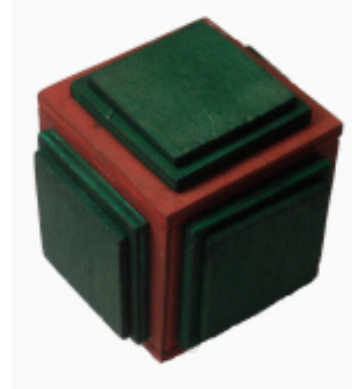


Chinese Torture-the Plans

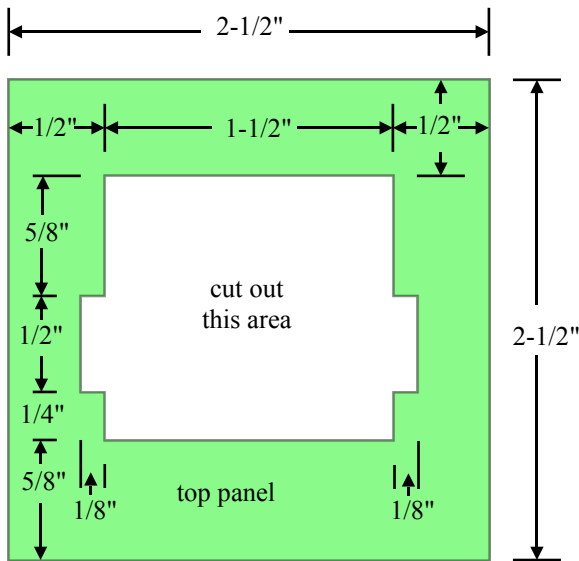
First, an explanation of how the puzzle works. On five sides, the outer panel is connected through the inner panel to a cross-slider, which engages in notches cut in the panel. These notches prevent both panels from moving. The cross-slider is also fixed to an inside panel, which prevents an adjacent inside panel from moving. Freeing the slider from the notches allows both exterior panels to move, and the inside panel can then move side-to-side and up-and-down, releasing their adjacent panels. After all five inside panels have moved, the last panel can move and be released altogether.



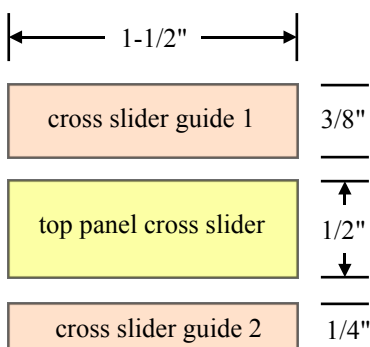
I made this puzzle with 1/4" and 1/8" plywood, so all the dimensions shown are based on those sizes. You can of course, make this any size you wish, but you will have to re-adjust all the dimensions.

Start with the top panel:

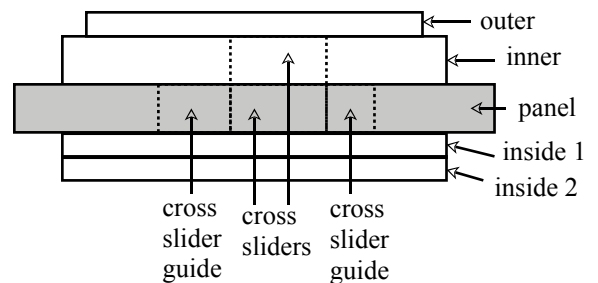
From 1/4" plywood, cut a square 2-1/2" x 2-1/2". This will be the panel. Cut out a hole as marked.



From 1/4" plywood, cut these three pieces:



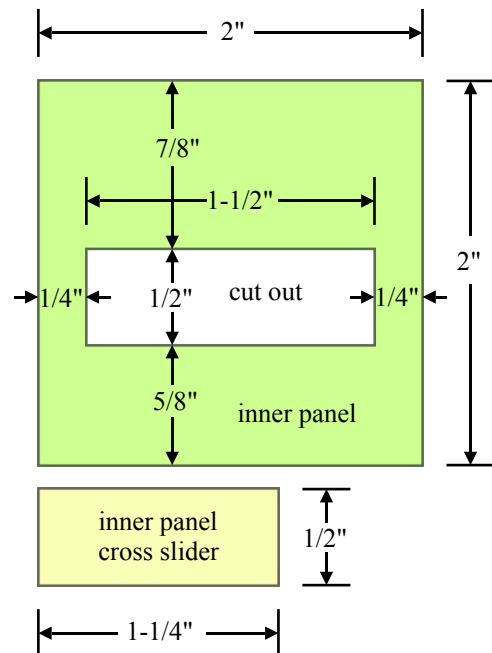
Names of parts:



From 1/4" plywood, cut a square 2" x 2".

This will be the inner panel.

Cut out a hole as marked. Cut a smaller piece as marked, the inner panel cross slider.



From 1/4" plywood, cut a square 1-3/4" x 1-3/4". This will be the inside panel. Not to be confused with the inner panel, which is on the outside of the box .

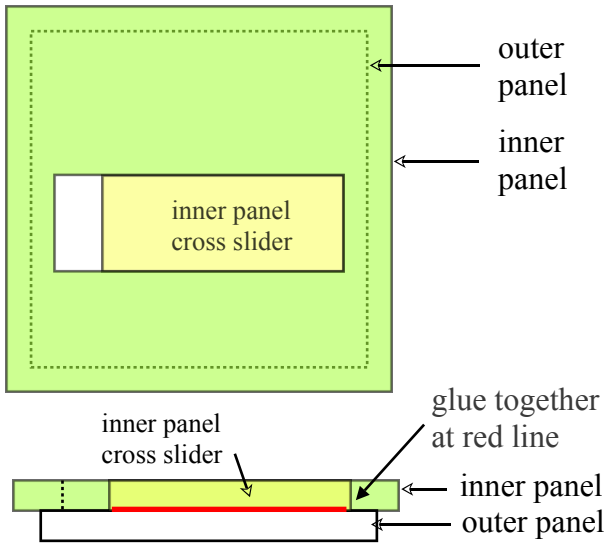
From 1/8" plywood, cut a square 1-3/4" x 1-3/4". This will be the outer panel, also on the outside of the box.

Assembly of the top panel.

Note that this is the inside view of the top panel.

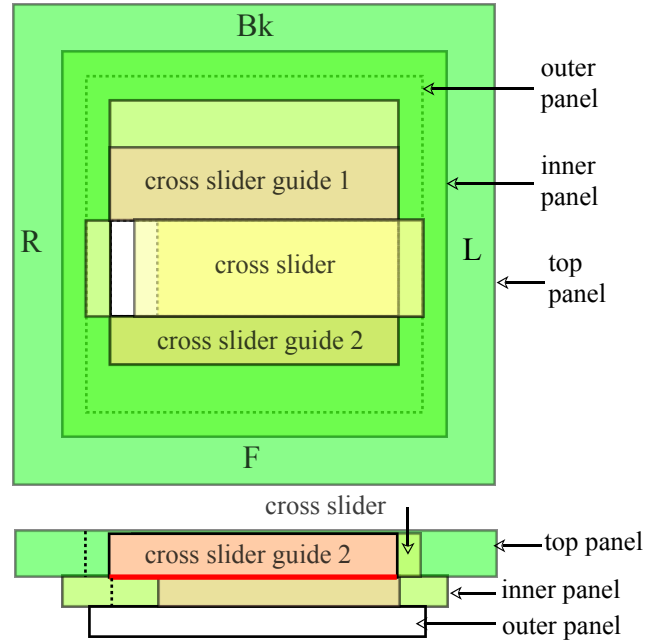
Step 1

Lay the outer panel down, and secure it so that it doesn't move. Lay the inner panel on top. Glue the inner panel cross slider to the inside face of the outer panel. Note the position of the inner panel cross slider.



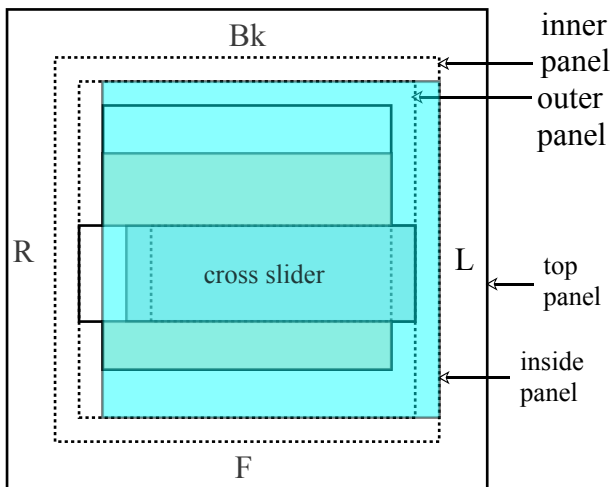
Step 2

Lay the top panel onto the inner panel. Glue the top panel cross slider to the inside face of the inner panel cross slider. Glue the cross slider guides to the inside face of the inner panel. Note the position of the cross slider.



Step 3

Lay the inside panel onto the top panel. Note the position, and glue to the inside face of the cross slider.

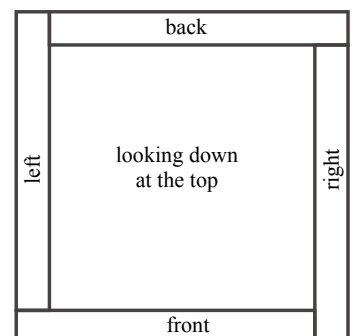


Notice the letters in the inside of the top panel. You should put these on for reference later.

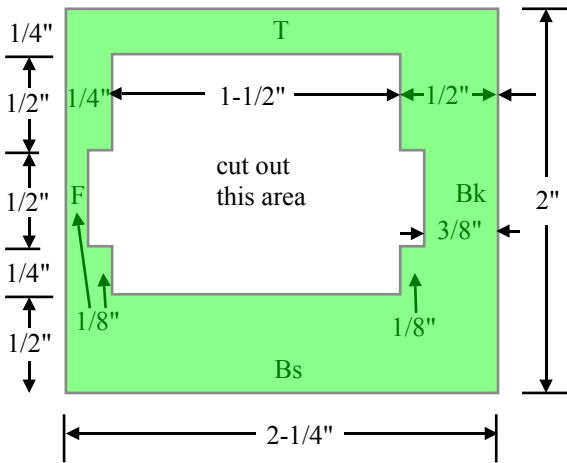
Test it!
 The inner panel shouldn't move at all, because the cross slider is engaged in the notch on the right (the notch in the top panel cut out).
 When the outer panel is moved to the left, the inside panel should also move to the left. If the outer panel is moved too far, the cross slider will engage in the left notch, re-locking the panels. When the outer panel is moved just halfway, neither end of the cross slider is engaged, and the inner and outer panels can move up. In the correct open position, the inside panel is exactly in the centre, even though both exterior panels are off-centre.

The left, front, right and back panels.
 These panels are all the same size: from 1/4" plywood, cut four pieces 2" x 2-1/14". All the outer and inner panels are the same size as the top panel, so you can cut them all now: the outer panels from 1/8" ply, 1-3/4" x 1-3/4" (five needed). The inner panels: from 1/4" ply, 2"x 2" (five needed).

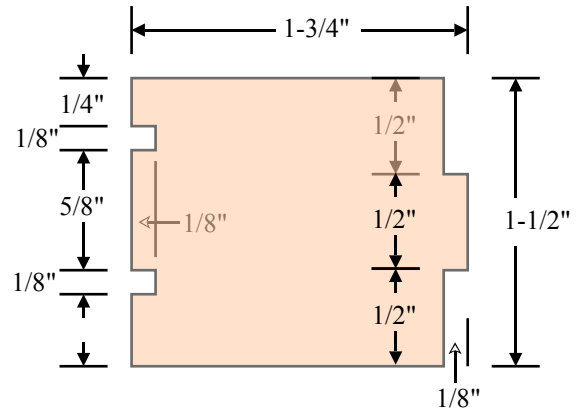
Don't glue any panels together just yet, but this is how the four panels are arranged. It's important to notice how they overlap at the corners, because the position of the holes depend on which way the four panels overlap. If you overlap the corners the wrong way, the puzzle won't work!



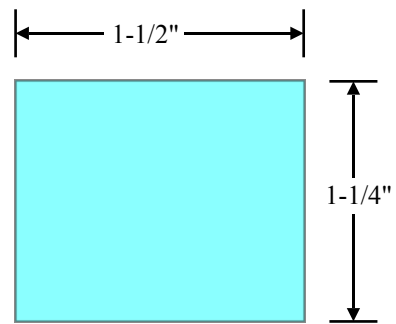
Cut out a hole in the left panel as shown:



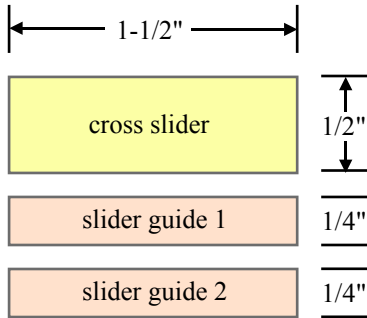
From 1/8" plywood, cut the inside 1:



Also from 1/8" plywood, cut the inside 2:

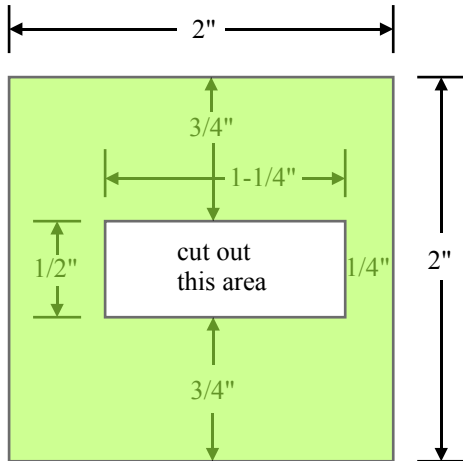


From 1/4" plywood, cut these three pieces:

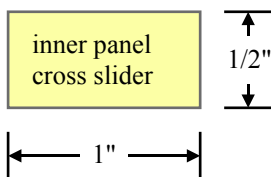


That's all the pieces for the left panel.
Next: assemble the left panel.

Cut out this hole in the inner panel:

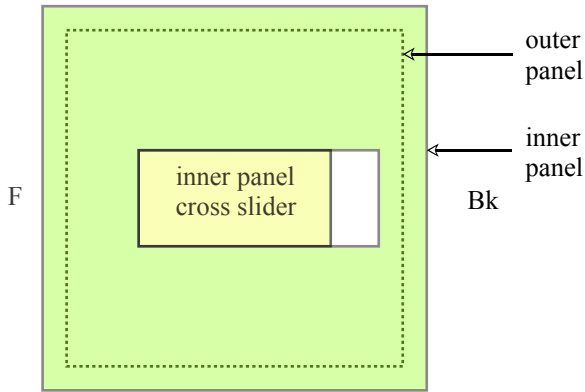


Cut this piece from 1/4" plywood:



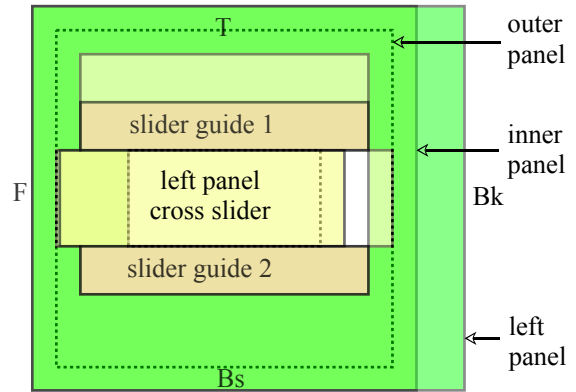
Lay an outer panel down, and secure it so that it doesn't move. Lay the left inner panel on top, position the inner panel cross slider to the left, and glue it to the inner face of the outer panel.

Step 1



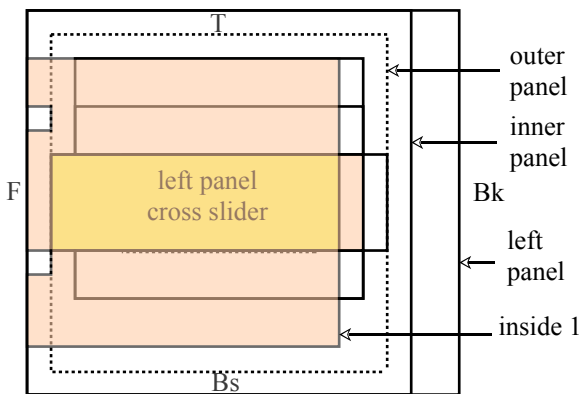
Step 2

Lay the left panel on top of the inner panel, and position the cross slider so that the left end is engaged in the left end notch in the left panel. Glue to the inner face of the inner panel cross slider. Glue the slider guides 1 and 2 to the inner face of the inner panel.



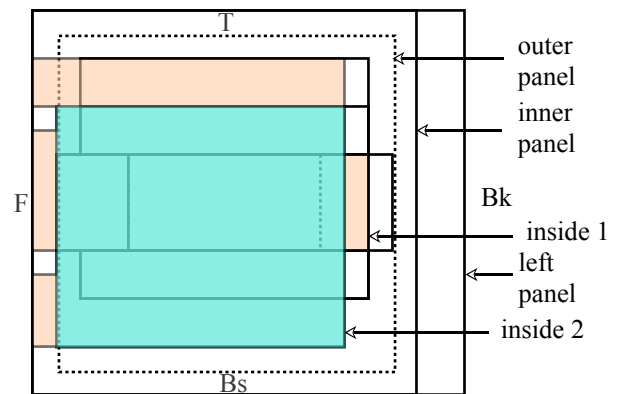
Step 3

Lay the inside 1 panel in position, and glue to the inner face of the left panel cross slider.

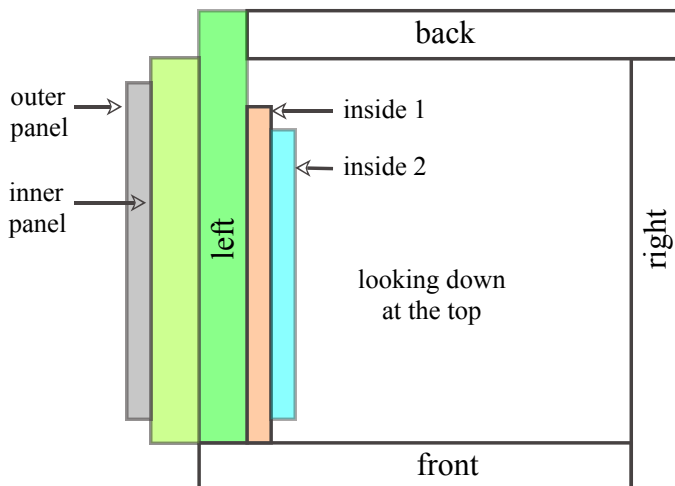


Step 4

Lay the inside 2 panel in position, and glue to the inner face of inside 1 panel.



Don't glue any box panels together yet, but hold the left panel against the other three panels, and the assembly should look like this:

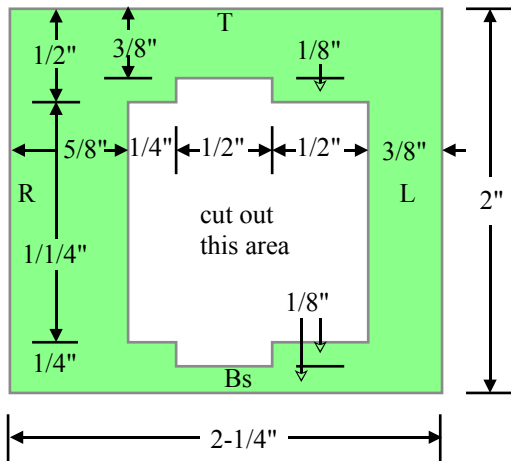


Notice the letters in the inside of the left panel. You should put these on for reference later.

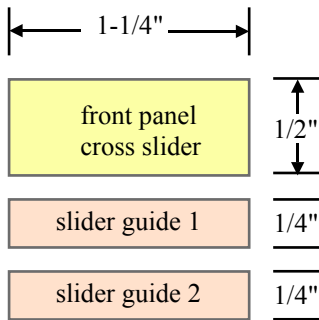
Test it!

The inner panel shouldn't move at all, because the cross slider is engaged in the notch on the left (the notch in the left panel cut out). (Remember, this is from an inside view. From the outside, this notch will be on the right.) When the outer panel is moved to the right, the inside panels should also move to the right. If the outer panel is moved too far, the cross slider will engage in the right notch, re-locking the panels. When the outer panel is moved just halfway, neither end of the cross slider is engaged, and the inner and outer panels can move up.

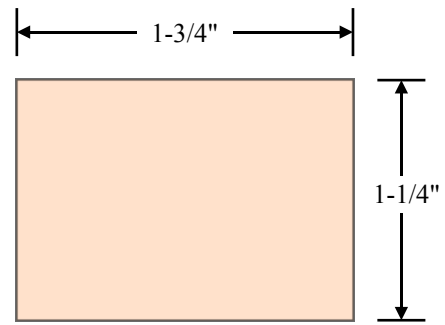
Cut out a hole in the front panel as shown:



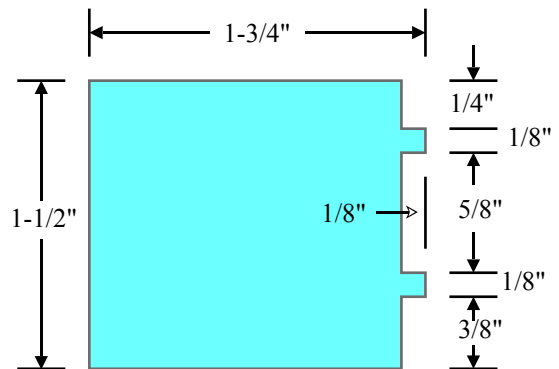
From 1/4" plywood, cut these three pieces:



From 1/8" plywood, cut the inside 1:

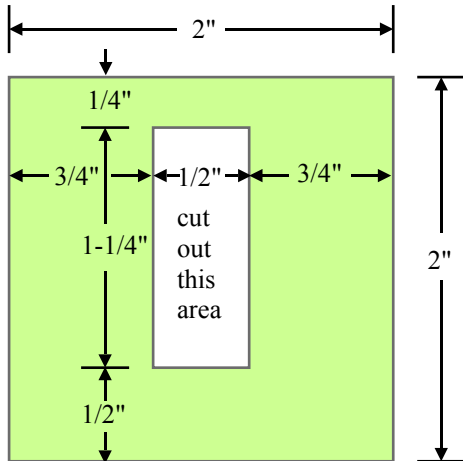


Also from 1/8" plywood, cut the inside 2:

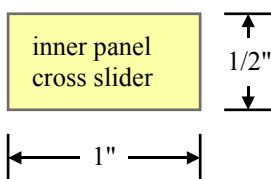


That's all the pieces for the front panel.
Next: assemble the front panel.

Cut out this hole in the inner panel:

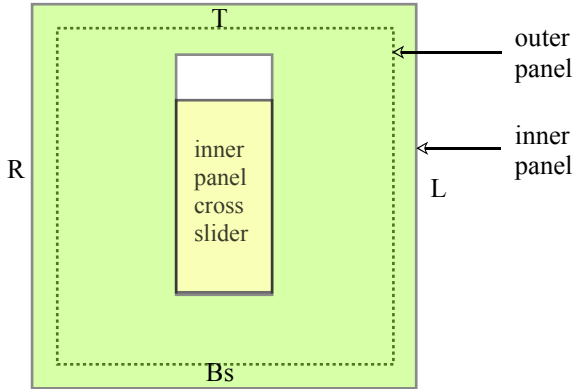


Cut this piece from 1/4" plywood:



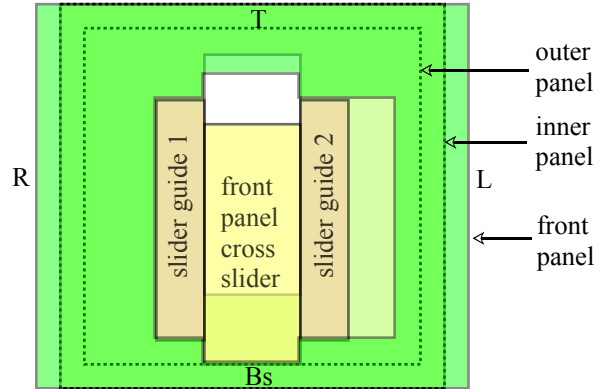
Step 1

Lay an outer panel down, and secure it so that it doesn't move. Lay the front inner panel on top, position the inner panel cross slider, and glue it to the inner face of the outer panel.



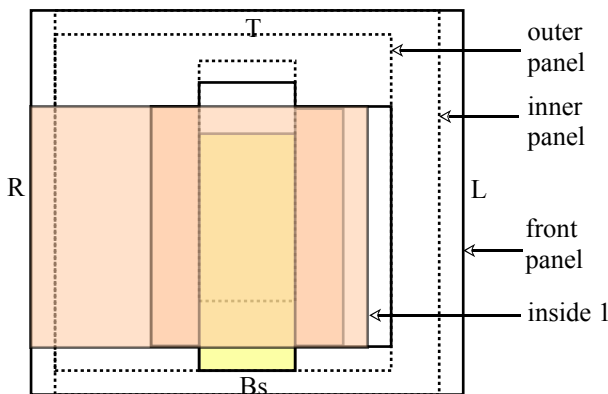
Step 2

Lay the front panel on top of the inner panel, and position the front panel cross slider so that the bottom end is engaged in the notch in the front panel. Glue to the inner face of the inner panel cross slider. Glue the slider guides 1 and 2 to the inner face of the inner panel.



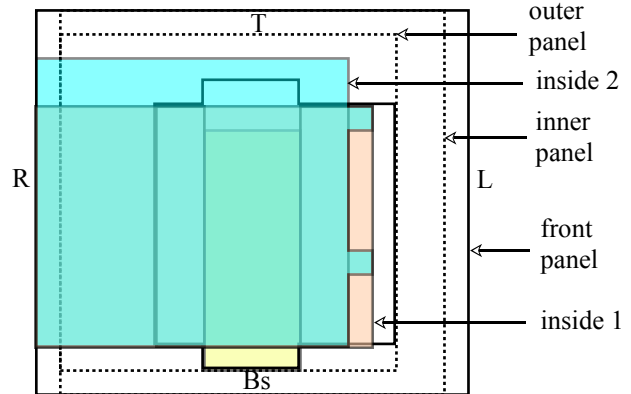
Step 3

Lay the inside 1 panel in position, and glue to the inner face of the front panel cross slider.

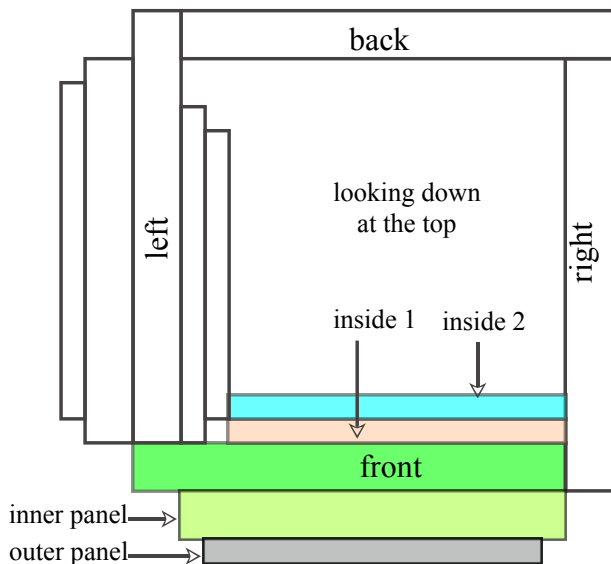


Step 4

Lay the inside 2 panel in position, and glue to the inner face of inside 1 panel.



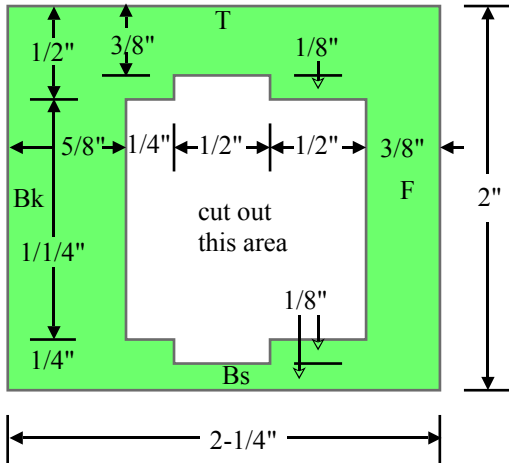
Don't glue any panels together yet, but hold the front panel against the other three panels, and the assembly should look like this:



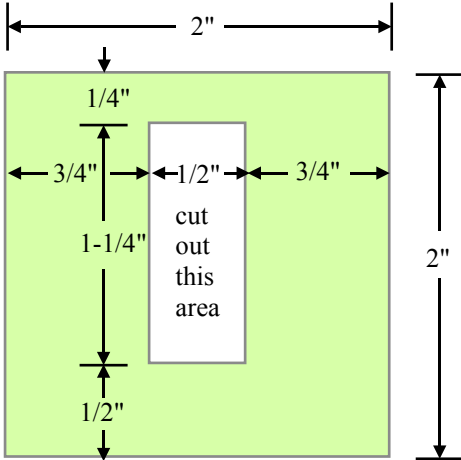
Test it!

For testing this panel, if you've got the left panel in place, take it away. The inner panel shouldn't move at all, because the cross slider is engaged in the notch at the bottom (the notch in the front panel cut out). When the outer panel is moved up, the inside panels should also move up. If the outer panel is moved too far, the cross slider will engage in the top notch, re-locking the panels. When the outer panel is moved just halfway, neither end of the cross slider is engaged, and the inner and outer panels can move towards the left.

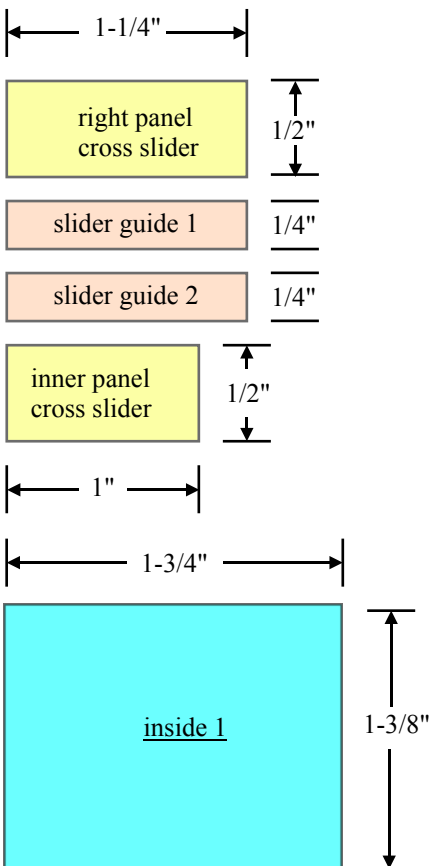
Cut out a hole in the right panel as shown:



Cut out this hole in the inner panel:



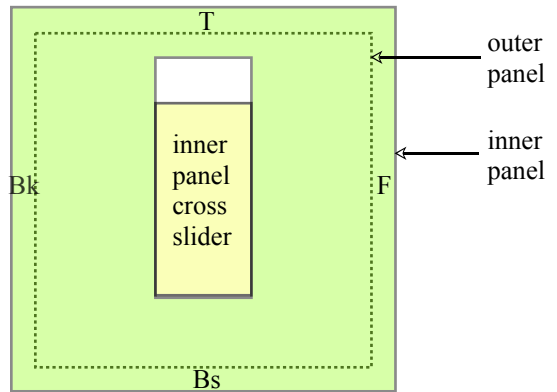
From 1/4" plywood, cut these pieces:



Assembly of the right panel.

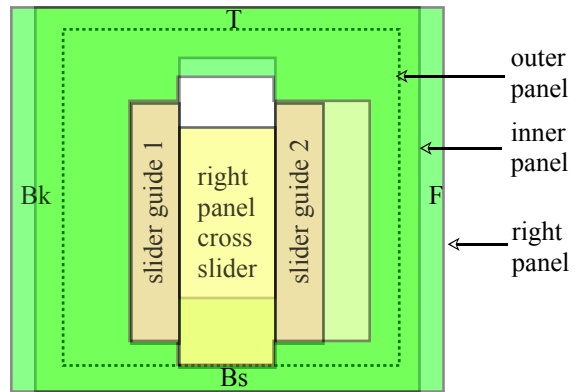
Step 1

Lay an outer panel down, and secure it so that it doesn't move. Lay the right inner panel on top, position the inner panel cross slider, and glue it to the inner face of the outer panel.



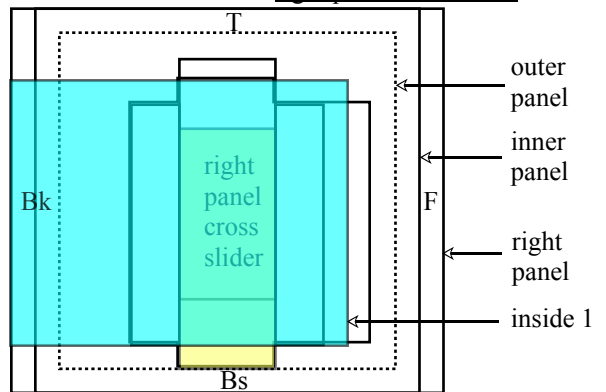
Step 2

Lay the right panel on top of the inner panel, and position the right panel cross slider so that the bottom end is engaged in the notch in the right panel. Glue to the inner face of the inner panel cross slider. Glue the slider guides 1 and 2 to the inner face of the inner panel.



Step 3

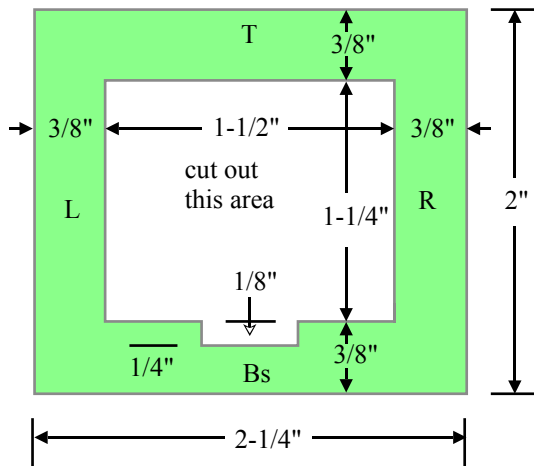
Lay the inside 1 panel in position, and glue to the inner face of the right panel cross slider.



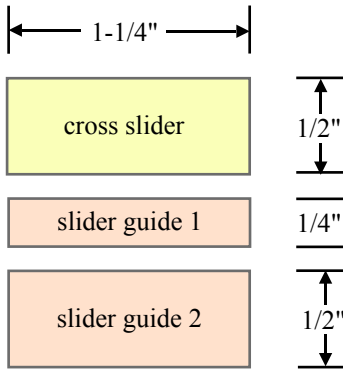
This inside 1 panel is 1/4" thick, so there isn't an inside 2 panel.

The Back Panel

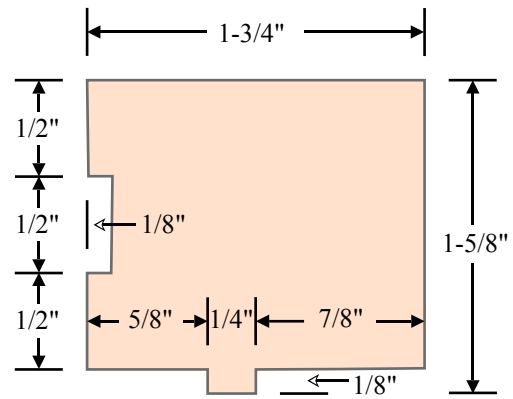
Cut out a hole in the back panel as shown:



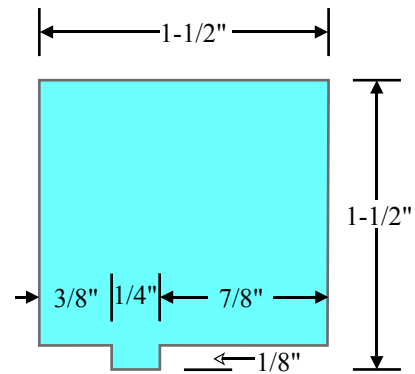
From 1/4" plywood, cut these three pieces:



From 1/8" plywood, cut the inside 1:

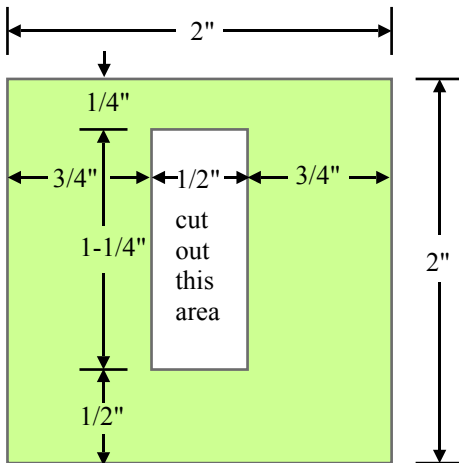


Also from 1/8" plywood, cut the inside 2:

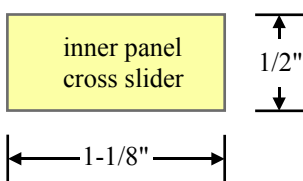


That's all the pieces for the back panel.
Next: assemble the back panel.

Cut out this hole in the inner panel:

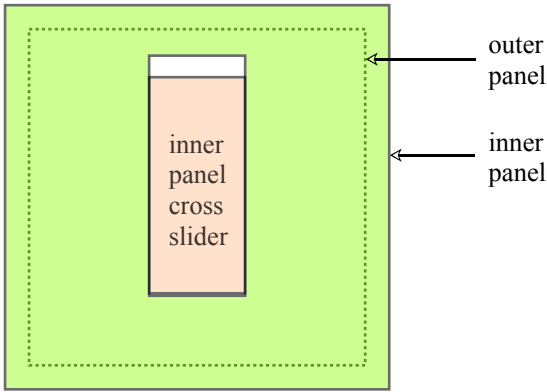


Cut this piece from 1/4" plywood:



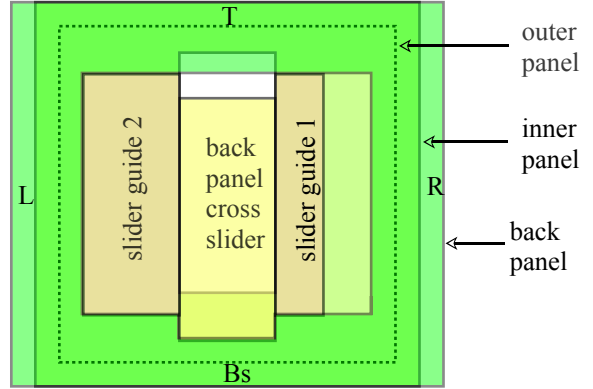
Step 1

Lay an outer panel down, and secure it so that it doesn't move. Lay the back inner panel on top, position the inner panel cross slider, and glue it to the inner face of the outer panel.



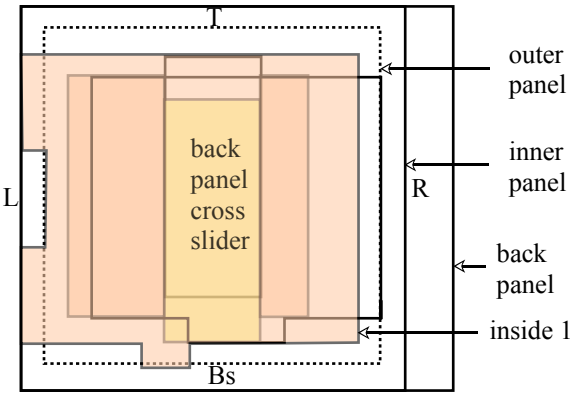
Step 2

Lay the back panel on top of the inner panel, and position the back panel cross slider so that the bottom end is engaged in the notch in the backpanel. Glue to the inner face of the inner panel cross slider. Glue the slider guides 1 and 2 to the inner face of the inner panel.



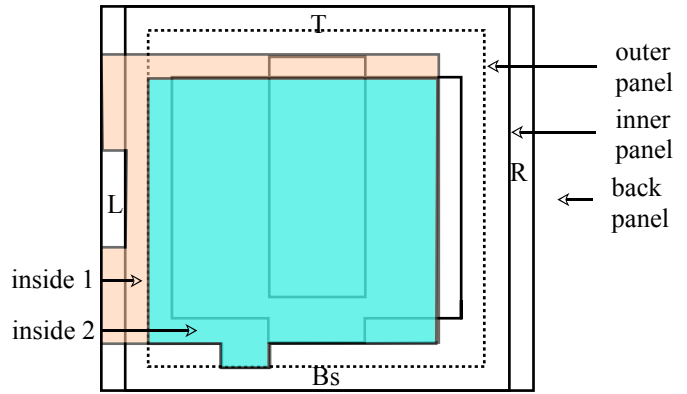
Step 3

Lay the inside 1 panel in position, and glue to the inner face of the back panel cross slider.

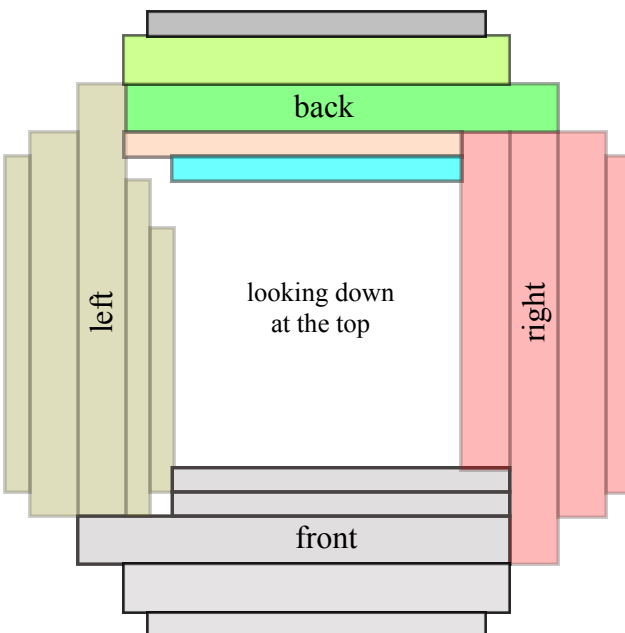


Step 4

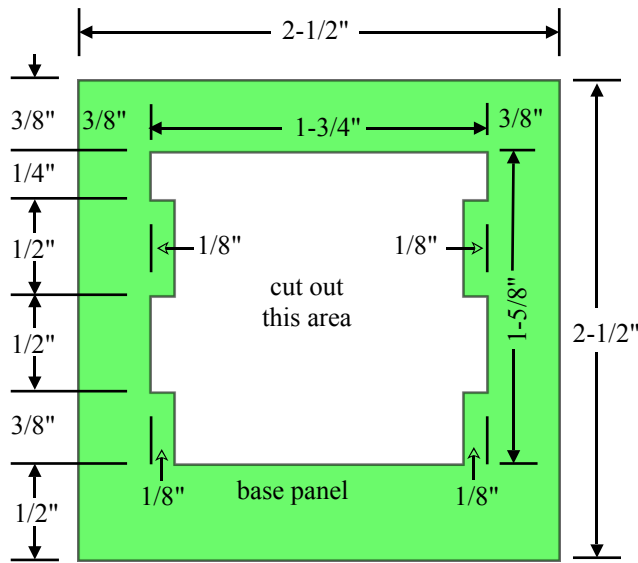
Lay the inside 2 panel in position, and glue to the inner face of inside 1 panel.



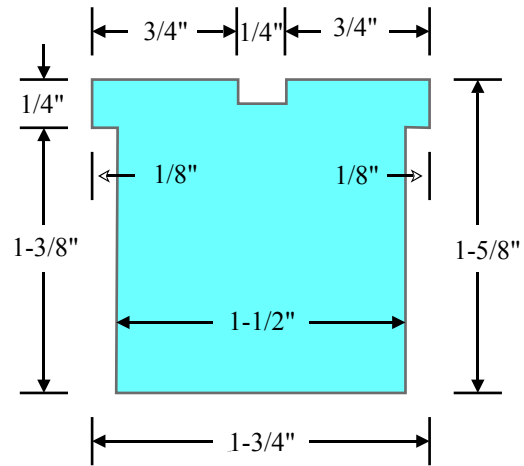
Don't glue any panels together yet, but holding the four panels together, the assembly should look like this:



From 1/4" plywood, cut a square 2-1/2" x 2-1/2".
Cut out a hole as marked.



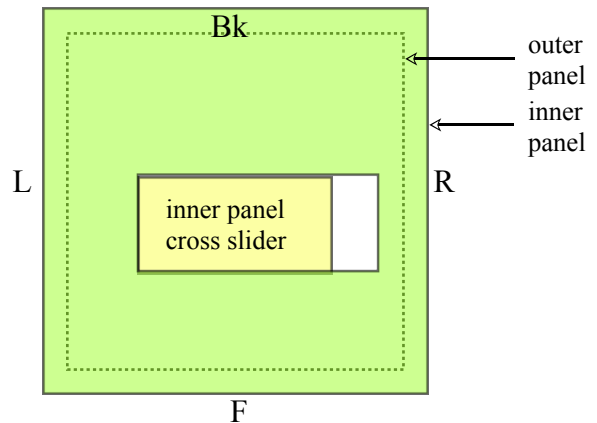
From 1/4" plywood, cut the inside 1 panel, to this shape:



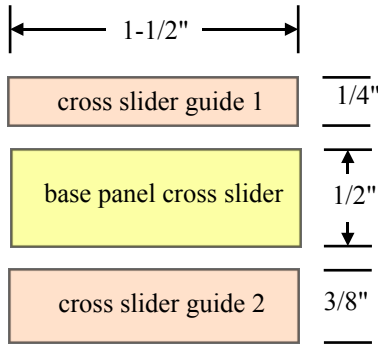
Assembly of the base panel.

Note that this is the inside view of the base panel.

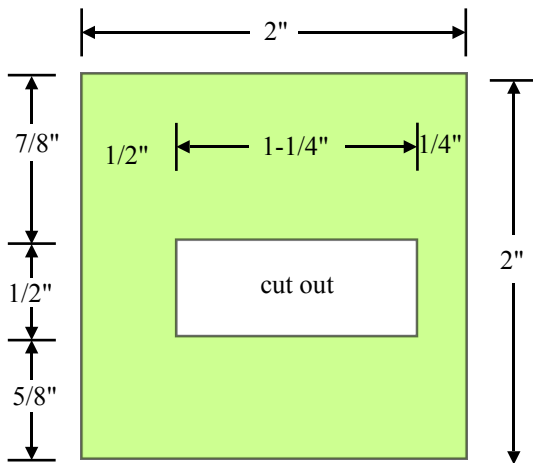
Step 1 Lay an outer panel down, and secure it so that it doesn't move. Lay the base inner panel on top. Glue the inner panel cross slider to the inside face of the outer panel. Note the position of the inner panel cross slider.



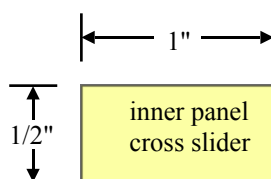
From 1/4" plywood, cut these three pieces:



Cut out this hole in the base inner panel:

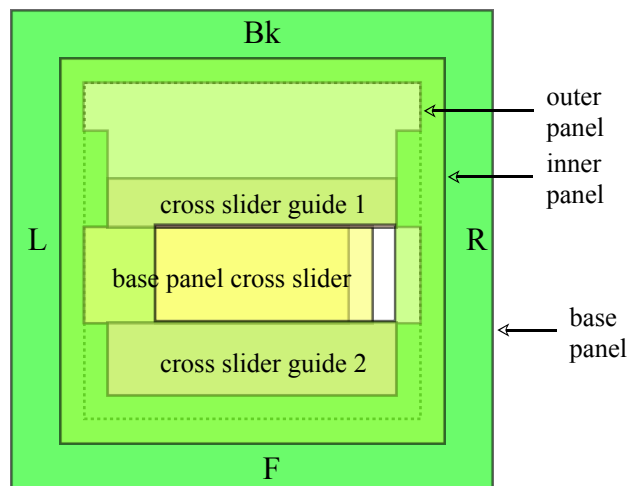


Cut this piece from 1/4" plywood:



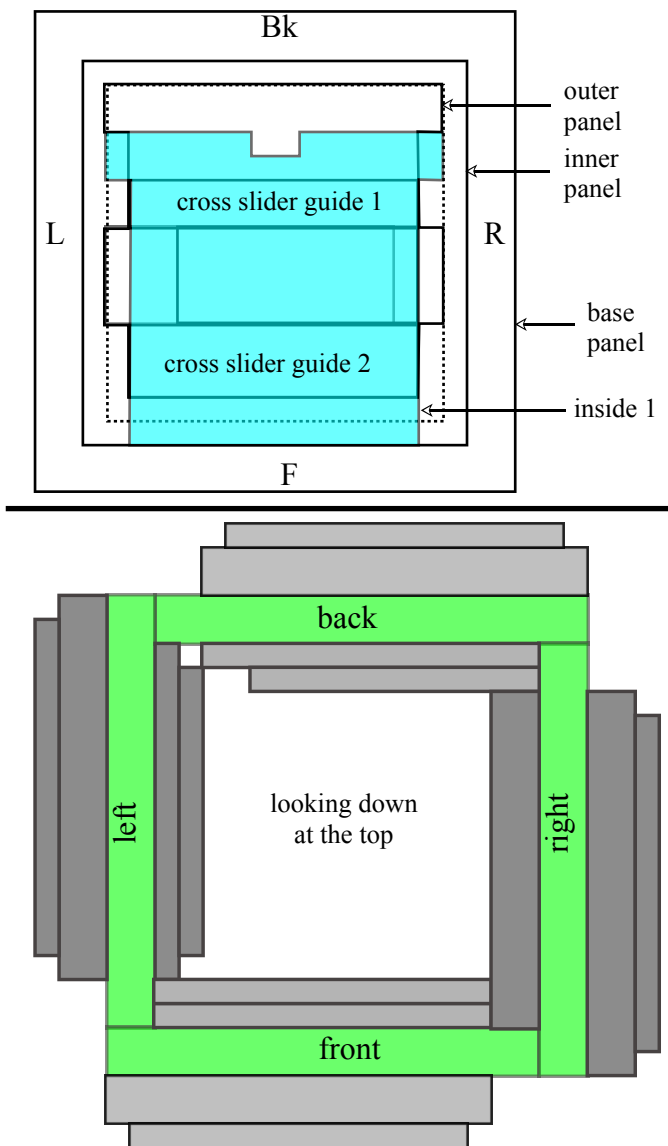
Step 2

Lay the base panel on top of the inner panel, and position the base panel cross slider so that the left end is engaged in the notch in the base panel. Glue to the inner face of the inner panel cross slider. Glue the slider guides 1 and 2 to the inner face of the inner panel.



Base panel Step 3

Lay the inside 1 panel in position, and glue to the inner face of the cross slider guides.



For the finish:

after cutting all the parts, and before gluing anything together, I put red dye on the box panels, and green dye on all the inside and outside panels.

I thought it looked vaguely "Chinese", so I called it "Chinese Torture".

I've taken every care to make sure these plans are accurate. However, if you find something wrong, please let me know, so I can put it right.

Now try it out on your friends!

These plans are free.
If you sell or give away this puzzle,
please mention where the plans came from.
© Bruce Viney. July, 2007

That's all the panels made, now it's time to test them. Hold the panels together with elastic bands, or clamps, but for the moment, leave the base panel off, so that you can see if the inside panels interact properly.

Start with the top panel: move the outer panel to the right 1/8" (if you go too far, the top inside panel will relock in the opposite notch).

Now move the top inner panel towards the back by 1/8" (if you go too far this time, the top inside panel should overlap the back inside panel, and will lock the back panel).

Move the left outer panel towards the back by 1/8" (if you go too far, the tongue on the left inside panel should engage in the notch in the back inside panel, stopping it from being raised). Now move the inner panel up by 1/8" (if you go too far this time, the two notches at the right of inside panel will be too high for the tongues in the front inside panel to engage in, so that the front panel cannot open properly).

Move the front outer panel up by 1/8" (if you go too far, the cross slider should engage in the upper notch in the front panel, locking it). Now move the inner panel to the left by 1/4" (all the way). The two tongues on the inside panel should engage in the notches in the left inside panel.

Move the right outer panel up by 1/8" (if you go too far, the cross slider should engage in the upper notch in the right panel, locking it). Now move the inner panel towards the front by 1/4" (if the front panel has moved properly, the right inside panel should move into the space left by the front panel).

Move the back outer panel up by 1/8" (all the way). Now move the back inner panel to the right by 1/8" (if you go too far, the tongue at the base of the inside panel will not line up with the notch in the base inside panel).

At this point, you should remove the top panel, and position the base panel in place.

Move the base outer panel to the left by 1/8" (if you go too far, the cross slider should engage in the opposite notch, locking the panels. Now move the inner panel towards the back 1/4" (all the way) and both inner and outer panels should come away from the base.

If everything works correctly, the panels can be glued together.

September, 2008: Slight changes to pages to separate the steps.
January, 2009: Changes to left panel hole spacing dimensions, P3.
January, 2009: The whole plan amended.
June and October, 2009: Further alterations added.

Get more plans and solutions at Homemade Puzzles.
Web address: www.homemadepuzzles.co.uk
E-mail: bruce@homemadepuzzles.co.uk