

by David Royer >>>>>>>>>>>>>>>>>>

First, the impedance of a capsule like the Neumann M-7 is many tens of megohms at audio frequencies, which demands that the "head amplifier" be very close to the microphone capsule. Second, the tube's output impedance is too high for feeding a long cable, so a transformer is needed to give an output impedance of roughly 200 ohms. Finally, the microphone capsule and the tube (both its heater and B+ supply) need very clean DC supplies to operate, which entails the use of a separate, dedicated power supply.

TAPFOP



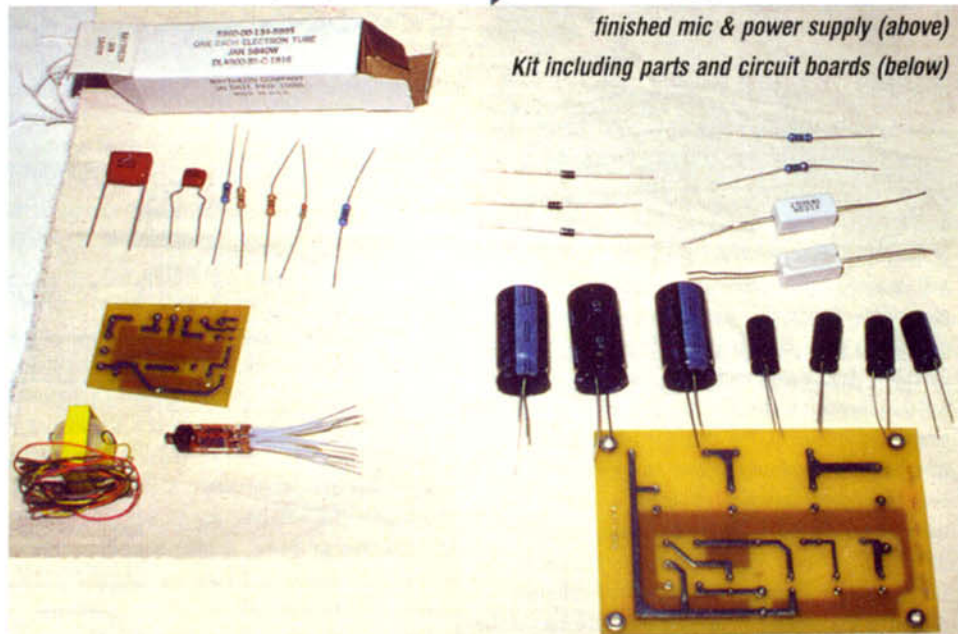
Fig 5a and 5b



The AC cord, switch, fuse, and pilot lamp are mounted at one end of the box, the XLR connectors are mounted at the other end, with the power transformer and the printed wiring board mounted along one side of the box. The board should be mounted so that the large wire-wound resistors are along the top edge of the board and so the end of the board where the three power connections (ground, 6 volts and 100 volts) are made to the board is adjacent to the pair of XLR plugs. BE CAREFUL TO DOUBLE CHECK THE WIRING. Figure 6 is a photo of the power supply with the printed circuit board installed and the wiring completed.



finished mic & power supply (above)
Kit including parts and circuit boards (below)



Finally, the last chore is to assemble the special multi-conductor cable that connects the microphone to the power supply. This cable needs a female 5 pin XLR plug at one end and a male plug at the other end. Unfortunately, the Canare cable that I recommend has two blue wires and two white ones so you have to use an ohmmeter or an continuity tester to verify that each wire is connected to the same pin at both ends of the cable. For example, the wire connected to pin one at one end of the cable must go to pin one at the other end of the cable, and so on - the cable shield being connected to pin 3 at both ends.

When you are confident that the work has been done properly, connect the microphone to the power supply and connect the AC cord to an outlet. After the tube has been allowed to warm up, the DC voltages should measure as shown on the schematic diagram, Figure 3. NOTE THAT ALL THE VOLTAGE MEASUREMENTS ARE TAKEN BETWEEN POSITIVE POINTS AND GROUND, WITH THE MICROPHONE CONNECTED. The voltages at the power supply will NOT be as specified if the microphone is NOT CONNECTED. If the microphone is properly modified, it will give excellent performance with any recording equipment that is set up to accommodate standard low impedance professional microphones. ☺

-And you probably thought David Royer only knew about ribbon microphones. <www.royerlabs.com>

Printed circuit boards and a parts kit for this microphone is available from Mojave Audio through Royer Labs at 818-760-8472 or email David Royer at david@royerlabs.com.

The kit is \$160 w/o the Jensen Transformer, which is \$66 from Jensen. The circuit boards only are \$20.



Finished power supply

Marshall Mic Modification Parts List

Microphone Amplifier Board

Capacitors:

- C1 .1uf. 250 volt Mylar
C2 1.0 uf. 250 volt Mylar

Resistors:

- R1 750 Ohms, 1/2 watt
R2 22 Meg. Ohms 1/2 watt
R3 3 Meg. Ohms 1/2 watt
R4 2.0 Meg. Ohms 1/2 watt
R5 100K Ohms 1/2 watt

Misc:

- V1 5840 vacuum tube (New Sensor, Antique Radio Supply)
T1 Output Transformer Jensen DB/E-U (Jensen Transformers)
PCB Printed circuit board (Mojave Audio)
Connector Switchcraft QG5M (output connector)

Power Supply & Cable

Capacitors:

- C1, C2, C3 2200uf, 35 volt electrolytic, radial lead
C4, C5 33uf, 100 volt electrolytic, radial lead
C6, C7 33uf 160 volt electrolytic, radial lead

Resistors:

- R1 100 Ohms, 5 watt wirewound
R2 82 Ohms, 5 watt wirewound
R3, R4 4.7K Ohms, 1/2 watt
D1-D3 1N4004 silicon diode

Misc:

- T2 24 VAC, .6 amp power transformer
(Mouser part number 41FK600)
Connector Neutrik NC3MP (3-pin male chassis mount)
Connector Neutrik NC5FP-1 (5-pin female chassis mount)
SW-1 SPST toggle switch (Mouser 103-0132)
Fuse Holder (Mouser 44FH033)
Fuse 1/2 amp (Mouser 504-AGC-1/2)
Cord AC power cord, 2-conductor zip, 18 Gauge
(Mouser 173-11102)
Pilot Lamp (Mouser 361-7672)

Microphone Cable:

- Cable Canare L4E65 (4 conductor with shield)
Connector Neutrik NC5MX (5-pin male cable connector)
Connector Neutrik NC5FX (5-pin female cable connector)