

Lithophane Light Panel Details

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Introduction

I engrave a lot of lithophanes, both small and large. The small lithos are usually for night lights (Photos 1 - 2). Large lithos are usually portrait size (Photo 3), and I custom build display boxes of my own design for them (Photo 4), and I use LED light strips (Photo 5), powered by a 12VDC wall transformer.



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

For some time now I have been wanting to make lithophanes that can be hung on a wall for display, but since the strip LEDs need to be placed about 1.5 inches (38 mm) behind the lithos to avoid bright, distracting hot spots, and because available commercial light panels are somewhat expensive, wall hanging has not been feasible. I decided I needed to design and make my own light panels from easily available materials to achieve my goal. This paper describes my prototype light panel, which I am pleased appears to be a success on my first try.

Light Panel Details

For the prototype body (Photo 6) I used a piece of 3/4 inch (19 mm) thick MDF that I had on hand. It is about 5 x 4 inches (127 x 102 mm). The lithophane I had hanging in a window of my home. It is about 3.25 x 2.25 inches (82.5 x 57.2 mm).



Photo 6

I routed out recesses on the inside of the MDF from the back side to fit the litho and the light panel (Photo 7). Once I determined what I wanted to do, I drew out the design in Vectric's Cut 2D, no other drawing software was needed.



Photo 7

The litho is a press fit into the deepest recess - no glue or tape was needed since the litho is retained in place by the light panel.

The light panel is a piece of 0.25 inch (6 mm) thick cast-cell plexiglass that I use for engraved edge-lit displays. I engraved one side of the plexiglass with a series of cross hatched lines at plus and minus 45° angles to the length (Photo 8). The lines were engraved with a 60° V-bit. The lines are spaced at 0.05 inches (1.3 mm), and are about 0.02 inches (0.5 mm) deep. The panel is installed in a recess that is the height of the plexiglass, but about 0.2 inches (5mm) longer to allow for the strip LEDs to be installed along each side (Photo 9 - 10). The non-engraved side is placed against the back of the lithophane.



Photo 8



Photo 9

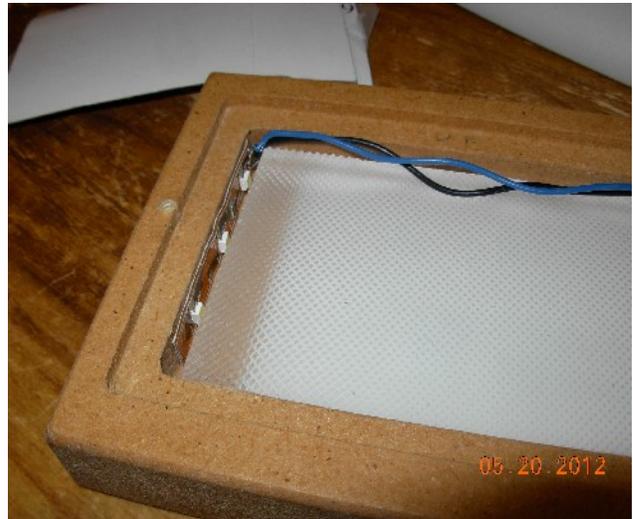


Photo 10

The 12 VDC wall transformer is wired directly to the LEDs. Future displays will utilize power plugs, and perhaps also small on/off switches. Also, larger lithophanes may need to have the LEDs installed across the top and bottom for greater brightness.

I used bright white LEDs for this prototype, but color can be used simply by placing small pieces of colored plastic film (plastic electrical tape and blue masking tape work well) between the LEDs and the plexiglass.

To improve the reflective properties of the light panel, I placed a piece of thin white cardboard on the back side of the plexiglass (Photo 11). A more subdued color change can be obtained by replacing the white cardboard with colored paper or plastic. Aluminum foil could also be used.



Photo 11

Finally, I used a scrap piece of thin plywood to close the back (Photo 12), held in place with a couple of small wood screws..



Photo 12

I plan to spray the MDF of the prototype with a black satin paint. Future frames will be made from oak or maple, and finished with stain and semi-gloss lacquer.



Comments and suggested improvements appreciated.
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