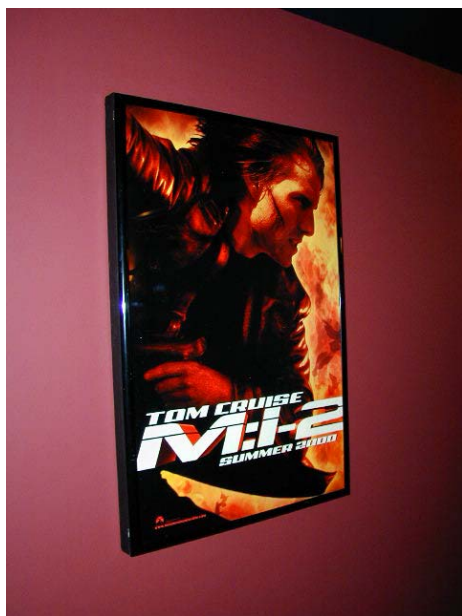


Backlit Poster Box Construction

By Scott Peters



1/7/04



Overview

This poster box combines an inexpensive off-the-shelf poster frame with some do-it-yourself work on the light box to create a very economical, good looking poster box for about \$90 in material cost (not including the poster). The box is for displaying double-sided 27X40 inch movie posters. The backlighting is accomplished by rope lighting which provides an elegant look to any home theater or media room. Double-side posters can be purchased from ebay and several other internet sites. The entire box is 28" X 41" and is only 2 3/8" thick. This is one of the thinnest boxes designed to date.

My design is based on research done on the AVS Forum website. I used some ideas that others had come up with along with a lot of my own design ideas. I thought the other boxes were too difficult and expensive to build, so I set out to do a simple, low cost box. Thanks goes out to AVS Forum and the contributors that helped form this design.

Below, I will detail the steps (with pictures where needed) so that you can create one of these boxes in a day or two.

Material List

Frame:

- | | |
|--|-------------------------------|
| 1 Joanne's 27X40 collage frame (substitute frames can be purchased at Suncoast Video or Bed Bath and Beyond) | \$24 or \$13 w/50% off coupon |
| 1 sheet of plexiglas or Lucite cut to 27X40" (purchased at Lowes or Home Depot) | \$19 |
| 4 metal brackets that are thin straight and magnetic | \$2 |
| 4 small 3/8" long screws | \$0.10 |
| 1 Can white all purpose spray paint | \$2 |

Light Box:

- | | |
|--|-------------------------------------|
| 1 6' long 1X2" piece of hardwood (I used poplar) | \$4.20 (0.70/foot) |
| 1 8' long 1X2" piece of hardwood (I used poplar) | \$5.60 |
| 1 sheet of 1/4" plywood for backing (probably have to buy a 4X8 sheet) | \$19 (but will make multiple boxes) |
| 1 24' long clear rope light (Home Depot) | \$15 |
| 1 Can black gloss spray paint | \$3 |
| 4 magnetic latches used on kitchen cabinets (Home Depot) | \$6 |
| 20 screws (drywall or wood screws) | \$0.20 |
| 1 Bottle of wood glue | \$1 |

Total cost: \$90 for one box (less for multiple)

Handy Tools to Have (but not absolutely necessary)

- Miter saw (electric or hand)
- Cordless screwdriver
- Reciprocal saw (may not be needed)
- Circular saw or table saw
- Router (a chisel and hammer or dremel tool could be used in its place)
- Framing clamps

Construction of frame:

- 1) Buy Joanne's (or other) 27X40" collage frame, remove the cardboard backing, the collage insert and the protective plastic over the plexiglas sheet.
- 2) Insert poster of choice.
- 3) Spray paint clear 1/8" plexiglas sheet (pre-cut to 27" X 39 15/16") with white spray paint. This will act as a light diffuser. **Note:** Translucent white plexiglas can be used for this if you can find it. I could only find it for about \$50 a sheet, so I decided to use the clear plexi and spray it white. It works perfectly).
- 4) Once dry, insert the plexiglas sheet into the frame with the painted side out (clean, clear side towards the poster). Fold down the holding clips.
- 5) The frame is almost complete with the exception of adding the metal pieces to magnetically adhere the frame to the light box. That will be done later after the box is complete.

Light Box Construction:

Note: The light box is designed to be flush with the Joanne's frame when completely assembled. Turn the poster frame upside down, so that the painted plexiglas is facing you and use the frame to measure out the correct lengths of 1x2" hardwood for the light box frame. I used a compound miter saw to miter the corners of the light box frame. You don't have to do this, but I thought the mitered corners looked better and fit together nicely. It is important to spend some time at Home Depot getting 2 good straight, non-warped pieces of hardwood (6-foot and 8-foot). I chose poplar because it was the cheapest of the hardwoods.

- 1) Miter one end of the 8-foot 1x2" piece of hardwood to a 45-degree angle as if you are making a picture frame.
- 2) Measuring the length of my Joanne's frame. I came up with 41", so mark the mitered hardwood 41" on the long side (outside edge) of the board.
- 3) Miter cut at 45 degrees the piece at 41" making sure that the miter cut is done in the correct direction (see Figure 1). Think of how a picture frame is pieced together.

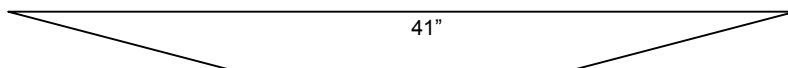


Figure 1

- 4) Repeat this procedure for the other side of the light box frame.
- 5) Miter one end of the 6-foot 1x2" piece of hardwood to a 45 degree angle as if you are making a picture frame
- 6) Measuring the width of my Joanne's frame. I came up with 28", so mark the hardwood (long edge) at 28".
- 7) Miter cut at 45 degrees the piece at 28" making sure that the miter cut is done in the correct direction.
- 8) Repeat this procedure for the other side of the light box frame.

Now the tricky part – assembling the cut pieces into a frame

- 9) Take one of the short pieces and one of the long pieces and join them together at a right angle. I used wood glue and a framing clamp to hold them together at 90 degrees while the glue dried.
- 10) Do the same with the other 2 pieces (long and short)
- 11) After the glue dries, drive a couple 1" finishing nails into each corner to further secure the pieces together.
- 12) Remove the clamps and join the 2 remaining corners together using glue and framing clamps.
- 13) After the glue dries, drive a couple 1" finishing nails into each corner to further secure the pieces together.

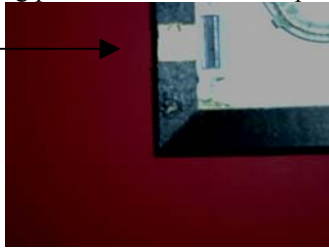
Now, you have a frame that is 28" wide, 41" long, and about 1.5" deep. Next, you'll add the 1/4 plywood to the back.

Note: If you plan to have the rope light cord hanging out of the bottom of the box to plug into an outlet, you'll need to notch the frame to allow for the cord to plug to fit through prior to securing the plywood back. In my case, I had a switched outlet directly behind the light box, so I did not need to notch the bottom of the frame.

- 14) Measure the plywood to 28x41" and cut using a circular saw or table saw.
- 15) Lay on frame (whichever side is the back side) and attach by screwing in 1" drywall or wood screws. Pilot holes can be drilled if necessary, but I did not need them with the sharp pointed drywall screws. The screws should be no more than about 6" apart to keep any stray light from escaping the completed box and the heads should be flush with the plywood. Now you have a frame with a back on it.
- 16) Spray paint the sides of the frame with gloss black paint. Two or three coats may be needed for a nice finish.

- 17) If you plan to have a switched outlet behind the box, now is a good time to cut an opening for it at the desired location. I used a jigsaw for this and made the opening slightly larger than the outlet. See picture in step 27 for what I did.
- 18) Turn the box over and paint the inside of the box white so that it reflects as much light as possible. Don't paint the top edge of the box frame, as this will be painted black later to match the Joanne's black frame.
- 19) Once the paint is dry, you'll need to carve or route out a recessed section in the box frame near each corner where the metal magnetic coupling piece will sit so that the poster frame will be flush with the box frame. See pictures below.

$\frac{3}{4}$ " wide cut
out area
adjacent to
magnetic
latch position



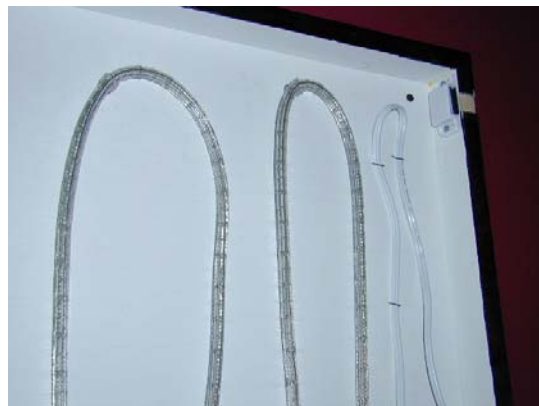
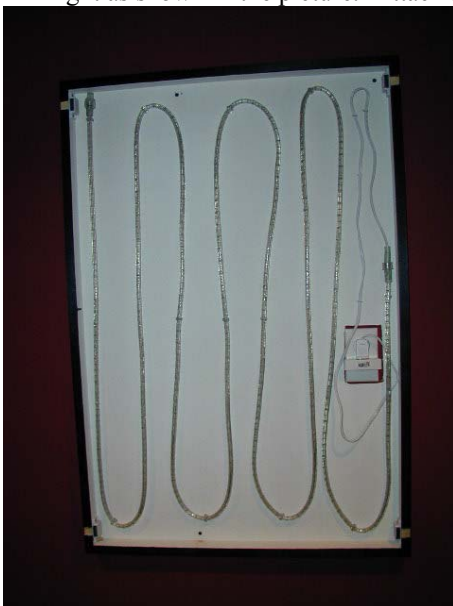
- 20) Temporarily position the magnetic latch about 1/4" away from one corner (on the long side of the box frame) and mark about a $\frac{3}{4}$ " wide section corresponding to the middle of the latch.
- 21) Repeat this for all four corners (since there will be 4 magnetic latches, one near each corner)
- 22) Once marked, notch the areas out deep enough so that the metal coupling piece (that will be attached to the Joanne's frame) will sit in the recess and be flush with the top of the box frame. This should be about 1/8" deep or so. A router will make this job very easy, but Figure 2 chisel and hammer can be used as well.

It is time to add the magnetic latches. These latches, bought at Home Depot come with 2 screws and a metal coupling piece as well as the magnetic latch. I don't think you'll be able to use the metal coupling piece, since it is not long enough to hit the latch once assembled.

- 23) Attach a latch at each corner of the box approximately 1/4" away from the corner on the long sides of the frame.
- 24) After placing the latch where you want it (approximately flush with the cutout area), drill 2 pilot holes and screw down the latch with provided screws. This will need to be fine-tuned later, so you don't need to screw them all the way down tight yet.
- 25) Once all 4 latches have been attached, paint the top of the light box frame black as shown in Figure 2. You should paint the cutout areas as well even though Figure 2 shows them unpainted.

Now, it is time to add the rope lighting

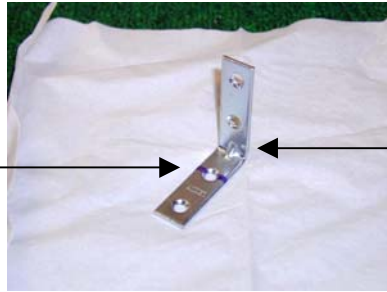
- 26) Use a 24 foot long clear rope light and attach to the plywood using the clips provided with the rope light. The screws that came with the clips were a little long, so I added a couple washers underneath, so that the screws would not go through the back of the plywood.
- 27) Start at the upper left corner and clip the rope light down. Put a clip at the top and bottom of each row and zig zag the rope light as shown in the picture. Attach any remaining clips to areas where the rope light needs some support.



Once the rope light is in, you are ready to make and attach the metal coupling pieces to the poster frame

- 28) You'll need to find a piece of sturdy metal that is magnetized to the latches in the box. I bought some 2" L brackets from Home Depot and cut them to about 1.5 inches long as shown below. I used a reciprocal saw for this. Cut the bracket right through the center of the hole closest to the bend. You'll need two L brackets to make 4 straight metal coupling pieces.

Cut through hole
where line is drawn.



2" L bracket prior to cutting

If you don't have a saw that will cut this, you can look for another piece of straight metal to use.

- 29) Place these metal coupling pieces on the latches and make sure they fit into the cutouts made in the light box frame earlier. They should sit down in the cutouts and be flush with the top of the light box frame.
30) Now rest the movie poster frame on the light box frame and line up the edges.

Note: Now is a good time to plug the box in and see how cool your poster looks lit up. If you have a good double-sided poster, you'll be amazed!

- 31) Mark the frame with a pencil on either side of the metal coupling pieces. This will serve as a guide for screwing in the metal brackets to the poster frame.
32) Remove the poster frame and the metal brackets from the magnetic latches.
33) Spray paint the metal coupling pieces black if desired.
34) Drill pilot holes very close to the inside edge of the plastic frame, centered between the marks just made. You don't want the metal pieces to stick out past the edge of the frame
35) Use small wood screws so that the heads are flush with the bracket when screwed in. Result looks like below picture.



- 36) After the four coupling pieces are attached, place the poster frame on the light box frame.
37) You should feel the magnetic latches grab the coupling pieces.
38) You'll need to tweak the height of the metal latches so that they grab the coupling pieces but the coupling pieces are sitting into the cutout areas. The poster frame needs to be flush with the light box frame so that little or no light escapes along the edges.
39) Once you have positioned the latches to your satisfaction, tighten them all down.

You can now plug it in and enjoy the finished product!!!!

Mounting

I just drove some drywall screw through the back of the plywood into some studs. You could use picture hangers or a french cleat as well.

HAPPY BUILDING!! It has been fun and very satisfying for me. All of my friends and relatives are amazed at how good they look.