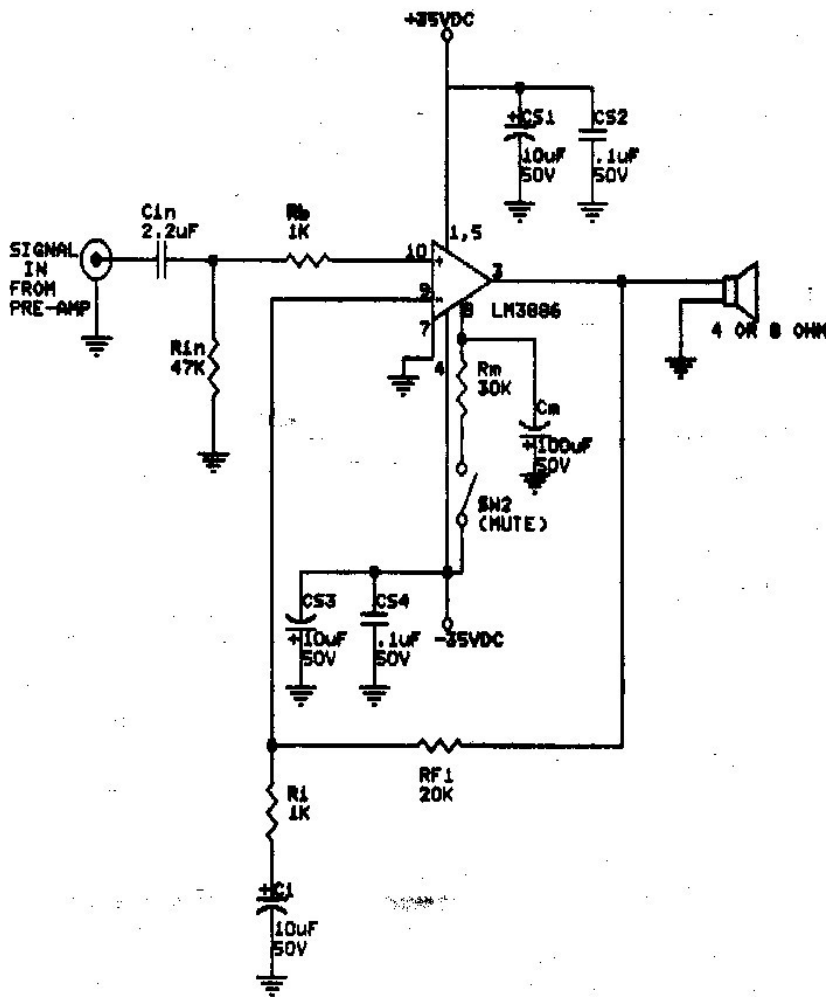


68 Watt Per Channel Amplifier Project

LM3886 AUDIO AMP (ONE CHANNEL SHOWN)



MAKE SURE THAT LM3886 IC IS PROPERLY HEAT-SINKED, USING A SILICONE PAD FOR ELECTRICAL ISOLATION (UNLESS THE ISOLATED VERSION, NSC LM3886TF, IS USED)

PLACE BYPASS CAPS CS1, CS2, CS3, CS4 AS CLOSE TO IC AS POSSIBLE

PLACE AMP IC AND INPUT AUDIO LINES AS FAR FROM TRANSFORMER AS POSSIBLE

IF "MUTE" FUNCTION IS NOT DESIRED, SW2 CAN BE OMITTED - HOWEVER, Rm MUST REMAIN IN CIRCUIT AND BE TIED TO VEE

SUPPLY VOLTAGES, VCC AND VEE, MUST NOT EXCEED +40VDC AND -40VDC, RESPECTIVELY

BE SURE TO OBSERVE POLARITY OF ELECTROLYTIC CAPS

DRILL SEVERAL VENT HOLES IN TOP AND BOTTOM OF ENCLOSURE TO PROVIDE ADEQUATE COOLING TO IC AND HEATSINK

AMP WILL DELIVER 68WRMS TO 4-OHM LOAD, 38WRMS TO 8-OHM LOAD

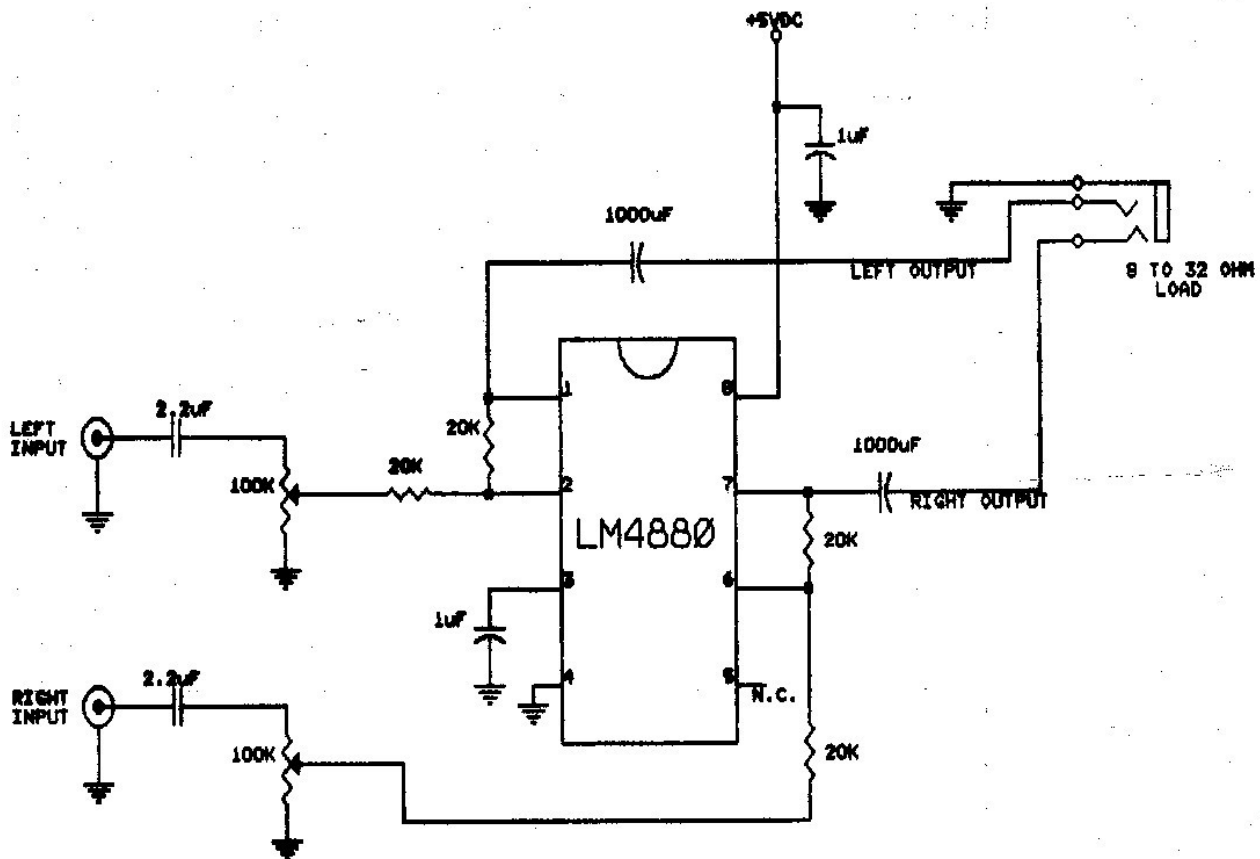
C1n SHOULD BE A GOOD QUALITY FILM CAP, TO CREATE A LOW-FREQ. POLE WITH R1n

DRAWN BY KEVIN S. BRADY

Size	Document Number	REV
A	LM3886	B
Date:	October 12, 1996	Sheet 1 of 1

Schematic above is my slightly tweaked version of a suggested design from the National Semiconductor data sheet for the LM3886 IC. This IC will drive 8Ω ohm and 4Ω speakers, but is not very stable with lower impedances. The volume control (attenuator) is not shown in this schematic, but it is the same potentiometer shown in the LM4880 headphone amp circuit below.

STEREO HEADPHONE AMP



DELIVERS APPROX. 100mW PER CHANNEL
 INTO 32 OHMS, 250mW INTO 8 OHMS
 DO NOT EXCEED VCC OF 5VDC

Size	Document Number	REV
A	LM4880	A
Date:	February 16, 1997	Sheet of

Circuit schematic for the LM4880 stereo headphone amplifier. This circuit is powered by a single 5VDC supply.



Audio amplifier in its aluminum enclosure. Not the most elegant thing to look at. Has a sort of retro, "Heathkit" look.



View of the front panel. Controls include main power on/off, volume, two line input selects, speaker/headphone select, LED display VU, and headphone jack. The volume control is a 100k Ω dual Alps attenuator pot. with detents.



View of the inside. Not terribly elegant inside either. However, the important thing is to keep line-level circuitry well isolated from the power circuitry.



Back end of the unit, showing line input jacks, speaker cable binding posts, and fuse holder. I used a 3A instrument fuse for the 120V input, which is supplied by a removable IEC cord. Note the robust, extruded aluminum heat sink for heat dissipation of the amplifier ICs. Probably a bit of overkill, but it's what I had on hand.



View of the toroidal transformers. The secondary taps of these, when rectified and filtered, provide the +35V and -35V DC power. I surrounded this power section with a grounded shield of galvanized sheet steel to protect the audio circuitry from EMI.



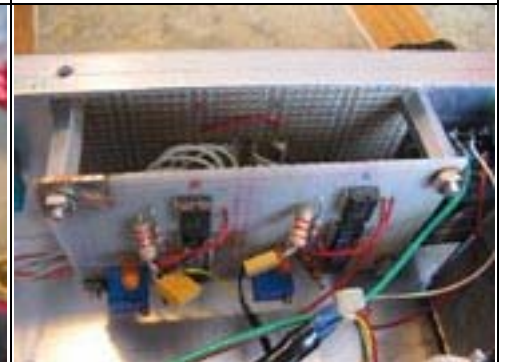
10A Bridge rectifier and filter capacitors for the DC power supply. The solid-state amplifiers do not require regulated DC. However, the DC supplies should be well-filtered to minimize line-frequency noise.



The two LM3886 amplifier ICs bolted to the heat sink, and circuitry. One IC for each audio channel. It's important to keep the components as close to the amp IC as possible, to minimize EMI noise and possible oscillations.



The LM4880 headphone amplifier circuit. The circuit board is DIY, etched from a small piece of copper-clad board. As is the case with the power amp, it's also important to cluster the components close to the IC here.



The driver circuitry for the LED display VU meters.

Sources of Materials

National Semiconductor <http://www.national.com/>

LM3886 data sheet at: <http://www.national.com/mpf/LM/LM3886.html>

LM4880 data sheet at: <http://www.national.com/mpf/LM/LM4880.html>

Toroidal power transformers <http://www.toroid.com/>

Alps potentiometers http://www.potentiometers.com/select_precision.cfm?session_num=2008020903564833

Electronics components suppliers:

Digikey <http://www.digikey.com/>

Mouser <http://www.mouser.com/>

MCM Electronics <http://www.mcmelectronics.com/>

Parts Express <http://www.partsexpress.com/>