

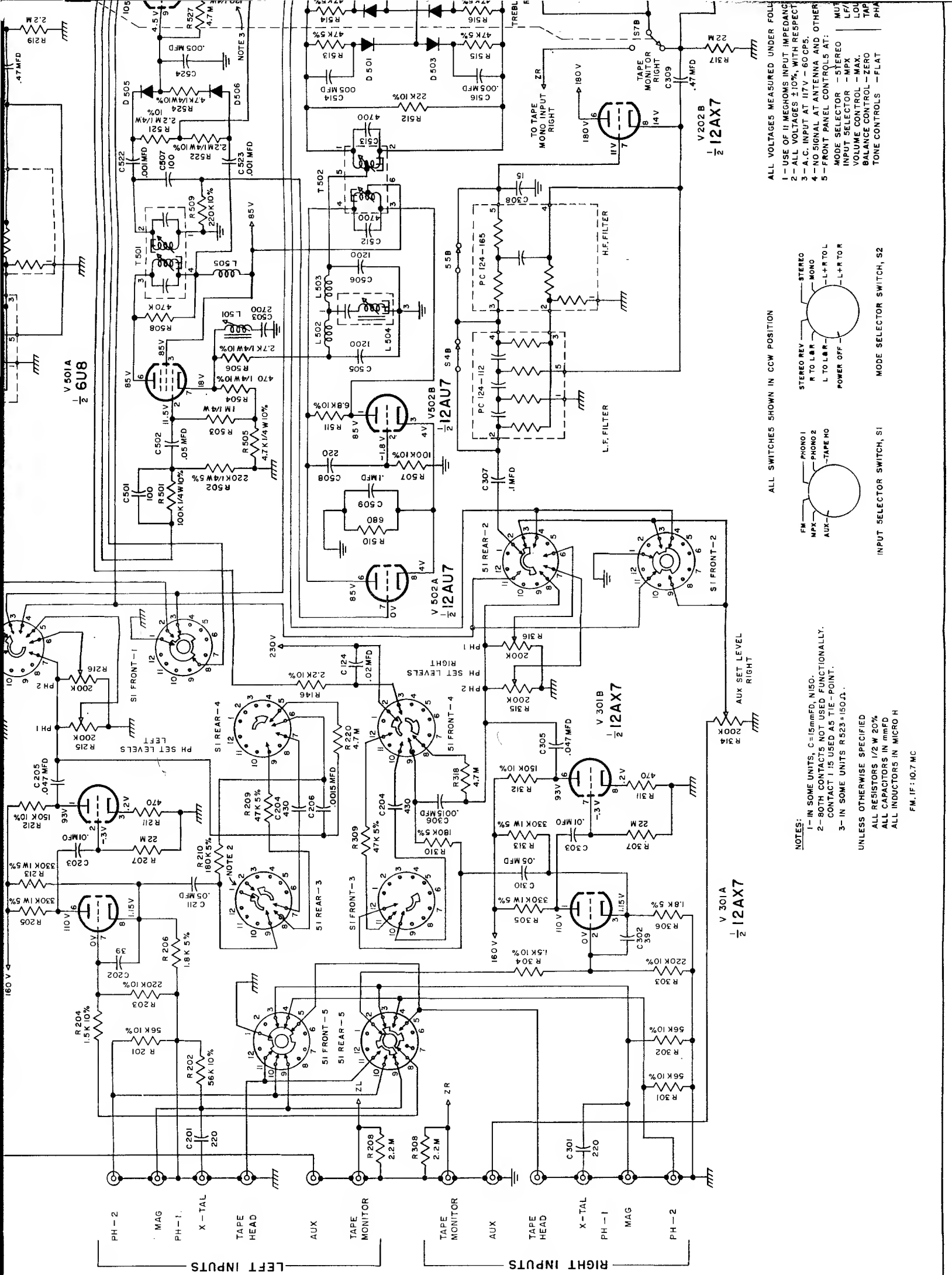
AGES MEASURED UNDER FOLLOWING CONDITIONS:  
 F II MEGHOMS INPUT IMPEDANCE VTVM VOLTMETER:  
 DILTAGES ±10%, WITH RESPECT TO GROUND  
 PUT AT 117 V - 60 CPS.  
 TAP AT ANTENNA AND OTHER INPUT TERMINALS.  
 PANEL CONTROLS AT:  
 SELECTOR - STEREO - OUT  
 SELECTOR - MPX - OUT  
 E. CONTROL - MAX. - OUT  
 CE CONTROL - ZERO - OUT  
 CONTROLS - FLAT - 0°

CHASSIS GROUND  
 OUTPUT AUDIO GROUND  
 INPUT AUDIO GROUND

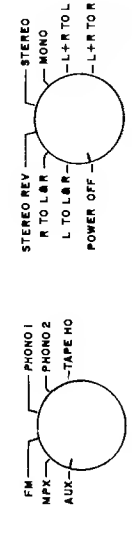
TITLE	MX 110 SCHEMATIC
DATE	11-11-62
SCALE	1" = 100'
DESIGN BY	MG
CHECKED BY	BB
APPROVED BY	SAC
DRAWN BY	MG
WORKING DRAWING NO.	SC124-231
REV.	

MATERIAL  
 FINISH  
 TOLERANCES - UNLESS OTHERWISE SPECIFIED  
 - 1/16" ANGLES - 45° MINIMUM  
 - .005 BORE DIA.  
 - .005 BORE DIA.

TO TAPE MONITOR RIGHT  
 180V  
 202B 2AX7  
 80V  
 14V  
 C309  
 .47MFD  
 R217  
 R218  
 500K  
 PC124-15  
 157B  
 BASS CONTROL RIGHT  
 R319B  
 1M



ALL SWITCHES SHOWN IN CCW POSITION



NOTES:  
 1- IN SOME UNITS, C=15MMFD. NISO.  
 2- BOTH CONTACTS NOT USED FUNCTIONALLY.  
 CONTACT 1 IS USED AS TIE-POINT.  
 3- IN SOME UNITS R523=150Ω.

UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS 1/2 W 20%  
 ALL CAPACITORS IN MMFD  
 ALL INDUCTORS IN MICRO H

FM, IF: 10.7 MC

ALL VOLTAGES MEASURED UNDER FOLLOWING CONDITIONS:  
 1- USE OF 11 MEGOHMS INPUT IMPEDANCE  
 2- ALL VOLTAGES ±10%, WITH RESPECT TO GROUND  
 3- A.C. INPUT AT 117V - 60 CPS.  
 4- NO SIGNAL AT ANTENNA AND OTHER INPUTS  
 5- FRONT PANEL CONTROLS AT:  
 MODE SELECTOR - STEREO  
 INPUT SELECTOR - MPX  
 VOLUME CONTROL - MAX.  
 BALANCE CONTROL - ZERO  
 TAPES - TAPE  
 TONE CONTROLS - FLAT

# McIntosh

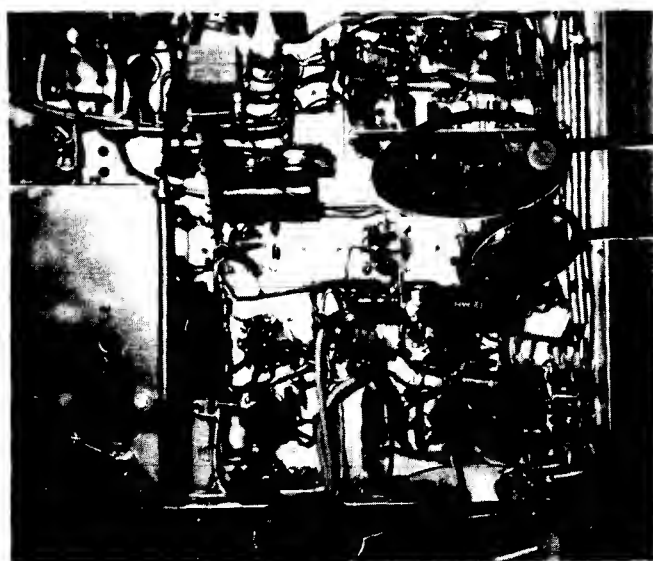
**DATE:** NOVEMBER, 1965

**MODEL NUMBER:** MX110

**MODIFICATION:** Popping noise from the speakers when the switch controls on the MX110 are operated can be caused by "leaky" .1 MFD disc ceramic coupling capacitors. Changing these capacitors to high insulation resistance mylar units will eliminate the problem. MX110 equipment built since April 1965 have this change.

**PROCEDURE:** Replacement of capacitors.

- A. If a popping is heard when depressing the LF filter replace C 97 or C 98. They are located on the LF filter switch. The replacement part number is 064-027. (.1 mfd 40 v).
- B. If a popping is heard when rotating the mode selector switch replace C 93 and C 95, or C 94 and C 96. The components are to be replaced with one 064-024. (.22mfd 40v). C 97 and C 98 may also cause popping.
- C. If a popping is heard when rotating the input selector switch between MPX and AUX or FM MONO, replace C 72, C 76, or C 52. Use 061-0455. (.02 mfd)
- D. If a popping is heard when rotating the input selector switch to various positions, replace C 91 or C 92. Use 061-045. (.02 mfd).
- E. If a high level of distortion is present on FM mono, replace C 54. Use 064-028. (.1 mfd 200 v).



C-72, 76, 52

C-54, C-91-96 (AT 6D10 TUBE SOCKET)

C-97, 98

**NOTE:** All of the above replacement parts should be acquired from McIntosh Lab.

**LEFT CHANNEL**

- LEFT CHANNEL INPUTS**
- AUX  $\text{10K } \Omega$
  - TAPE  $\text{10K } \Omega$
  - TUNER 1  $\text{10K } \Omega$
  - TUNER 2  $\text{10K } \Omega$
  - PHONO 1  $\text{10K } \Omega$
  - PHONO 2  $\text{10K } \Omega$
  - MIC
  - TAPE HD
  - MONITOR INPUT
  - TAPE OUTPUT

LEFT TAPE

RIGHT TAPE

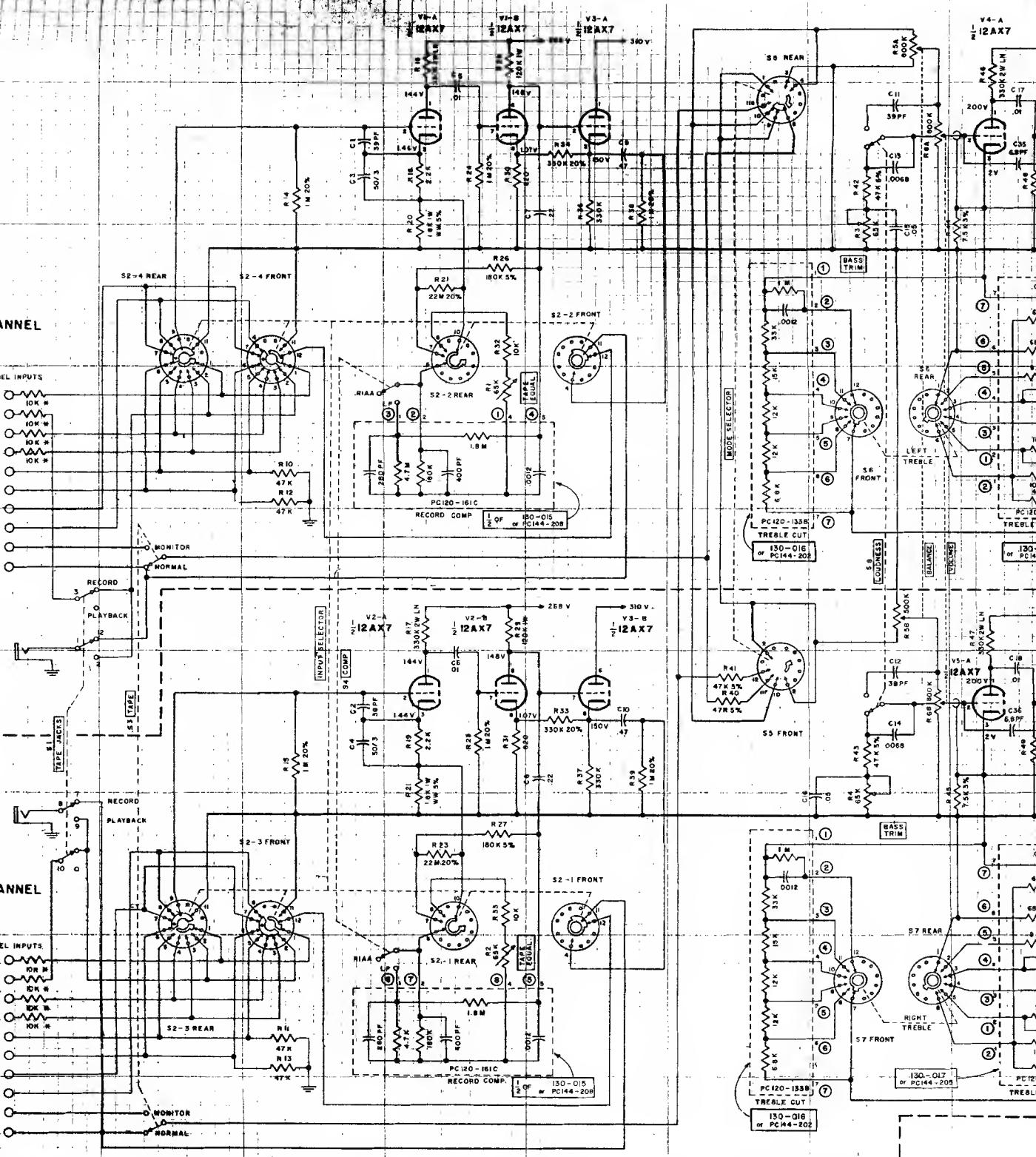
**RIGHT CHANNEL**

- RIGHT CHANNEL INPUTS**
- AUX  $\text{10K } \Omega$
  - TAPE  $\text{10K } \Omega$
  - TUNER 1  $\text{10K } \Omega$
  - TUNER 2  $\text{10K } \Omega$
  - PHONO 1  $\text{10K } \Omega$
  - PHONO 2  $\text{10K } \Omega$
  - MIC
  - TAPE HD
  - MONITOR INPUT
  - TAPE OUTPUT

\* RESISTORS  $\frac{1}{2}\text{W}, 20\%$

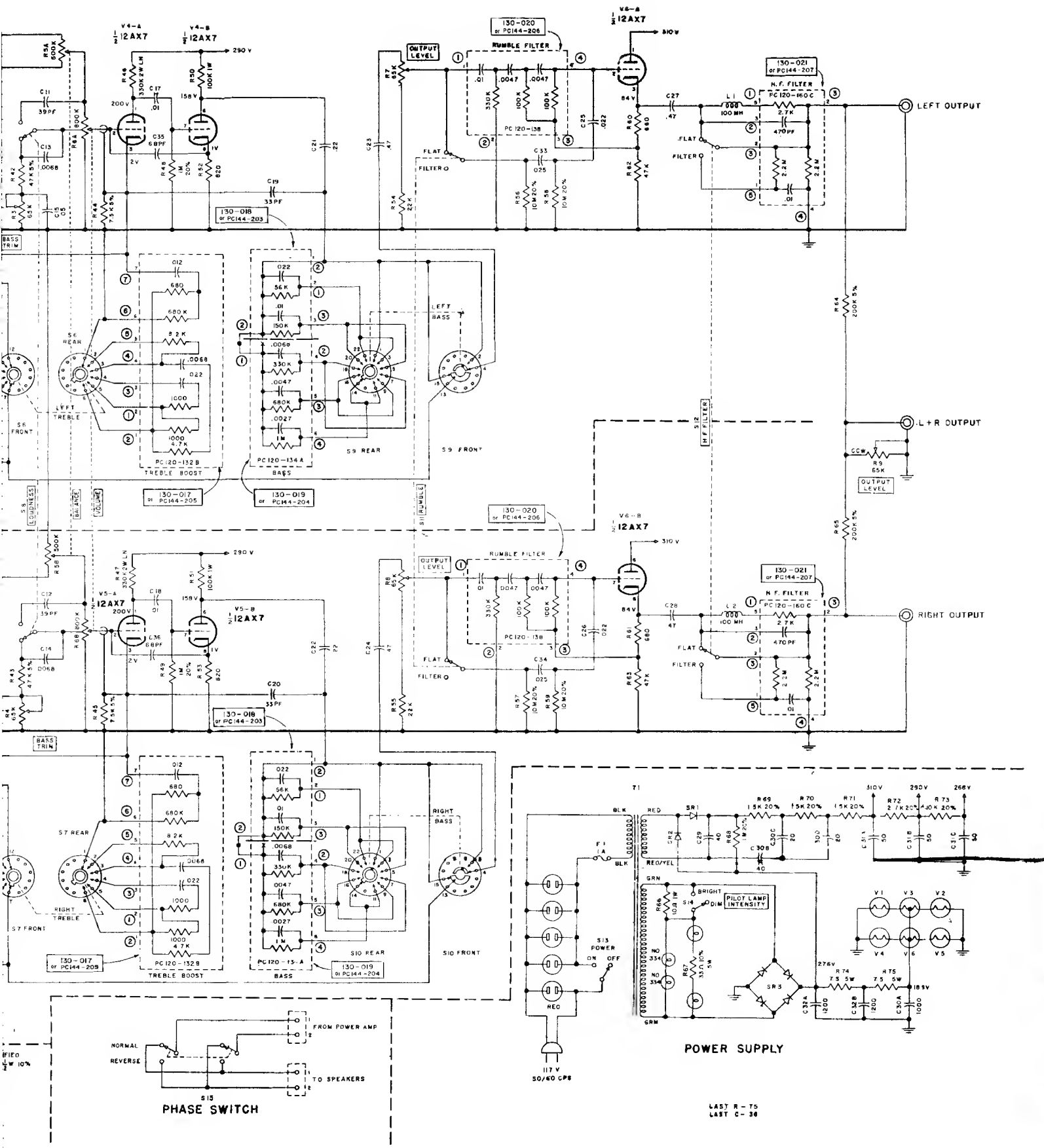
THIS DRAWING SHOWS HOW TO REPLACE DISCONTINUED SERIES MODULES WITH CURRENT SERIES MODULES.

UNLESS OTHERWISE SPECIFIED  
ALL RESISTORS IN OHMS  $\frac{1}{2}\text{W } 10\%$   
ALL CAPACITORS IN MFD



NORMAL  
REVERSE

PHA



**POWER SUPPLY**

LAST R - 75  
LAST C - 38

# McIntosh

**MODEL NUMBER:** MR 65B, MX 110, MR 67

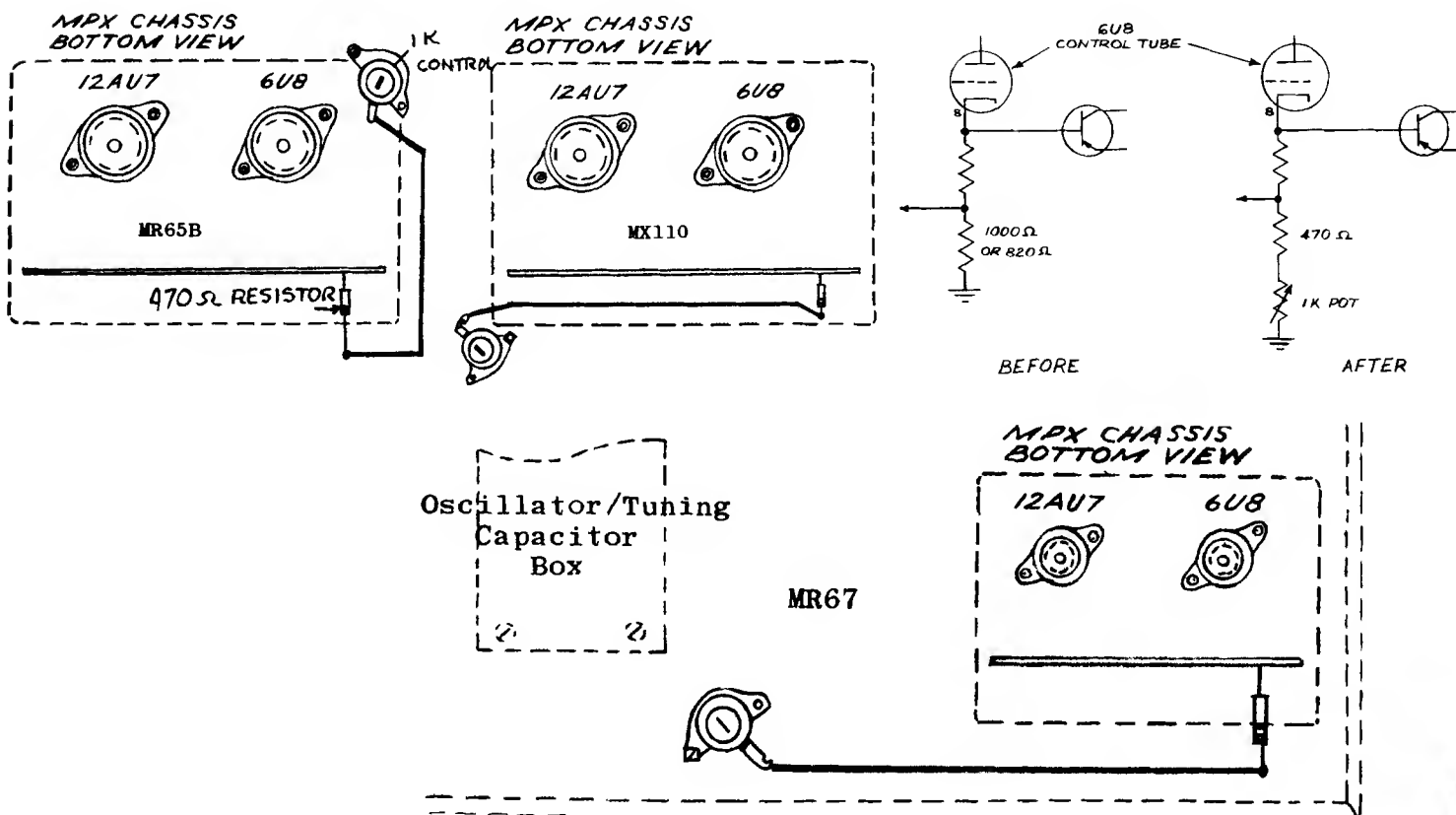
**DATE:** MARCH 1965

**MODIFICATION:** To allow adjust control for instant correction of tube and circuit variations. This will insure proper MPX indicator light operation.

**PROCEDURE:** This modification will allow you to adjust the MPX light on all tuners with ease. The reason for this modification is to allow simple field adjustment of varying tube and circuit characteristic.

MR 65B  
and  
MX 110 tuner/preamp.

1. Install 1K control (WC 807) to MPX chassis. Use the existing MPX chassis mounting screw.
2. Remove the 820 ohm or 1K ohm resistor. (cathode circuit of 6U8)
3. Solder one end of 470 ohm resistor to bottom hole nearest the chassis.
4. Connect a lead from other end of the resistor to the terminal lug on a 1K control.



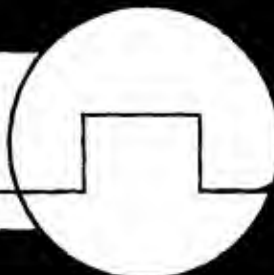
1. Install 1K control to the tuner chassis under the existing screw as shown in the diagram.

2. Follow steps 2, 3, 4, as above.

**TO ADJUST THE CONTROL:** Tune to point of no station. Place mute to "IN" position. Turn control from full clockwise position to a point where the light just goes out.



# McIntosh



**MODEL NUMBER:** MX110 Z and X series.

**DATE:** JUNE 1966

**MODIFICATION:** This modification eliminates both the "opening" of the tuning eye after warm up, and the muting threshold change with tuner warm up.

The drift problem is corrected by replacing the IF transformer T 4. T 4 is replaced by a transformer of improved design. There are several circuit modifications that must also be made.

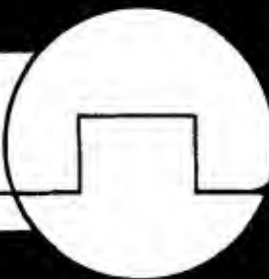
Part of the change includes adding a potentiometer. This potentiometer allows adjustment of the amount of tuning eye closure.

After the modification has been made it is necessary to align the IF transformer T 4, the tuning indicator adjustment, and the muting adjustment control.

**PROCEDURE:**

1. Remove IF transformer T 4. Replace this transformer with McIntosh part #162-029. Remove and do not connect back into the circuit capacitor C 24 and the small parallel lead capacitor that was between pins 1 and 4 on the transformer.
2. Replace diode D2 with a new diode, McIntosh part #070-022.
3. Change R 33 from 100K to 47K 10% 1/2W. This is McIntosh part #136-180.
4. Remove the present muting control. Discard it. Install a dual control. (#134-168). The top of the dual control is re-wired as the previous muting control. The bottom of the control is the new control.
5. Connect the end contact of the tuning indicator adjust control to the end contact of R1.
6. Remove resistor R 35. Replace it with a short section of wire. Solder the wire to ground.
7. Disconnect the end of R 32 which connects to feed through capacitor C33. Connect this end of R 32 to the arm contact on the tuning indicator adjust control. To make this connection extend the lead on R 32. Use a short section of wire and spaghetti tubing.
8. Align and adjust the MX 110 as follows: If proper alignment equipment is at hand use procedure A. If limited test equipment is available use procedure B.
  - A) Switch the MX 110 muting control to the "out" position. Connect a 10.7MC signal to the grid of the first IF amplifier. Feed in enough signal to develop at least 10 volts at test point 1 (TP-1). Turn the "tuning indicator adjust" control to mid position. Adjust T-4 top and bottom cores for maximum tuning indicator closure. Then adjust the "tuning indicator adjust" control for 1/16" opening of the tuning eye.
  - With the 10.7MC signal connected to the MX 110 check the adjustment of IF transformer T 5. Measure the DC voltage present at test point 2 (TP-2). If this voltage measures more than  $\pm 0.2$  volts, adjust the top core on T 5 so the voltage at TP-2 is zero. DO NOT ADJUST THE BOTTOM CORE OF T 5.

# McIntosh



Next feed a 6 microvolt FM signal into the antenna terminals of the MX 110. Tune the MX 110 to the FM signal generator. Modulate the FM signal generator with a 400 cps or 1000 cps audio signal. Switch the muting switch to the "in" position. Adjust muting control R1 so the MX 110 output just starts to mute.

THIS COMPLETES THE ADJUSTMENT PROCEDURE.

IF YOU DO NOT HAVE TEST EQUIPMENT USE THE FOLLOWING ADJUSTMENT PROCEDURE.

B) Switch the muting switch to the "out" position. Connect a FM antenna to the MX 110. Tune in a strong local station. Connect a DC voltmeter to test point 2 (TP-2). Carefully tune the MX 110 tuning knob for zero volts at TP-2. Adjust the "tuning indicator adjust" control to mid position. Adjust T4 top and bottom cores for maximum tuning indicator closure. Then adjust the "tuning indicator adjust" control for 1/16" opening of the tuning indicator.

Next tune in a weak station. The station should have background noise but still be listenable. Switch the muting switch to the "in" position. Adjust the "muting adjust" control R1 so the MX 110 output just starts to mute.

THIS COMPLETES THE ADJUSTMENT PROCEDURE.

#### PARTS NEEDED:

- 1 162-029 IF Transformer
- 1 070-022 Diode
- 1 136-180 47K Resistor
- 1 134-168 Control

# McIntosh

## PROCEDURE FOR MOUNTING "TUNING INDICATOR ADJUST" CONTROL

- ① CHANGE T4 TO PART # i62-029. REMOVE C 34 AND PARALLEL WIRE CAPACITOR.
- ② CHANGE D2 TO PART # 070-022.

