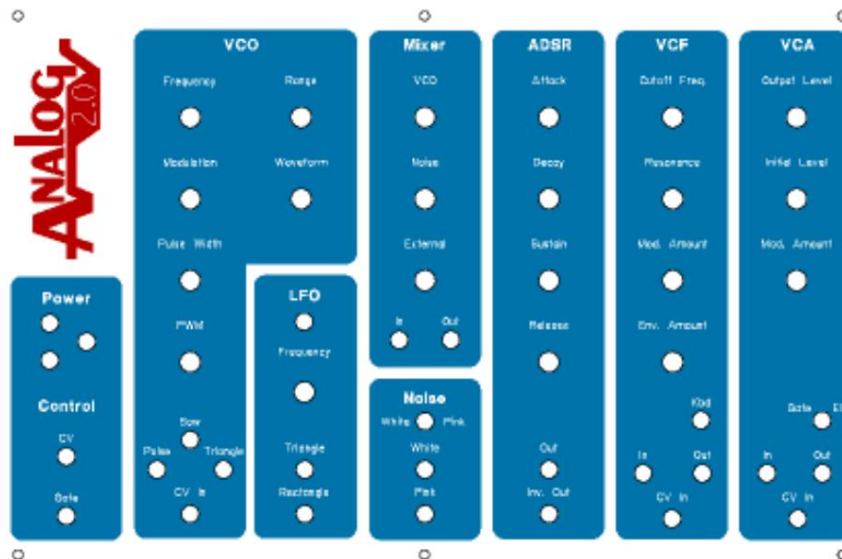




Analog 2.0 documentation

Vol. 2

Panel production



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1. Purpose of this document

This document describes an example of creating a panel for Analog2.0.

Based on the panel design example in the Analog2.0 prototype, we will explain how to actually manufacture the panel.

The panel can be produced in any way by the creators, and the production method introduced in this document should be taken as an example. Also, the production of the housing will not be introduced in Analog 2.0. Instead, I will introduce a mounting example of the prototype with a photo. This is an example of the minimum cut-out

2. Introduction of production examples

2.1. Overview of panel design example

The panel design example introduced here is the one used in the prototype. (Fig. 2-1)

In the design example, as shown in Fig. 2-2, the OHP sheet is sandwiched between a 300mm x 200mm x 1mm aluminum plate and a transparent acrylic plate. Print panel artwork on transparencies. The mounting holes for the parts are stacked and the drill is passed through. It's a simple design, but
Has the following benefits

- Eliminate the most troublesome painting and lettering in panel production - When drilling holes, mark the transparencies so you don't have to scribble



Figure 2-1 Prototype panel

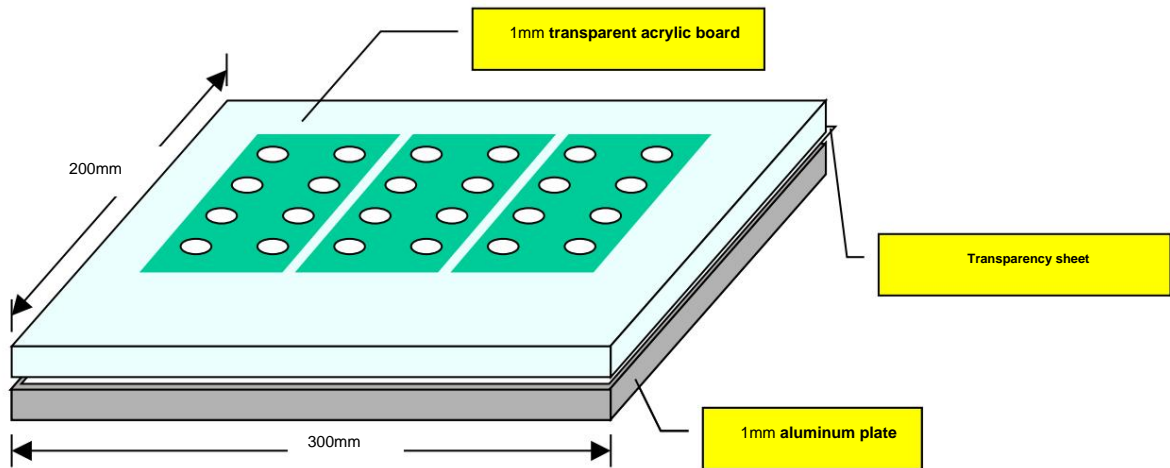


Figure 2-2 Prototype example Panel structure

Based on such a panel design, the production is performed in the following order.

1. Disconnect

2. OHP sheet printing for drilling

3. Drilling

4. OHP sheet printing and processing for artwork

2.2. Necessary items for panel

production Tools:-(If necessary)

Acrylic cutter

-Drill _

-Tapered reamer

-Driver pliers

-Printers that can print on OHP sheets such as inkjet printers

Material:

--300mm x 200mm x 1mm aluminum plate

--300mm x 200mm x 1mm transparent acrylic plate

--A4 Transparencies 2

sheets - 3mm x 10mm screws

6 pieces - 3mm nuts 6 pieces

Select a transparency that can be printed by a printer. Inkjet pudding

Transparencies for each printer type, such as laser printers, are on sale.

Screws and nuts are used to fix stacked aluminum plates, acrylic plates, and transparencies.

increase.

2.3. Cutting of material

When making a panel, first of all, cut the aluminum plate and acrylic of the material to the desired size.

The most recommended method is to get a board that has been cut to the desired size from the beginning.

That's right. No need to prepare tools, it's easy and reliable. A place where there is no one of the desired size

In that case, you can ask the home center to cut it. In this prototype

Use an aluminum plate of 300mm x 200mm x 1mm, and cut the acrylic plate by yourself.

Did. Use an acrylic cutter to cut the acrylic board.

I can easily think of a method using a gold saw to cut an aluminum plate, but it seems that an

aluminum plate with a thickness of about 1 mm can be cut with a utility knife. As long as the link is alive, the following site

It will be helpful.

<http://webryalbum.biglobe.ne.jp/myalbum/1003289007923048b35a00dd242ffab118c63f430/65490414752138311>

The size of the A4 OHP sheet is 297mm x 210mm, which is slightly different from 300x200. It is necessary to cut the protruding part. This is easier to work with if done at the finishing stage.

2.4. Printing OHP sheets for drilling Next,

drill holes in the panel. In the prototype example, in order to simplify the production, follow the procedure below to make a hole.

I will do it.

1. Print the artwork marked with the drilling position on the transparency
2. Place the printed transparency between the aluminum plate and the acrylic plate.
3. Make holes according to the artwork mark.

In this section, you will print transparencies for drilling. Enclosed with this document

Print out panel_with_reference.pdf. The following are notes on printing.

-Select an OHP sheet in the paper selection when printing.

-Choose high quality. (Because darker colors are easier to work with) -Print

at 100% scale.

-Do not touch the printed surface immediately after printing. Printing on transparencies is in
It is often difficult to dry.

-After printing, be sure to check if it was printed at the correct scale. How to do it later
I will explain in detail.

For reference, the option settings when printing from Adobe Reader 8 are as follows. under
Where the line is drawn is where you need to change from the default.

Print range	all
Number of	1
copies Page enlargement / reduction	none
Automatic rotation and centering	can be
Select paper according to page size	None

When you print, the layout shown in Figure 2-3 is printed. This layout has a bird

There is a center mark (red plus mark) at the position of the seat, so it is the final panel sheet.

Cannot be used. However, it is used for positioning when drilling by sandwiching it in the panel. child
This eliminates the need for scoring on the panel and simplifies drilling work.

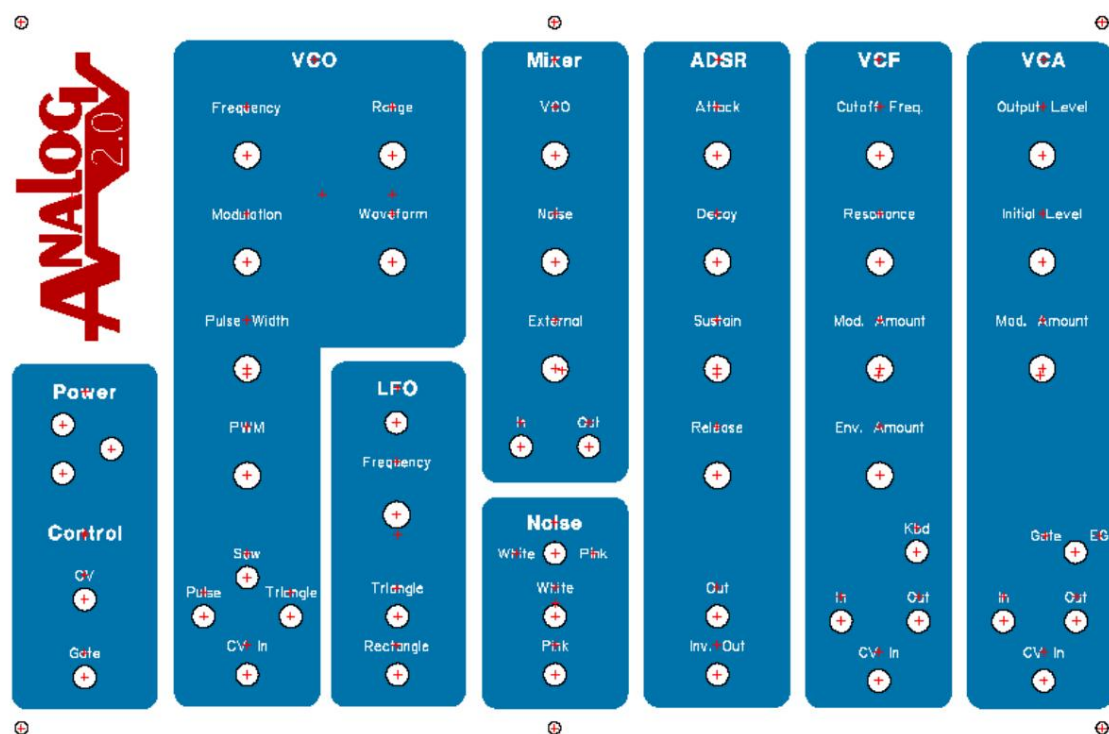


Figure 2-3 Drill guide OHP sheet for drill guide

Now, when the transparency is printed, check that it was printed to the correct scale.

Measure the distance between the frequency in the VCO frame and the center mark of the PWM on the printed sheet. If it is 84 mm, it is OK (Fig. 2-4). If they are different, check if there are any differences in the settings and reprint.

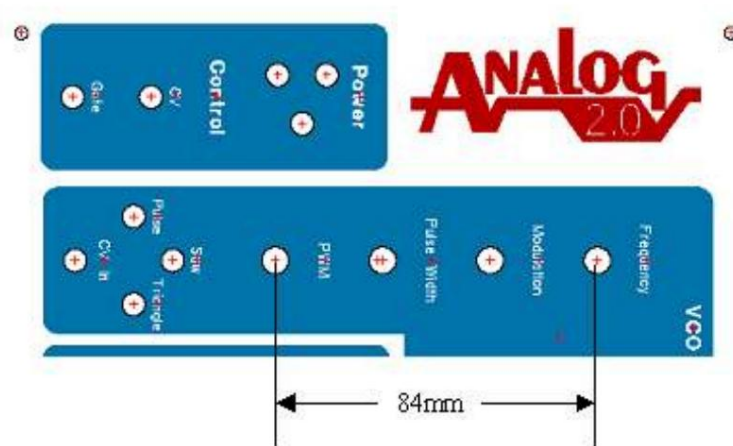


Figure 2-4 Transparency OHP Transparency Check Scale

2.5. Drilling After

printing the OHP sheet, it is time to start drilling. To make a hole, follow the procedure below.

1. Place the OHP sheet between the aluminum plate and the acrylic plate.
2. Make holes in the screw holes at the four corners and fix them with screws.
3. Make holes for panel parts.

Fixing Transparencies The

first task of drilling is to sandwich the transparencies between aluminum and acrylic plates. Place the sheet in the correct position and pinch it firmly. For alignment, the screw hole positions at the four corners are I think it's easier to do it so that it is equidistant from each corner. The arrangement determined here is the finish Please work carefully as it will be the arrangement of the shavings. If the acrylic protective sheet is transparent, leave it on. Leave the protective sheet on the aluminum plate still affixed.

When fixing the OHP sheet, stick double-sided tape on both sides of the sheet to proceed with the work.

It may be easy to find. This is because it can prevent deviation from the determined position.

Screw hole drill

After fixing the OHP sheet, start drilling work. First, make a hole from the screw hole in the corner. Drill the screw holes with a 3.2 mm drill.

If you make a screw hole first and fix the acrylic plate, OHP sheet, aluminum plate, then Since they do not shift from each other, it is easier to perform subsequent work. On the contrary, in this work 3 If the sheets are misaligned, it will be difficult to recover them, so work carefully.

The screw hole work is performed according to the following flow.

1. First, make a hole in one of the four corners.
2. Pass the screw through the hole and tighten it with a nut to fix it. 3.
- Make a hole diagonally to the hole you just made and fix it with a screw.
4. Make holes in the remaining two corners and secure with screws. 5.

Drill the two remaining screw holes on the top and bottom of the panel. Fixing with screws is not essential.

Follow the steps below to make each screw hole.

1. Drill holes while stacking aluminum plates, transparencies, and acrylic plates.
2. Mark the center mark position of the hole to be drilled with a punch. Look as vertically as possible and mark
Be careful not to shift the punch from the center mark.
3. Drill with a 3.2mm drill.

Drill screw holes for

panel holes, fix the four corners with screws, and finally drill holes for panel parts.

The number of millimeters of the hole to be drilled is written in the attached sheet panel_with_drill_sizes.pdf. Since the drill diameter is large this time, be careful not to cause misalignment. The following is the drill method I took. You can make holes with few mistakes with a relatively cheap tool.

1. Hit the punch according to the center mark of the hole to be drilled
2. First, make a small hole using a drill of about 1.5 mm. This work uses a hand drill
It is less likely to cause misalignment. The thinner this drill is, the better.
3. Use a 5mm drill to make a large hole. 4. Use a taper reamer
to widen the hole to the required size.

If you can do it so far, the drilling work is completed.

2.6. Printing and processing of OHP sheets **for artwork** After **drilling, we will start finishing work.**

The transparencies used for the drilling guides so far have been damaged throughout the work. Discard this sheet, print another transparency for your artwork, and use it for finishing. is.

Print the pdf file panel.pdf for the artwork. The printing procedure is the same as for drills. The method of checking the scale is the same, but this time there is no center drill, so it is a drill. Measure the drill hole spacing using the edge of the hole.

Next, remove the acrylic plate and aluminum plate that are fixed with screws, and then remove the new OHP sea.

I will pinch it. At that time, the sheet in the drill hole part gets in the way, so either of the following methods Remove it with.

1. Punch a hole with a leather punch

**2. After sandwiching the OHP sheet between acrylic and aluminum and fixing it with screws, the sea of the drill hole part
Hollow out with a utility knife**

I used method 1. It takes some practice to punch cleanly, but once you get used to it, you can work efficiently.

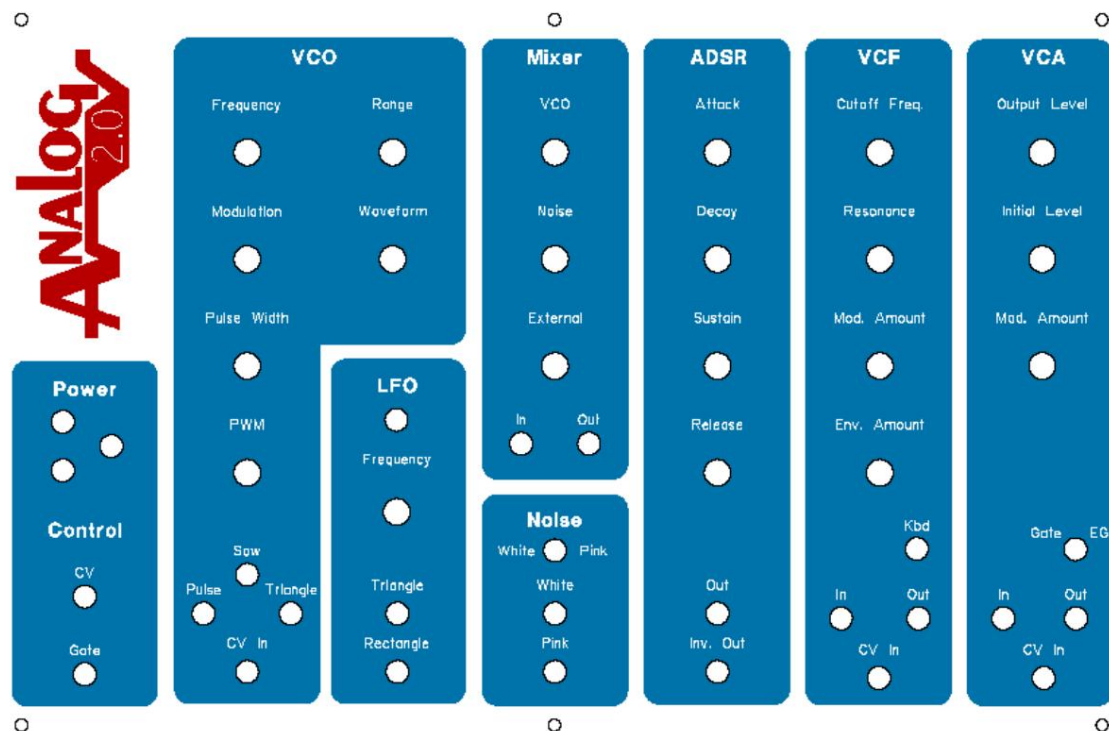


Figure 2-5 Layout of OHP sheets for artwork

Now the panel is complete. Does it look like Figure 2-1?

3. About the housing

That is all for the panel production example introduced in Analog2.0. However, as it is, the synthesizer Module production should not remain. This is because even if the panel is erected, it will fall down immediately.

To proceed with the production, the panel needs to be fixed to some case. The best is

It is to put it in the housing. When designing the housing, the inner depth must be at least 100 mm

It is important. If possible, it is safer to have a size of about 120 mm.

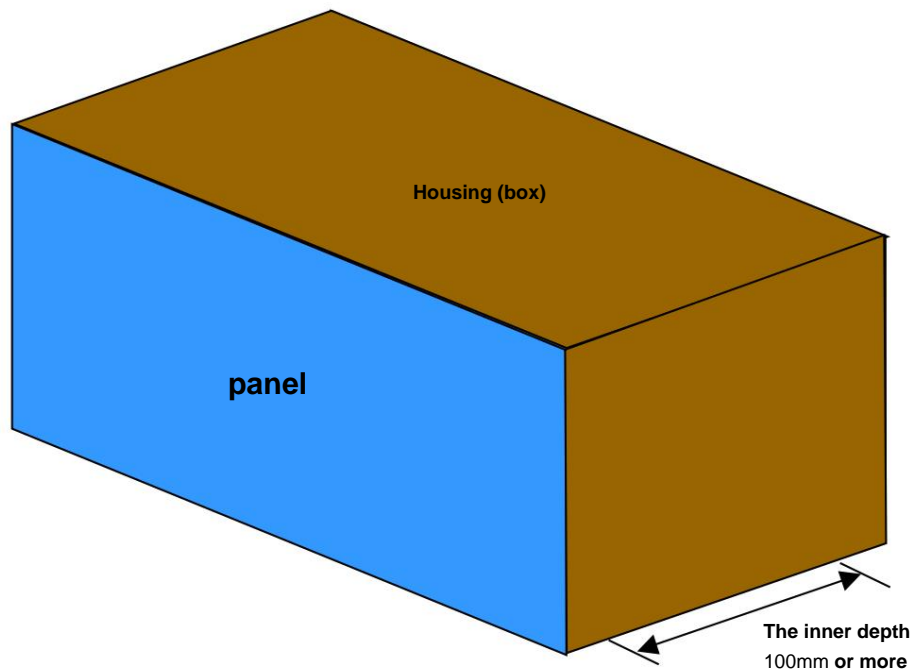


Figure 2-6 Image of housing

In the prototype, we saved the trouble of manufacturing the housing and just fixed it to the wooden board with L-shaped metal fittings. Decision Although it is not recommended, it would be great if this area could be used as a guideline for the lowest line. I'm sorry.

By the way, in the prototype example, in order to reduce the deflection of the panel, the upper side is reinforced with an L angle. I will.



Figure 2-7 Analog2.0 Analog2.0 Overview of the prototype

Appendix A: About the original design

of the panel Designing and manufacturing the panel independently is in line with the purpose of Analog2.0, and we would like you to do it a lot. I have attached the file under the design (analog20.FPD) as a stepping stone for customization. To view and edit this file, you need software called Front Panel Designer (<http://www.frontpanelexpress.com/index.p>

Analog2.0 is designed so that the board mounts directly to the panel, as shown in the image in Figure 3-1. In order to maintain this mounting policy, we designed the panel independently.

Please note some points.

If you are not particular about the panel mount of the board, the following restrictions do not apply. In this case, the board and the parts on the panel are connected by lead wires. It gives you more freedom in panel design at the cost of tedious mounting.

Do not change the vertical spacing of

volumes The vertical positional relationship of volumes is constrained by the board design. In order for the board to be panel mountable, it is necessary to maintain the vertical positional relationship of the volumes. As long as the positional relationship of the volumes is maintained, there is no problem with rotation and trans

Keep the distance between the boards

As shown in Figure 3-1 in Analog 2.0, the board is separated for each functional module. When

changing the panel layout while maintaining the panel mount, make sure that the boards do not come too close to each other. You need to consider Zain.

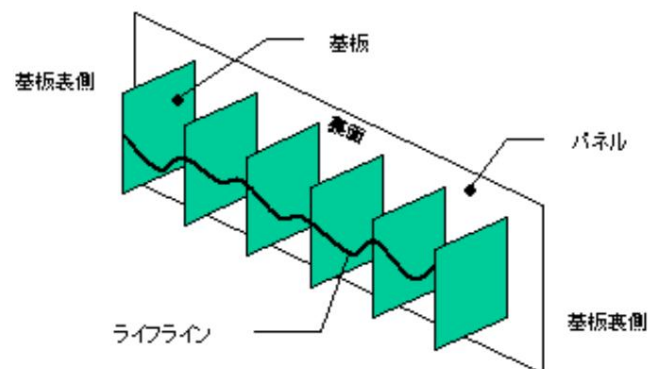


Figure 3-1 Image of board mounting on the panel