

A Versatile Audio Amplifier



...built around the TBA 810 Integrated Circuit

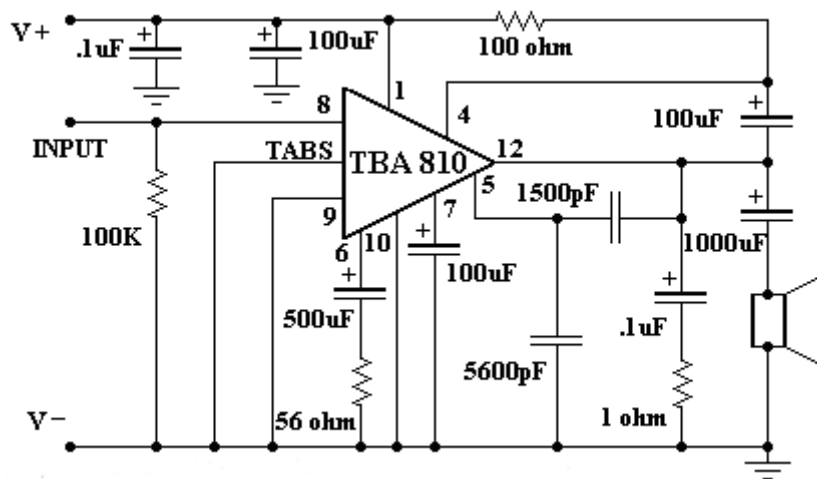
You can build a versatile audio amplifier for your workbench or for any other of your audio projects...with the TBA 810 IC (Integrated Circuit). It can also be cross-referenced to an NTE1115. You may view the data sheet of the IC [HERE](#). It has special characteristics that make it quite attractive for the home constructor. From this IC, you will obtain different ranges of audio power, according with the supply voltages of your power source, as it is shown in the table below...

Power Supply	Audio Power
6.0 Volts	1 Watt
9.0 Volts	2.5 Watts
14.4 Volts	6 Watts
16.0 Volts	7 Watts

Not only can you vary the current input voltages, you can also connect the audio output to different loud speakers of appropriate size... either 4 or 8 ohms.

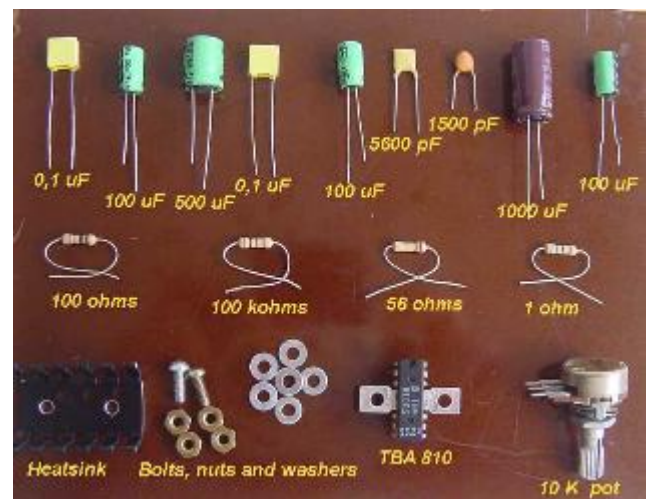
As you can see in the schematic diagram of the versatile audio amplifier, the overall number of components for the project is only 16; which includes the loud speaker and the TBA 810 Integrated Circuit!

Schematic Diagram of the Versatile Audio Amplifier



COMPONENT VALUES/RATINGS

CAPACITORS	RESISTORS
500uF/25v Electrolytic	1 Ohm
1000uF/25v Electrolytic	100 K Ohm
1500pF Ceramic	100 Ohm
.1uF Ceramic	56 Ohm
100uF Electrolytic/25v (3 needed)	
5600pF Ceramic	
.1uF Mylar or Ceramic	



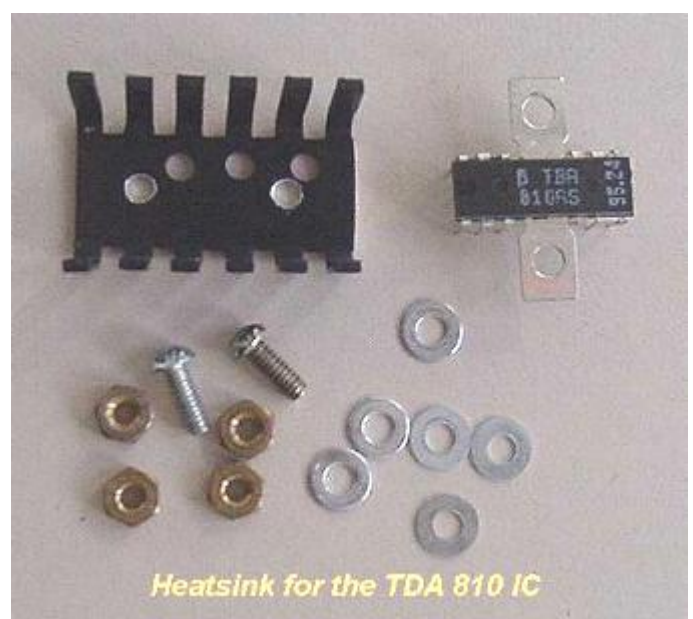
Project Assembly...

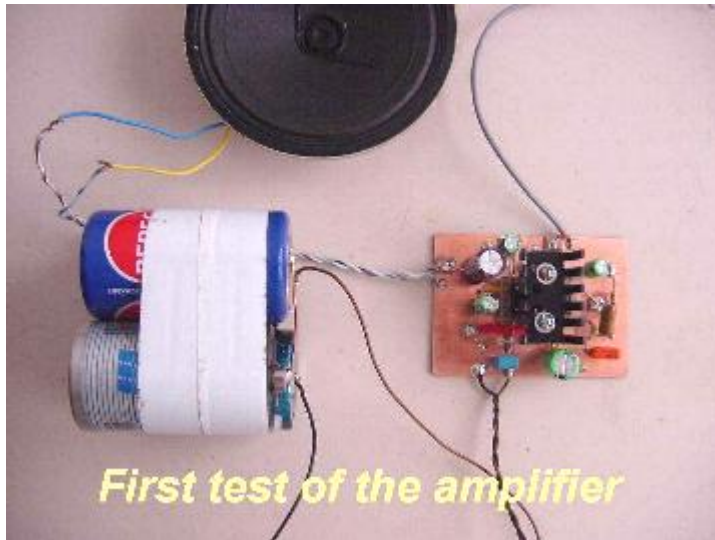
The heatsink and its' accompanying screws/nuts/washers...are needed for the TBA 810, to keep it from over-heating. Some extra components will be a potentiometer to regulate the amplifier volume and an LED with its' protecting resistor to see the ON/OFF of the unit.

I built my project in the 'Manhattan' style, which is the way I am very fond of...in building electronic circuits. If you are interested in knowing how to construct a circuitry in this style, plenty of informaton can be obtained from the webpage of W7ZOI at the following address:

<http://users.easystreet.com/w7zoi/bboard.html>. The title of this work is 'Some Thoughts on

Breadboarding', where you will find suggestive ideas about how to make up your circuits without the complicated task of printing and etching a PCB (and using chemicals that are even dangerous to tackle with)!





Building in the 'Manhattan' style is a direct way of working. You pass directly from the drawn schematic to soldering the components on the copper panel in an almost always vertical position. So it is quite easy to compare the work you are doing with the schematic...and detect possible errors.

I started cutting a piece of PCB at 70mm's long and 50mm's wide. The copper face of this small panel was cleaned and polished to facilitate the soldering of components.

(Click on the picture above for larger viewing)

Afterward... it is necessary to create a positive rail, while the rest of the panel being the negative rail. The positive rail is a track of 3 or 4 mm's wide and 50 mm's long, in more or less with the center of the panel. You can cut this track with a sharp utensil and a ruler, or any other suitable device that fits your taste. After the positive rail is cut, be sure that it is absolutely isolated from the rest of the panel. This is a condition known as 'sine qua non', for on the contrary...you will have a short circuit to your power source! The dimensions of the positive rail are enough for the few solders that go to it.

Next... the mounting and soldering of the components on the panel is very easy indeed. The position of the components is not critical at all and the only difficulty is how to mount the integrated circuit. I solved this part of the project by making another smaller panel of sheet of 25mm's X 18mm's from a perforated board with metal strips on one of its' faces. On this smaller panel, I mounted and soldered a DIL socket for the TBA 810 IC. To the strip of each leg of the socket, I soldered a piece of bare copper wire. So these bare copper wires of .8mm's in diameter are the connections from the TBA 810 to the rest of the circuit. In this way, you have the facility of soldering the IC easily and the possibility of changing it without the annoying and difficult task of de-soldering an integrated circuit!

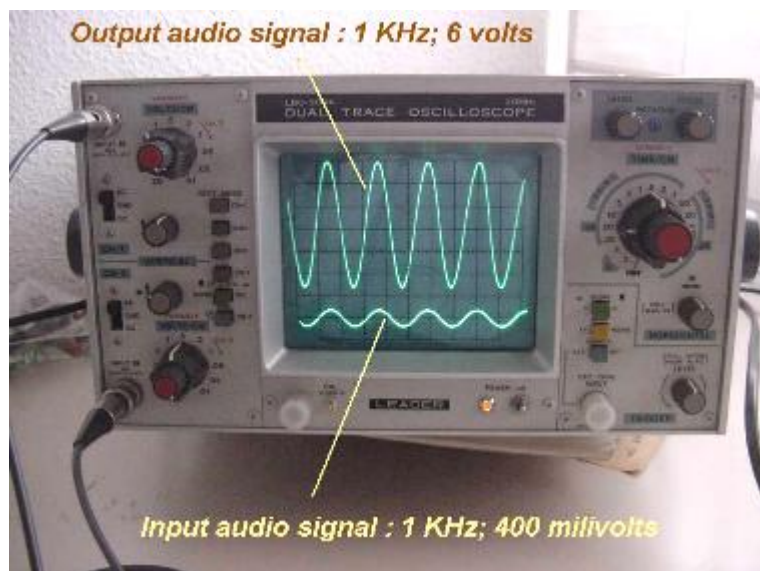
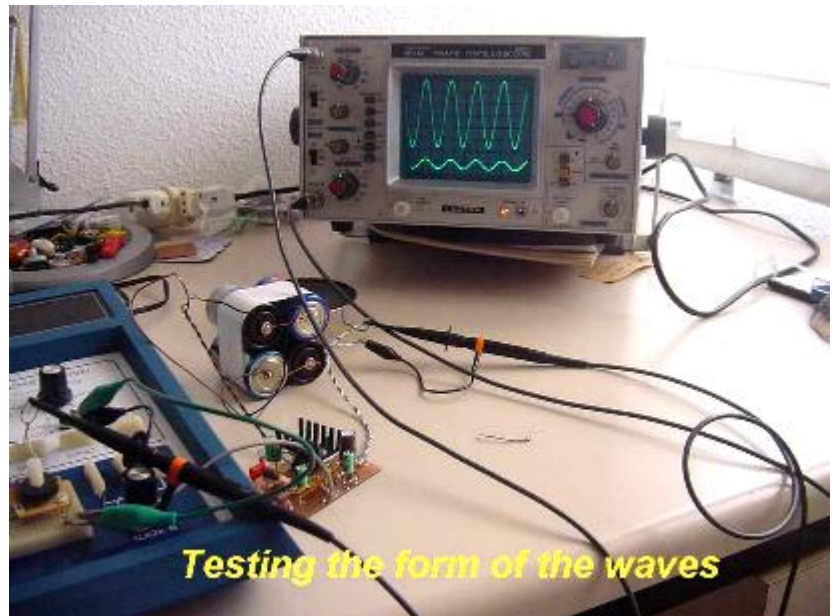
It is important to know...that when you buy a TBA 810, in any one of its' versions, the pins of the IC are bent. So, if you use a socket for the IC, you will have to straighten out all of the pins before placing the unit on its' socke

First Test of the Amplifier

Once I finished soldering all of the components, a quick test was impressionable. So I plugged an 8 ohm loud-speaker to the output and applied power to the amplifier, with a voltage of only six aken from a battery of four cells in a series connection. If everything has been done correctly, the unit starts working from this first connection...your will hear a faint background sound on the speaker. Now, if you touch the active terminal of the audio input cable, you should hear a loud noise created from the electromagnetic filed of your home electrical system. Feel relieved...you are now a successful constructor. This is the easiest was of testing an amplifier.

Testing The Forms of Audio Signals

Nevertheless, an amplifier can introduce deformation in the audio signals with which you are feeding it. So a more precise test must be taken. It is necessary to have an oscilloscope, preferable a double-trace oscilloscope, and an audio signal generator. For the generator, I used a Heathkit Electronic Design Experimentor, which has frequencies from 200 Hz to 20 KHz. With a double-channel oscilloscope, you plug one of the channels to the input signal of the amplifier and the other channel to the output. Now you can compare the forms on the screen and see if the amplifier deforms the input signal.



I found in my project that a signal of .4 volts, at 1 KHz, was amplified to an output of 6 volts. The audio signal amplified was an exact replica of the input, without any appreciable deformation. It is important not to introduce an excessive audio voltage to maintain the senoidal form of the wave.

The TBA 810 IC has sensitivities that can reach minor values of 80 milli-volts and frequencies from 40 Hz to 20,000 Hz. By adding different power supply voltages and the facility of connecting speakers of 4 or 8 ohm, you will realize that this IC is an ideal tool for most of your audio related projects!

