INSTRUCTION MANUAL

McINTOSH MODEL MI-200AB

200 WATT POWER AMPLIFIER
FOR RACK MOUNTING

TYPE K-107

Serial No. 2H001

McINTOSH LABORATORY, INC.

2 Chambers St., Binghamton, N. Y.

U.S.A.

SPECIFICATIONS FOR THE McINTOSH

MODEL MI-200AB

ELECTRICAL CHARACTERISTICS

(NOTE: The MI-200AB is similar to former models MI-200A and MI-200B and differs only in the output impedances provided.)

Power Output:	200 watts continuous, with distortion less than 1.0%, 20-20,000 cps
Frequency Response:	20 to 20,000 cps ± .2 db at 200 watts output
Harmonic Distortion:	Less than 1.0% at 200 watts output or less, 20 to 20,000 cps
Intermodulation Distortion:	Less than 1.0% if instantaneous peak power is below 400 watts
Noise and Hum Level:	85 db or more below rated output
Input Level:	Approximately .5 volts will drive the amplifier to 200 watts output. A gain control is provided to handle input levels up to 20 volts. Greater input sensitivity is possible using a plug-in input transformer.
Input Impedance:	250,000 ohms
Output Impedance:	4, 8, 16.5 (57½ volts), 25 (70.7 volts), 66Ω (115 volts), 100 (141.4 volts) and 600 ohms. The 600 ohms output is balanced to ground; the low impedance outputs may be operated balanced or unbalanced. All low impedance outputs may be operated isolated from ground. For reference, the output impedances and schematic for the MI-200A and MI-200B are indicated on Page 7 of this manual.
Output Damping Factor:	10 to 1 or greater 20 to 20,000 cps
AC Power:	108/117/125 volts, 50/60 cps, 300-600 watts
Pre-amp Input:	May be operated with any McIntosh pre-amplifier

MECHANICAL CHARACTERISTICS

Chassis Dimensions:	The amplifier and its power supply are designed for relay rack mounting. The amplifier chassis requires 10½ inches of panel space (standard 19 inch wide panel) and projects approximately 1¼ inches in front of the panel and approximately 9 inches behind the panel. The power supply chassis requires 7 inches of panel space and projects approximately 9 inches behind the panel. There is no projection in front of the panel.
Operating Controls:	All operating controls are mounted on the amplifier chassis panel. An on-off switch, gain control, meter (to monitor current of output tubes), and meter switch are provided. A fuse is provided at the rear of the amplifier chassis.
Finish:	Panel is finished in dark grey hammertone. Chassis is finished in light grey hammertone.
Weight:	140 pounds
Tube Complement:	Amplifier Chassis: 12AX7 input amplifier 12AU7 phase inverter 2—6AV5 drivers 2—6BX7 drive cathode followers 2—8005 output amplifiers, cathode-plate loaded using the McIntosh unity coupled output circuit. Power Supply: 4—5U4 high voltage bridge rectifiers 2—5Y3 low voltage and bias rectifiers

ACCESSORIES

Input Transformers: (Plug-in Type)	Type M-107 (or M-107A) provides a 50, 250, or 600 ohm input at approximately —14 dbm Type M-108 provides a 20K bridging input at approximately —2 dbm Type M-180 provides a 250 or 600 ohm input at approximately —24 dbm NOTE: The maximum input level that can be used with any of the above transformers must be limited to + 10 dbm

DESCRIPTION

The McIntosh MI-200 is a 200 watt industrial power amplifier designed for such applications where high power and distortion-free performance is required. The Model MI-200 designed for rack mounting, like all other McIntosh power amplifiers, uses the exclusive McIntosh high efficiency output circuit and bifilar output transformer to obtain its high standard of performance. Some of the more important characteristics of the amplifier are: less than 1% harmonic distortion at any power output up to 200 watts and at any frequency in the audio spectrum, (20 to 20,000 cps); less than 1% intermodulation distortion for all power levels up to 400 instantaneous peak watts; noise and hum 85 db or more below rated output level.

The MI-200 input facilities include a high impedance input which may be operated from any signal source delivering 0.5 volts or more, or directly from a McIntosh Audio Compensator such as the Models C-4 or C-8. An input transformer socket is provided to accept a plug-in input transformer for low impedance or isolated bridging input.

INSTALLATION

Location

The MI-200 must be located in a well-ventilated area. If the amplifier is housed in a cabinet or other enclosure, adequate ventilation and air circulation must be allowed.

Input Connections

1. To use the 0.5 volt high impedance input connect the input signal leads to the input terminals at either the input barrier strip or the "PRE-AMP" input receptacle. On the input barrier strip connect the grounded input lead to barrier terminal 1; the "HIGH" input lead to barrier terminal 2. If use of the octal input receptacle is desired the grounded lead attaches to pin 1; the "HIGH" lead to pin 2.

2. When a McIntosh Audio Compensator without power supply is used with the MI-200, plug the pre-amplifier's inter-unit cord into the "PRE-AMP" receptacle on the MI-200 and adjust the MI-200 "GAIN" control to approximately ¾ full gain. The "PRE-AMP" receptacle supplies the required plate and filament voltage to the pre-amplifier as well as providing the necessary audio connections.

3. When a low impedance line input or bridging input is desired a plug-in input transformer must be used in the M-200 "TRANSFORMER" receptacle. Three types of transformers are available.

The input levels, impedances, and amplifier input lead connections follow.

All input connections are to the input barrier terminated strip only. Terminal 1, on the input barrier terminal strip is ground.

Transformer Types:

Type M-107

(or M-107A)

50, 250, or 600 ohm input at approximately —14 dbm.

Input Impedance	*Connect Input to Terminals:*	*Jumper Terminals:*
50 Ohms	4 and 5	2 to 3
250 Ohms	4 and 6	2 to 3
600 Ohms	4 and 7	2 to 3

Type M-108

20K bridging input at approximately —2 dbm.

Input Impedance	*Connect Input to Terminals:*	*Jumper Terminals:*
20K Bridging	4 and 7	2 to 3

Type M-180

250 or 600 ohms input at approximately —24 dbm.

Input Impedance	*Connect Input to Terminals:*	*Jumper Terminals:*
250 Ohms	5 and 6	2 to 3
600 Ohms	4 and 7	2 to 3

Output Connections

All output connections are made to the output barrier terminal strip only.

Connect the load to the output terminals as follows:

Load Impedance	*Connect to Terminals*	*Jumper Terminals*
4 ohms	4 and 5	4-8, 5-9
8 ohms	5 and 7	5-9, 7-11
16.5, 57.5 volts	4 and 6	4-8, 6-10
25 ohms, 70.7 volts	4 and 7	4-8, 7-11
32 ohms	5 and 11	7-9
66 ohms, 117 volts	4 and 10	6-8
100 ohms, 141.4 volts	4 and 11	7-8
600 ohms, balanced only	2 and 3	none

Terminal 1 is ground and the 600 ohm centertap.

If possible it is advisable to ground one side of the output circuit (except 600 ohm output) so as to reduce the possibility of stray coupling between the output circuit and input circuit of the amplifier.

It is important that the loudspeaker or other load be properly matched to the amplifier if best performance is to be obtained. If the amplifier is used to power motors or reactive loads the power factor of the load should be corrected as well as possible. Excessive heating of the output tubes will result if this measure is not heeded.

Power Connections

A plug and socket arrangement is provided inside the power supply chassis for adjusting the amplifier for a 108, 117, or 125 volt 50/60 cycles power source. The desired line voltage adjustment should be made prior to inserting the power cord into the power source. The amplifier is shipped connected for a 117 volt source.

Meter Operation and Bias Adjustment

The panel meter monitors the current passing through the output tubes. The output tube standing current can be adjusted by means of the bias controls. These controls are located adjacent to the meter selector switch and are adjusted by means of a screw driver.

The bias has been adjusted at the factory prior to shipping the amplifier, but the standing current should be tested when first placing the amplifier into operation. This test is performed by: 1—Turn the amplifier gain control fully counter clockwise. 2—Turn on the amplifier power switch. 3—Allow two minutes or more for the tubes to heat. 4—Rotate the meter selector switch and observe the readings. The meter should read about 50 MA for each tube and 100 MA for both tubes. If these readings are not obtained, adjust the bias controls to obtain these readings.

When signal is passed through the amplifier the output tube current will increase with increasing signal output. A meter reading of approximately 425 MA corresponds to full power output (200 watts) into a matched load. If meter readings in excess of 425 MA are noted the amplifier is being operated under an overload condition.

Output Tube Plate Color

It is normal for the 8005 output tubes to operate with a moderate red color. Do not be alarmed by this glow, it is a characteristic of this tube type.

GUARANTEE

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

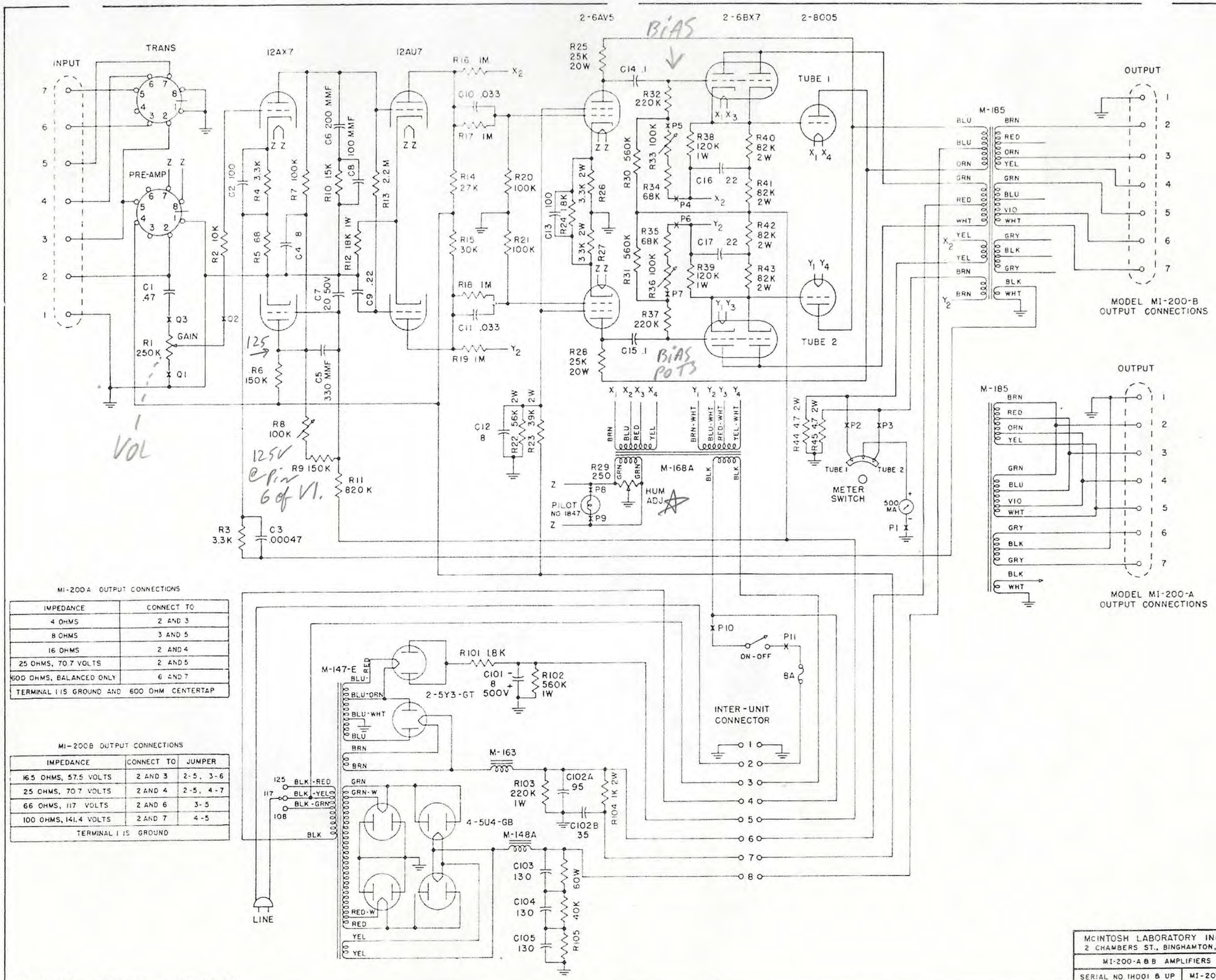
SERVICE INFORMATION

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 serviced by your dealer, or a competent service man, or returned to the factory. Please write for return authorization before returning defective equipment to the factory.

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 pins 6, 7, and 8 of the interunit connector grounded and unit turned off. Voltages are measured with a 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 200W Out @ 1KC*	*AC Volts 200W Out @ 1KC*	*Resistance Unit Off*
12AX7	1	95	95	1.5	250K*
	2	0	0	.5	0 to 260K
	3	1.0	.96	.3	3.4K
	6	125	124	0	150K*
	7	−1.05	−1.27	0	250K*
	8	0	0	0	0
12AU7	1	265	200	7.5	27K*
	2	95	95	1.5	250K*
	3	105	98	.5	18K
	6	265	200	7.5	30K*
	7	78	78	0	2.6M*
	8	105	98	.5	18K
6AV5	1	25	19	6	95K
(2)	3	57	44	.4	2K
	5	500	500	380	25K*
	8	195	130	0	24K*
6BX7	1—4	−75	−72	380	350K
(2)	2—5	365	290	255	50*
	3—6	−31.5	−20	350	80K
8005	1	1.1	4.4	260	22
(2)	3	−31.5	−20	350	80K
	Cap	930	850	260	22*
INTERUNIT	1	0	0	0	0
SOCKET	5	−435	−430	0	0
	6	365	290	0	0*
	7	355	280	0	0*
	8	931	855	1	0*



MI-200A OUTPUT CONNECTIONS

IMPEDANCE	CONNECT TO
4 OHMS	2 AND 3
8 OHMS	3 AND 5
16 OHMS	2 AND 4
25 OHMS, 70.7 VOLTS	2 AND 5
600 OHMS, BALANCED ONLY	6 AND 7
TERMINAL 1 IS GROUND AND 600 OHM CENTERTAP	

MI-200B OUTPUT CONNECTIONS

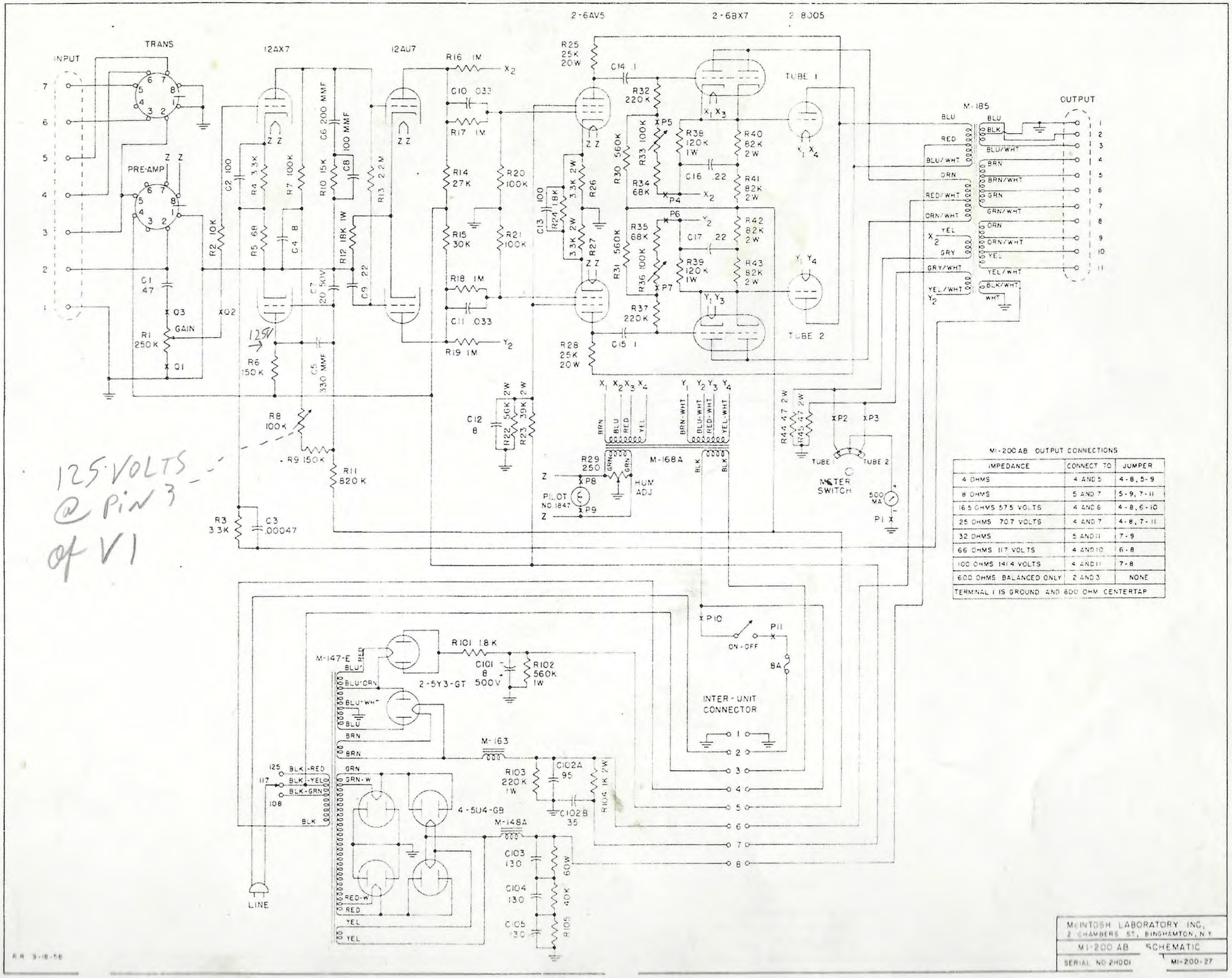
IMPEDANCE	CONNECT TO	JUMPER
16.5 OHMS, 57.5 VOLTS	2 AND 3	2-5, 3-6
25 OHMS, 70.7 VOLTS	2 AND 4	2-5, 4-7
66 OHMS, 117 VOLTS	2 AND 6	3-5
100 OHMS, 141.4 VOLTS	2 AND 7	4-5
TERMINAL 1 IS GROUND		

McINTOSH LABORATORY INC.
2 CHAMBERS ST., BINGHAMTON, N.Y.

MI-200-A & B AMPLIFIERS

SERIAL NO. 11001 & UP | MI-200-19

J.W.C. 4-29-57 REV. 6-21-57 REV. 11-17-58 R.R.



MI-200 AB OUTPUT CONNECTIONS

IMPEDANCE	CONNECT TO	JUMPER
4 OHMS	4 AND 5	4-8, 5-9
8 OHMS	5 AND 7	5-9, 7-11
16.5 OHMS 57.5 VOLTS	4 AND 6	4-8, 6-10
25 OHMS 70.7 VOLTS	4 AND 7	4-8, 7-11
32 OHMS	5 AND 11	7-9
66 OHMS 117 VOLTS	4 AND 10	6-8
100 OHMS 141.4 VOLTS	4 AND 11	7-8
600 OHMS BALANCED ONLY	2 AND 3	NONE
TERMINAL 1 IS GROUND AND 600 OHM CENTERTAP		

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MI-200 AB SCHEMATIC

SERIAL NO 2H001

MI-200-27