

Replacement McIntosh Input Board 128-165-PAE

For MC2100, MC2105, MC2300 (Assy. 043-795, 044-331, 044-650)

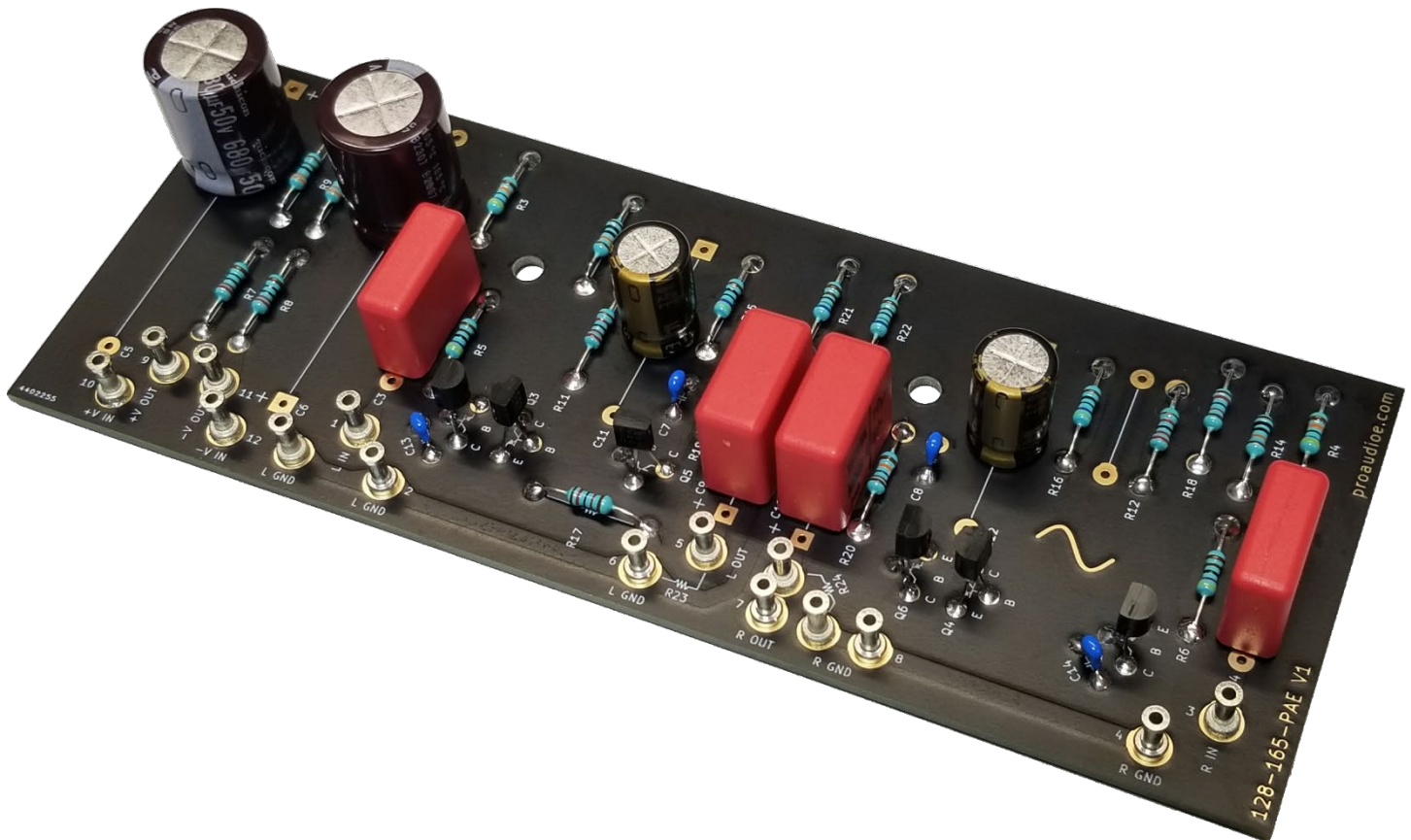
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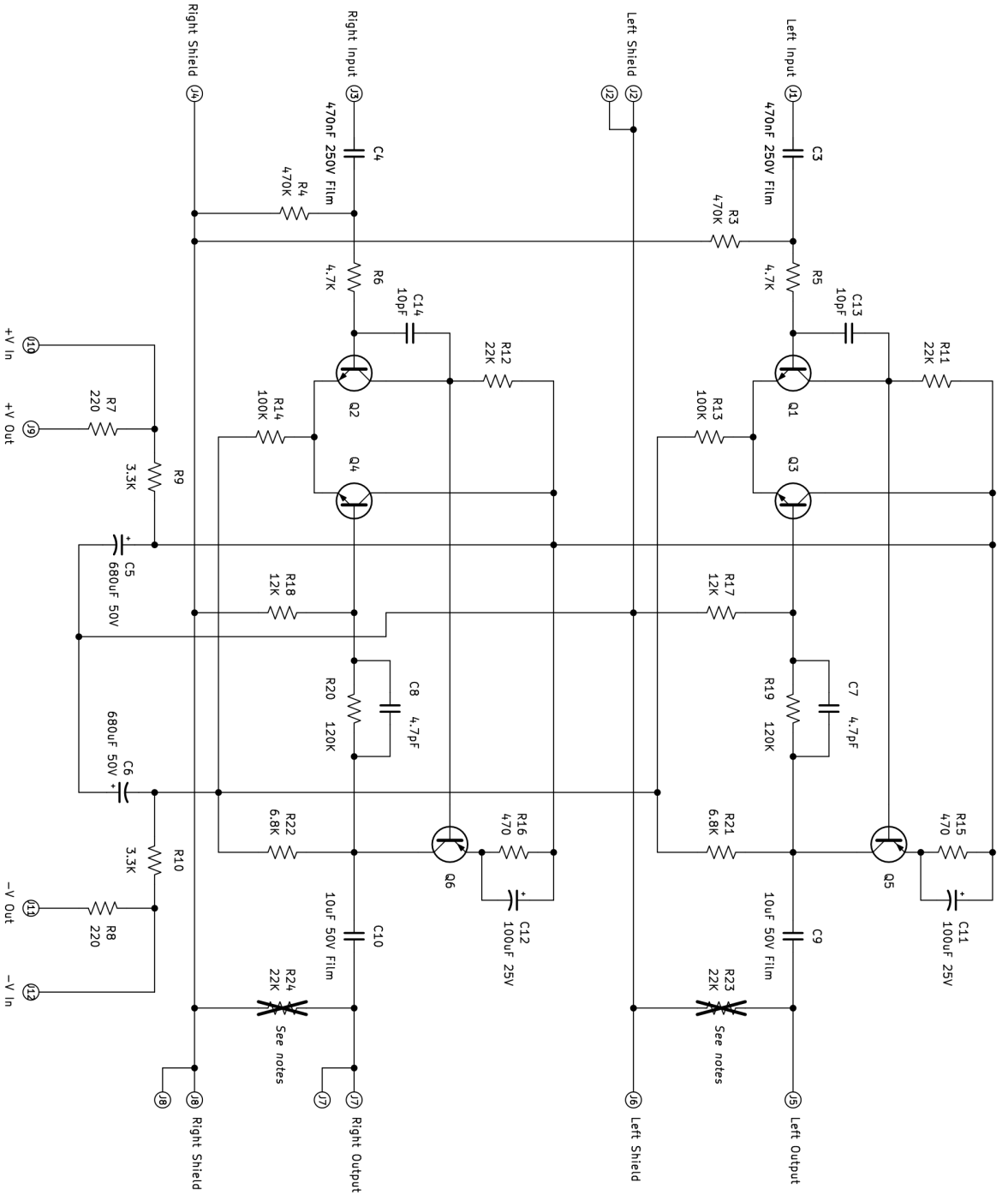
Thank you for your order! This is a replacement input preamplifier board used in the McIntosh MC2100, MC2105, and MC2300 power amplifiers. It is designed to be a drop-in replacement, and no changes were made to the original circuit. The main differences are described below:

The new PCB uses 2 oz. copper with a gold finish, plated through-holes, slightly wider traces, and silkscreen labels on both sides. Boards are hand assembled with high quality components including 1% tolerance 50ppm TCR metal film resistors, Nichicon electrolytic capacitors (UPM in supply filters, UKZ in audio stages), WIMA film capacitors, and new transistors. Robust wiring turrets replace the original hollow posts that the supply and signal cables solder to.

This document includes a redrawn schematic, board layout, parts list, and installation notes.

Please do not install this board if you are not thoroughly familiar with safely diagnosing, repairing, and testing amplifiers at the component level with test equipment (sig gen, oscilloscope, load, etc.) and a current-limited power supply.





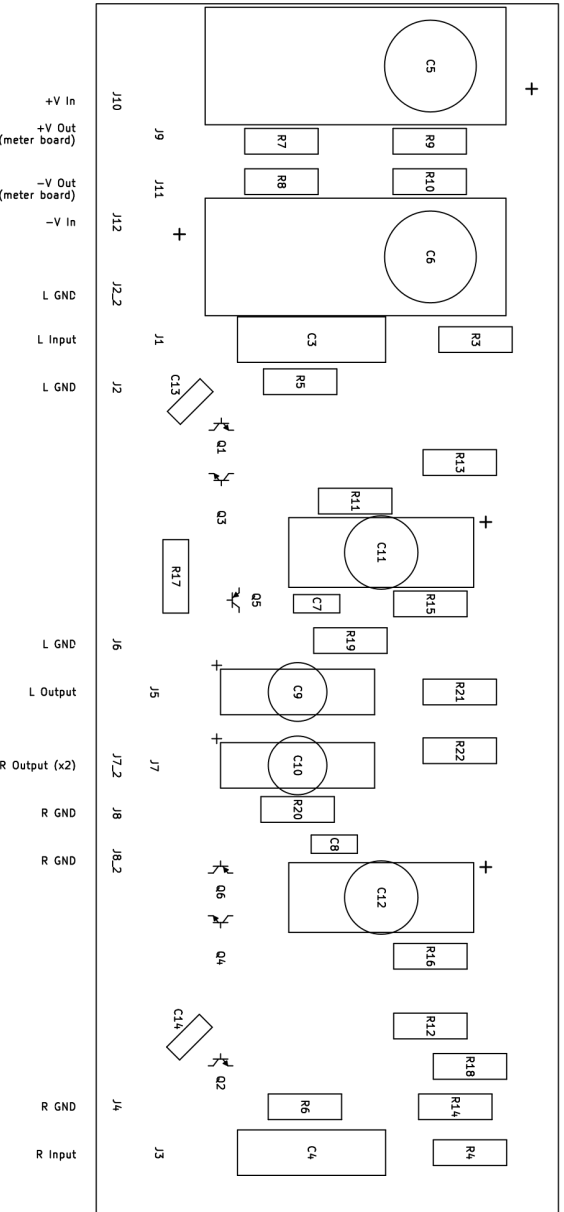
McIntosh Input Board 128-165-PAE
 Original Schematic and Design: McIntosh Laboratories
 Used In MC2100, MC2105, MC2300

ProAudio Electronics
 Size: USLetter Date: 2023-10-22 Drawn By: MSJ

Rev: 1
 Id: 1/1

Notes:

- R23 and R24 were only used in MC2300 units below serial number 4Y426
- Original MC2100, MC2105, and MC2300 schematics have two differences between the schematic and PCB:
 - 1.) Junction of C5 and C6 actually ties to L GND, not R GND
 - 2.) R3 actually ties to R GND, not L GND
- Component reference designators are the same as in the MC2105 and MC2300 schematics. Numbers differ in the MC2100
- All resistors are 1% tolerance, 600 mW metal film construction
- Capacitors in the picofarad range (pF) are ceramic NP0/C0G type. Polarized capacitors are aluminum electrolytic type



McIntosh Input Board 128-165-PAE
 Original Design: McIntosh Laboratories
 Used in MC2100, MC2105, MC2500

ProAudio Electronics

Size: USLetter Date: 2023-09-01

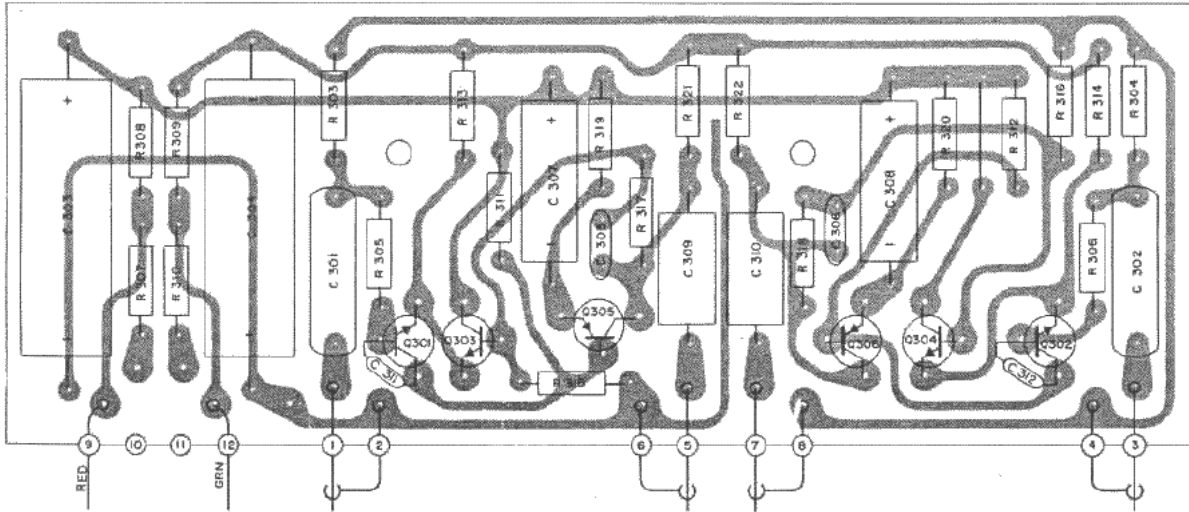
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Original Board Layouts

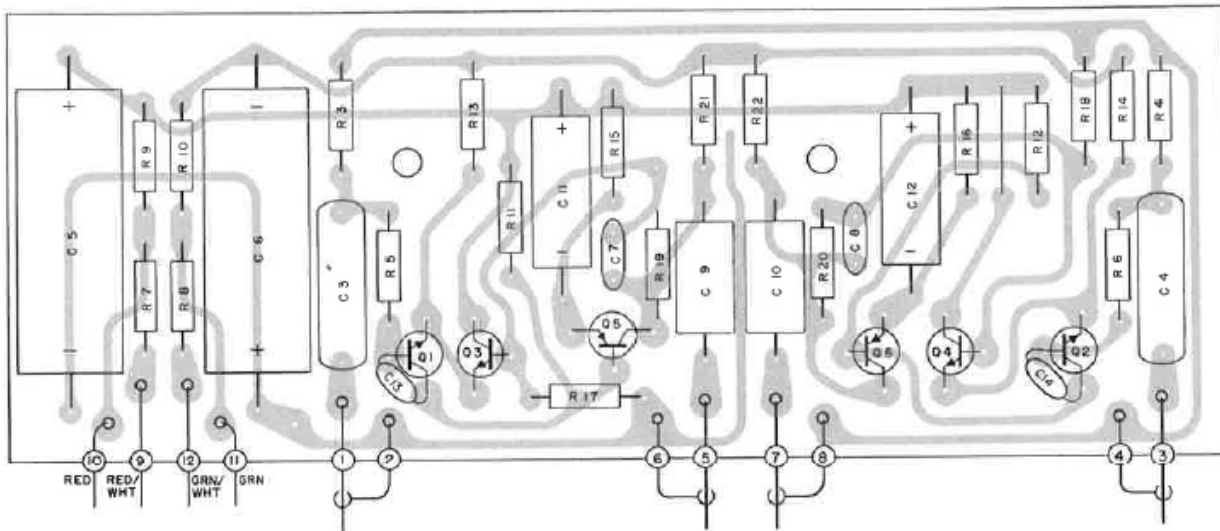
MC2100

INPUT SECTION PRINTED CIRCUIT BOARD 043 - 795



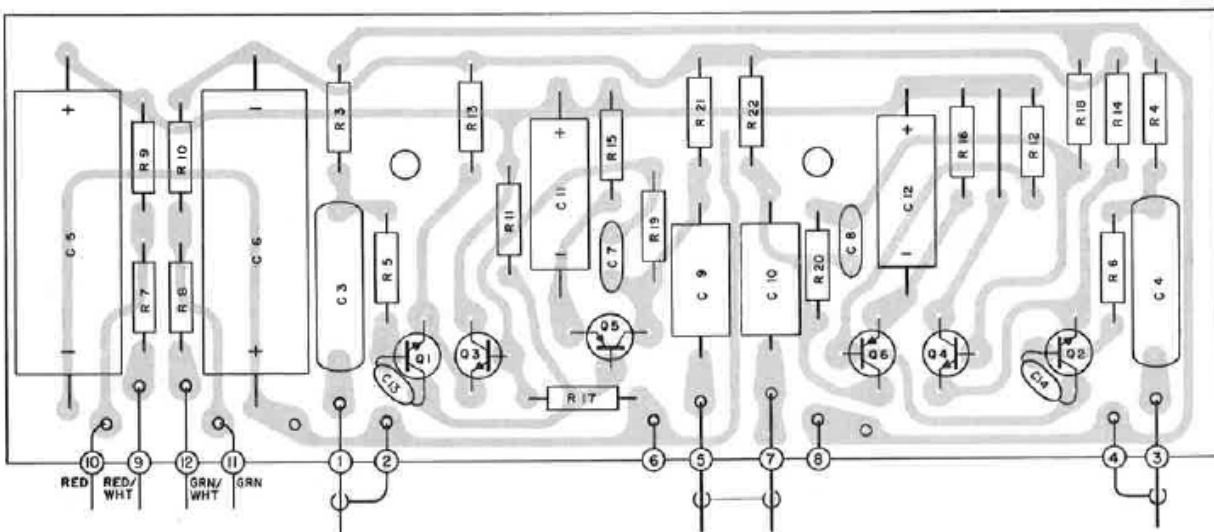
MC2105

INPUT SECTION PRINTED CIRCUIT BOARD 043 - 795



MC2300

INPUT SECTION PRINTED CIRCUIT BOARD 044 - 650



In the MC2105 and MC2300 service manuals, pins 11 and 12 are swapped on the board layout diagram and do not match their corresponding schematics. This was a simple numbering error and does not affect the wiring scheme.

Parts List

- All resistors are 1% tolerance, 600 mW, ± 50 ppm/ $^{\circ}$ C, metal film construction

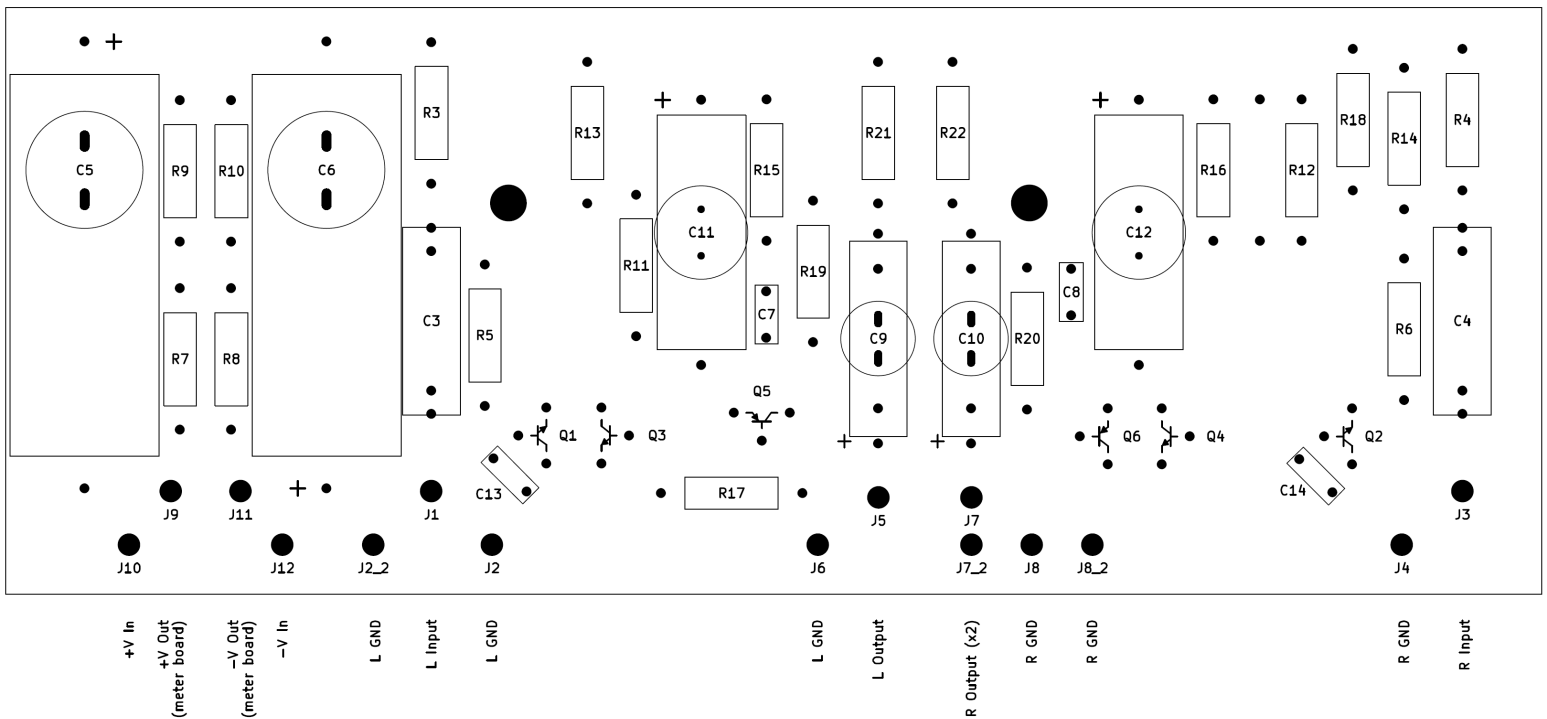
Reference Designator	Value	Remarks
R3, R4	470K	
R5, R6	4.7K	
R7, R8	220	
R9, R10	3.3K	
R11, R12	22K	
R13, R14	100K	
R15, R16	470	
R17, R18	12K	
R19, R20	120K	
R21, R22	6.8K	
R23, R24	<i>Unpopulated</i>	Populated with 22K in MC2300 units below S/N 4Y426
C3, C4	470nF 250V Film	WIMA MKP 4
C5, C6	680uF 50V Aluminum Electrolytic	Nichicon UPM
C7, C8	4.7pF 100V Ceramic NPO/C0G	
C9, C10	10uF 50V Film	WIMA MKS 4
C11, C12	100uF 25V Aluminum Electrolytic	Nichicon UKZ
C13, C14	10pF 100V Ceramic NPO/C0G	
Q1, Q2, Q3, Q4	BC546CTA	NPN BJT TO-92
Q5, Q6	2N5087	PNP BJT TO-92

Value in microfarads (μ F)	Value in nanofarads (nF)	Value in picofarads (pF)
<i>micro = 10^{-6}</i>	<i>nano = 10^{-9}</i>	<i>pico = 10^{-12}</i>
0.001	1	1,000
0.01	10	10,000
0.1	100	100,000
0.47	470	470,000
1	1,000	1,000,000

Installation

It is recommended that you test your original unit first before replacing the input board. Replacement will not remedy problems that exist elsewhere in the unit, such as in the power supply and power amp stages.

1. Take pictures or make diagrams of your original installation. **All cables will connect to turrets in the same spots on the new board.**
2. Remove the original input board. Try to leave the cables as long as possible. The included anti-static bag can be used to store your old board.
3. Solder the cables to the turrets. All cables will connect to the same positions on the new board as they did on the old board, but it's good to double check with the picture/diagram of your original installation.
4. If you are using this board in an MC2300 below S/N 4Y426, the two included 22K resistors can be wrapped around the output signal and ground turrets in order to populate R23 and R24.
5. Make sure the shields of the input RCA jacks are making a solid connection to chassis ground, and that these ground connections are solid all the way from the jacks to the volume pots and the input preamp board.
6. We recommend using a "dim bulb" tester (i.e., an incandescent bulb used as a line current limiter) when performing your initial tests on the amplifier as a whole.



Other Notes

- **It is imperative that the “L GND” and “R GND” terminals on the input board have a solid electrical connection to chassis ground via the shielded cables and input RCA connectors.** If your RCA connectors are the original riveted type, we recommend replacing them with “bulkhead” type chassis mount connectors that bolt down with a hex nut and tooth lock washer.
- While servicing your unit, it’s a good idea to clean any internal connectors and switches with DeoxIT or similar contact cleaner. Make sure the driver card connectors are tight and secure. Tighten any internal screws that make electrical connections such as those used with the large screw terminal electrolytic capacitors.
 - **For MC2100 units, it is critical that the stereo/mono switch be in good working order while operating the unit in mono mode.** Because both 4 Ohm taps of the autoformers are tied together in mono, a failing switch could potentially result in a situation where both channels are not receiving the same signal, causing the output stages to drive each other. Avoid switching the stereo/mono switch while the unit is powered on.
- If your unit still has the original silver multi-sector can capacitor, it is worth considering replacement as these parts age over time. We offer ready-made kits for this (066-095-PAE) as well as unpopulated 4-in-1 capacitor mounting boards. We would also recommend replacing any other original aluminum electrolytic capacitors in your unit for the same reason.
- All output transistor heatsinks are electrically “hot” and **MUST** be floating from chassis. Carefully inspect around the heatsinks and check that there are no shorts between them and chassis. We have seen cases where flakes of rust have bridged this gap.
 - If you are doing work to the output transistor heatsinks, also note that there is one TO-3 transistor on each negative heatsink that uses an insulator. This is due to the use of a collector resistor for current sensing.
- If you are repairing your unit, it’s a good idea to monitor the output stage bias current for both channels to make sure they stabilize and do not “run away.” McIntosh schematics indicate that there should be about 50 mV across each 0.56 Ohm emitter resistor of the first set of TO-3 output transistors.