Building a Box Lens Board for Packard Ideal Shutters

By Bob Fowler

A little background is in order...

In traditional internal installations of Packard shutters, the shutter is mounted behind the front standard, often with a short spacer between the shutter and the standard. The problem with this type of installation is that it requires you to bore a hole in the standard, or as I've seen on some cameras, putting a hole in the bellows, for the rubber tube. That is not, in my opinion, a viable option if you want to keep your camera in collectable condition. The internal installation can also cause problems if your lens has a rear cell which protrudes rather deep into the camera body. It is for these reasons that I usually front mount a Packard, but I have come up with a suitable alternative for rear mounting - a box lens board which carries both the Packard and the lens.

Since each camera and lens combination is different, I'm going to explain the basic concept and you can fill in the blanks yourself (read that as necessary dimensions), to fit your equipment. You don't have to be a Norm Abrams in the woodshop, but you WILL need to have some decent woodworking skills to make a usable box lens board.

The box lens board will protrude from the front of your front standard a little. This is great is you're going to use a long focal length lens as it adds a bit of extra extension. Since the box lens board is married to the Packard shutter and to the lens, it won't interfere with your other, modern shuttered, lenses.

The downside to the box lens board is that it can cause problems if you use large degrees of tilt or swing. If you often use extreme movements, I would suggest either spending the money to get the lens shuttered or front mount the Packard.

With the traditional internal installation of a Packard shutter, the felt covered side of the shutter goes towards the lens and the air piston side goes towards the film. In this situation, we will install it bassackwards. This creates an issue with the pin that is used for "instant" exposures. To rectify that, it is necessary to take the Packard apart and drill out the nub that the pin stops against on the piston side of the shutter. We will use brass tube to make an extension that will extend out the front of the box lens board assembly. The shutter doesn't care from what side the pin goes in, just as long as it bottoms out and allows the pin to trip the bar.

The first thing you need to do is determine if this is even possible with your camera/shutter/lens combination. Needless to say, if your lens requires an opening larger than the lens board size, you're screwed. If your camera has a 6X6 inch lens board, there isn't much you can't do. For those 4X4 boards, life isn't so easy and your options are somewhat limited.

I start my planning with a blank lens board, the Packard shutter I plan to use, and the lens that is the root cause of this whole operation. I like to start at the camera end and work forward. I'll use my 5X7 Eastman View #2 (4 1/2" square lens board), 14" Red Dot Artar, and a 4" square (2" opening) #6 Packard as an example.

For purposes of this description, I'll call the actual lens mounting surface of the box lens board the lens plate and the part that attaches to the camera will be the lens board.

The Essential Numbers:

1) The rear cell of my 14" R.D. Artar extends 9/16" beyond the rear surface of the mounting flange.

2) My sample Packard requires 13/16" mounting depth as measured from the felt covered surface to the end of the actuating pin.

3) The required clearance from the back side of the shutter to the end of the pin is 1/2". A little extra meat here wont hurt so we will call it 5/8".

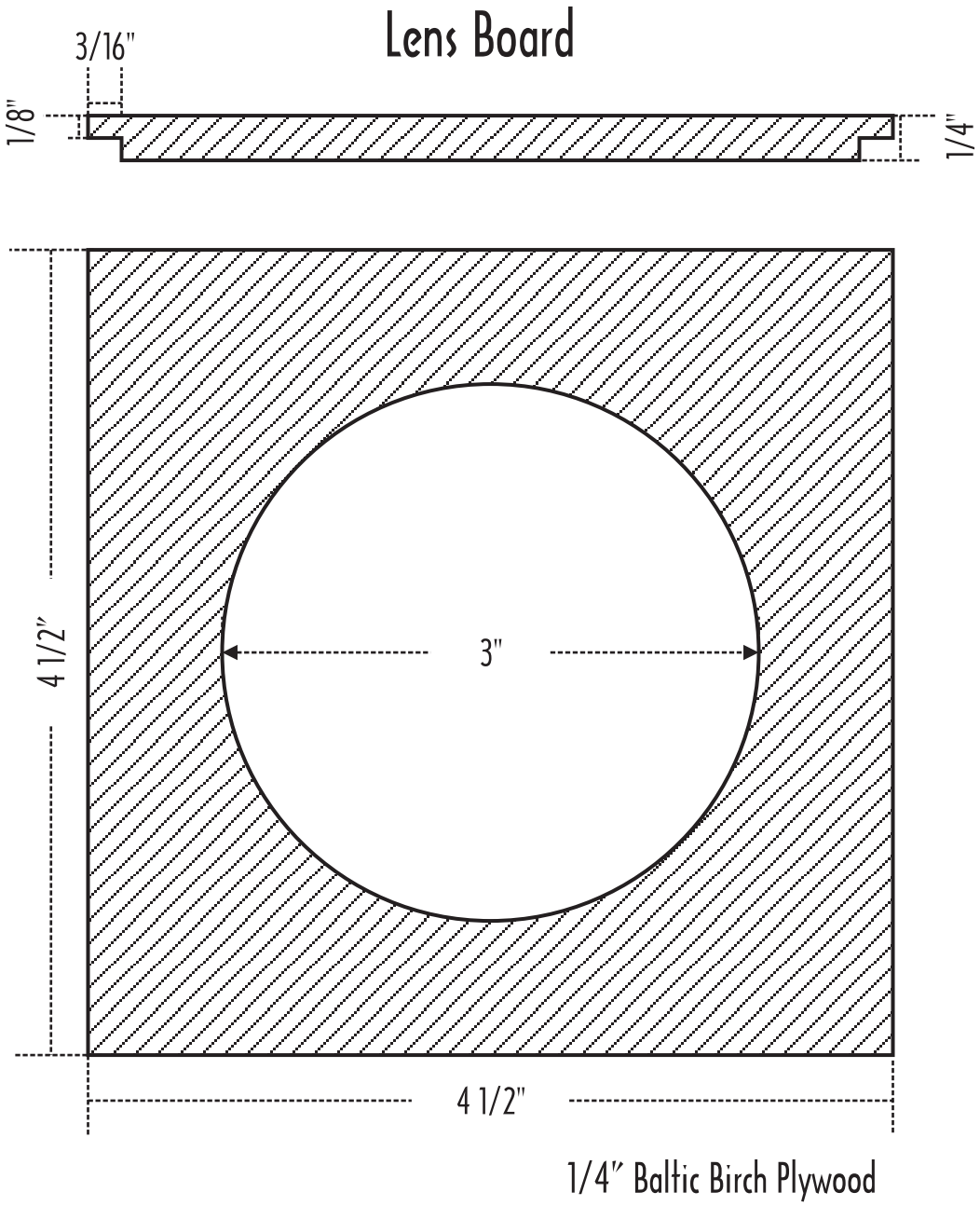
4) The dimensions of the lens board are: 4 1/2" square, 1/4" thick, with a 1/8" deep - 3/16" wide rabbet cut all around the back face.

5) The distance between the vertical members of the front standard is 6 5/8". This is an important dimension to keep in mind if your camera has lens axis front tilts. For a camera with lens axis tilts, you have to remember that you can't have a box wider than that inside dimension if you plan on tilting the lens. This isn't an issue with the Eastman #2 as it only has rise/fall on the front standard (hey, it's a portrait camera...).

6) The lens board secures to the front standard with a sheet brass slide lock.

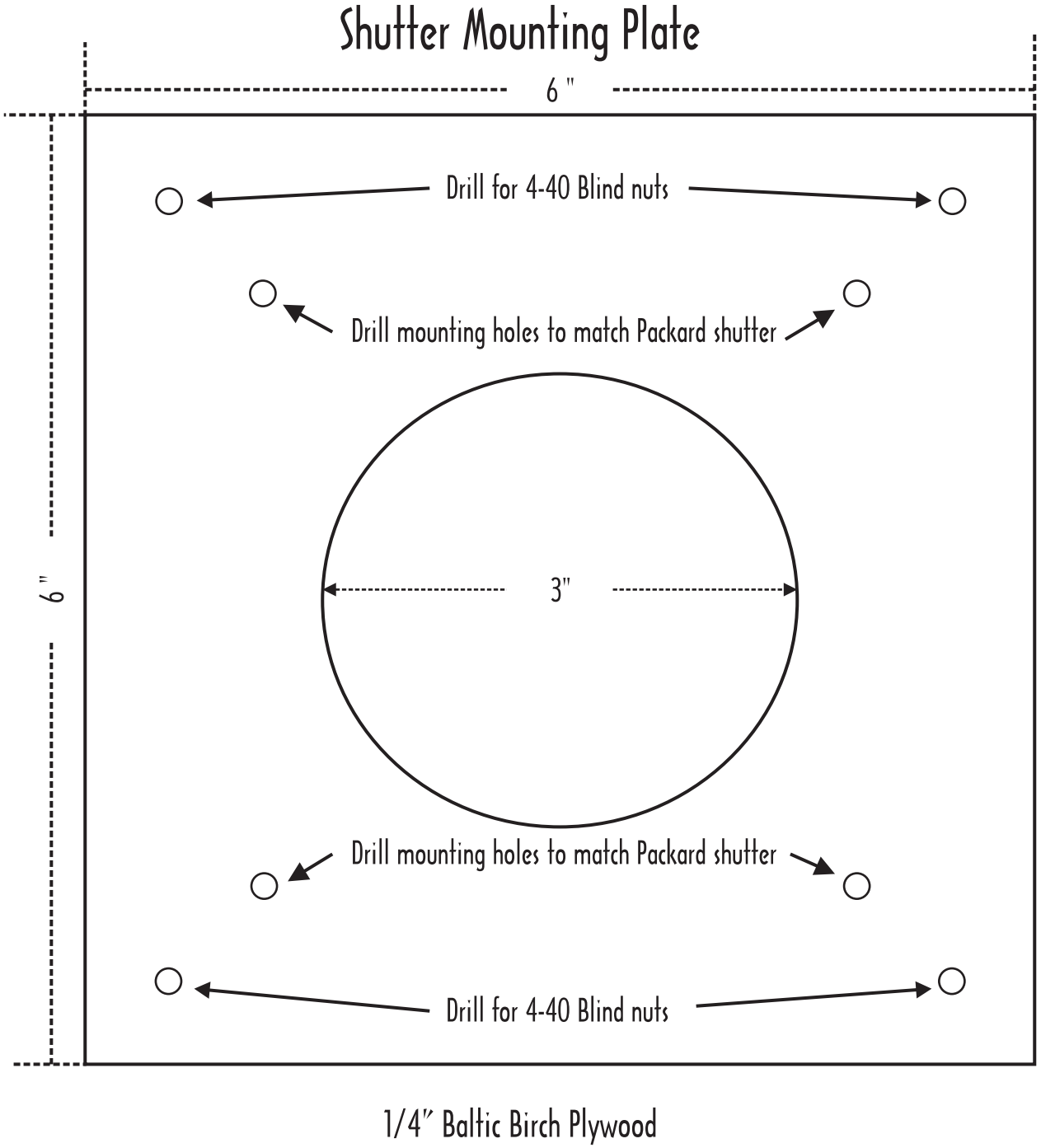
7) I want a bit of air between the lens board and the shutter mount so that my slide lock will still be functional. 1/4" is more than enough.

Okay, now that we know what we're up against, it's time to design the box lens board...

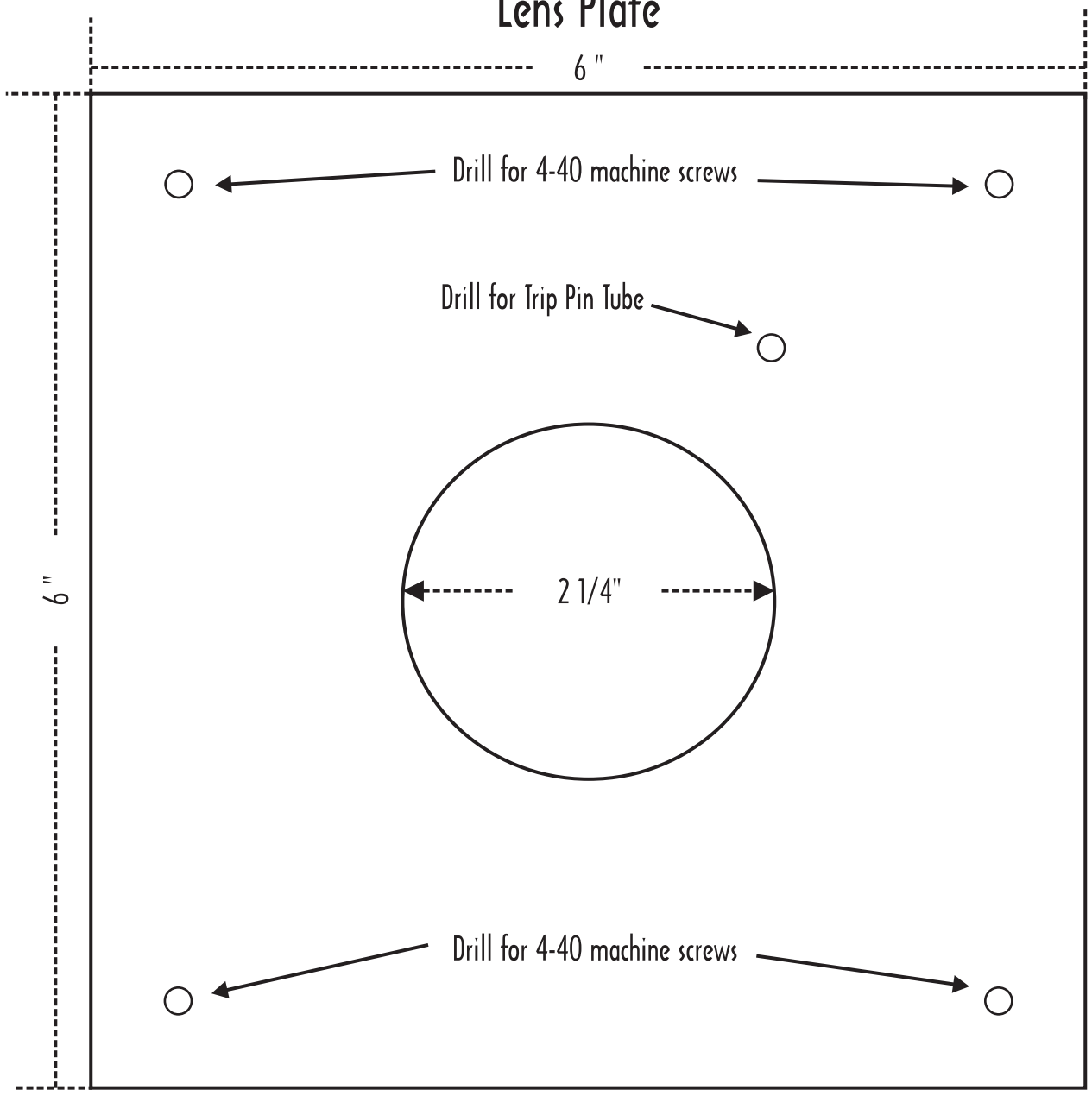


Start with a fresh lens board - they're easy to make. If you don't find it easy, don't bother to try the rest of this project! Since my shutter is 4X4" with a 2" hole and my lens board is 4 1/2X 4 1/2", I'm in good shape. Because the 14" RD Artar has plenty of coverage for using all of my available rise on 5X7 film, I'm going to make sure I don't squander any of that by making the hole in the lens board too small. In this case, a 3" hole is fine.

Even though the shutter is only 4X4", I'm not going to be cheap with the materials. We'll make a 6X6" shutter mounting plate from 1/4" Baltic Birch plywood with a 3" diameter hole in the center. While we're at it, we'll cut another 6X6" piece of Baltic Birch plywood for the lens plate. In the case of my 14" RD Artar, the lens plate will get a 2 1/4" diameter mounting hole.



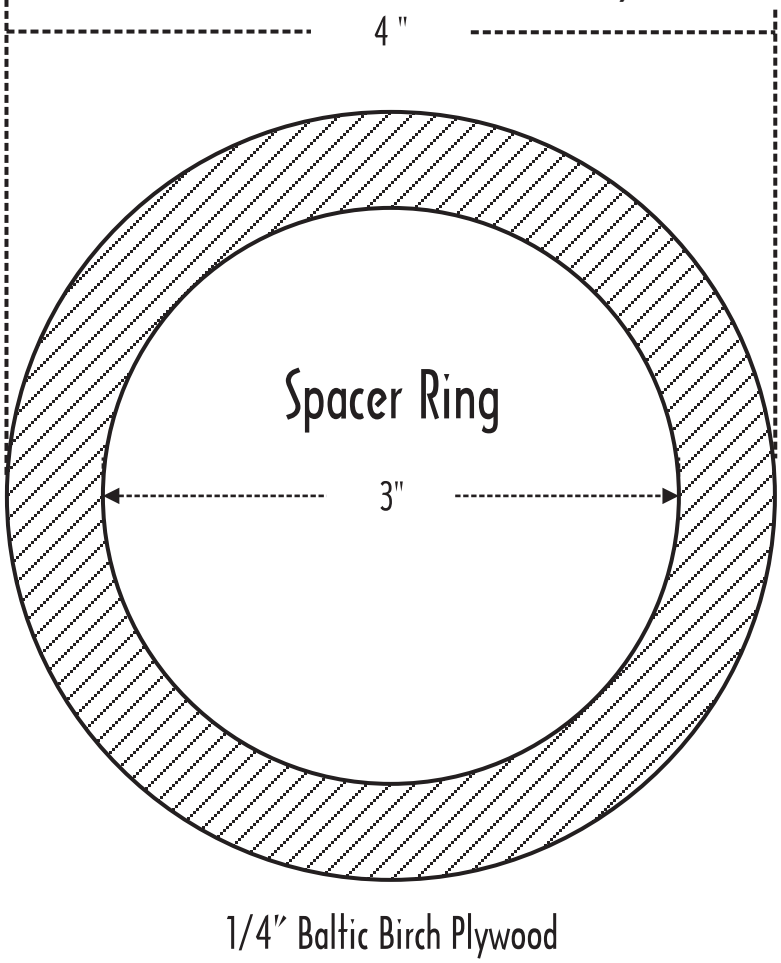
Lens Plate



1/4″ Baltic Birch Plywood

Since I don’t want a conflict with the slide lock on the front standard, we'll cut a spacer ring 4" in diameter with a 3" hole in the center out of 1/4" Baltic Birch plywood. Using yellow carpenters glue, attach the spacer ring to the lens board.

While that's drying, mark and drill the shutter mounting plate for the mounting screws for the Packard. I like using 4-40 cap screws and blind nuts. If you're not familiar with them, blind buts look like an inverted top-hat with little teeth that come off the face of the flange. They are press fit into the back side of the mounting plate and the teeth dig into the wood. Using them makes any maintenance required later a bit easier. You can get them in just about any good hobby store. While you're drilling and installing blind nuts, install one in each corner. To mark for the corner blind nuts, draw diagonal lines from opposite corners of the shutter mounting plate. Drill for the nuts 3/4" down the diagonal lines from each corner. Grab the lens plate that you cut and mark it as you did the shutter mounting plate and drill for the 4-40 machine screws (hint, it's NOT the same drill that you used for the blind nuts, it's smaller).



Sandwich the lens plate and the shutter mounting plate together and the corner holes should line right up. Put the lens plate aside.

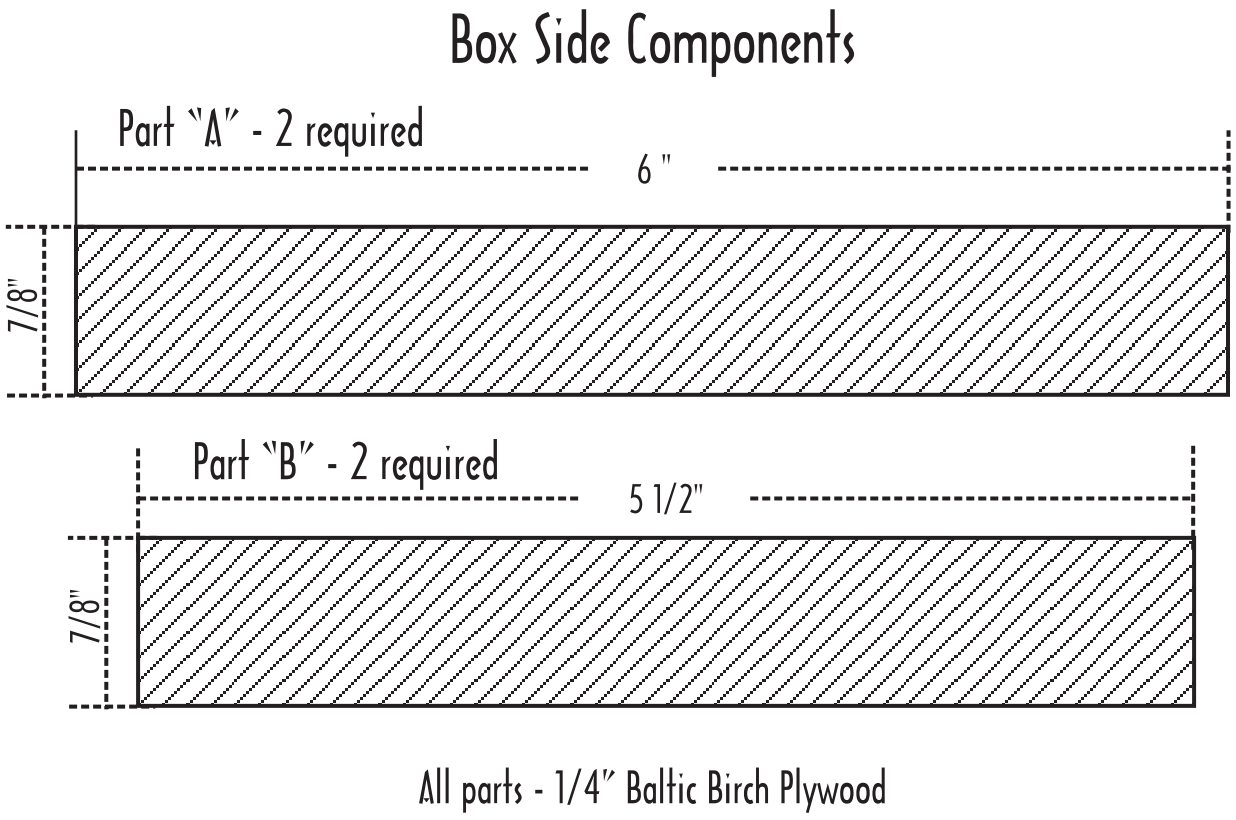
Once all 8 blind nuts are installed, it's time to build the box part of the box lens board. If you live next door to Norm, buy a 6-pack and knock on his door. If not, have some fun!

THE most important thing here is that our box is even - NO ski slopes allowed! Without going into a bunch of math (and unless you're building for the exact camera/shutter/lens combo you'll need to do a bit of figuring), I've determined that I want the rear surface of my lens plate to be 7/8" from the front surface of my shutter mounting plate.

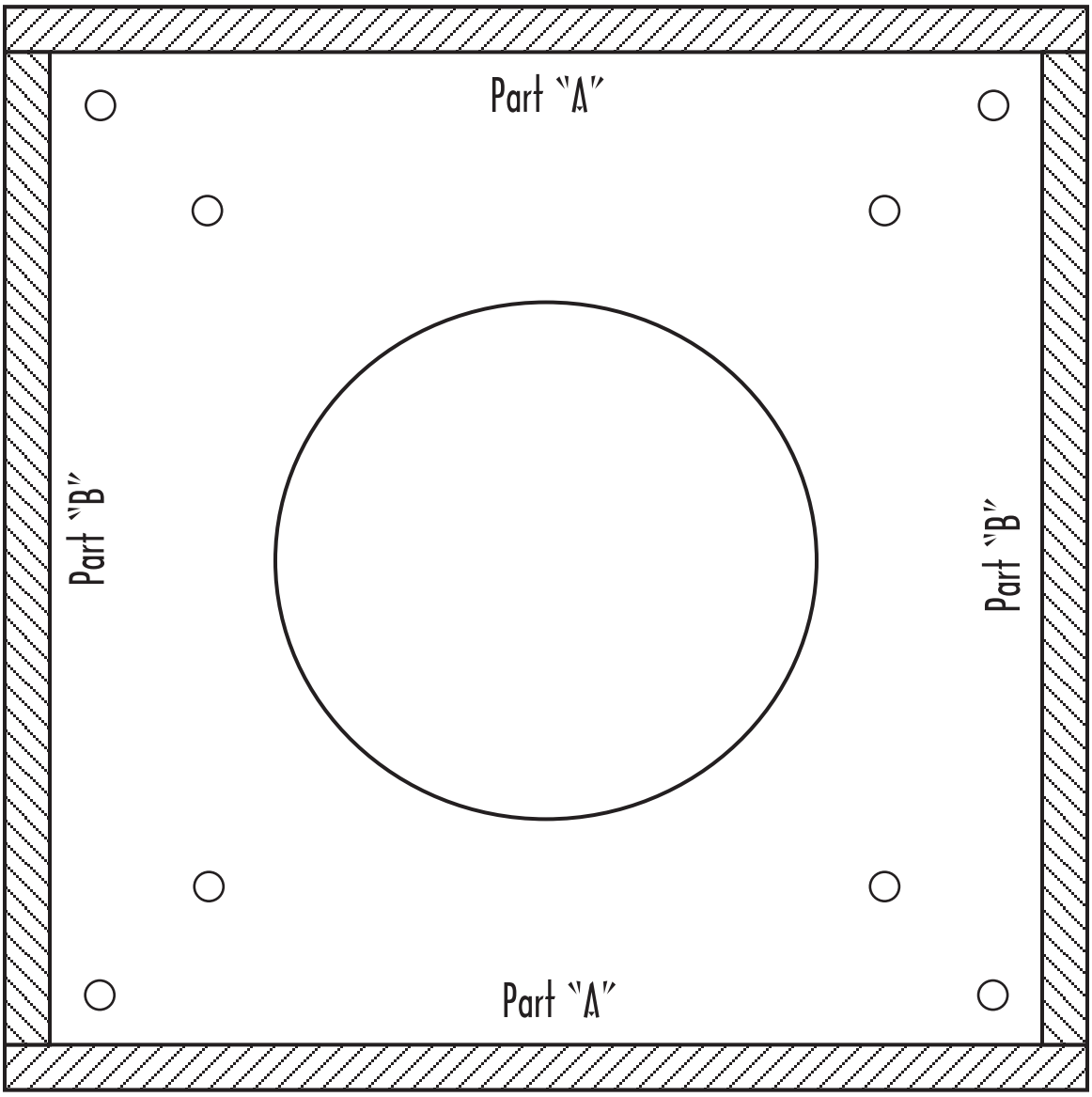
An elegant solution would be to make the sides of the box 1 3/8" wide and cut a 1/4 rabbet on both long sides. This serves several purposes: 1) it hides the edges of the shutter mounting plate and the lens plate, and 2) provides more surface area for the glue, and 3) shows off your woodworking skills. The downside is you'll need something thicker than 1/4" ply for the sides and this thing will start to get heavy - and that's before the lens is even mounted.

A not so elegant, much easier, and very practical solution is to do what I did, not worry about the damn edges. You can always use some iron-on veneer later and cover them up.

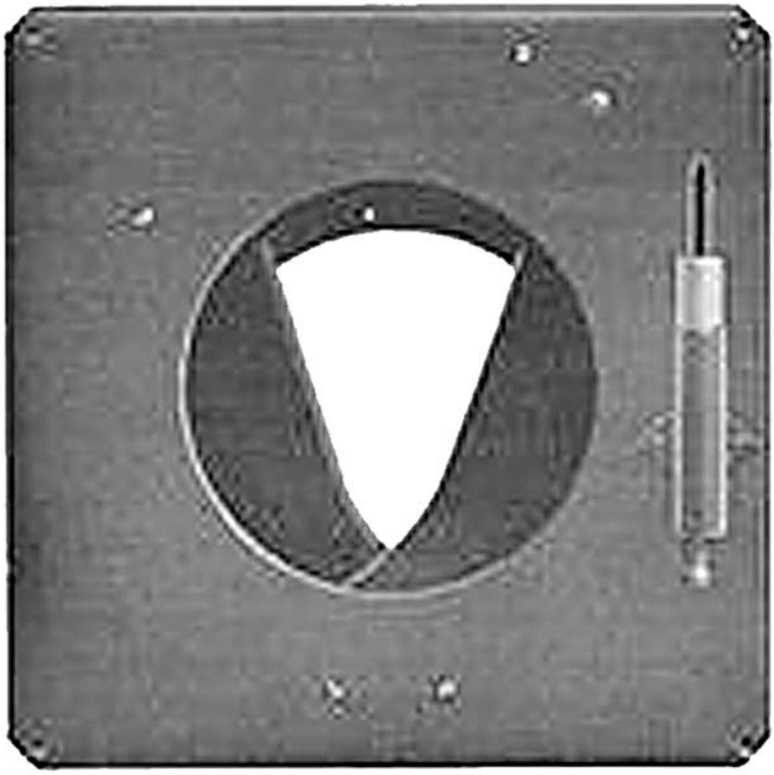
Cut 2 pieces 7/8"X6" and 2 pieces 7/8"X5 1/2" from 1/4" Baltic Birch plywood.



Glue the 6" long pieces to what will become the top and bottom sides of the shutter mounting plate, and the 5 1/2" pieces to the left and right sides. You'll want to use something to keep the pieces square to the shutter mounting plate. It's a good idea to do these one at a time. Wipe off any excess glue that oozes out of the seam - neatness counts.



While your handiwork is setting up, take your Packard with you to the hobby store. You've been inside with dust and glue fumes and you can use the break. We're shopping for brass tube, we'll need at least 2, but maybe 3, sizes. You want a piece that will slip over the "nub" that you drilled out on the Packard, and the size immediately smaller that will telescope into the "nub" size. You'll also need some tubing that is the right size for the rubber tubing that actuates the Packard. If you're lucky, the "nub" size may work. While you're at it, make sure you have some kind of tool to cut the tubing without crushing it.



Back in the shop: Temporarily mount your Packard in the box - use cap screws and washers. Cut a piece of the "nub" size brass tube the height of the nub + 1/4" and slip it over the nub. Put a length of the smaller tubing into the "nub" tube. Place a straight edge across the front of the box and mark the smaller tube 1/8" beyond where it meets the bottom of the straight edge. Cut the smaller tube at the mark.

Set your "nub" tube and the smaller diameter tube aside. With the Packard still in the box, make sure it is completely closed (piston down). Take something that will fit in the hole you drilled for the trip pin (a small drill bit will do), and press it through the nub gently and make a mark on the shutter mounting plate - don't go boring holes, just make a mark.

Take the Packard out of the box. Here's where you get to use some of the geometry you slept though in high school - measure where the mark you made is on the shutter mounting plate and transfer it to the lens plate. On the lens plate, drill a hole the size of the tubing that telescopes into the nub tube. While you're playing with the box, determine where you want the rubber tube to attach (keeping in mind how you'll route the tube inside) and drill a hole for that tubing. Cut a piece of brass tube for the pneumatic system about 1" long.

Use some 5 minute epoxy and attach the nub tube to the nub on the Packard. You'll need to rough up the surface of the shutter housing around the nub and the brass tube with a bit of fine sandpaper. When attaching the nub tube, epoxy it from the outside - you don't want anything getting in the hole. It doesn't have to be pretty, but it has to stay put.

While you've got the epoxy mixed, attach the telescoping tube to the lens plate so that it is flush with the front surface of the plate. Go ahead and epoxy your pneumatic system tube to the box before all the epoxy cures up...

We're Almost Done!

Once the epoxy has cured, it's time to glue the box to the lensboard/spacer ring assembly. Make sure it’s nice and square, keep the edges of the box and lens board parallel. You don't want something crooked hanging off the front of your camera, do you?

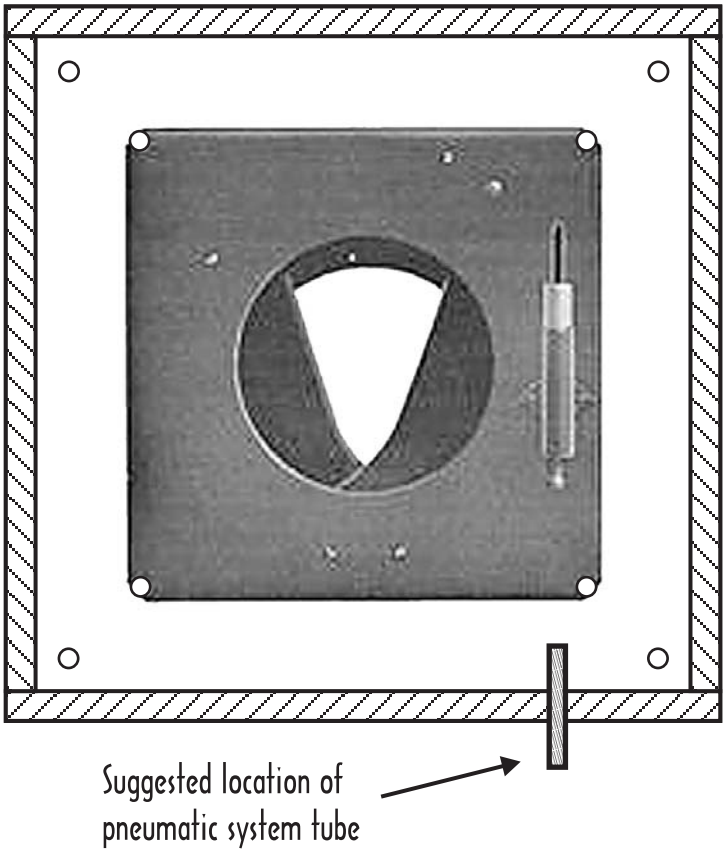
After the glue is dry, paint the entire inside surface of the box and the back of the lens plate and the lens board with flat black paint. Paint the exposed brass tube black while you're at it - to include the tube you epoxied to the Packard. If you are going to paint or stain the exterior of the box, now's the time. When that's dry, glue a strip of black felt to the forward edges of the box. Better yet, contact my good friend Jon Goodman about getting some of his 1/16" thick neoprene foam. Jon sells the absolute best kits for re-foaming cameras via eBay. His eBay name is "interslice". The foam (or felt) will act as an extra light tight seal when the front of the box is attached.

Install the Packard in the box and attach some rubber tube from the piston to the tube you epoxied to the side of the box. Attach the lens plate to the box - be careful that the telescope tube slides into your nub tube - using 4-40 cap head screws and washers. Attach the mounting ring for your lens to the lens plate, screw on your lens, and you're ready to rock 'n roll. You may need to make a longer pin for the "instant" setting - if you've gone this far, that's easy enough.

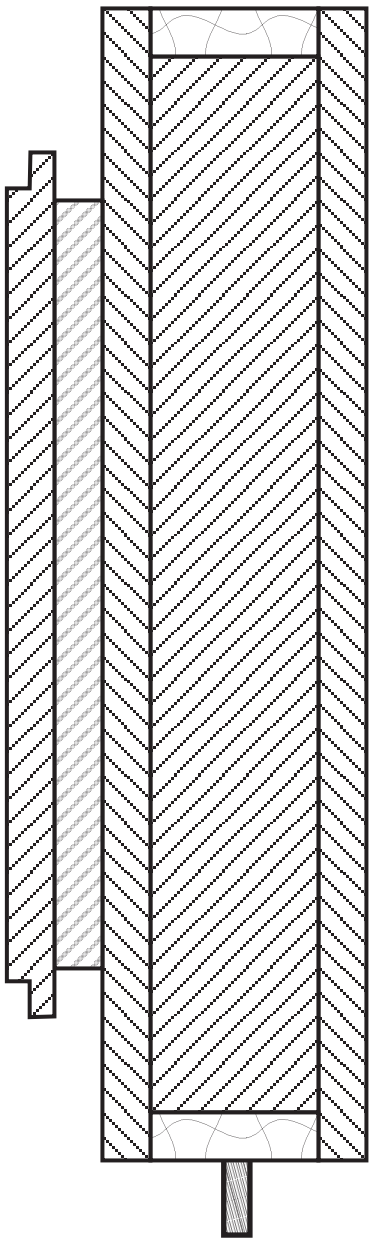
Oh crap... I didn't mention flash sync... OK, you've got the idea, if your Packard has sync, come up with an elegant way to get that connection to the outside of the box. I've got confidence in you.

The beauty of this system is that you can make lens plates for additional lenses IF the shutter will be a good size for the extra lenses and if you have enough internal clearance. Another important point, with this system, the Packard shutter is readily accessible should it require service.

Box Assembly - Side View



Suggested location of
pneumatic system tube



An Afterthought:

In my description of the box lens board, I assumed that the subject camera is an older, flat bed wood camera. Since this was written, I realized that this is also applicable to modern, metal monorail cameras. That being said, if your camera has a metal lens board, while you might not think you need the ring spacer as described above, using the ring spacer will give plenty of clearance for any small protruding amount of the 4-40 machine screws that are used to secure the Packard shutter and the lens plate.

Needless to say, you can't glue the spacer ring to a metal lens board. Instead, glue the spacer ring to the reverse side of the shutter mounting plate (after the box is assembled) and attach the assembly to the lens board with countersunk flat head machine screws and nuts. Make sure you paint the portion of the mounting screws and nuts which protrude into the camera body with flat black paint.

Sources:

Packard Ideal shutters are available from:

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Fax: (609) 561-3298

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