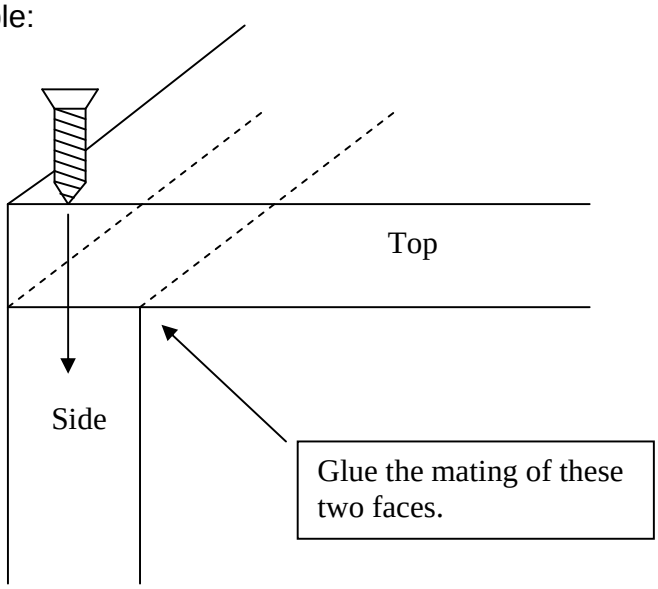
Ice ‘n’ Lemon Instrument Amplifier
Part 4

This is the last in a (long awaited) series of documents on the construction of a musical instrument amplifier. The construction is best shown using computer aided design drawings and photographs. Therefore this document will be quite short.

Box

My construction makes use of 18mm MDF which is glued and screwed in a butt joint configuration. This is the simplest possible construction method. For example:



Standard wood glue is suitable. If you are accurate in the cutting and joining the glue will cause the box to be air tight. For this reason I have not used silicon sealant to make the box air tight. If you use MDF / chip board / ply it is important to drill clearance holes in the “top” and thread size holes in the “side”. Failure to do this invites the wood to split. If using natural wood this is not so serious an issue because natural woods have a fibrous grain and tend not to be so dense.

Front Panel (Baffle)

The front panel is screwed into a hole cut into the baffle. It is simply a metal plate with holes for the on/off switch, the brightness switch, high and low impedance ¼ inch inputs treble, middle, bass, gain and master volume, and the neon on/off lamp.

The speaker hole is approximately 12” in diameter. The best way to avoid error is to place the driver on the baffle and draw around it. It is also well to mark the

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position of the holes at this time. A jigsaw or router can be used with equal success.

Two lengths of 1 1/4" x 1/2" pine are glued and screwed to the inside sides of the box to form something for the baffle to be screwed into (see pictures or drawings).

Note that if you intend to use grill cloth you will need to remove an extra 0.5mm – 1mm from all sides of the baffle because the cloth will add width and length. You will not be able to change the size of the baffle once the nylon is on, without causing yourself a lot of work. Modifying the box will also be a lot of effort. To be sure of avoiding this problem you might consider making the baffle completely before beginning the rest of the box. It will then be possible to check the exact size required.

Finish – Box
The outside of the box is covered in Tolex which is available from various supplies in the UK. I have found Terralec Ltd to be entirely satisfactory. Their paper catalogue is very handy if website ordering annoys you as much as it does me. Tolex is glued to the box using Copydex, which is an art/craft glue; wood glue would probably be fine if somewhat expensive. PVA may be ok if you don't plan to get the box soaking wet, but the longevity may be somewhat questionable, especially if you intend your amplifier to have a life on the road.

Finish – Baffle
The grill cloth is also from Terralec. Its application can be tricky so I will describe the process which I used in the summer of 2005. It has lasted practically unchanged until now (late 2009).

Beg, steal, borrow or otherwise obtain a reasonably beefy mains powered nail / staple gun. Generally the manual (not electric) ones don't have the guts for the job.

Cut your cloth to the size of your baffle, adding 3 to 4 inches in all directions.

(Optional)
Assuming you have bought nylon or other plastic based grill cloth…
Get an iron (preferably not the same one you use on your work shirts, etc). Set it to the lowest setting and iron the cloth to remove any folds/creases. Caution is advised, as different plastics melt at different temperatures. Even if no melting is observed plastic can become brittle if it is unduly heated.

If you don't get the folds out you can try to stretch them out in the gluing process but it's fairly certain that they will reappear after a few months.

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Having cut and ‘ironed’ the cloth lay the cloth on a stout table, or the floor if your knees are up to it, and nail gun one edge (either long or short, but I prefer long) down. Use the longest nail you can without coming through the front side of the baffle. I would advise one nail per inch minimum. Glue with copious quantities of glue. When I say ‘copious’, I mean take the lid off the glue and pour freely from the pot onto the work surface, and then spread it about with a ruler or off-cut of wood. Wait for that to go off (24 hours usually).

Having secured one side, stretch the cloth across the baffle and pull it taught. Put a few nails in (say five) and stand the baffle up so that the front side may be observed. Check that the line of the cloth is vertical (if you do long edge first) or horizontal (if you do short edge first). You want the grill cloth to run vertically. Usually the amp will be at floor level and the player will look down on the amp. If the line of the cloth deviates from vertical it will look horrid. Make adjustments by tensioning the required parts of the cloth some more* and re-nailing in roughly the same places. When you are satisfied, add nails at one inch intervals and glue as before. Nylon will stretch quickly if the force on it is not even. Around the nails the forces are not even at all, so use many of them to distribute the effect as far as is practical. The glue will take a while to go off. If you don’t use enough nails to distribute the force the nylon will go all flappy as the glue goes off, and you’ll need to start again.

You will then need to do the same for the horizontal (short edge) or vertical (long edge) direction depending on how you started off. In my opinion, vertical errors are subjectively much worse than horizontal errors, because of the viewing angle.

The outer edges of the box are rounded with router bit (I think the radius of the bit was 15mm and was the closest I had to 18mm at the time). The corners are capped with “ball corners”: three-sided ball corners on the back and two-sided on the front so that the baffle can easily be removed.

* My preferred method is to place my palm on the back of the baffle get my fingers on the cloth and begin to make a fist, then get a nail in quick with my free hand (nail gun is necessary!). If you need two hands to grip the cloth or to bang a nail in with a hammer, you may have to get some help. It’s not easy and patience is essential, but if it looks bad it’ll drive you nuts.

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