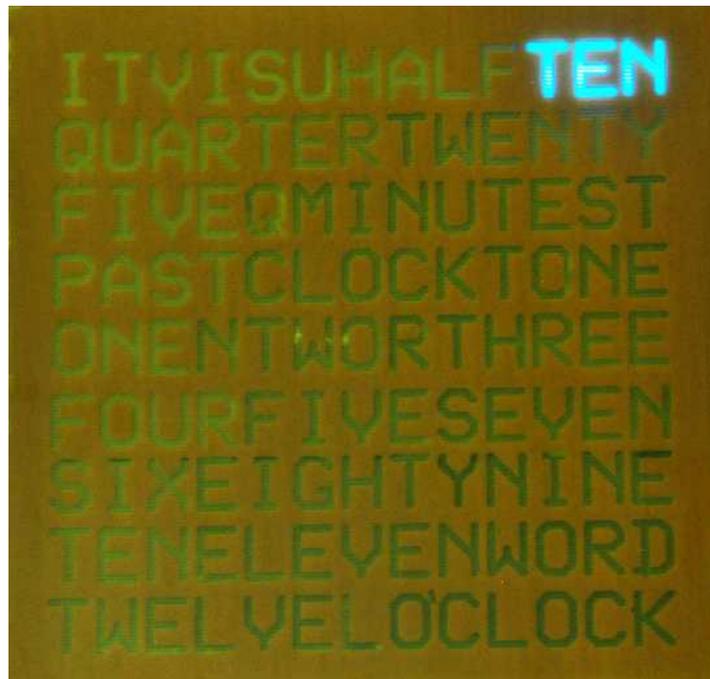


Word Clock

Stencil Construction Notes

A fun clock to build



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Welcome

Thanks for deciding to make this great little clock project. You will find that this clock will be a centre piece for many discussions into the future, as well as providing a great way to tell the time.

Because there are so many ways to construct the clock, I have broken assembly down into various documents – this document details the construction of the front display (stencil) and baffles.

You will find that construction of this clock is very simple. If you are methodical with your construction practices, and careful with you soldering, you will find that the clock almost assembles itself.

Parts List

The first thing you need to do is to verify that you have all of the necessary components required to assemble your front stencil. Here is the complete parts list. Feel free to check off each component as you verify it is present.

Baffles

140mm long card	20
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Side Supports

140mm long Perspex	4
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Stencil

Stencil	1
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You will need a hot melt glue gun, sidecutters, a pen, and ruler, and some hot melt glue sticks to assemble the baffles.

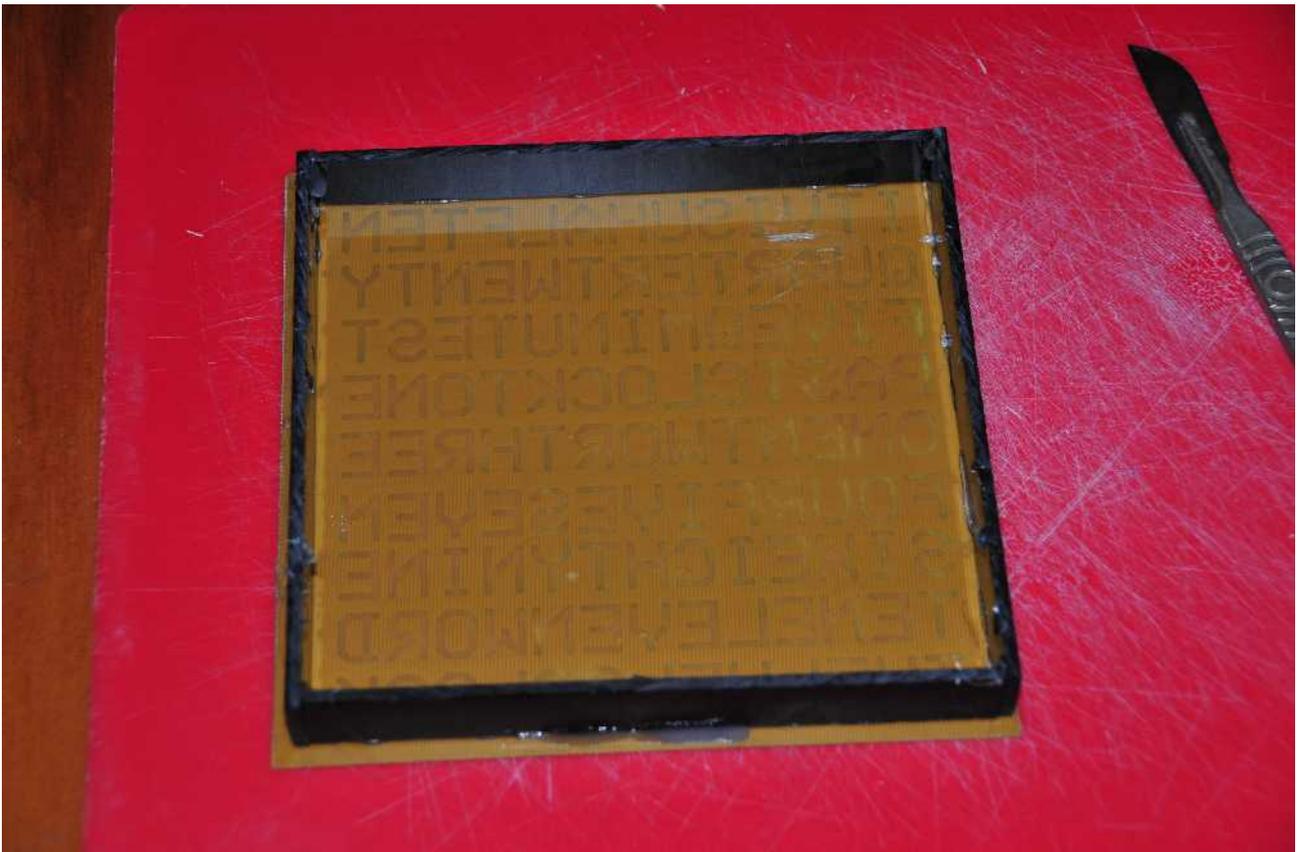
Note that the wording on the stencil may vary from these instructions depending on the custom words you have chosen.

Construction

Assembly of the stencil and baffle assembly is straight forward. You will use hot melt glue to glue the supports to the edges of the display, construct a matrix of card strips to isolate each LED, and install the matrix into the space within the support boundary. Which side is the inside will vary from clock to clock, depending on whether you requested the copper to be on the inside or the outside.

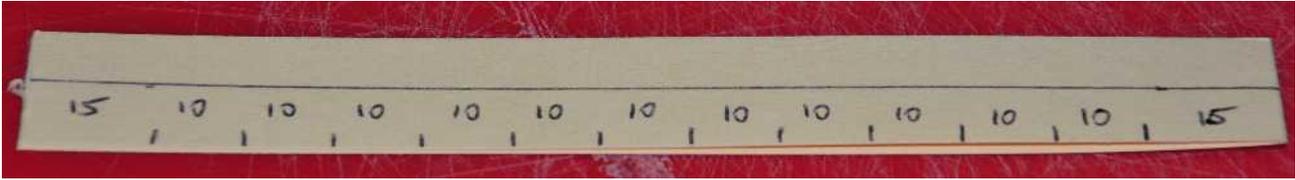
CAUTION: DO NOT SOLDER TO THE COPPER SURFACE OF THE STENCIL. If you have requested fiberglass on the outside, you may be tempted to solder materials to the copper surface of the stencil. The PCB material used for the stencil is 1/32" thick (half that of the controller or display PCBs) to ensure that maximum light transmission is possible. Soldering will heat the PCB material, and cause discoloration on the front of the face. Use **HOT MELT** glue instead.

Start assembly by running a bead of hot melt glue along one of the baffle supports and gluing it into place against the back of the stencil. Repeat until all of the acrylic supports are installed (4 units). Be careful to align the supports evenly.



If the glue sets before you have mounted the supports, simply strip the glue off, and start again.

Next draw the following measurements on 8 of the card strips. All strips are 140mm long. The 8 strips will be used as horizontal baffles. All measurements are in mm. The line in the photo is half way along the strip, and shows us where we have to cut to. Note that there are 12 cuts in each of the horizontal strips.

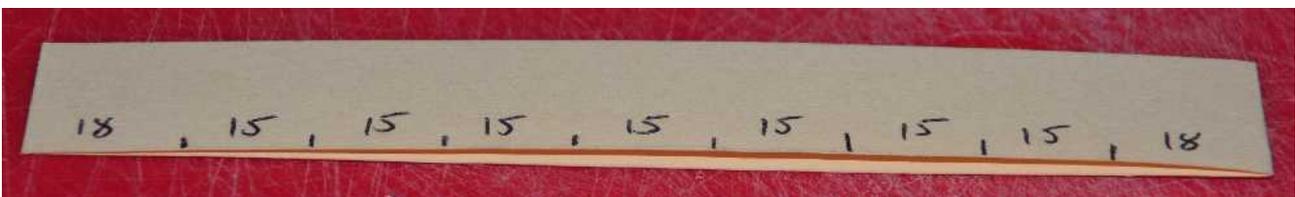


Once the 8 horizontal card strips have been measured, cut slots in the strip using a pair of sidecutters or scissors. Be careful to cut up to the half way line – if you do not cut far enough, then when you slide a vertical strip into the horizontal strip, the strips wont engage far enough and a gap will be created.

You will find that the card is easy to cut. Note that I am cutting 2 strips at a time in the picture – the strips are simply cut apart once the slots have been cut.



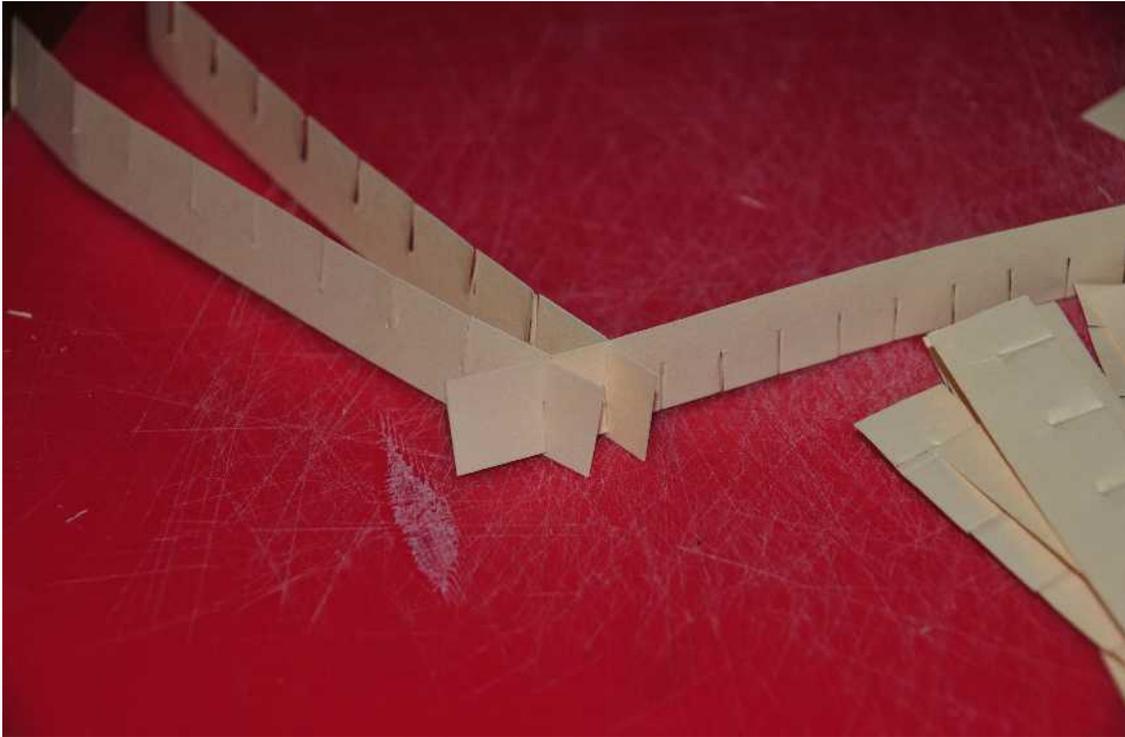
Next, we need to measure the 12 vertical card strips. Again, measure the cuts as per the following photo – and cut them in the same way. Note that there are 8 cuts on the vertical strips.



The card used is light weight card stock, so it is easy to work with. Just make sure that you protect any nice table surfaces while you are working – I used a chopping board.

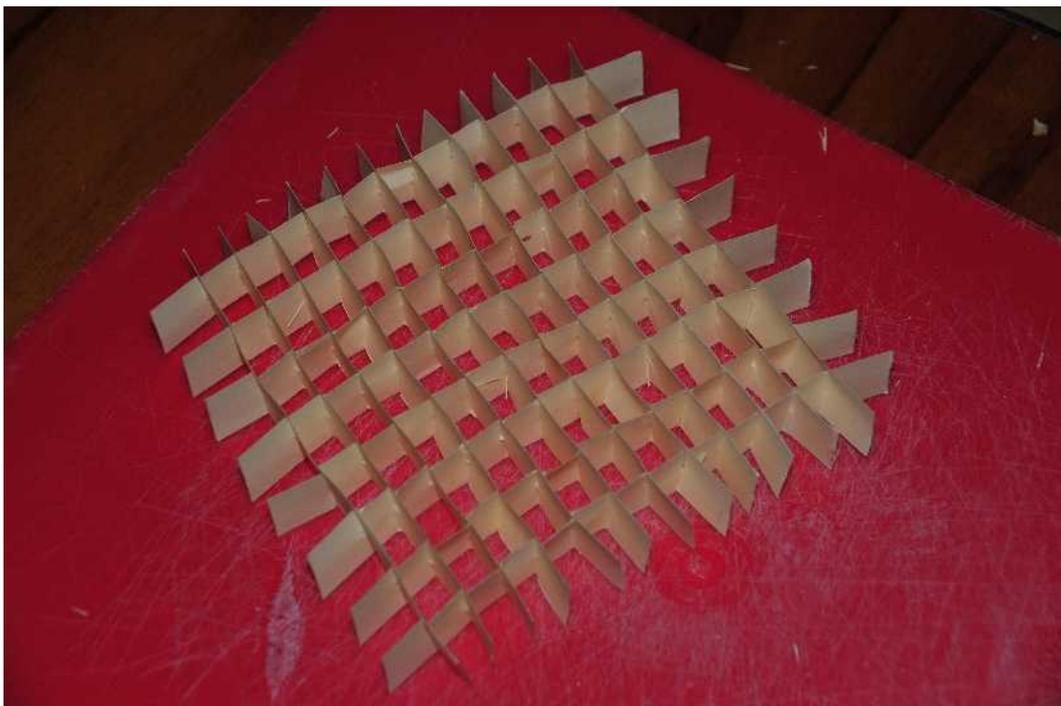
You should now have a set of cut card strips.

Now, we need to assemble the baffles. We are going to slide a horizontal strip into the slot for a vertical strip;



Working slowly and carefully, slide all of the horizontal strips into the vertical strips. You may find that the strips don't slide in far enough. If that is the case, simply make the slot that you cut slightly deeper and try again.

Here is what the completed set of baffle strips will look like.



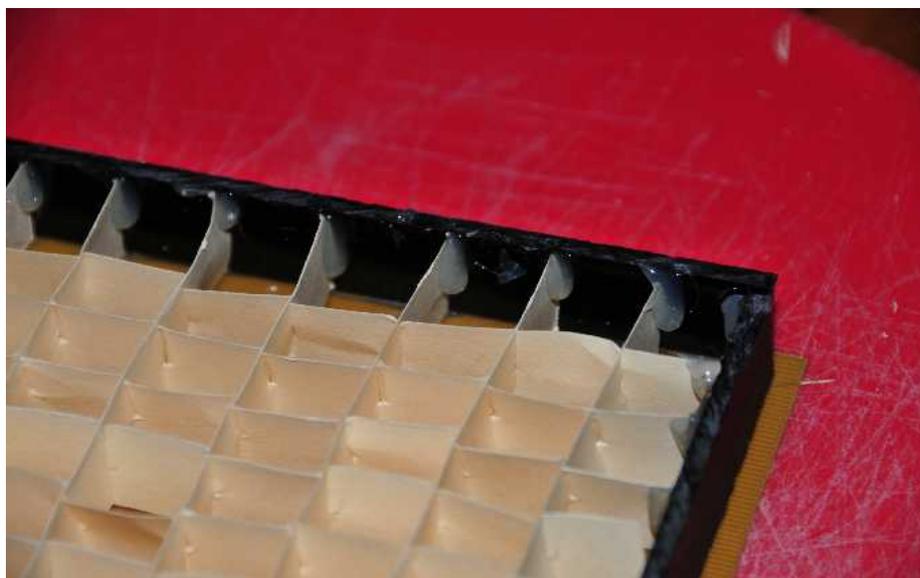
Next, we need to install the baffle into the space between the stencil supports.

Start by carefully sliding the baffle assembly into place. Use the following photo as a guide.



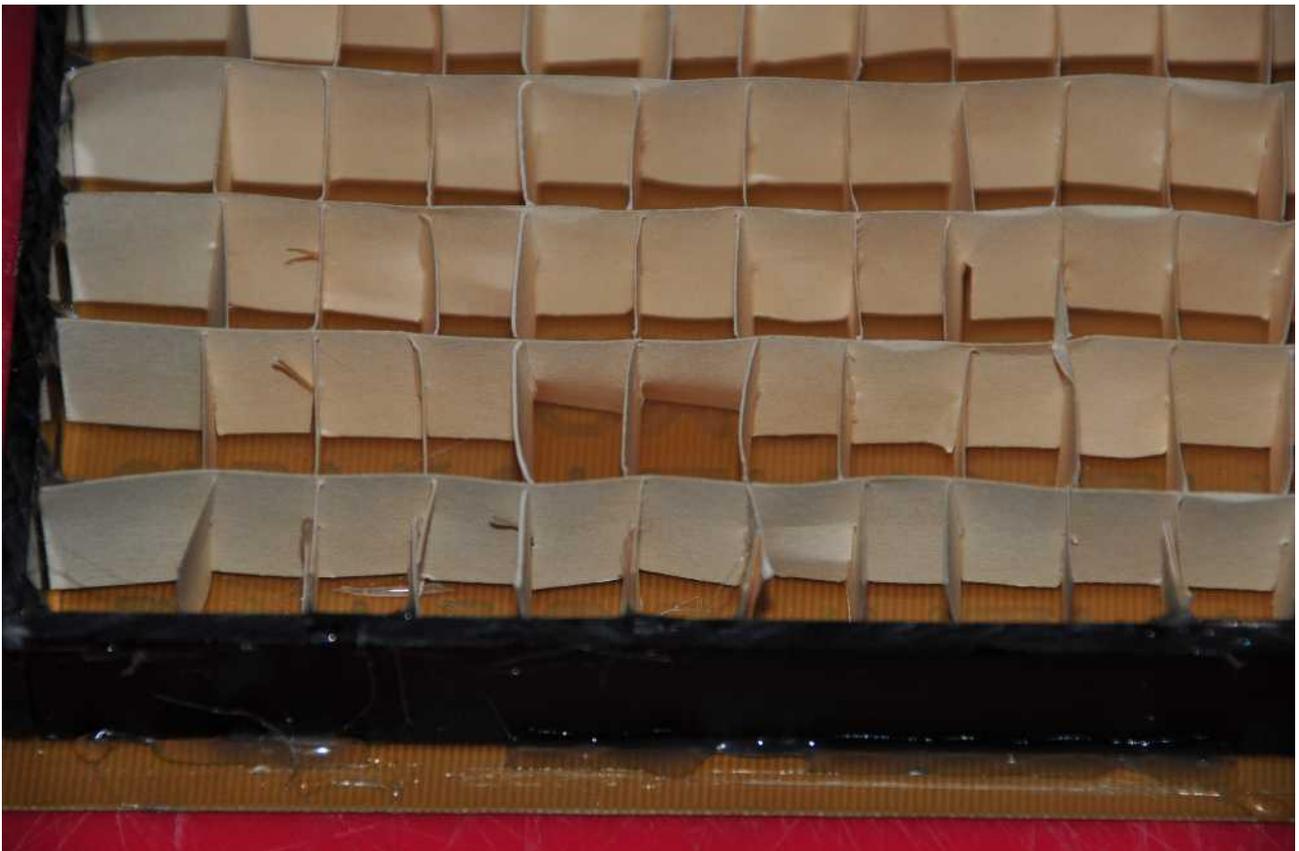
You may notice that the alignment initially is very poor. As the famous "Hitch Hiker's Guide" says, Don't Panic!

Start alignment by moving the array within the frame till all of the strips are not covering any letters. Once you have the array in place, use a small amount of hot melt glue to bond the strip to the edge support.



Next, perform fine alignment of the strips to make sure that all of the strips are touching the stencil – if any are high, simply press them down gently till they are in place.

You may find that some of the strips have obscured the letters (as shown in the following photo) - if that is the case, just use a small pair of pliers or tweezers to manoeuvre the card so that it is in the correct alignment.

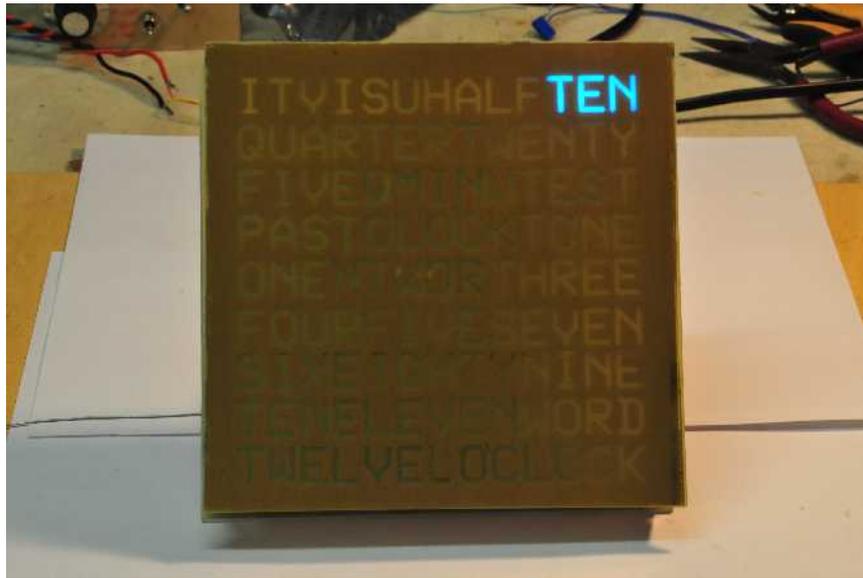


And – That's it – Your stencil is completed.

The stencil assembly is now ready to be mounted (glued) to the LED assembly, and placed inside your clock frame.

The stencil can be covered with colored paper, or cellophane, or any material that light can pass through – experiment with various media until you find a combination that is right for you.

When you mount the stencil over the LED display, be careful to make sure that the LEDs do not crush the card. Your baffles should be cut so that the LEDs are centred within the baffle space.



Here is a picture of a sample stencil, mounted in a LED display, with just the word "ten" being driven from a bench power supply.