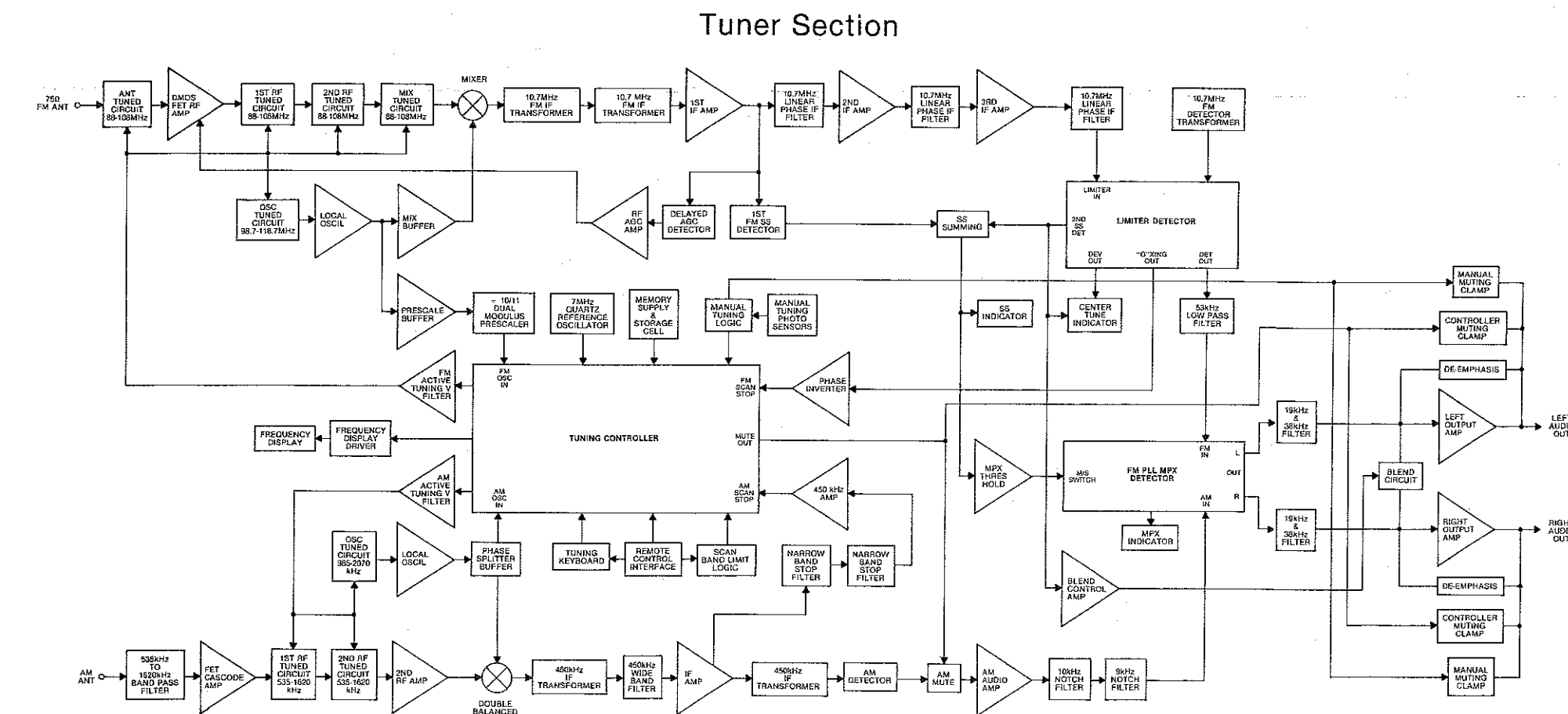
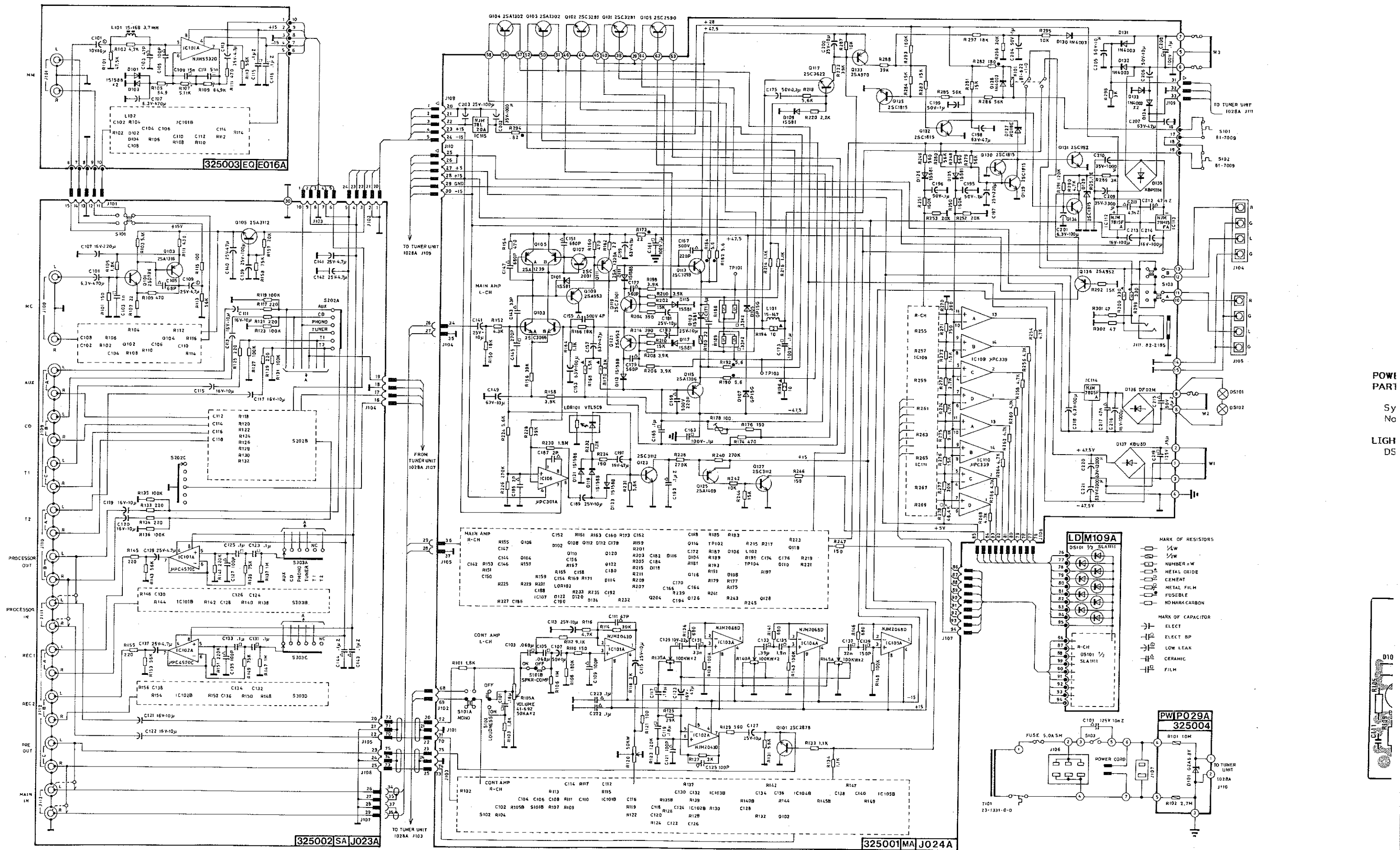
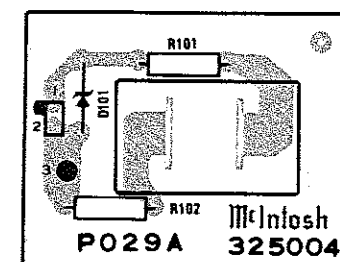
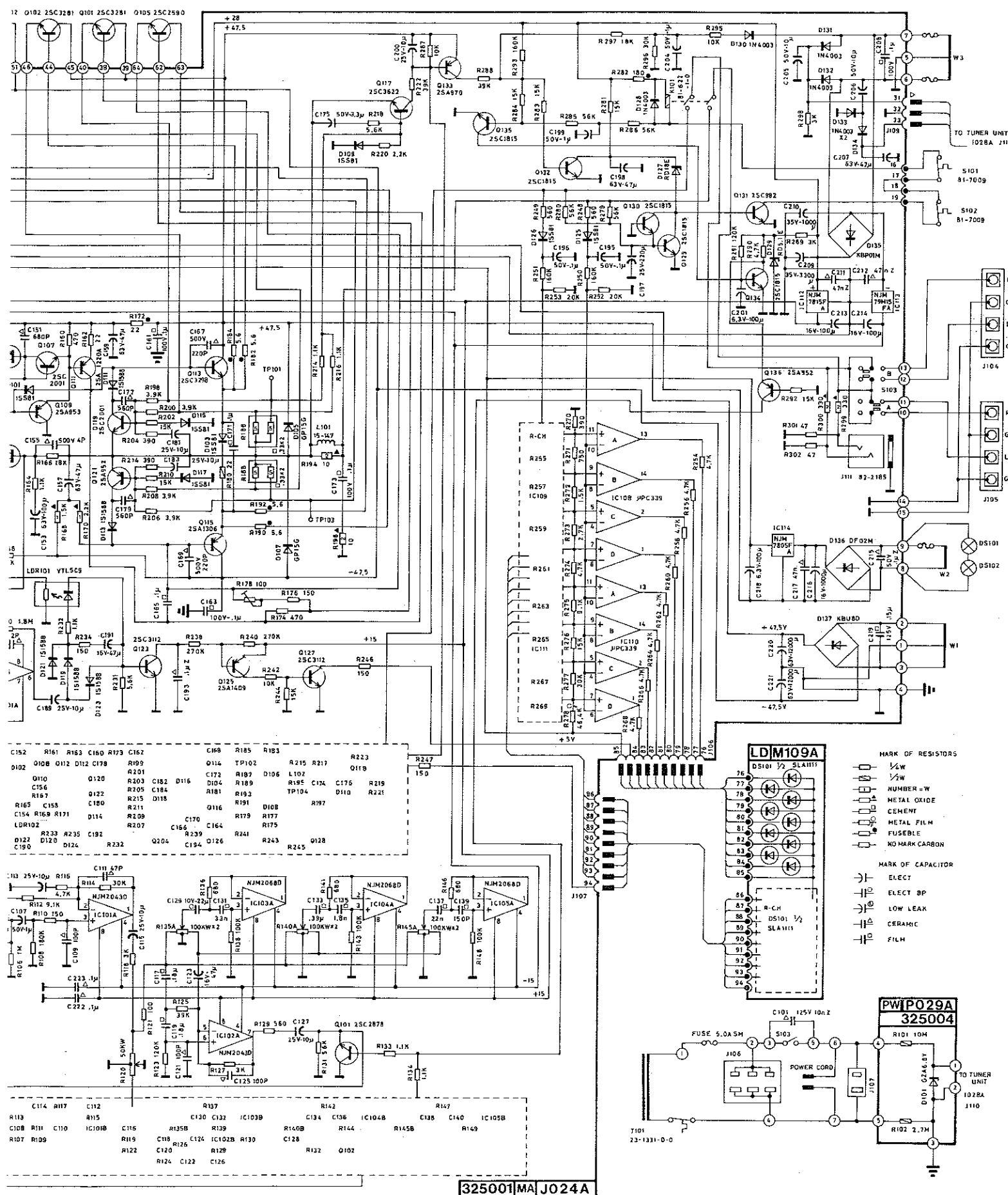


Fig. 4 Top View with cover removed.







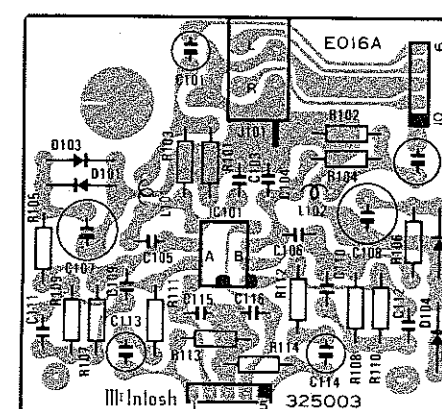
BACK-UP POWER SUPPLY  
PCB 325004

# BACK-UP POWER SUPPLY PARTS LIST

| Symbol No. | Part No. | Description    |
|------------|----------|----------------|
| DIODES     |          |                |
| D101       | 310122   | Zener, GZA6.8V |

# CHASSIS MOUNTED COMPONENTS PARTS LIST

| Symbol No.                  | Part No. | Description          |
|-----------------------------|----------|----------------------|
| LIGHTING DEVICES            |          |                      |
| DS101, DS102                | 310168   | Lamp, 8V, 100mA      |
| FUSES                       |          |                      |
| F1                          | 310082   | 5A, 250V, SB, 3AG    |
| TRANSISTORS - LEFT CHANNEL  |          |                      |
| Q101, Q102                  | 132238   | 2SC3281              |
| Q103, Q104                  | 132239   | 2SA1302              |
| Q105                        | 310162   | 2SC2590              |
| TRANSISTORS - RIGHT CHANNEL |          |                      |
| Q101, Q102                  | 132238   | 2SC3281              |
| Q103, Q104                  | 132239   | 2SA1302              |
| Q105                        | 310162   | 2SC2590              |
| SWITCHES                    |          |                      |
| S101, S102                  | 310175   | Thermal Switch, 95°C |
| S103                        | 310176   | Power Switch, TV8    |
| TRANSFORMERS                |          |                      |
| T101                        | 310183   | Power Transformer    |



PHONO PREAMP  
PCB 325003

# PHONO PREAMP PARTS LIST

| Symbol No.          | Part No. | Description |
|---------------------|----------|-------------|
| INTEGRATED CIRCUITS |          |             |
| IC101               | 133094   | NJM5532D    |

# Audio 1

## AMPLIFIER-POWER SUPPLY PARTS LIST

| Symbol<br>No. | Part<br>No. | Description      |
|---------------|-------------|------------------|
| <b>DIODES</b> |             |                  |
| D101-D104     | 310113      | 1SS81            |
| D105-D108     | 310114      | GP15G            |
| D109,D110     | 310113      | 1SS81            |
| D111-D114     | 310115      | 1S1588           |
| D115-D118     | 310113      | 1SS81            |
| D119-D124     | 310115      | 1S1588           |
| D125,D126     | 310113      | 1SS81            |
| D127          | 310116      | Zener, RD18E B2  |
| D128          | 310117      | IN4003           |
| D129          | 310118      | Zener, RD5.1E B3 |
| D130-D134     | 310117      | IN4003           |
| D135          | 310119      | KBP01M           |
| D136          | 310120      | DF02M            |
| D137          | 310121      | KBU8D            |

## INTEGRATED CIRCUITS

|             |        |            |
|-------------|--------|------------|
| IC101,IC102 | 310141 | NJM2043D   |
| IC103-IC105 | 310142 | NJM2068D   |
| IC106,IC107 | 133068 | uPC301A    |
| IC108-IC111 | 133092 | uPC339C    |
| IC112       | 133087 | NJM7915FA  |
| IC113       | 310143 | NJM79M15FA |
| IC114       | 133108 | NJM7805FA  |
| IC115       | 310144 | NJM78L20A  |

## LIGHT DEPENDENT RESISTORS

|              |        |        |
|--------------|--------|--------|
| LDR101,LD102 | 144179 | VTL5C9 |
|--------------|--------|--------|

## RELAYS

|      |        |                 |
|------|--------|-----------------|
| K101 | 310182 | Relay, MR72A24U |
|------|--------|-----------------|

## TRANSISTORS

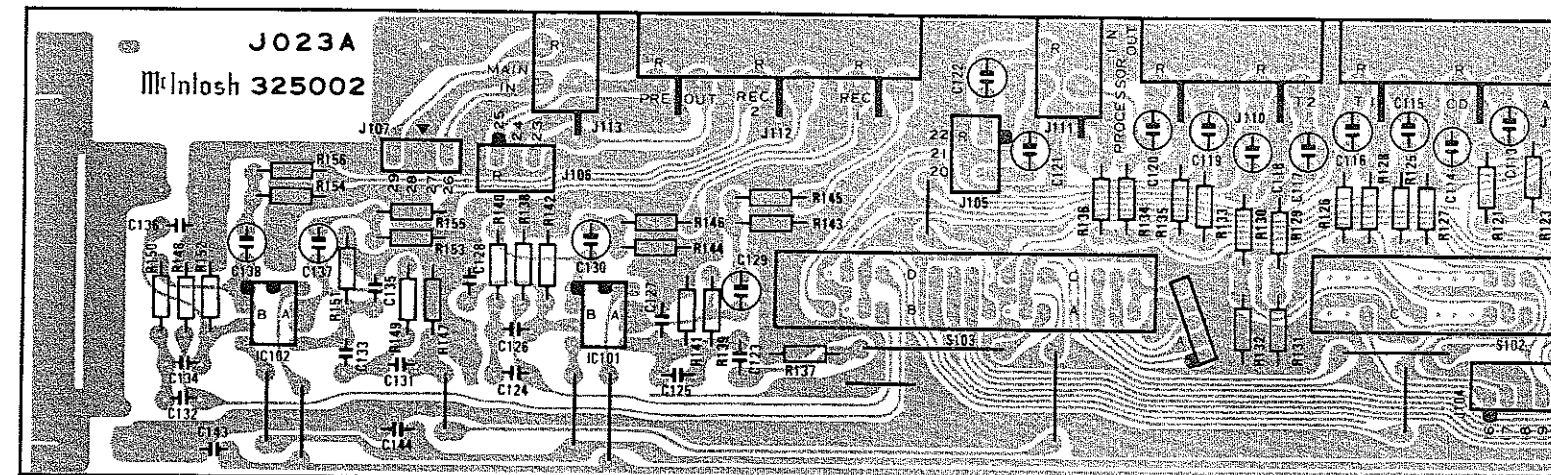
|           |        |          |
|-----------|--------|----------|
| Q101,Q102 | 310152 | 2SC2878  |
| Q103,Q104 | 310153 | 2SC3066  |
| Q105,Q106 | 310154 | 2SA1239  |
| Q107-Q108 | 310155 | 2SC2001  |
| Q109,Q110 | 310156 | 2SA953   |
| Q111,Q112 | 310157 | 2SA1220A |
| Q113,Q114 | 132231 | 2SC3298  |
| Q115,Q116 | 132232 | 2SA1306  |
| Q117,Q118 | 310158 | 2SC3622  |
| Q119,Q120 | 310155 | 2SC2001  |
| Q121,Q122 | 310159 | 2SA952   |
| Q123,Q124 | 310151 | 2SC3112  |
| Q125,Q126 | 310160 | 2SA1409  |
| Q127,Q128 | 310151 | 2SC3112  |
| Q129,Q130 | 310146 | 2SC1815  |
| Q131      | 310161 | 2SC982   |
| Q132,Q134 | 310146 | 2SC1815  |
| Q133      | 132236 | 2SA970   |
| Q135      | 310146 | 2SC1815  |
| Q136      | 310159 | 2SA952   |

## RESISTORS

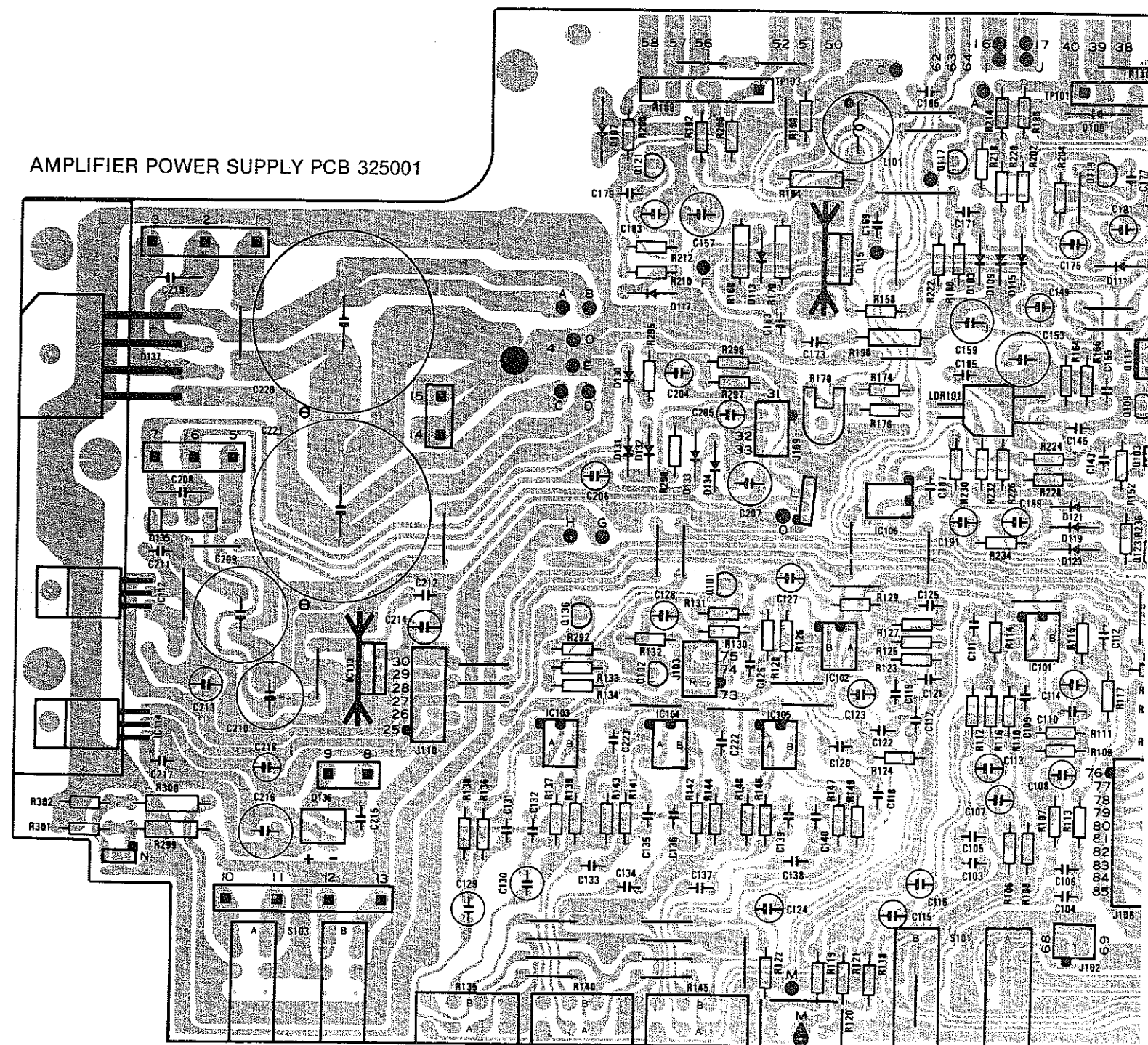
|           |        |                            |
|-----------|--------|----------------------------|
| R105      | 310178 | Volume Control, 50KAX2     |
| R120      | 310179 | Balance Control, 50KW      |
| R135,R140 | 310180 | Equalizer Control, 100KWX2 |
| R145      | 310180 | Equalizer Control, 100KWX2 |
| R178,R179 | 310181 | Bias Adjust, 100 ohm       |

## SWITCHES

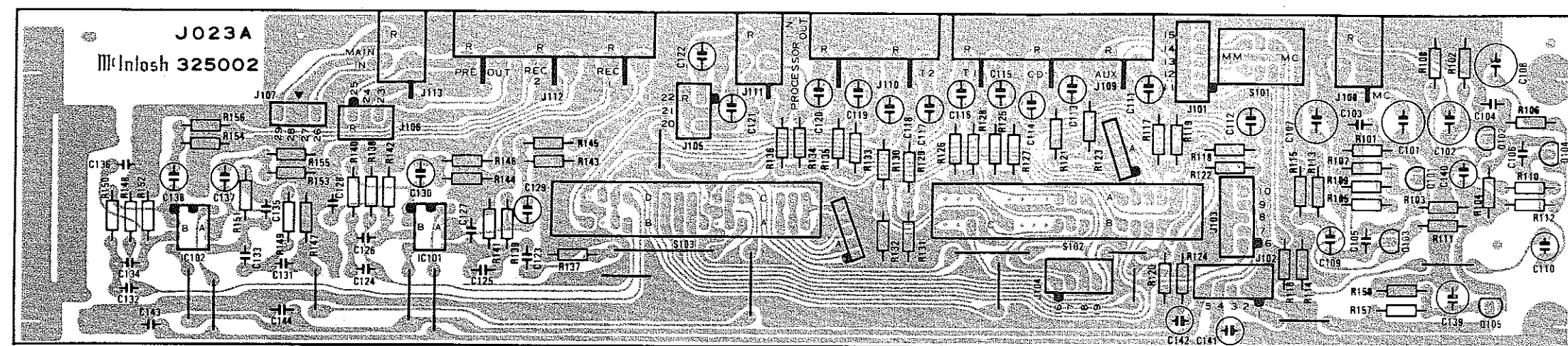
|           |        |                     |
|-----------|--------|---------------------|
| S101,S103 | 310173 | Push Switch, SPUN23 |
| S102      | 310174 | Push Switch, SPUN12 |



SWITCHING PCB 325002



AMPLIFIER POWER SUPPLY PCB 325001

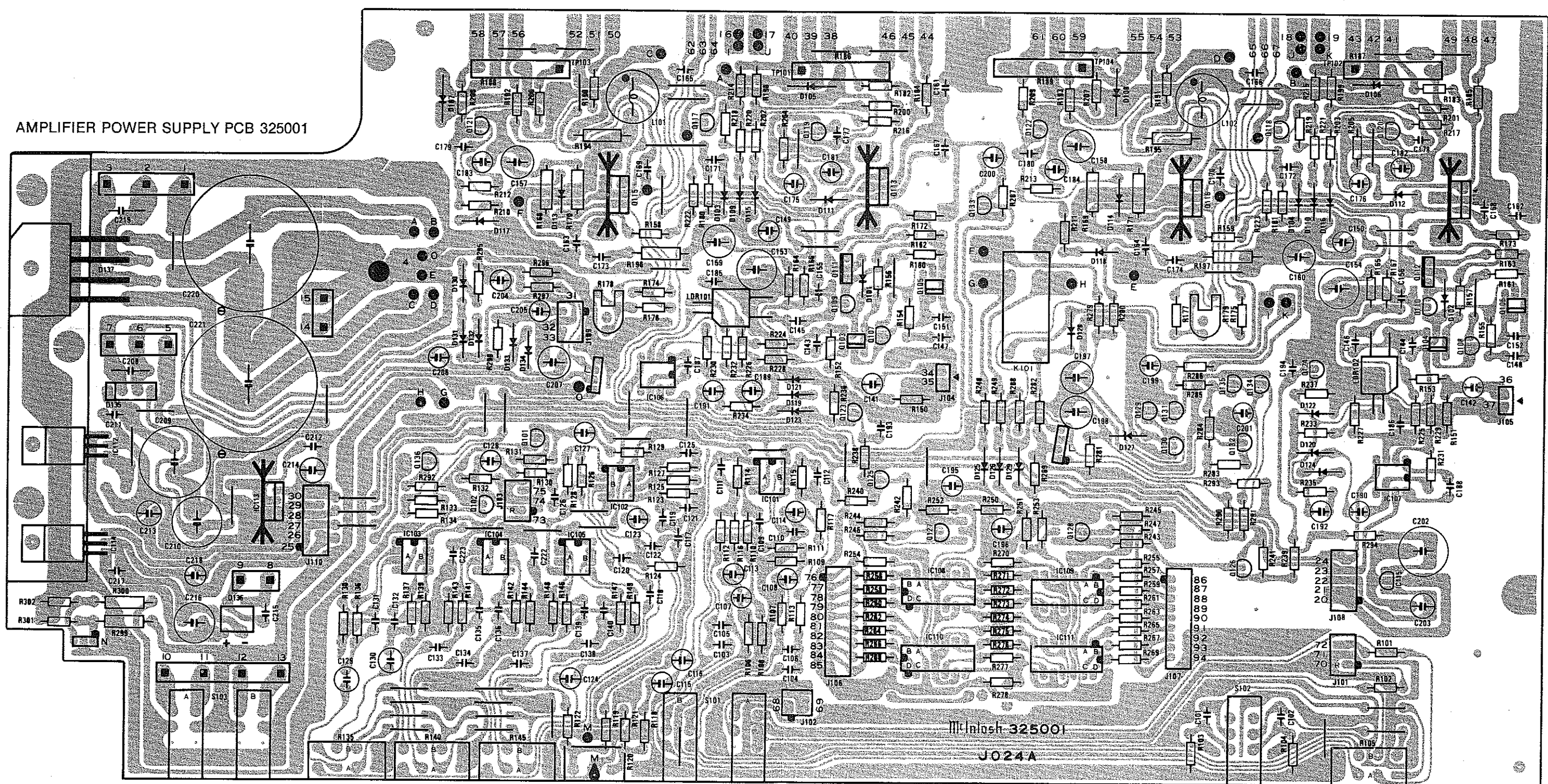


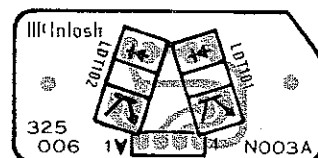
SWITCHING PCB 325002

SWITCHING PARTS LIST

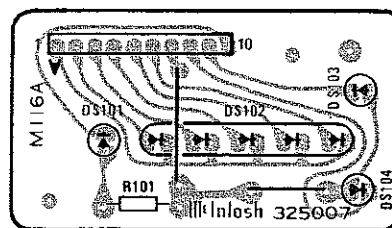
| Symbol No.         | Part No. | Description           |
|--------------------|----------|-----------------------|
| INTEGRATED CIRCUIT |          |                       |
| IC101, IC102       | 310140   | uPC4570C              |
| TRANSISTORS        |          |                       |
| Q101, Q102         | 310149   | 2SD786                |
| Q103, Q104         | 310150   | 2SA1316               |
| Q105               | 310151   | 2SC3112               |
| SWITCHES           |          |                       |
| S101               | 310170   | Slide Switch, SSP322  |
| S102               | 310171   | Rotary Switch, SRRZL4 |
| S103               | 310172   | Rotary Switch, SRRZR4 |

AMPLIFIER POWER SUPPLY PCB 325001

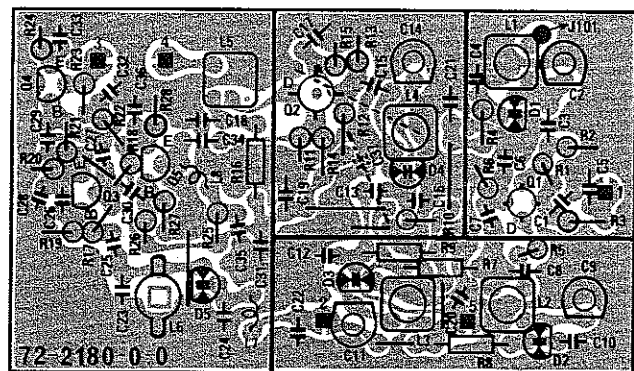




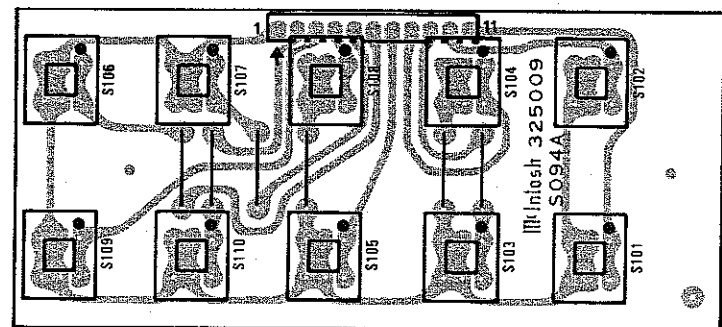
ROTARY SENSOR  
PCB 325006



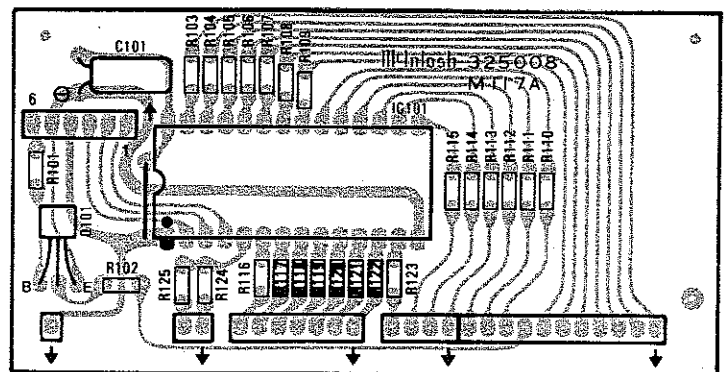
SIGNAL STRENGTH METER  
PCB 325007



FM FRONT END  
PCB F019B



SWITCHING  
PCB 325009



FREQUENCY DISPLAY  
PCB 325008

### ROTARY SENSOR PARTS LIST

| Symbol No. | Part No. | Description |
|------------|----------|-------------|
|------------|----------|-------------|

### PHOTO INTERRUPTOR

|                |        |         |
|----------------|--------|---------|
| LDT101, LDT102 | 310177 | TLP801P |
|----------------|--------|---------|

### SIGNAL STRENGTH METER PARTS LIST

| Symbol No. | Part No. | Description |
|------------|----------|-------------|
|------------|----------|-------------|

### LIGHTING DEVICES

|              |        |                   |
|--------------|--------|-------------------|
| DS101        | 310163 | LED, Red, SLP151B |
| DS102        | 310164 | LED, Red, SLP152B |
| DS103, DS104 | 310165 | LED, Red, TLR207  |

### FM FRONT END PARTS LIST

| Symbol No. | Part No. | Description |
|------------|----------|-------------|
|------------|----------|-------------|

### DIODES

|       |        |                |
|-------|--------|----------------|
| D1-D5 | 310108 | Varicap, 15V55 |
|-------|--------|----------------|

### SWITCHING PARTS LIST

| Symbol No. | Part No. | Description |
|------------|----------|-------------|
|------------|----------|-------------|

### SWITCHES

|           |        |                     |
|-----------|--------|---------------------|
| S101-S110 | 310169 | Push Switch, SPEA12 |
|-----------|--------|---------------------|

### FREQUENCY DISPLAY PARTS LIST

| Symbol No. | Part No. | Description |
|------------|----------|-------------|
|------------|----------|-------------|

### LIGHTING DEVICES

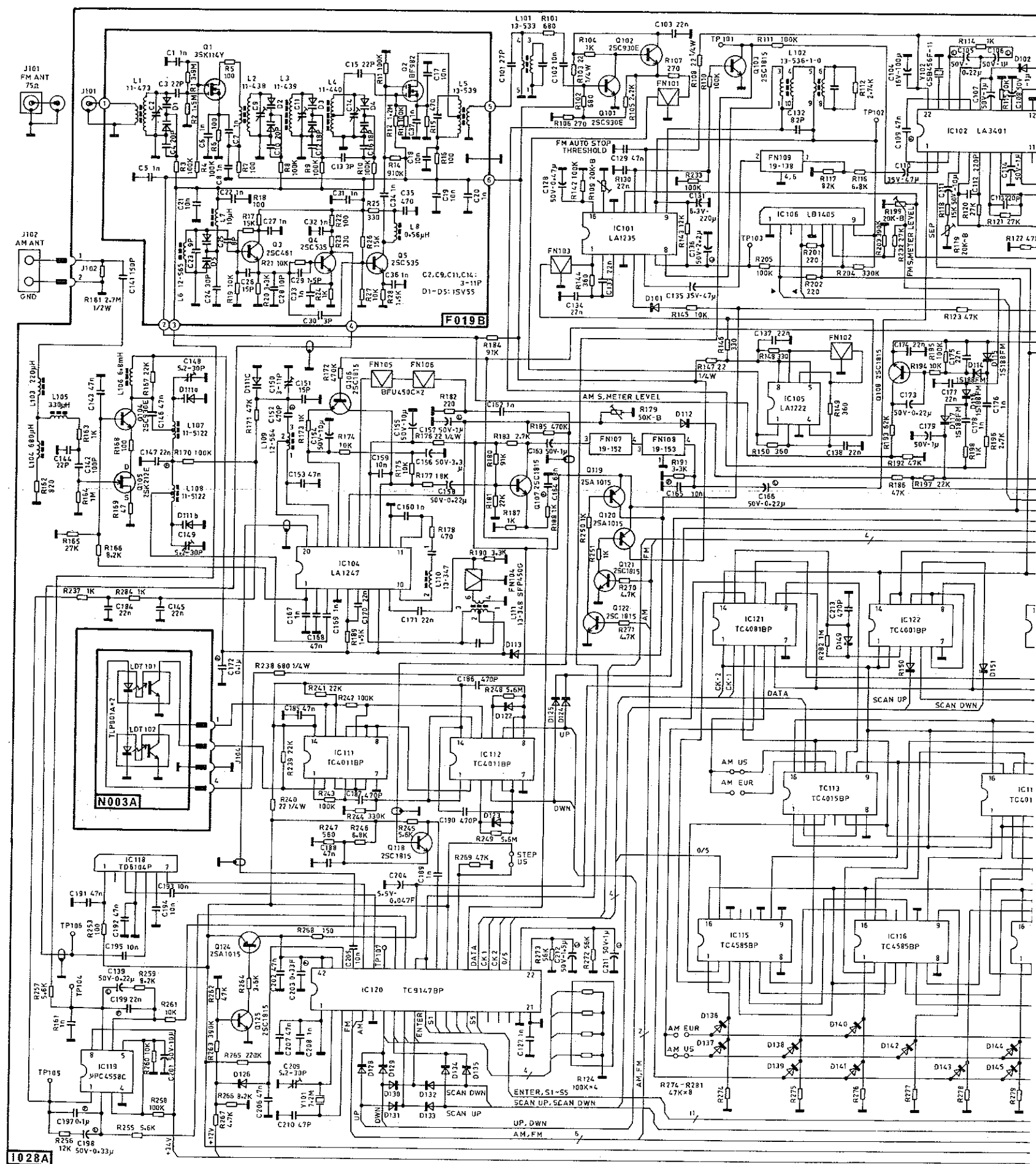
|       |        |                  |
|-------|--------|------------------|
| DS101 | 310166 | LED, SL-1015-41T |
|-------|--------|------------------|

### INTEGRATED CIRCUITS

|       |        |          |
|-------|--------|----------|
| IC101 | 310139 | TD6301AP |
|-------|--------|----------|

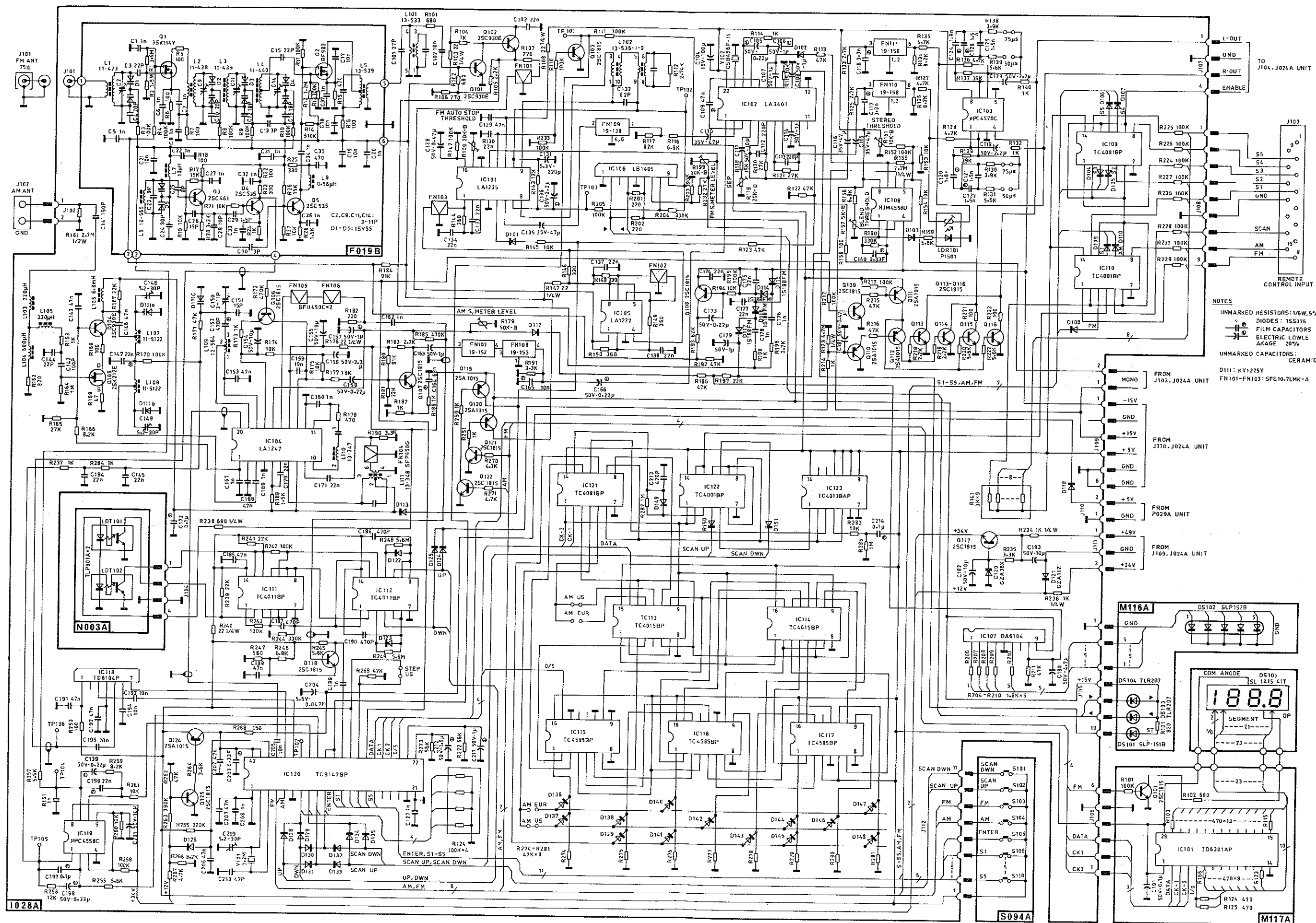
### TRANSISTORS

|      |        |         |
|------|--------|---------|
| Q101 | 310146 | 2SC1815 |
|------|--------|---------|



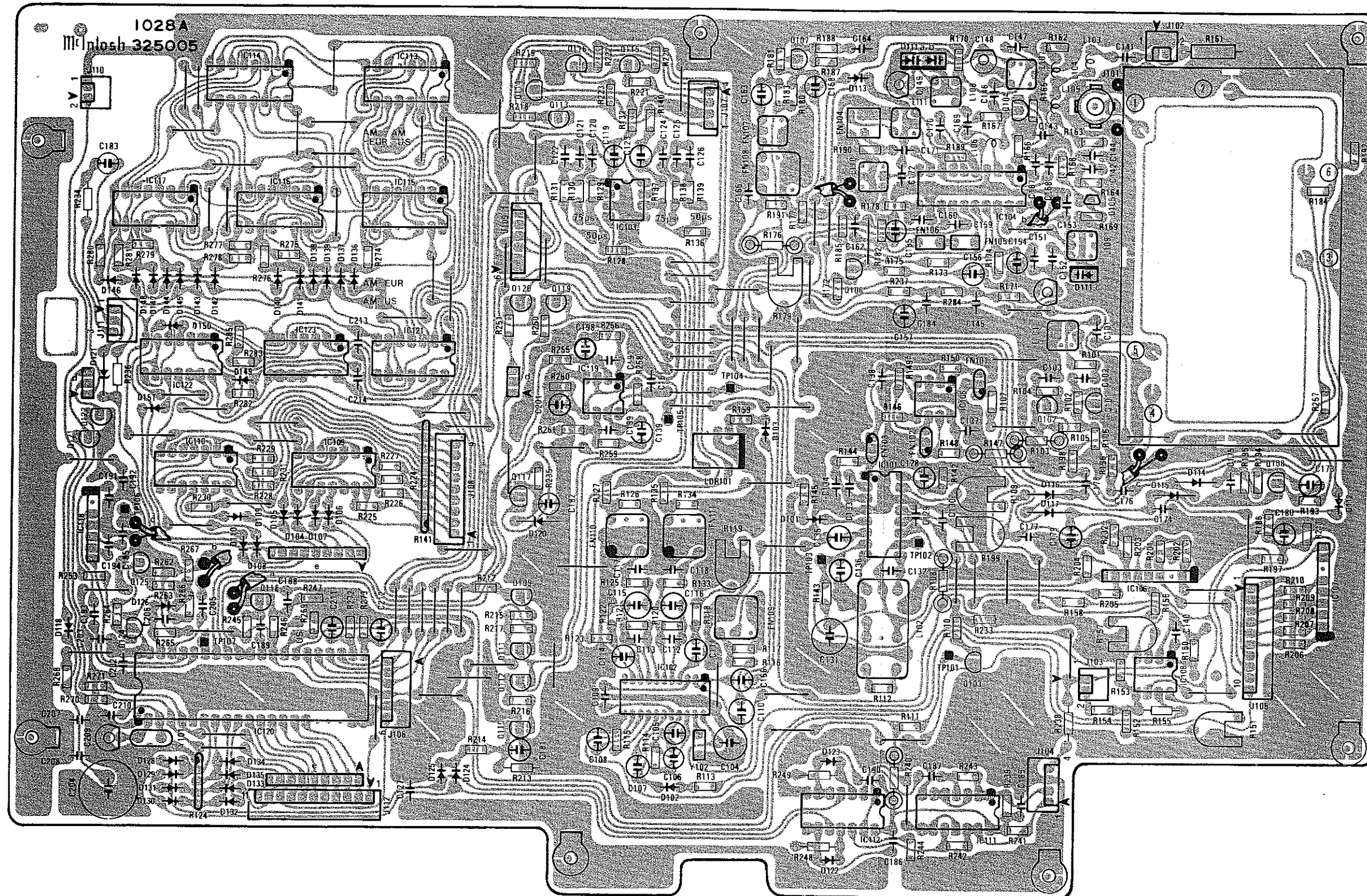
51B  
52B  
07

EA12



# Tuner 2

TUNER PCB 325005



## TUNER PARTS LIST

| Symbol No.                       | Part No. | Description            |
|----------------------------------|----------|------------------------|
| <b>DIODES</b>                    |          |                        |
| D101-D110                        | 310109   | Signal, 1SS176         |
| D111                             | 310112   | Varactor, KV1225Y      |
| D112                             | 310109   | Signal, 1SS176         |
| D113                             | 310109   | Signal, 1SS176         |
| D118                             | 310109   | Signal, 1SS176         |
| D120                             | 310110   | Zener, GZA36X          |
| D121                             | 310111   | Zener, GZA11Z          |
| D122-D126                        | 310109   | Signal, 1SS176         |
| D128-D151                        | 310109   | Signal, 1SS176         |
| <b>FILTERS</b>                   |          |                        |
| FN101-FN103                      | 310124   | Ceramic, SFE10.7 MLK-A |
| FN104                            | 310125   | Ceramic, SFP450G       |
| FN105, FN106                     | 310126   | Ceramic, BFU450C       |
| <b>INTEGRATED CIRCUITS</b>       |          |                        |
| IC101                            | 133110   | LA1235                 |
| IC102                            | 310129   | LA3401                 |
| IC103                            | 310130   | uPC4570C               |
| IC104                            | 310131   | LA1247                 |
| IC105                            | 310132   | LA1222                 |
| IC106                            | 310133   | LB1450                 |
| IC107                            | 310134   | BA6104                 |
| IC108, IC119                     | 133028   | uPC4558C               |
| IC109, IC110                     | 133064   | TC4001BP               |
| IC111, IC112                     | 133063   | TC4011BP               |
| IC113, IC114                     | 310135   | TC4015BP               |
| IC115-IC117                      | 310136   | TC4585BP               |
| IC118                            | 310137   | TD6104P                |
| IC120                            | 310138   | TC9147BP               |
| IC121                            | 133076   | TC4081BP               |
| IC122                            | 133064   | TC4001BP               |
| IC123                            | 133053   | TC4013BAP              |
| <b>LIGHT DEPENDENT RESISTORS</b> |          |                        |
| LDR101                           | 310123   | Photo Coupler, P1501   |

# Alignment Procedure

## FM ALIGNMENT

### A. SYNTHESIZER FREQUENCY ADJUSTMENT

1. Connect a Frequency Counter between TP106 and ground.
2. Tune the Receiver to 98MHz.
3. Adjust C209 so the local oscillator frequency shown by the Frequency Counter reads 108.700MHz.

### B. FRONT-END ALIGNMENT

1. TUNING VOLTAGE
  - a. Connect a DMM to TP104.
  - b. Tune the Receiver to 88MHz and adjust L6 if the voltage is not 3.6V +/-0.5V.
  - c. Tune to 108MHz and check that the voltage is within 21 to 25 volts.
2. TRACKING ADJUSTMENT
  - a. Connect the FM Generator to the 75 ohm antenna input, and a Detector Probe to Pin 1 of IC105 and ground. (See how to make the Detector Probe in figures 5 and 6 on page 20).
  - b. Tune the receiver to 106MHz and adjust the generator so a waveform is displayed on the Oscilloscope.
  - c. Adjust C2, C9, C11 and C14 for maximum waveform height.
  - d. Tune to 90MHz and adjust the Generator so a waveform is displayed on the Oscilloscope.
  - e. Adjust L1, L2, L3 and L4 for maximum waveform height.
  - f. Repeat above steps a few times as necessary to obtain the maximum waveform height.

### C. IF ADJUSTMENT

1. Tune the Receiver to 98MHz and adjust the Generator to display a curve on the Oscilloscope.
2. Adjust L5 in the front-end for maximum output, and L101 for a symmetrical output curve, using as little input as possible such as 2uV at the antenna input.

### D. DETECTOR ALIGNMENT

1. Remove the Detector Probe and connect the tuner output to the Oscilloscope and Distortion Analyzer.
2. Connect a DC Meter across TP102 (-) and TP103 (+).
3. Tune the Receiver and Generator to 98MHz feeding 54uV to the antenna input.
4. Adjust L102 secondary for minimum distortion.
5. Adjust L102 primary for OV center.
6. Repeat above steps for best result.
7. Adjust L5 in the front-end for minimum stereo L or R distortion.
8. Adjust L101 in the same way for the same result.
9. Repeat above steps for best result.
10. Check to confirm that the DC Meter reads 0V +/-50mV.

### E. DISTORTION

1. Tune the Receiver and Generator to 98MHz and feed 50uV to the antenna input.
2. The Distortion should be within the following limits:  
Less than 0.12%: MONO  
Less than 0.1%: L+R, L, R, L-R

### F. SEPARATION

1. Tune the Receiver and Generator to 98MHz and feed 50uV to the antenna input.
2. Modulate L Channel only and adjust R119 for minimum output on R Channel VTVM and Oscilloscope.
3. Modulate R Channel only and adjust R119 for minimum output on L Channel VTVM and Oscilloscope.
4. Readjust R119 if necessary to obtain the same reading on both channels.
5. Check and confirm that the reading is more than 46dB on each channel.

### G. AUTO BLEND

1. Tune the Receiver and Generator to 97.50MHz and feed 56uV to the antenna input.
2. Check and confirm that the S/N ratio is more than 60dB.
3. Adjust the attenuator of the FM Generator so the S/N ratio reads 60dB.
4. Adjust R157 so the S/N reading is 2dB down.

### H. SIGNAL METER

1. Tune the Receiver and Generator to 97.50MHz and feed 14dBu to the antenna input.
2. Adjust R199 so the second LED lights at this input level.

### I. AUTO STOP AND STEREO LEVEL

1. Tune the Receiver and Generator to 97.50MHz and feed 3.2uV to the antenna input.
2. Connect a DMM to TP101.
3. Adjust R109 to obtain a high level.
4. Next, adjust R151 so the Stereo Indicator LED lights.

## AM ALIGNMENT

### A. TUNING VOLTAGE ADJUSTMENT

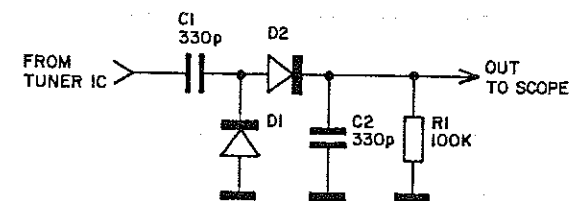
1. Connect a DMM to TP105.
2. Tune the Receiver to 520kHz and adjust L109 and C150 so the voltage reads within 1.6 to 1.7V.
3. Tune to 1710kHz and check that the voltage is within 27 to 28V.
4. Repeat above steps until within specified voltage.

### B. TRACKING ADJUSTMENT

1. Tune the Receiver and Generator to 1400kHz and feed 10uV to the antenna input.
2. Adjust C148 and C149 for maximum output.
3. Tune to 630kHz.
4. Adjust L107 and L108 for maximum output.
5. Repeat above steps as necessary.

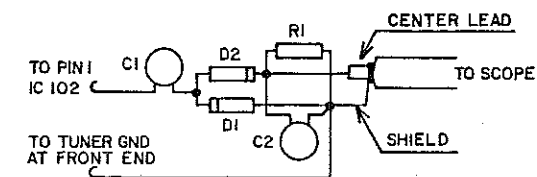
### C. SIGNAL METER

1. Tune to 1000kHz and feed 100uV to the antenna input.
2. Adjust R179 so the fifth LED lights.



SCHEMATIC DIAGRAM OF DETECTOR PROBE

Diodes should be point contact germanium; some commonly available types are: OA80  
AA119  
IN60  
IN34  
IN22



PICTORIAL DIAGRAM OF DETECTOR PROBE

Keep leads as short as possible to minimize stray signal pickup.

#### POWER AMPLIFIER BIAS ADJUSTMENT

1. Operate the Receiver 3 to 5 minutes without a signal (volume control CCW).
2. Connect a DC millivolt meter from TP101 to TP103 in the left channel.
3. Adjust R178 bias control for  $23\text{mV} \pm 2\text{mV}$ .
4. Connect a DC millivolt meter from TP102 to TP104 in the right channel.
5. Adjust R179 bias control for  $23\text{mV} \pm 2\text{mV}$ .

# Repacking Instructions

In the event it is necessary to return the MAC 4275 to McIntosh Laboratory for service, the unit must be repacked carefully using all of the original pads and carton.

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 the pads and carton are in good serviceable condition.

| QTY | PART NO. | DESCRIPTION              |
|-----|----------|--------------------------|
| 1   | 033512   | Shipping carton only     |
| 1   | 033513   | foam pad, left           |
| 1   | 033514   | foam pad, right          |
| 1   | 046597   | Shipping carton complete |

**McIntosh<sup>®</sup>**  
**MAC4275 AM/FM RECEIVER**

The continuous improvement of its products is the policy of McIntosh Laboratory Incorporated, who reserve the right to improve design without notice. Because of the constant upgrading of McIntosh products' circuitry and components, the Company cannot insure, and does not warrant, the accuracy of the within schematic material, which is intended for information only.

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