CDDA_Mixer

COLLABORATORS

	TITLE : CDDA_Mixer	

ACTION	*NAME*	*DATE*	*SIGNATURE*
WRITTEN BY		August 24, 2024	

REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

Contents

Chapter 1

CDDA_Mixer

1.1 Build Your Own CDDA Mixer

```
Build your own CDDA Mixer

Typed/Edited by Craig

Purpose:
All modern CD-ROM drives come with audio output connections. A headphone
socket is standard on the front panel, but there's also a less obvious
output on the back, commonly refered to as CDDA (CD Digital Audio).
Wouldn't it be handy if you could patch this into your Amiga's audio
output?

You could then have just one stereo connection feeding your speaker system.
Even though the A4000 and A3000 have connections on the motherboard
specifically for this, even then the level of the CD audio is much lower
than the Amiga audio, so this project is quite applicable to all Amigas.

Background Info:
This little project is based around the highly useful TDA2822 stereo amp
chip, which makes life a lot easier. Most of the components are on-board
the chip so very few external components are needed. FIGURE 1 gives you the
schematic for the little amp and you can clearly see that the whole project
fits onto a small piece of stripboard.

The two audio sources are fed into the inputs of the chip via the resistor
array comprising R4 to R9. The TDA2822 does its work and the outputs are
fed out through C5 and C6. These capacitors are present to block potentialy
harmful DC current reaching the output connections. R3 is a small current
limiting resistor and the decoupling is done via C2. Due to the fact that
this project will be run from the computer's power supply, decoupling of
the electrical supply isn't really needed, but should you decide to run it
from a different supply, a 470uF electrolytic capacitor should be fitted
across the supply rails the same as C2. R1 and R2 give a preset output
impedance of about 8 ohms and should suffice for most applications.

+-------------------------------------------------------------------------+
|Required Tools:                                                          |
+-------------------------------------------------------------------------+
|Phillips Screwdriver                                                     |
```

|Soldering Iron |
|Solder |
|Craft Knife (if your not sure about this, get an adult to help you) |
|Ruler (straight edge) |
|Wire Strippers |
|Multimeter (continuity tester) |
| |
|Optional but useful tools: |
|Tweezers |
|Straight Screwdriver |
|Digital Multimeter |
|Heat Shrink Sleeving |
|Side Cutters |
|Hacksaw |
|"Helping Hands" Soldering Tool |

|Parts List (All parts are obtainable from Maplin Electronics) |

QUANTITY:		DESCRIPTION:	ORDER NO:
1	CDDA Header Socket	YW11M	0.42
1	LM387N Dual Pre-amp	UJ38R	1.29
2	4R7 1/4W Resistor	M4R7	0.05
1	1R1/4W Resistor	M1R	0.05
2	47K 1/4W Resistor	M47K	0.04
2	1K2 1/4W Resistor	M1K2	0.04
2	100R 1/4W Resistor	M100R	0.04
1	100NF Polyester Disc	YR75	0.18
2	100uF 16V Electrolytic	AT40T	0.10
2	470uF 16V Electrolytic	AT43W	0.16
2	100NF 16V Polyester Layer	WW41U	0.27
1	Stripboard	JP47	1.52

| Parts List - Continued (Optional Extras): |

QUANTITY:		DESCRIPTION:	ORDER NO:
1	3.5mm Stereo Line	RK51F	0.55
1	each Phono Plug	FJ88W/9W	0.32
1m	Coax Cable	XR21X	0.39
10m	Power Cable Black	BL00A	0.59
10m	Power Cable Red	BL07H	0.59
1	Enclosure	FK73Q	1.21
TOTAL COST:			£8.83

Step 1: The PCB:
Due to the simplicity of this circuit, you can build it on a piece of Stripboard. All parts are obtainable from Maplins Electronics. If you do not live near a local Maplins store, you can pick up a copy of the Maplins catalogue at your local WH Smith's and you can order the parts via mail order. Firstly, we need to mark out and cut the stripboard. You will need a piece of stripboard which is 19 holes long by 7 holes high. It is possible

to cut the board to this size by scribing along the strip of holes to cut with a craft knife and ruler.

Once the board has been scribed, gently flexing it in either direction will result in it cracking. Hopefully, if you made the scibes deep enough, it will crack along the marked lines. Do take care when trying to crack the board. Do it very gently until you hear it start to crack. Otherwise it is a job for a hacksaw and lots of patience.

Note that the strips should run along the board and not up and down. Check the picture (FIGURE 2) to see how it should look - it also shows where the traces should be cut. These cuts can be made very simply by using a drill of about 5 to 6mm in diameter. Rotate the drill bit by hand in the hole that corresponds to the cut in the trace. The drill bit will start to remove the copper. Keep going until all the copper around the hole is removed. Repeat this process for all the cuts, 14 in all.

An important note to make here is to make sure that all the bits of copper are removed whilst making these holes/cuts otherwise these will short out the neighbouring traces. Using a craft knife, run it down the insulator strips at each trace to ensure they are clear. If you have a continuity tester or a multimeter, check that no short circuits exist. Care should be taken when handling stripboard as it can be very fragile, and too much pressure in one area can lead to the board cracking along a run of holes. If you need to push hard (you may have a blunt drill bit!), support the board on a hard, flat surface.

Step 2: Soldering:
So now we need to start soldering the components in place. There is no real order in which to do this, but you may find it easier to start with the smaller components first. Check the circuit board picture for reference (FIGURE 2) and (FIGURE 3). Hold the board as in the picture. The left hand side is where the CDDA header socket fits on so turn the board over so that the left side stays the left side. Try to keep the board up this way until you start to put on some of the components. I'd hate to think you put the parts on the board upside down!

The wire links are fiddly so it is probably better to start with these. FIGURE 3 shows how the links fit in. A tip here is to use the legs cut off the components to make the links, but do make sure you leave enough wire on the components to allow soldering. Because of the physical size of the traces on the stripboard it makes soldering quite difficult to the beginner. To ease this situation I would recommend you buy one of those refillable gas soldering irons. Most mains soldering iron tips may be too large, but you could file them down.

Another benefit of a gas iron is the heat. Many components don't like excessive heat, especially chips and the TDA2822 is no exception. The chip will withstand 300 degrees for about 10 seconds but any more will undoubtedly damage the part beyond useability. With a gas iron you can alter the tip heat by turning up the gas setting.

Soldering is the most important part of any kit building, as not enough heat will result in something known as a 'cold solder joint'. These set up a large resistance at the joint and can be a real pain to track down, but by the same token, too much heat will start to kill electronic components.

Step 3: Plug Ins:
So now you should have the wire links soldered in. Link 1 is in a rather awkward place and you need to make sure that any surrounding components do not short out on it, so bend it accordingly to clear it away from the holes. By looking at FIGURE 4, you can start to place the rest of the parts into their positions. FIGURE 4 shows component location and the holes used by each (as designated by a small black circle). I would recommend installing the resistors next.

Start from the left hand side and work your way across. As each component goes in, the legs should appear through the board into a trace. If for some reason you end up with a leg on a cut, you have either put it in the wrong place, or you have the board the wrong way around. Capacitors would be next, and again start from the left and work across. Referring to FIGURE 4 again, note that C3 to C6 are electrolytic and, as such, are polarised.

This means that they have to go in the right way around. If you put them in backwards they won't work as well. Each of the capacitors has markings on the body, usually in the form of a line that points to one of the legs. It may have minus signs in the line and this shows that the indicated leg is the cathode or negative connection. FIGURE 4 shows the polarity of these parts. C2, C7 and C8 are not polarised so they can be fitted either way around.

Then comes the CDDA header socket. Again care should be taken to avoid shorts with the wire link L1. And lastly the TDA2822 chip itself. One note here is that the chip has to be orientated correctly. If you look at the top of the chip you'll see that it either has a small scollop in one end or a small dot.

In the case of the dot, this marks pin 1, whereas the scollop if it were at the top, pin 1 will be the one at the top left. A warning here is that if you do manage to put the chip in incorrectly you'll damage it, so FIGURE 4 shows that pin 1 is at the bottom right. In effect the chip is in upside down.

Step 5: Connections:
You now have a finished circuit board. This brings us to adding the cabling so that we can plug the different bits in. This is where the setup specific requirements come into play. On my version, I opted to bring the Amiga audio in on phono leads.

This is not too bad on a Zorro'd Amiga as there are always ways of getting cables in and out. If you are thinking of using this on an Amiga 1200 with an external CD-ROM then you'll have to make up the leads to suit your type of setup. If all else fails you could opt to solder straight onto the back of the audio sockets from inside the machine. Although possible, it is extremely fiddly and involves heat on a lot of components very local to the sockets. Use it as a last resort.

So our master has phono leads to bring the audio back into the machine, and it has a 3.5mm stereo socket on a lead for the PC-type speakers to be plugged into. This again depends on how you have your audio connected up. You could always wire up two phono sockets on the outputs to replace the originals.

These cables should be made from sheathed coaxial cable to give a good

earth screen around the in/out cables. This helps to cut down on the electrical noise from inside the computer. Things like disk drives, hard drives, etc can sometimes interfere, and a good screening will eliminate some of this.

The power is taken from the 12V lines running out of the power supply. The easiest way to tap into these would be to find a vacant power connector. The connector for hard disks has the power we need. Two lengths of cable, one red and one black, should be connected up to a vacant hard disk connector. A spare floppy drive power connector would do just as well. In fact, if you have a multimeter, you can take a 12V DC supply from pretty much anywhere you can find one.

Step 6: Testing:
Just to be on the safe side, it’s nice to be able to check that things are looking alright before proceeding. Using your multimeter, check the Amiga audio input pins for a resistance. If all is well, you should have about 2.5K across the two inputs and a reading of at least 500 Ohms from each one to earth.

Repeat this process for the CDDA socket, checking first the left and right together. Is it greater than 150 Ohms? Good. The last thing is to measure the value across the outputs. This should typically be high, at least 50K, but don’y worry about being exactly as specified. Different component tolerances will affect these readings.

Step 7: Plugging In:
Right, what are you waiting for? If you’ve got this far, let’s plug it all in and try it out. You’ll need some software to play an audio CD on your Amiga, such as MCD Player, insert your fave music CD and away you go!

End.

Back To Main Menu
Back To Projects Menu