

INSTRUCTION MANUAL
McINTOSH MODEL MC-60
60 WATT POWER AMPLIFIER

Type A-121

McINTOSH LABORATORY, INC.
2 Chambers St. Binghamton, N. Y.
U.S.A.

DESCRIPTION

The McIntosh Model MC-60 is a 60 watt high fidelity power amplifier designed for home entertainment systems and professional applications where high power and distortion free performance is required. The Model MC-60, like all other McIntosh power amplifiers, uses the exclusive McIntosh high efficiency output circuit and bifilar output transformer to obtain the high standard of performance found in this amplifier. Some of the more important characteristics of the amplifier are: less than 1/3% harmonic distortion at any power output up to 60 watts and at any frequency in the audio spectrum, 20 to 20,000 cps; less than 1/2% intermodulation distortion for all power levels up to 120 instantaneous peak watts; and noise and hum level 90 db or more below the rated output level.

The MC-60 has two high impedance inputs and may be operated from any signal source delivering 0.5 volts or more, or directly from a McIntosh Audio Compensator or Pre-Amplifier such as the Models C-4, C-8, C-104 or C-108. Output impedances of 4, 8 and 16 ohms are provided for direct connection to loudspeakers. An additional 600 ohm output is present for use with lines, etc.

INSTALLATION

Location

The MC-60 should be located in a well ventilated area. If the amplifier is housed in a cabinet or other enclosure, holes must be provided for air circulation.

Input Connections

1. When a McIntosh Audio Compensator or Pre-Amplifier of the non-self powered type is used with the MC-60, plug the pre-amplifier's output-power cord into the "PRE-AMP INPUT" receptacle on the MC-60 and turn the "GAIN" control fully counter clockwise. This receptacle supplies the required plate and filament power to the pre-amplifier equipment as well as providing the necessary audio connections.

For pre-amplifier installation, adjustment and operation refer to the pre-amplifier's instruction manual.

2. When using a self-powered McIntosh Audio Compensator or Pre-Amplifier, connect the audio output from the pre-amplifier to the input of the MC-60 using the cable supplied with the pré-amplifier. Turn the "GAIN" control fully counter clockwise.

3. When a signal source of 0.5 volts or more is used to drive the MC-60, such as the output of a tuner, tape recorder, or other pre-amplifiers, plug the source into the "0.5 VOLT" pin jack receptacle or connect to the "0.5 VOLT"

and "GND" screw terminals. Use the "GAIN" control to obtain the desired operating level.

If desired, the signal source may be wired to an octal plug for insertion in the octal "Pre-Amp Input" receptacle. In this case connect the input lead to pin #5 and the ground lead to pin #1. When using this connection the source must not have a DC output component.

Output Connections

The MC-60 has output impedances of 4, 8 and 16 ohms available at either the screw terminal connector or the output socket. In addition, a 600 ohm output (balanced to ground) is available at the output socket. See schematic diagram for socket connections.

It is important that the loudspeaker or other load be properly matched to the amplifier if best performance is to be obtained. Because many loudspeakers do not have voice coil impedances exactly matching 4, 8 and 16 ohms, the following table lists suggested connections for best impedance matching.

| | | | |
|-------------------|-----------------|----------------|---------------|
| Speaker Impedance | 3.2 to 6.5 ohms | 6.5 to 13 ohms | 13 to 32 ohms |
| Connect To | 4 ohms | 8 ohms | 16 ohms |

WARNING: Output plugs wired for McIntosh 20W-2 and 50W-2 amplifiers must not be used with the MC-60 without rewiring the plug. Output connections for the MC-30 are the same as those for the MC-60.

Power Connections

The MC-60 operates from any 110 to 130 volt 50-60 cycles power line. (When continuous use is contemplated on 120 to 130 line volts the transformer primary should be re-connected using the 125 volt tap.)

When the MC-60 is used with McIntosh Pre-Amplifier equipment, tuners, or other associated equipment, the MC-60 power cord may be plugged into the receptacle at the rear of these units. When thus connected the power switch of these units controls the MC-60.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

Specifications for the McIntosh Model MC-60 Audio Amplifier

| | |
|-------------------|---|
| Power Supply | 117/125 volts, 50/60 cycles |
| Power Consumption | 280 watts at 60 watts output 155 watts at zero signal output |

| | |
|--------------------------------|--|
| Power Output | 60 watts continuous |
| Input Level | Input #1, .5 volts to 30 volts, with gain control. Input #2, 2.5 volts (for use with McIntosh Audio Compensators and Pre-Amps). |
| Frequency Range | 20 to 30,000 cycles \pm .1 db at 60 watts output 16 to 60,000 cycles \pm .5 db at 60 watts output 10 to 100,000 cycles \pm 1.0 db at 30 watts output |
| Harmonic Distortion | Less than 1/3% at 60 watts output or less, 20 to 20,000 cycles. |
| Intermodulation Distortion | Less than 1/2% if instantaneous peak power is below 120 watts |
| Impulse Distortion | Negligible |
| Noise and Hum Level | 90 db or more below rated output |
| Damping Factor | 15 or better for 4, 8, and 16 ohm output, 20 for 600 ohms |
| Input Impedance | 0.5 meg for 0.5 volt input and 0.13 meg for 2.5 volt input. 20 cycles to 40 KC |
| Output Impedance | 4, 8, 16 and 600 ohms (600 ohm is balanced to ground) |
| Phase Shift | \pm 8° 20-20,000 cycles |
| Tube Complement | Rectifier: 2-5U4GA Pre-Amp: 12AX7 Phase Inverter: 12AU7 Voltage Amp: 12BH7 Driver: 12AX7 Output: 2-6550 |
| Auxiliary Equipment Connection | Designed to power C-4, C-8 and other McIntosh pre-amplifiers |

| | |
|--------|--|
| Size | 14"x10"x8" high, chassis type construction |
| Weight | 41 pounds net |
| Finish | Chrome and Black |

GUARANTEE

We guarantee the performance of this equipment and the mechanical and electrical workmanship to be free of serious defects for a period of 90 days. This guarantee does not extend to components damaged by improper use nor does it extend to transportation to and from the factory.

SERVICE INFORMATION

All McIntosh equipment is designed for long trouble free operation. All components are of the highest quality and are conservatively operated. If trouble develops the amplifier may be returned to the factory for repair or may be repaired by a competent electronics service man. The following chart of operating voltages and resistances is offered as a guide for servicing the unit. All voltages and resistances are measured to chassis except those with asterisk (*). These are measured to chassis with pin #2 of either 5U4GA grounded. Voltages are measured with high impedance VTVM. NOTE - UNIT MUST BE TURNED OFF WHEN MEASURING RESISTANCES.

VOLTAGE AND RESISTANCE CHART

| Tube | Pin No. | DC Volts No Signal | DC Volts at 60W out | AC Volts at 60W out | Resistance in Ohms 1Unit Off |
|-------|-----------|-----------------------|------------------------|------------------------|------------------------------------|
| 12AX7 | 1 | 82 | 81 | 1.5 | Inf. |
| | 2 | 0 | 0 | .45 | 100K to 560K |
| | 3 | 1.1 | 1.1 | .45 | 3.3K |
| | 6 | 360 | 310 | 0 | 10K* |
| | 7 | 108 | 108 | 0 | 1.2M* |
| | 8 | 111 | 110 | 0 | Inf. |
| 12AU7 | 1 | 284 | 240 | 8.4 | 40K* |
| | 2 | 82 | 81 | 1.5 | Inf. |
| | 3 | 92 | 88 | .5 | 18K |
| | 6 | 284 | 240 | 8.4 | 38K* |
| | 7 Approx. | 62 | Approx. 67 | 0 | Inf. |
| | 8 | 92 | 88 | .5 | 18K |

| Tube | Pin No. | DC Volts No Signal | DC Volts at 60W out | AC Volts at 60W out | Resistance in Ohms Unit Off |
|--------------------------|---------|-----------------------|------------------------|------------------------|-----------------------------------|
| 12BH7 | 1 | 340 | 285 | 148 | 12K* |
| | 2 | 0 | 0 | 11.6 | 210K |
| | 3 | 16.5 | 15 | .52 | 1.2K |
| | 6 | 340 | 285 | 148 | 12K* |
| | 7 | 0 | 0 | 11.2 | 210K |
| | 8 | 16.5 | 15 | .52 | 1.2K |
| 12AX7 | 1 | 430 | 365 | 106 | 45* |
| | 2 | -45 | -44 | 148 | 1M |
| | 3 | -45 | -45 | 148 | 140K |
| | 6 | 430 | 365 | 106 | 45* |
| | 7 | -45 | -44 | 148 | 1M |
| | 8 | -45 | -45 | 148 | 140K |
| 6550 (Both Tubes) | 3 | 430 | 365 | 106 | 45* |
| | 4 | 430 | 360 | 110 | 2500* |
| | 5 | -45 | -45 | 148 | 140K |
| | 8 | .8 | -2.5 | 110 | 6 |
| 5U4GA (Both Tubes) | 2 | 435 | 380 | 9.4 | 0* |
| | 4 | | | 335 | 14 |
| | 6 | | | 335 | 15 |
| | 8 | 435 | 380 | 6.4 | 0* |
| Pre-Amp Input Socket | 4 | 425 | 365 | 0 | 10K* |
| | 5 | 0 | 0 | .36 | 320K |

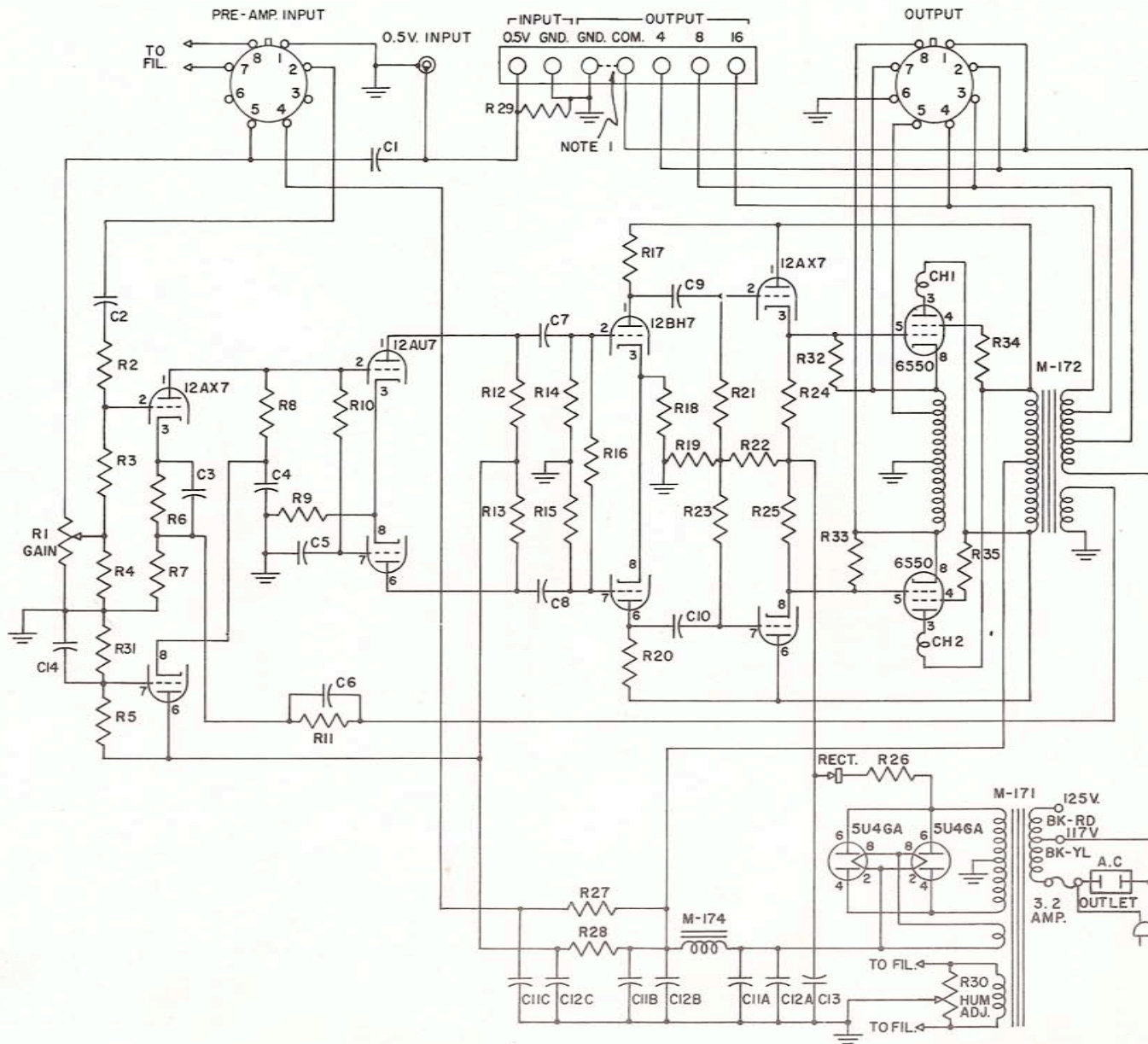
Pins not listed are either filaments, have no voltage or are not used.

U.S. Patents No. 2,477, 074; 2,545, 788; 2,646, 467;
2,654, 058 others pending

McINTOSH LABORATORY, INC.

2 Chambers Street

Binghamton, N. Y., U.S.A.



**Output Connections
Using Octal Socket**

- 4 ohms - pins 1 and 2
- 8 ohms - pins 1 and 3
- 16 ohms - pins 1 and 4
- 500/600 ohms - pins 7 and 8
(pin 6 is CT and ground)
- 70.7 Volts - pins 5 and 6
(pin 6 is ground)

**Pre-amplifier Input
Socket Connections**

- Pin 1 - ground
- Pin 2 - pre-amp input (2.5V)
- Pin 3 - not used
- Pin 4 - +360V at 3.5 ma.
- Pin 5 - not used
- Pin 6 - not used
- Pins 7 and 8 - 6.3V at 1 amp.

Note 1 - This jumper strap may be removed if ungrounded low impedance outputs are desired.

| | | | |
|-----|-------------------------|------|--------------|
| R1 | 500K Pot. (Gain Adj.) | CH1 | Plate Choke |
| R2 | 100K | CH2 | Plate Choke |
| R3 | 27K | C1 | .1mf, 400V |
| R4 | 3.3M | C2 | .47mf, 200V |
| R5 | 560K, 5% | C3 | 100mf, 12V |
| R6 | 3.3K | C4 | 8mf, 250V |
| R7 | 68 ohms, 5% | C5 | .22mf, 400V |
| R8 | 100K | C6 | 470mf, 500V |
| R9 | 15K, 1W | C7 | .047mf, 600V |
| R10 | 2.2M | C8 | .047mf, 600V |
| R11 | 1.3K, 5% | C9 | .25mf, 600V |
| R12 | 27K, 5% | C10 | .25mf, 600V |
| R13 | 30K, 5% | C11A | 40mf, 500V |
| R14 | 220K | C11B | 80mf, 450V |
| R15 | 220K | C11C | 20mf, 450V |
| R16 | 330K | C12A | 40mf, 500V |
| R17 | 12K*, 2W | C12B | 80mf, 450V |
| R18 | 1.2K | C12C | 20mf, 450V |
| R19 | 120K, 5% | C13 | 10mf, 450V |
| R20 | 12K*, 2W | C14 | .47mf, 200V |
| R21 | 1M | | |
| R22 | 820K, 5% | | |
| R23 | 1M | | |
| R24 | 220K | | |
| R25 | 220K | | |
| R26 | 1.8K | | |
| R27 | 10K, 10W | | |
| R28 | 10K, 2W | | |
| R29 | 180K | | |
| R30 | 250 ohm Pot. (Hum adj.) | | |
| R31 | 270K, 5% | | |
| R32 | 220K | | |
| R33 | 220K | | |
| R34 | 220, 1W | | |
| R35 | 220, 1W | | |

*Matched to within 1%

SERIAL NO. 1858 AND UP

| | | |
|--|--------------|------------------|
| MCINTOSH LABORATORY, INC. 320 Water Street, Binghamton, N. Y. | | |
| SCALE: | APPROVED BY: | DRAWN BY: |
| DATE: 6-30-55 | SL. | REVISED: 4-20-56 |
| MODEL MC-60, TYPE A-121 POWER AMPLIFIER | | |
| | | DRAWING NUMBER |
| | | MC-60-3 |

Output Connections
Using Octal Socket

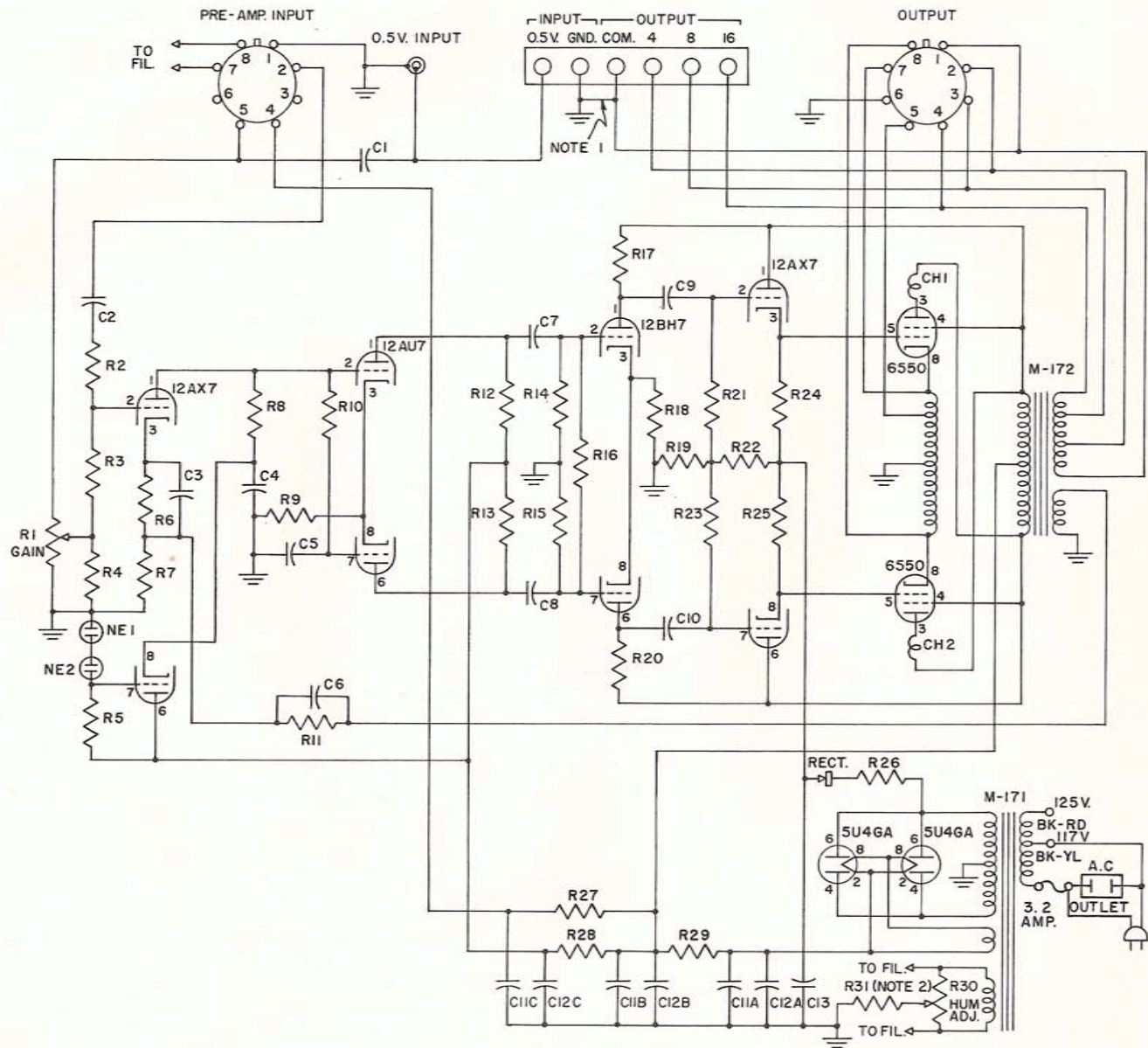
- 4 ohms - pins 1 and 2
- 8 ohms - pins 1 and 3
- 16 ohms - pins 1 and 4
- 500/600 ohms - pins 7 and 8
(pin 6 is CT and ground)
- 70.7 Volts - pins 5 and 6
(pin 6 is ground)

Pre-Amplifier Input
Socket Connections

- Pin 1 - ground
- Pin 2 - pre-amp input (2.5V)
- Pin 3 - not used
- Pin 4 - +350V at 3.5 ma.
- Pin 5 - not used
- Pin 6 - not used
- Pins 7 and 8 - 6.3V at 1 amp.

Note 1 - This wire may be removed if ungrounded low impedance outputs are desired.

Note 2 - R31 is not used on some amplifiers.



- R1 500K Pot. (Gain Adj.)
- R2 100K
- R3 27K
- R4 3.3M
- R5 1.2M
- R6 3.3K
- R7 68 ohms, 5%
- R8 100K
- R9 18K, 1W
- R10 2.2M
- R11 1.3K, 5%
- R12 27K, 5%
- R13 30K, 5%
- R14 220K
- R15 220K
- R16 330K
- R17 12K², 2W
- R18 1.2K
- R19 120K, 5%
- R20 12K², 2W
- R21 1M
- R22 820K, 5%
- R23 1M
- R24 220K
- R25 220K
- R26 1.8K
- R27 10K, 10W
- R28 10K, 2W
- R29 40 ohms, 10W
- R30 250 ohm Pot. (Hum Adj.)
- R31 100 ohms

- C1 .1mf, 400V
- C2 .47mf, 200V
- C3 20mf, 50V
- C4 .22mf, 400V
- C5 .22mf, 400V
- C6 470mmf, 500V
- C7 .047mf, 400V
- C8 .047mf, 400V
- C9 .25mf, 600V
- C10 .25mf, 600V
- C11A 40mf, 500V
- C11B 80mf, 450V
- C11C 20mf, 450V
- C12A 40mf, 500V
- C12B 80mf, 450V
- C12C 20mf, 450V
- C13 10mf, 450V

This diagram covers only MC-60 amplifiers with serial numbers from No. 560 to No. 1763 inclusive.

* Matched to within 1%.

| | | |
|---|--------------|---------------------|
| MCINTOSH LABORATORY, INC. 320 Water Street, Binghamton, N. Y. | | |
| SCALE: | APPROVED BY: | DRAWN BY: 70 |
| DATE: 6-30-55 | SC. | REVISED: |
| MODEL MC-60, TYPE A-121 POWER AMPLIFIER | | |
| DRAWING NUMBER | | MC-60 |