



## ArcadeCab's MAME Cabinet Plans

This simple PDF document has been due to popular demand. The reason has generally been either they wanted a convenient method to print out all the pages or wanted an electronic document they could pull up on a non-Internet connected machine while they worked on the cabinet. For whatever your reason, here it is.

I have included all the pages of the cabinet construction as well as the control panel pages. The order is cabinet pages first, followed by all the full-screen photos of the construction, in order. Next, the control panel webpage, and finally its associated photos finishing up the document. I split the photos from the descriptions for those persons wanting to simply print all the text out. Each page has its own bookmark and thumbnail for ease of finding what you want.

I hope that this helps you with your goal of building you own MAME cabinet. If you have any questions, feel free to contact me at [Mike@ArcadeCab.com](mailto:Mike@ArcadeCab.com). If you use these plans, be sure to send pictures of the completed project to me for display.

Good luck!

Mike Trello  
January 4th, 2006

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Welcome to ArcadeCab.com- Here you will find information about the construction of MAME cabinets and other arcade-related topics.



In the [Cabinet Plans](#) section, I detail the construction of my first MAME arcade cabinet, built specifically around the X-arcade™ controller. I include a great many photos of the construction process to assist even a complete novice builder. These plans have helped many new to the hobby; I hope they can help you, too.

Check out the [News](#) page for updates. I routinely add updates of arcade-related news and projects I'm working on. Speaking of projects, a popular project has been the table top [BarCade](#), which is

found on the [Projects](#) page. A complete PDF help document is available. This great weekend project can be built for less than \$100, using a 486 or slow Pentium and a spare 15" monitor.



In the [Store](#) you will find a favorite controller of mine. The CNC cut Ultra-Trackball controller is perfect for the PC golfers out there who demand Golden Tee-accuracy and durability. Tiger Woods PGA Tour™ is so much more enjoyable with this controller. These trackballs are very portable and are built to last! Also available are the control panel-only boxes where you add your own trackball and buttons. Check them out.



The [Control Panel](#) section, found on the [Projects](#) page, details the construction of my first custom control panel and shows how it was integrated into my cabinet design. There are a number of photos and a detailed parts list. This is the controller I use to this day.

I use [Mamewah](#) as the front-end for my cabinet. I give an overview of this excellent application on my [Projects](#) page and have recently added a detailed install. Step-by-step instructions have also been added on how I added the [Atari 2600 games](#) to the cabinet. Watch the [News](#) page for additional updates.

Have a look around. Hopefully you will find something of interest to you here. If you have any questions or comments, feel free to email me at [info@arcadecab.com](mailto:info@arcadecab.com). I'd love to hear from you.



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Welcome to the little document on how I built my MAME (Multiple Arcade Machine Emulator) arcade cabinet that, today, can play over 3,500 arcade favorites. I spent the time to create this for all the people who asked for plans after hearing me discuss what I was doing and after seeing pictures of the cabinet's progress. Hopefully this will help you past some of the problems I encountered and point out areas to pay special attention to. You don't have to be too skilled a carpenter to build this nor have fancy tools. I am proof even a computer geek can build one.

The pages are laid out in sequence. On most screens, there will be a series of small pictures at the right. Hover over each and you can see the caption. They all expand to a full screen version so you can make out the details better.

A full menu will always be available on the left of each screen so you can go immediately to the pages that interest you. If you don't like how drab the pages are, sorry. I am not a graphic designer and was too lazy to do anything real elaborate.

Feel free to explore.



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## Why build a cabinet?

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You may be asking why anyone would build an arcade cabinet? Why not. For a little money and a weekend or two of your time, you can have a machine that will offer endless hours of fun for you and any visitors that may happen by. If you are reading this document you are interested.

I had wanted an cabinet that could play *Dragon's Lair* for years. But it was always thought of in the context of "when I become rich, I can get one of those." I discovered MAME cabinets on the Internet sold for \$4,000 (and more). Plus shipping! They were impressive but way beyond my means. As I did a little more research, I found that there were a number of people who had built these themselves, on the cheap. I hit a lot of web sites looking at these examples and how they built them.

About the same time I discovered plug-and-play arcade controllers available for purchase. One highly rated controller was the X-arcade. It was also one of the more inexpensive controllers that were available. That got me even more interested and I ordered it. My intention was to use this controller and 'eventually' construct a cabinet.

However, over a period of several weeks, I slowly realized that it would be possible to construct a cabinet myself (with some help, of course). I set a budget and designed toward that budget. I won't lie and say I stayed under budget. I ended up building



a new PC to be installed within and purchased a new 19" monitor. If I ignore these two items, I basically stayed within the original constraints.

I found a [design](#) that I modeled mine after. Of course, there were no plans, just pictures. I spent several weeks developing the design for mine, and even that 'final' design saw some additional revisions as I progressed.

It took me quite a while to build the first cabinet but, with hindsight, the next one would go a lot faster. This document was designed with the goal of making your cabinet building experience go much faster. I have noticed that there are precious few free cabinet plans available that are detailed enough for a beginner to feel comfortable with. This site is intended to offer an alternative to those plans.

The rest of the document will lead you through the process that I went through to build my cabinet. If your cabinet design is different, adjust the plans accordingly. I have included a list of most all the items I needed, plans, and a ton of pictures of the process.

With the wood that is used, the cabinet could be stained instead of painted, if that is more your taste. You have no idea how much crap I was given for painting the beautiful birch wood like I did. That's what I wanted, so that's what I did. You can do the same with yours.



**X-ARCADE  
CONTROLLER**

**BRING**

**THE**

**ARCADE**

**HOME**

**GEAR UP!**



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The cost of the cabinet is flexible. You can add everything I did or you can skip putting in a coin box and marquee for now. I built into the cabinet a new PC and new 19" monitor. This upped the cost considerably but is somewhere you can save money. You likely will have a spare PC available that will run most of the MAME games quite nicely. The roms can be obtained from a variety of [sources](#).

I was able to find some items on ebay and paid substantially less than retail price for them. Do a little looking and you can save yourself a fair amount of money.

A complete list of items is included. An abbreviated list of the more expensive items follows:

Item	Where	Price (includes S/H & tax)
X-arcade Controller	<a href="http://www.x-arcade.com">www.x-arcade.com</a>	orig 160 now \$130
Coin door	ebay	46
Mag 19" Monitor	Best Buy online	233
3 sheets 3/4" ply	Lowes	117



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You will need a table saw (or circular saw), drill with screwdriver bits, jig saw, (miter saw, if you have one available), router with a 1/16" slot cutting bit, and at least one pair of clamps. A pair of sawhorses is also greatly recommended. You will be generating a lot of dust so, if you construct it in your garage like I did, don't plan to clean your house until after you complete your cabinet. In addition, make sure you have safety glasses.

If you have access to a orbital sander, get it. I did not need one but you may.

[*Update*- I purchased a table saw to help with later cabinets and would recommend it, if your budget allows. This is a low-end model that Lowes sells for less than \$180]



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I found it was best to gather all your materials, other than wood and paint, well before your construction day. You will never get everything you need in one trip and it is annoying to have to stop to make a Lowes run. Some items will need to be shipped, which adds time. I gathered items for three weeks prior to the first day of construction.

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## Game Day

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Off to Lowes (or Menards) to purchase your plywood sheets and 2x4s. You will need 3 sheets of 4'x8' plywood. I used  $\frac{3}{4}$ " birch, cabinet-grade plywood. I know, it is overkill for something that will be painted. However, you will have to do a minimum of sanding and it machines very nicely. It also has less warping than other options. You could get by with 2 sheets of birch and a sheet of MDF for the interior parts if you wished to save a few dollars. Have Lowes cut one board into three 20"x48" strips. This will save you time later on. 20" boards are used for the base, monitor shelf, top pieces, back and controller strip (mentioned in [Cabinet Dimensions](#)). I spent a fair amount of time with a circular saw trying to get these pieces right. Hindsight is 20/20.

I purchased six 8' 2x4s. I ended up using a little over four of them but it is better to be safe than sorry and they are not that expensive. And, if you have a small car as I do and need a truck/van to transport them, it is a lot easier now. I ended up using one of them as a straight edge.

I also picked up the Kilz and paint this same day. I had them tint the Kilz to a nice gray shade. They will not want to do this but they will when pressed. Having bright white under a black layer of paint is a recipe for disaster. They also recommended Valspar Duramax



black paint for durability. It is incredible.

Take all your purchases back to ground zero and unload.

In summary:

- 3 - 4x8' sheets of plywood
- 6 - 8' 2x4s
- 1 - gallon Kilz, tinted black
- 1 - gallon Valspar Duramax Latex Gloss Enamel

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## Step 1- The two sides

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Put a plywood sheet on the sawhorses. Using the measurements provided, draw the cabinet side onto the plywood. Take your time with this step. If you screw this part up, your whole cabinet will be off. Use the best long edge of the ply as the back and work from there. The back and base should meet at a crisp 90 degrees.

*FYI- The person you see in these series of pictures is just a prop. You can safely ignore him.*

To prove the measurements were going to work, we built a prototype. We started with a scrap piece of 1/4" ply we just had lying around. We carefully measured the controller section onto the ply and cut it out with a jig saw that had a fine tooth blade in it.

We propped the X-Arcade controller up on 2x4s so that it was at the height the design called for. This was done just to ensure it was a height we were going to like. It was.

You can skip this intermediate step if you trust the supplied measurements to be correct. They are.



Finish laying out the outline. After laying it out, place strips of masking tape over the lines. Press down firmly. This will help keep the plywood from splintering when it is being cut. If you have difficulties seeing the line, just go over them again on top of the tape with your pencil. The tape may seem needless but I could always tell when I forgot to use some. Your cabinet, your call.



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Next you will begin to cut. Set up your cutting guide along the top of the cabinet. You will cut the entire board off at the 6' point. This will make your next cuts easier. Then cut the back angle. After you do that, you will be left with the second picture.



Next cut in from the far side past the top of the controller area, stopping at the back of the controller area. Examine the 3rd and 4th pictures to see what was cut if the previous sentence made no sense.



Next we cut up from the base all the way up to the underside of the peninsula. Pictures five and six show that. The short cut around the outcropping was made with the jig saw.



We used the jig saw to make the small cuts in the controller area. We also used it for the rounded areas. We used a 1" round as the basis for the cuts. Just try to follow the curves with the saw. Any rough areas can be corrected with some sandpaper. My cabinet had some goofs but the T-molding covered them up completely. The starting and ending point of the curve is more important than a perfect curve.



The straight edge of the monitor front was used with the circular saw, being careful to stop slightly short of where we needed to be and used the jig saw to finish the cut.



Once the side starts to take shape, you may find easier ways of cutting the board down. Where possible use a circular saw as the jig

saw is tough to make a straight line, even with a guide.

Finally, you will be left with a completed side. Stand it up and admire your handiwork. This might be a good time to test fit the controller to make sure the fit is right. It should be quite snug. If it won't fit, trim some more out. If it is too large, you can correct that at the T-molding stage with no problem. We actually make the first side a bit too tight and then overcompensated. There was too much movement of the controller. You can't tell on the completed cabinet that it was not cut perfectly the first time without knowing what to look for.

Next, you can lay the completed side down on the second sheet of ply and trace the outline. Keep the pencil line as close to the ply edge as possible as you trace.

Cut this side out just like you did the first. [*Update-* If you have a flush cutting router bit, you could rough cut the second side out with your jig saw, staying within 1/4 to 1/2" from the line you drew. Then you could put this rough side atop the good, first side, clamp together, and router the edges so it is a perfect match.]

When complete, you should then router the edges for the T-molding. Use the 1/16" slot cutting bit (from RouterBits.com) and go around the entire cabinet, except for the base. This took us under ten minutes to router both sides.



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The base needs to support the entire weight of the cabinet, as well as all the equipment housed within. It will distribute the weight across the four casters, which will be attached in a later step. I used a 19" monitor, which is about 54 lbs. The monitor shelf needs to be sturdy enough to handle this weight. This shelf will also serve to keep the cabinet sides from bowing.

Start by cutting two 2x4s at 20 inches. These are the front and back framing members.

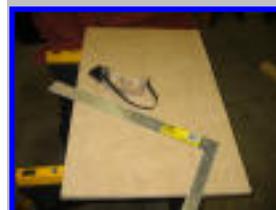
Cut two more at 30-1/2". These are the side members. Finish with two at about 16". These last two are the monitor supports.

Cut a piece of plywood 20 x 30-1/2". Cut another at 20 x 18, which will be the monitor shelf.

Finally, cut a plywood strip 20" x 2". This will be the backing board mounted atop the shelf to keep the monitor from slipping backwards.

Sink one screw into each corner. Then sit the ply base atop the frame to ensure it is square. Then drive an extra screw into each corner of the frame. Screw the ply top to the frame with a screw in each corner. You can drive more but gravity, all the components, and the cabinet sides will keep it in place.

[*Update*- I found that if I laid the plywood base, good side down, on my table, I could



align the 2x4s much easier atop them. I made sure the everything was exactly lined up with the edge of the plywood, then screwed a 3" wood screw into each corner of the 2x4s to really secure it. Then I finished securing it with 2" screws.]



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Click [here](#) for a brief word about how I came about the monitor placement.

Measure and mark the points of the monitor support. Draw a line between the two points. This will be the **top** of the monitor support. This is where we had to be inventive. We did not own clamps that were long enough to hold the boards together while we screwed them together. To solve this problem, we took a 1/16" bit and predrilled two holes two inches down from this line on this side. Then we laid the first 16" 2x4 on this line. Then I got under the ply side and my assistant sat on his knees on the board to keep it from slipping when I drove in the screw. For the innocent spectators, it was a bit humorous. For obvious liability reasons, I did not include photos of this.

We measured up 1-3/4" from the bottom of the ply side and placed the bottom edge of the base along this line. We screwed a couple screws to hold it in place. We then screwed two screws from above the monitor shelf down into the 2x4 support.

This held everything together enough for the time being. Every step we measured to make sure everything was as it should be. Miscalculations at this point could make the cabinet sit askew or make the monitor sit un-level. Neither results were what we were



looking for.

Next, the other side is attached. We drove two screws into the base from the top plywood side to stabilize it. Again, we made sure our measurements were correct before securing the parts.

[*Update-* While the cabinet is on its side, you could attach the wheels. See bottom pic for an example of how to start.]



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## Monitor Measurements

Each monitor is different and its placement will be different than mine. I used a 19" MAG monitor that was placed without its base. I'll briefly walk you through how I calculated my placement.

First, you know the height of the monitor area already. It is 22-1/2". I measured top-to-bottom the *viewable* portion of my monitor. This was 10-7/8". I wanted the monitor centered in the cabinet area so I subtracted 10-7/8" (the monitor screen) from 18-7/8" (the cabinet area) and got 8". I divided that by 2 (because it was to be centered) and I got 4".

I now knew that I wanted the viewable portion of the monitor to be 4" from both the top and bottom of the cabinet area. This was an important number.

There is probably several more elegant ways of determining where the supports should be placed but I used the brute force method.

Now I also needed the angle of the screen. To get that, I first laid the plywood cabinet side on the ground. Then I physically took the monitor and laid it on its side, matching the angle of the cabinet area. I moved it back 5/8" from the edge, keeping it's face parallel to the cabinet edge. Then I measured down 4" from the top of the monitor area and lined the upper *viewable* screen edge with this. The distance from the lower screen edge to the bottom of the cabinet monitor area should also be this same figure now.

Whew! Lose you yet? Where the monitor sits should be exactly the position you want it in. You can either now duct tape it in place or do what I did. I took a nice sheet of scrap 3/4" plywood and placed it against the underside (bottom) of the monitor, being sure to press against all four of it's feet. When you have done that, draw a line along the underside of this board. You now have a line which will serve as the upper edge of the 2x4 monitor support you will place shortly.

Now you can resume placing the monitor shelf.

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This is the fun part. Stand the cabinet up and step back to admire your work so far. It certainly does look like an arcade cabinet already. Grab your controller and place it in it's spot to make sure it fits correctly. Stand in front and pretend.

After you are happy, remove the controller and put it away again.

Add some more screws to the monitor shelf as well as to the base structure. I was fairly liberal with the drywall screws. The entire weight of the cabinet will coming down on the base and I wanted to make sure I had plenty of screws distributing it.

Try to pop the screws through the face a bit, so, with a bit of patching, you'll never know where they are located. If they don't pop through on the first try, back them out about a quarter-inch, then drive back in again. That worked for me often enough.

[\* Update- Countersinking the screws by predrilling helps, too]



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I added two rear beams in the cabinet for a couple reasons. I found that the plywood walls were spreading apart the higher you went on the cabinet. While the width was 20" at the monitor shelf, it was nearly 23-1/2" at the top. These beams keep the walls more parallel as well as adding strength to the cabinet.



Second, the back and top panels will be screwed into these beams. I wanted to be able to remove the back if needed and these beams gave me something to drill into from behind.



I cut the beams at an angle. I wanted the top, angled board to rest on this beam and be screwed in. That would ensure the top of the cabinet would remain at 20" width.

You need to cut two 2x4s that are the same angle as the sides. The top edge of the 2x4's height is down 1-1/4" from height of wall (1/2" inset + 3/4" ply). I put the 2x4 up where it would sit and drew a line that followed the side's angle. I gave myself an extra 2" to work with, made the cut, then saw if it was right. When the cut was exact, I made the board the proper length. You might find an easier way. The second board was cut using the same angle.



These are screwed 1-1/4" in from the back edge. This is for the 1/2" the front and back walls are recessed combined with the 3/4" plywood that will be covering the beams. I clamped the top while I drove screws every

4 to 6 inches down the beam from the outside. Once I finished with the first one, I worked on the second beam.



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I added ledger boards, that are screwed in from the side, to support the top pieces. The ply boards will screw down into them from above. The ledger boards are just 2x4s cut into 1" strips.

*[Update- I have since used 1"x2" boards, 8 (eight) cut 4 inches long and 2 (two) cut to 8" and they seemed to work better, without any splitting.]*

Start by cutting eight 2x4 pieces 1" wide. The first one I placed about midway between the back beam and the top angle of the cabinet side. It is down 7/8" from the cabinet edge and follows the side line as the beveled back beam starts. I clamped it in place, and put two screws in it from the outside. Repeat for the other side panel. *Examine the pictures if the text is hard to follow.*

The next ledger was the topmost one. It is 7/8" down and at the midpoint between the top cabinet angle and the cabinet front. Again, clamp and screw. Repeat for other side.

The last ledger goes 7/8" from the underside. The [fifth picture](#) shows it's placement. Same process as the prior four.

At this point I added a ledger board and plywood strip to the front of the cabinet ([Picture 6](#)). I placed the ledger board down 1/8" from the underside of the controller to account for the little feet, and 3/4" from the



front of the controller (to allow for the 1" plywood strip which will attach to the front of it in the next sentence), and screwed it in. I then took a 1"x20" strip of plywood and screwed it to the two ledgers. I didn't pre-drill the plywood so it cracked slightly. This strip will keep the front from bowing outward, which it would otherwise.



Lastly, I test fit the controller again to make sure I didn't mess up the width. The side of the controller should be flush with the side of the cabinet.



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To hide the 2x4 base from the back, I created a plywood face for it. Remember how we recessed the base 1-1/4" inch in from the back? That was with this in mind. Cut a 20" x 5-7/8" strip of plywood. Get the top of it lined up with the top of the cabinet base, so it flows smoothly out. Screw it to the framing. This is not structural so four screws should be more than enough.

[*Paragraph has been updated*] Next, you will create the board for the angled part of the top. Because the board will be meeting two other boards at an angle, you will want to bevel these edges. Cut the board 20" wide. Then measure 22" for the outside edge. You will want to lay the board on its good side and cut one end at 35° and the other end at 25°. I used a table saw for these cuts. The bevel should look like picture 4.

Next, you will cut the back board. It is flat on one end (the bottom) and beveled on the top edge, where it meets the board we just cut. You start with a 20" wide board, cut to 26" long. Lay it on its good side and cut the bevel at 35°.

After you cut it, test fit it just to make sure. It should fit very snug. Remove it. *You will not secure it until after the cabinet is painted.*



Now you can attach the top board. Line it up so that the back board will butt up against it properly. I found the ply should barely peek over the edge of the 2x4 beam. Screw one side into the beam and the ledger.



You will now find that the cabinet walls resist being pulled together. Even with a second person pushing the sides together, it defied us. I finally had to lay (carefully) the cabinet on its side and basically sit on the cabinet side while screwing the board on. This ensured that the plywood was holding the sides together as tightly as possible. In the bottom picture, notice I left the back board temporarily in place just to ensure it would still fit when finished.



Stand it up when finished. It is now time to throw the monitor in.

[*Update*- A bar clamp at least 24" long does a much better job of holding the two sides together than the "sitting atop it" strategy. I did not have any clamps when I first constructed the cabinet.]



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Once you get the cabinet upright, go get the monitor. I used a 19" model so it was fairly heavy and a little clumsy getting into the cabinet. It has little rubber feet that does not allow it to be slid once it is on the shelf (a good thing, actually). Consequently I just had to muscle it into place.

*Due to an oversight, there are no pictures of the next step but it is easy enough to follow.*

Cut an approximately 2" strip of plywood 20" wide. You should be able to just trim a strip off of some spare 20" stock. Now you need to make sure your monitor is exactly in the correct position. I assumed I would be using 1/8" glass for the monitor bezel. I also wanted the glass to be recessed 1/2" from the front, to be consistent with all the other sides. Therefore, I made sure the front of the monitor was 5/8" in. Then I took the plywood strip and placed it flush against the back of the monitor, on the plywood shelf. I drew a line on the backside of it. That's where it will be screwed in place. [I ended up ordering 1/4" glass, so my careful measurements were thrown off a bit.]

Before I did that, I threw in both the controller and the coin door and pretended again. I did that to reassure myself my design would actually work.

After I stood and admired my work, I removed the items from the work area. Then I screwed the ply strip into place, pre-drilling it to eliminate splitting.





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## Step 10- Attach the casters

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Lay the cabinet back down on its side. Attach the four casters at the four corners of the base. The two I put on the front had brakes on them. Make sure that they swivel 360 degrees, without hitting the plywood wall or catching anywhere else.

Stand it back up and test the rollers. It should move well on concrete.

[*Update-* The casters could more easily be added when attaching the [base/shelf](#). Doing it earlier was definitely easier.]



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## Step 11- Patching and Sanding

The next step is to patch all of the holes. Make sure you have driven all the screws below the surface of the wood. If you haven't, do so before continuing. If you are having trouble getting one below, reverse it out a bit, then re-sink it full throttle. If that fails, just accept that it was not meant to be. I have a few screws that stubbornly remained above the surface but they aren't too noticeable once you have painted. I guarantee no visitor will notice (nor point out) any imperfections they see. It's all about the game.

Patch all the holes and let it sit overnight. Zzzzzzz...

The next day you get to sand. By using cabinet grade plywood, minimal sanding will actually be needed. I used a 120 grit paper to sand down the patched areas and to go over the entire cabinet, inside and out. Then I used 220 to go over the entire cabinet again, paying special attention to the areas that will be visible: sides, front, back, and top. Brush off everything to get the major dust particles off.

Next, clean up all your work area. Sweep the whole area good and maybe let the area air out for a while. You don't want stray dust particles ending up in your paint job. Time for a beer.

When you are done with your celebratory beer, wipe the whole cabinet off very good with tack cloths. Don't be stingy. I went through six wiping it all down.

[*Update*- I used clean, cotton shop cloths to wipe of the cabinets well, then used one tack



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cloth to finish it all off. Worked much better.]

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## Step 12- Priming and Painting

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Next day you can prime the whole thing. I started from the inside and did the outside last. I primed every surface as I intended to paint it all. By painting it all black inside, you eliminate the chance of seeing through gaps in your cabinet and seeing bright, unaltered plywood. It's your call as to whether you want to mess with it.

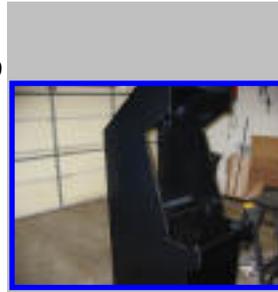
The plywood piece for the back that you created several steps ago should be primed and painted also. I just put it across the two saw horses (see picture 3) and did the interior side first. The reason I did not install it yet will become obvious when you start to paint the interior- it makes it a lot easier to paint from the back side without it in place.

I applied both the primer and paint with foam brushes, 3" rollers, and an 8" roller for the sides. The rollers made quick work of the large areas. I let the primer sit about an hour before applying my first coat of paint. I was quite anxious to get it painted as well as clear the garage so I could move the cars back indoors. It was winter.

Inside areas got one coat while I put on two generous ones on the outside and the back panel. The first two pictures show one coat all over. You can definitely see areas that were missed in these two. However, it will never be noticed due to these areas being enclosed within the cabinet. The goal is to get color inside so if there are any gaps in your construction, you won't be able to see anything that will detract from the gaming



experience. Be sure to also lightly hit the edges, where the T-molding will go but no so much that paint gets into the slot. A toothpick works if some paint does find the crevice.



The second coat made all the difference. Two coats made it look very nice. The photos don't do the cabinet justice. Black doesn't photograph well. I ended up using a third coat on the sides just because it wasn't entirely perfect after two. As I said before, no one except the builder will ever notice these slight imperfections (read: character).



Let it sit over night. The next day you can attach the back panel. Just push it up tight against the top of the cabinet and screw in four screws at the edges. I left the screws exposed so I could easily remove the back if needed.



After that you can take it inside for T-molding installation and the all important testing.



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## Step 13- Taking the toy inside

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I could not wait to get it inside and start playing.

With some help, I moved it from the garage into the house. I rolled it into the middle of a room. This is where I installed the T-molding. Since it is such an easy process (actually, I forgot) I did not take any pictures. Just force the molding into the grooves you cut at the start and smooth it all down. A rubber mallet helps and I used the side of a screwdriver handle to smooth it all down. At some of the corners, I was forced to cut a 'V' of the molding groove out so it would lie flat. I used a steak knife but anything sharp will do.

Once that was complete, I moved it to the room where it would be set up temporarily. Then I loaded all the components inside and powered it all up for a nice test drive.

Take a few pictures so your co-workers can be jealous and start playing. I actually used it this way for most of a week before continuing. Whenever you are ready to continue, move to the next section.



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## Step 14- Cutting the drawer and coin door

Time to create a mess outside again. You will need to cut a piece of plywood 19" wide x 16" deep. Also, one that is 2-1/2" tall by 19-7/8" wide, for the face drawer. In addition, you need to cut the coin door face which is 31 x 19-7/8". The first picture shows a test fitting of the board. The boards under it are the shims to keep it at the right height.

Now take the measurements for the cutout of the coin door, if you are installing one, and trace them onto the door. Cut it out carefully with a jig saw. It doesn't have to be perfect because it will be hidden by the coin mechanism.

Sand/prime and paint these boards. I was able to do all that in a (long) evening. I put two coats on both sides of the door, and one coat on the drawer itself and it's face. I let them sit overnight to finish drying.

Next, you get to install the keyboard drawer. I first attached the side rails to the keyboard drawer. I lined it up flush with the backside of the board and put two screws in each side. I then attached one set of rails.

This part is hard to describe, so you may want to look at the pics for assistance. What I did was come down about 3-3/4" from the bottom of the controller 'U' (where the X-arcade sits). That was where I lined up the bottom of the drawer slide. The front was pushed back just far enough so the attached plywood face would be flush with the 1" ply strip above it when the drawer was closed. I had problems getting this perfect, so I might



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not be the best person to tell you exactly how to do this.

After I got the drawer slides installed and the drawer in place, I took a drill and pre-drilled two holes through the face and into the ply base itself. Then I took the face and drawer outside and screwed them together. I applied another coat of paint on the face to help hide the screws. It worked well.



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## Step 15- Installing the coin door

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Although this is fairly straight forward, it is awkward. Spend some time looking at everything and make sure you understand how it all works before screwing things together. In my desire to personalize my cabinet, I put the screws on the right side of the door, instead of the left. You may wish to do it differently.

I first screwed the hinges to the door edge. I spaced them evenly apart and started at the top. I put one screw in most. Then I put the door on the shims and made sure it was perfectly straight, door being open. Then I drove in one screw per hinge into the cabinet side. I closed the door to ensure it would close easily, without binding. Once it did, I finished driving the rest of the screws into place.

Next, I forced the coin door into its opening and locked it into place with the supplied 'fingers'. It is straight forward.

[*Update-* I purchased and installed a 30" piano hinge, which worked better. I attached it first to the door itself, adding screws to every other hole. Then I lined it up into the opening, making sure it was positioned correctly. Then I screwed the strip to the inside of the cabinet, using every other hole.]



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I purchased a 1-1/8" Utility Cam lock from Lowes, good for up to 3/4" wood. I determined the where on the door I needed the lock, then drilled a 3/4" hole with a spade bit. It made a beautiful hole. I then followed the instructions and installed the lock, using the 90 degree piece.

For the lock to catch on something and stay, I installed an L bracket just inside the door, on the cabinet wall.



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You will want to get hold of a standard PC power supply. I had an old 486 PC lying around in a closet that I just removed the supply from. You will also need some wire. I used some 18 gauge, solid core, hook up wire from Radio Shack. It has three colors of wire included with 15' of each. That was plenty for my immediate requirements. I also purchased some electrical connectors from Lowes.

Next, I determined that the yellow and black wires were for the 12v (lamps). I clipped two sets of these, and put a terminal on each. I wired these to the coin door lamps. As long as one yellow and one black goes to each lamp, you are fine.

I plugged the power supply into my UPS and everything was ready to go. The connections aren't wired to the 'Coin up' button on the controller yet, so all the coin door does at this point is light up. I'll get to the rest at some point in the future. I also want to secure the power supply to the interior wall of the cabinet so it isn't just stacked on top of the other equipment.



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## Step 18- Installing the speaker area

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I cut a ply board 20" wide x 11" long. I then designed, on paper, how the cutouts would look. I based it on another design I found on the Internet.

I laid out the cutouts by starting with two circles. I used a standard CD to trace for the circles (4-3/4"). I put each circle in 2" from the side and the bottom of each was 5-3/4". Within that I laid out the pattern in picture 3. I started each cut with a drilling a 1/2" hole at each end and then using the jig saw to make the straight cuts.

I also cut the two boards for the marquee, which are detailed on the [next page](#).

Next I sanded it all, including inside the cutouts. I then tacked it off and primed both sides. I painted the inside of the cutouts from the back side first. I gave the back a real quick swipe of paint as it will never be seen. I painted the front with three coats, just for the heck of it as it took me a while to get the inside of the cutouts looking good. [I painted both sides of the other two pieces, two coats on the front/top.]

Now, the fun part. Your speakers will need to be mounted somehow behind the speaker cutouts. I started by removing the legs from my speakers.

I then cut two pieces of fabric (actually a



black bed sheet) and stapled the pieces to the backside of the board. I then screwed in four cuphooks, for the wiring to loop around.

Then I, very elegantly, strapped the speakers down using some spare speaker cord I had laying around and a little electrical tape for good measure. I made sure the on/off button was extended into one of the cutouts so it would still be useable.

I then attached it to the cabinet by screwing four screws into the ledgers found on either side. From the playing position you cannot even see the speakers. The fabric keeps them totally invisible.

There are two protuberances on the left speaker, the volume and the on/off. The on/off switch can still be used as it is a simple toggle. The volume can now only be adjusted through Windows. This is not a big deal.

[*Update*- I tried using Velcro for some customer cabs. I bought some 2" wide, black stuff from [Lowe's](#) (sorry for the Staples link). I attached a strip to the top and bottom of each speaker 'grill', in the cabinet. I then cut two strips of the opposite half of the Velcro and attached to the speaker. Then I simply attached the speaker inside the cabinet. The angle of the speaker area is very shallow so the chances of the speaker



falling are pretty slim. This method turned out to be **much** better than strapping the speakers in place.]



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## Step 19- The marquee area

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I needed two boards for the marquee area, the removable top board which will have the light fixture attached to it, and the small board below the marquee. I cut a 9" deep x 20" wide board for the top. This is not beveled. I also cut a small strip that is 2" wide at the narrow and a bit more at the wide point, beveled. After you cut these, you will need to sand and paint them.

I ordered the marquee from [www.emdkay.net](http://www.emdkay.net), which did a fantastic job!

I supplied my custom measurements, being sure to include a 3/4" black border on the top and bottom. A week later, it arrived safe and sound in a box that could likely support my weight. Mine was 19-15/16w x 5-3/4 actual marquee height, physical height of 7-1/4". This included the border on top and bottom.

I cut two strips of Happ marquee retainers with a hacksaw and then sanded the cut edge well. I cut two pieces of 0.08" plexi with the special plexi cutter they sell. I caught on by the third cut (there were 4 total). Two pieces of the plexi was cut to 7"x19-15/16". The marquee itself will sit between this. I decided to leave the protective film on the rear piece of plexi to help defuse the light.

After I determined how far the retainers would extend out from the boards, I drilled pilot holes through the retainers. I used 1/2" black, rounded-head, wood screws to attach them.



I also installed the marquee lighting at this point. I just used a 12" fluorescent bulb (3rd picture).

I decided to secure the light to the top board with two 1" L brackets. This was easy to do. Before I did that, I dropped the end of the 6' power cord down into the cabinet and fished it out and plugged it in to a power strip, which was then plugged into my switched, wall outlet.

Once I got the light up and working, I put the marquee into place and stood back to marvel at its beauty. Correction, I went for a beer, then stood back to admire the marquee's beauty.



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I purchased a sheet of standard, clear, float glass from Vision Glass ([www.visionglass.com](http://www.visionglass.com)) in Springfield. I got a 1/4" thick, 21 x 19-7/8" sheet with sanded edges. I opted not to get tempered glass because: 1) it would have had to be ordered, and 2) the glass will be supported almost entirely on its backside by the monitor so poses little risk of personal injury. It was just \$16 and some change and was complete the end of the same day.

When I got it home, I first test fit it. It fit just fine but it was then that I discovered my cabinet was not entirely square inside. The top picture shows that. After I was satisfied it was going to fit, I removed the glass and set about installing the two straight irons that were to support the glass. These I attached to the underside of the monitor shelf, far enough out so that a small dowel can be inserted in the furthest hole to keep the glass in place. The dowel can be seen in the fourth picture.

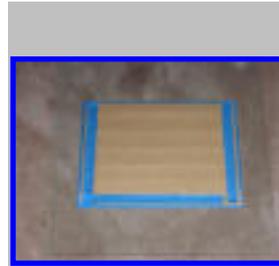
I then put the glass in place and taped off the screen with painters tape. Then I laid the glass on the floor, tape-side down, and duplicated the taping on the other side. I did this because the glass didn't sit exactly square so I could not just tape off the front and paint that. You may get off easier.

Next I went out in the garage and painted the taped side with *several* coats of black spray paint. I took my time to ensure I made even strokes to eliminate runs. I think I put



on at least eight coats.

Next came the fun part. I installed the glass and inspected how it looked. To be honest, I didn't think the glass would make so much difference but it really did.



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The following pages include the cabinet dimensions, list of the boards used, and some other items that may be of interest. I include the design I based my cabinet on to give credit where it is due.

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When I originally ordered the X-arcade, I had planned to use it only for a length of time to decide how I wished to design my own controller. It had been years since I played any games at the arcade. I also did not know if I would actually end up constructing the cabinet. Sometimes we dream and never follow through, right?

In my searches, I stumbled upon a design that used the X-arcade as the controller. That got me thinking. I could use this controller in a cabinet and could eventually upgrade to a creation of my own at a later date. In addition, it had a lot of characteristics I desired so I used it as the basis of my design. You'll notice I have made a number of modifications and enhancements.

The site is

<http://www.geocities.com/lusosarge2000/eindex.html>.

Have a look. He also has recently added a driving cabinet that I think is very interesting.



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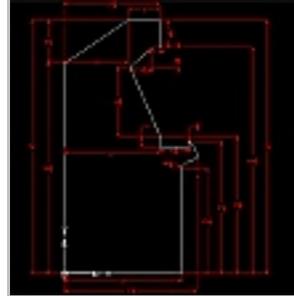
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Here are the dimensions of the cabinet. I have supplied a side diagram with the major dimensions to make your life easier. From the front side, all interior widths are approx. 20". I say approx, because mine varied from 20" on most widths to about 19-7/8". This was due to my poor measuring skills.

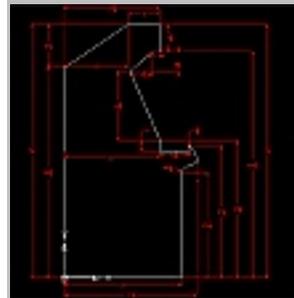
I suggest having Lowes make four cuts, 20 inches apart. This will give you 4 20"x48" boards and a strip about 16" wide. By having them make these four cuts, you will be saving a fair amount of time and getting very clean cuts. Have them go 20" from one side, cut, go 20 more inches from that same side, cut, 20", cut, and go over one final 20" section and cut. This is all done while the board is lying on its long side. This would have made my life soooo much easier...

Throughout this document, I have provided many pictures of the construction process. Wherever possible, I also include measurements. Hopefully, between the pics and the figures, you should be able to create this cabinet with less fuss than I did. Your measurements will invariably vary from mine on some parts. I apologize for any confusing explanations.

\* 3/2005 Update- I have updated the dimensions and included one in AutoCad.



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## Material List

Item	Qty	Where From	Unit Price
X-arcade controller	1	<a href="http://www.xgaming.com">www.xgaming.com</a>	160 (now \$130)
30x32" 0.08" Acrylic sheet	1	Lowe's	11.67
Coin Door ( <a href="#">Happ over-under</a> )	1	ebay	47
T-molding (3/4" black, smooth) - 100'	1	<a href="#">Happ</a>	19
Marquee Retainer - 10'	1	<a href="#">Happ</a>	12
Keyboard drawer slides- 16"	1	Lowe's	10
1-1/8" Utility Cam Lock	1	Lowe's	3.50
4x8' sheet of 3/4" birch, cabinet-grade plywood	3	Lowe's	35
8' long 2x4	6	Lowe's	2.93
Drywall screws- 1-5/8" course thread	1 box	donation	0
Cabinet Screws - 3"	8	Lowe's	.12
Framing Square	1	Lowe's	7
Insulated Disconnect terminals (small pack)	1	Lowe's	
18-gauge, 45' solid core, hookup wire	1	Radio Shack	
Mini-keyboard	1	ebay	21
3" paint rollers (3/8" medium pile) (2 pk)	6	Lowe's	2.93
Kilz (gallon) tinted	1	Lowe's	10.88
Valspar Duramax Latex Gloss Enamel paint (gallon)	1	Lowe's	21
12" fluorescent light w/ 6' cord	1	Lowe's	12
Elmer's Wood Filler - 8oz	1	Lowe's	2.96
Plastic sheeting 1mil (to cover floor)	2	Lowe's	2.46
Lucite plastic cutting knife	1	Lowe's	2.35
2" Industrial Casters - Rotating and locking	2	Lowe's	3.74
2" Industrial Casters - Rigid	2	Lowe's	1.96
30" Piano Hinge	1	Lowe's	6.66
Foam brushes (1" and 3")	6	Lowe's	.55
Sandpaper 150 grit- 3 pack	1	Lowe's	1.87
Sandpaper 220 grit- 3 pack	1	Lowe's	1.87
Tack cloth	6	Lowe's	.70
Computer power supply	1	spare parts	0
Mending Plates/Straight Irons (3"- 2pk)	1	Lowe's	.96
L brackets (4 pack- 1-1/2" x 5/8")	2	Lowe's	1.46
1/16" slot cutting bit w/ arbor	1	<a href="http://RouterBits.com">RouterBits.com</a>	20.00

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Valspar Multi-purpose Black Enamel Spray Paint	1	Lowes	1.96
1/4" glass - 21 x 19-7/8"	1	Vision Glass	16.50

\* I left out incidentals such as a putty knife, paint trays, screwdrivers, sledgehammer, etc. I already had these items. In addition, I did not detail the computer parts as they change so rapidly and each person will make personal choices as to what machine is included. If I missed a few other items, too, I apologize.

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The following is an overview of the dimensions of the parts being used. The Cabinet side dimensions are found on the next page.

### *Plywood pieces*

Name	Dimensions	
Coin door	31h x 19-7/8w	
Drawer base	19w x 16	
Drawer Face	2-1/2h x 19-7/8w	
Back	20w x 26h	beveled
Upper back	20w x 22*	beveled x 2
Back, bottom	20w x 5-7/8h	
Monitor shelf	20w x 18d	
Monitor stop	20w x 2d	
Base	20w x 30-1/2d	
Controller support	20w x 1h	
Removable top	19-7/8w x 8-1/2	
Speaker grill	20w x 11*	beveled
Under Marquee	20w x 2*	beveled

### *2x4 pieces*

Name	Count	Length	
Braces	4	20"	
Base supports	2	30-1/2"	
Back Beams	2	54*	beveled
Shelf supports	2	16"	

### *1x2 pieces*

Name	Count	Length	
Ledger	8	4"	
Ledger	2	8"	

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\* The angles of the bevels are included in the section that details each cut.

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This page is included to show what specs we actually worked with when creating the cabinet. As you can tell, it is not the easiest set of plans to work from. In addition, I made some last minute changes to it, primarily increasing the overall depth of the cabinet. This was done because of the increased depth required when the monitor was tilted back like it was.

Hopefully the final plans are easier to work from.



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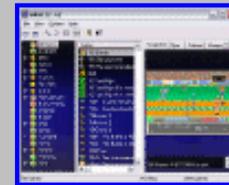
> **MAME**

MAME, or Multiple Arcade Machine Emulator, is the reason that this cabinet is in existence. It is an emulator that allows you to play a multitude of old arcade games. The emulator runs the games (called Roms) exactly as they were in the arcade.

You can download these Roms from sites on the Internet. I did this and it was a lengthy process. I believe I had downloaded about 350 games before it became too much to do. I had found a service mentioned a number of places that would create you a set of disks that contained **all** of the current Roms, for a small charge. This charge was to cover shipping and handling, as well as the blank media costs. I used an excellent individual who created me two DVDs full of the Roms, and other assorted goodies. I paid under \$18 for it. The site is <http://www.tombstones.org.uk/~arcadelover/>. I feel it is an extremely good deal.

You will still need to download the most recent version of MAME, which you can do from many sites, including <http://www.mame.net/> and [www.mameworld.net](http://www.mameworld.net). These sites can also provide you with more information on MAME.

I also have used another individual to purchase all of the laserdisk games that [Daphne](#) uses. I paid \$30 for 3 DVDs. His email address is [mameburner@jbowers.com](mailto:mameburner@jbowers.com). He was a pleasure to deal with.



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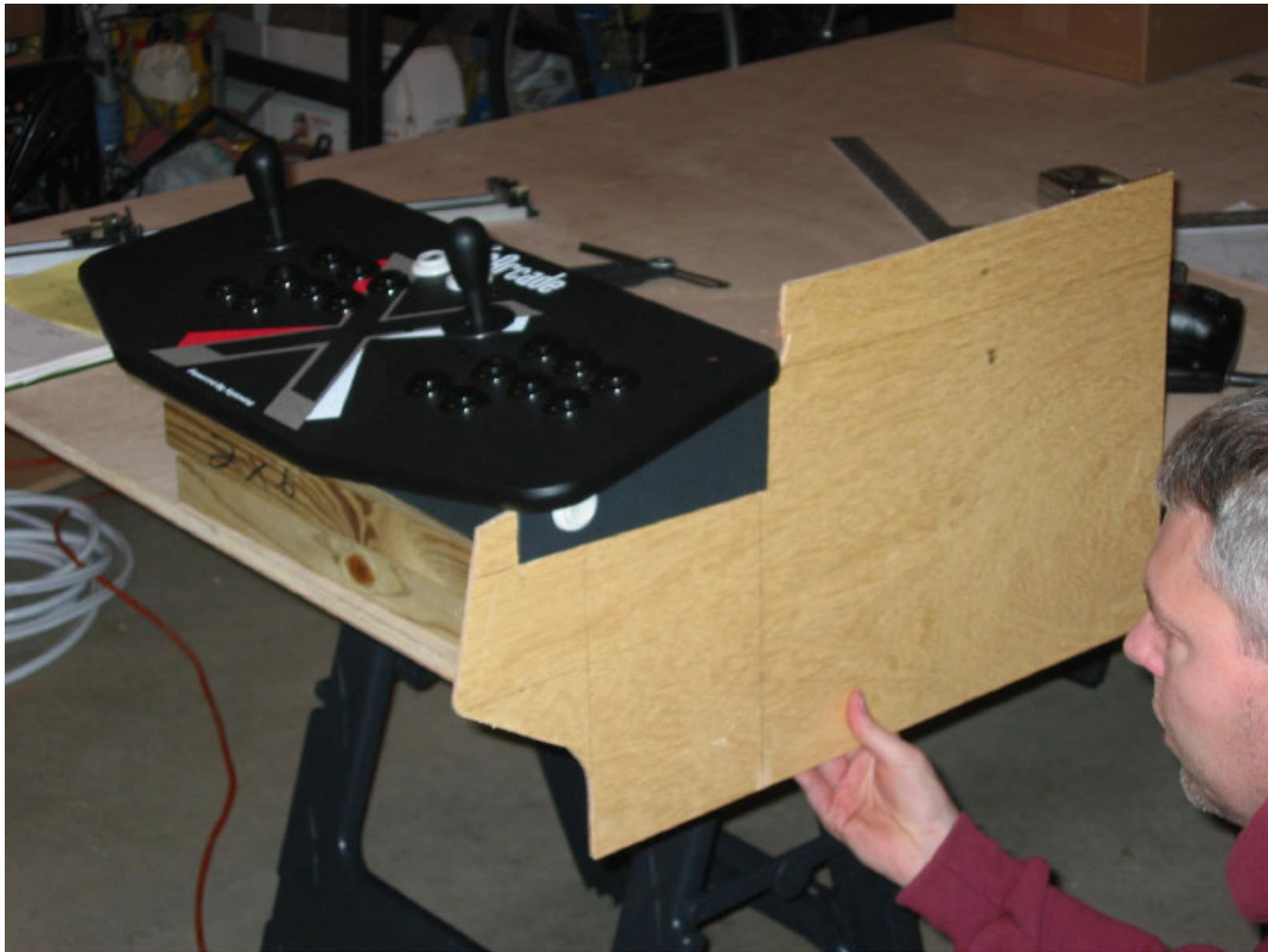






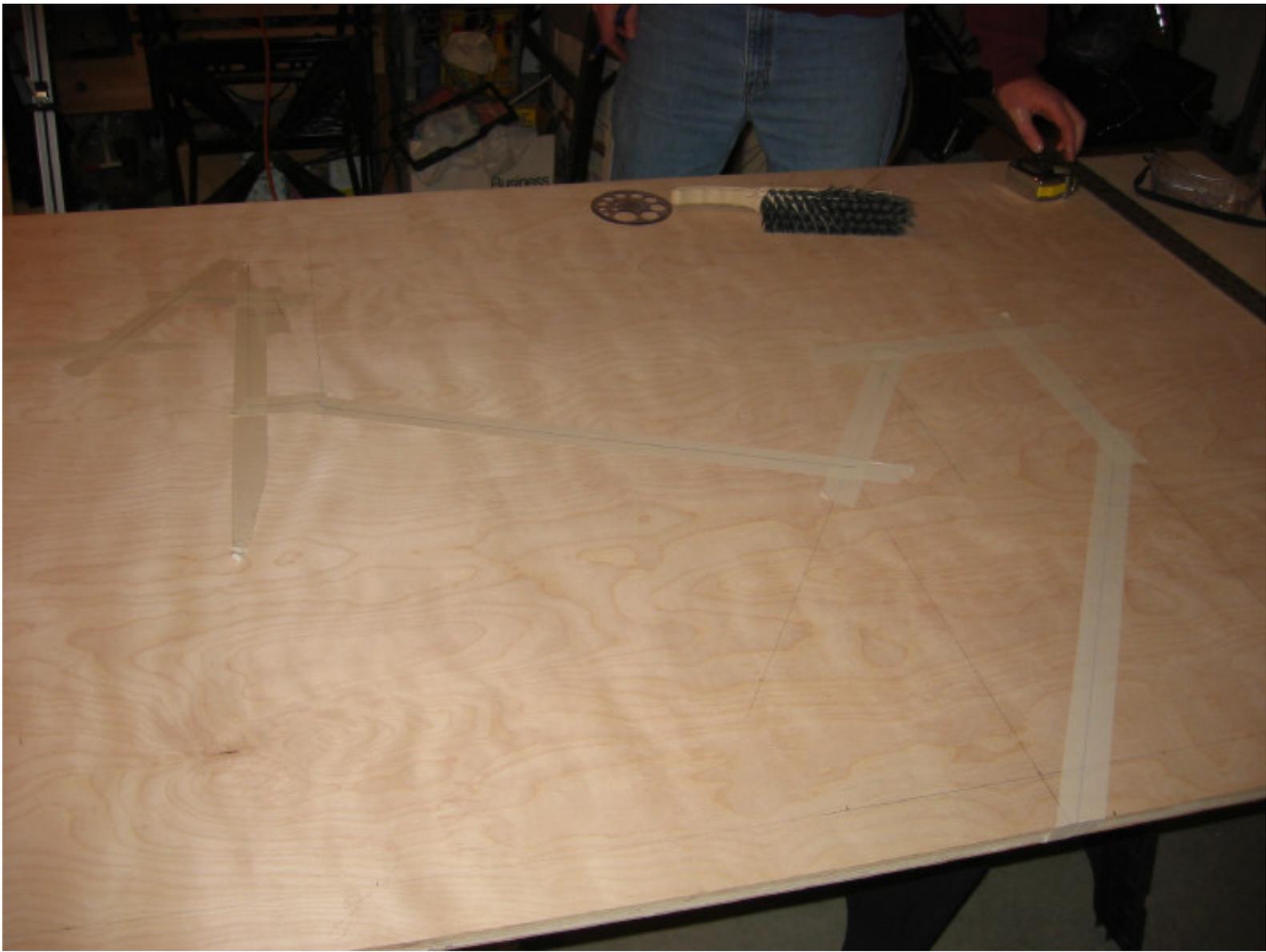


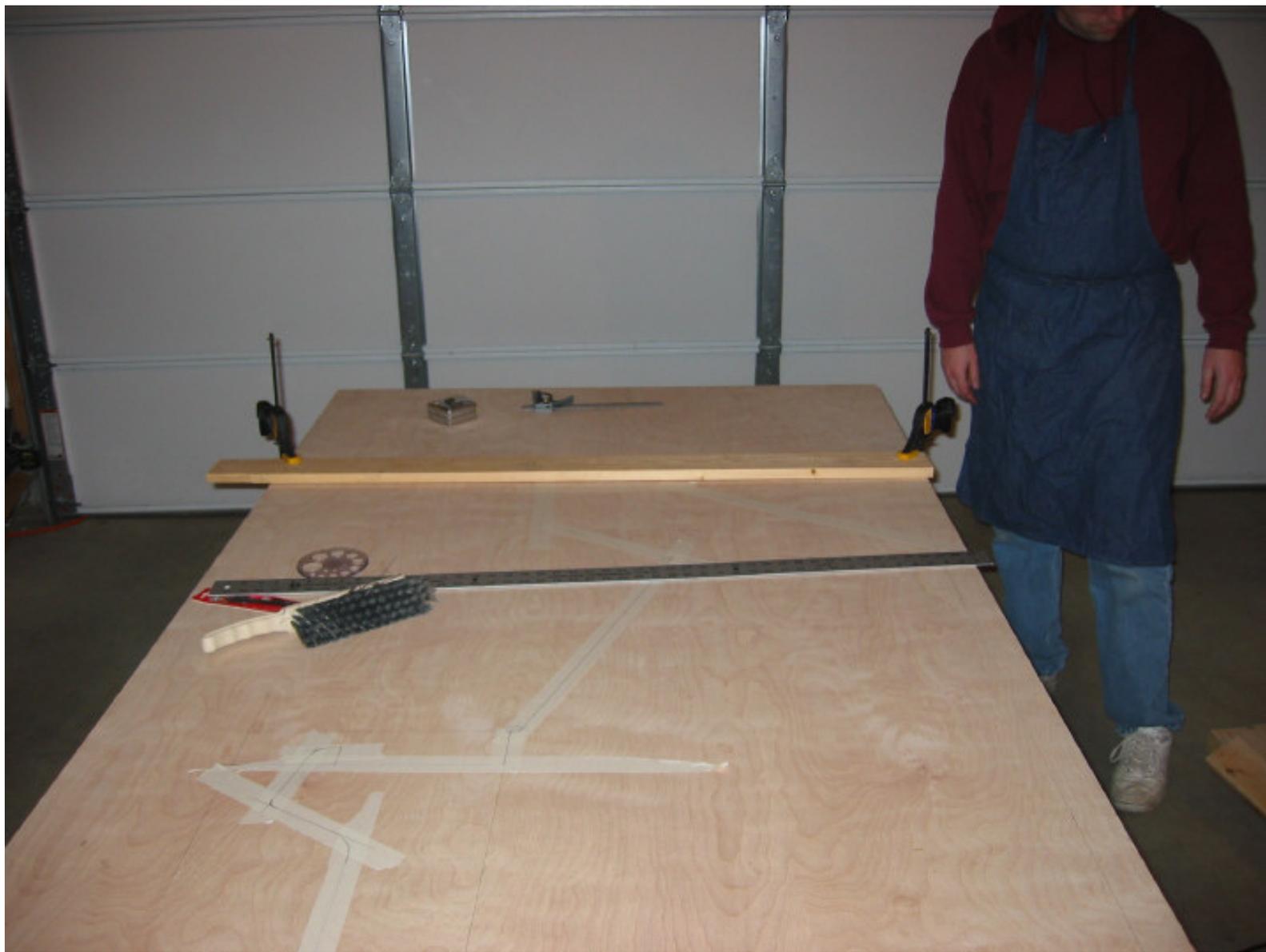






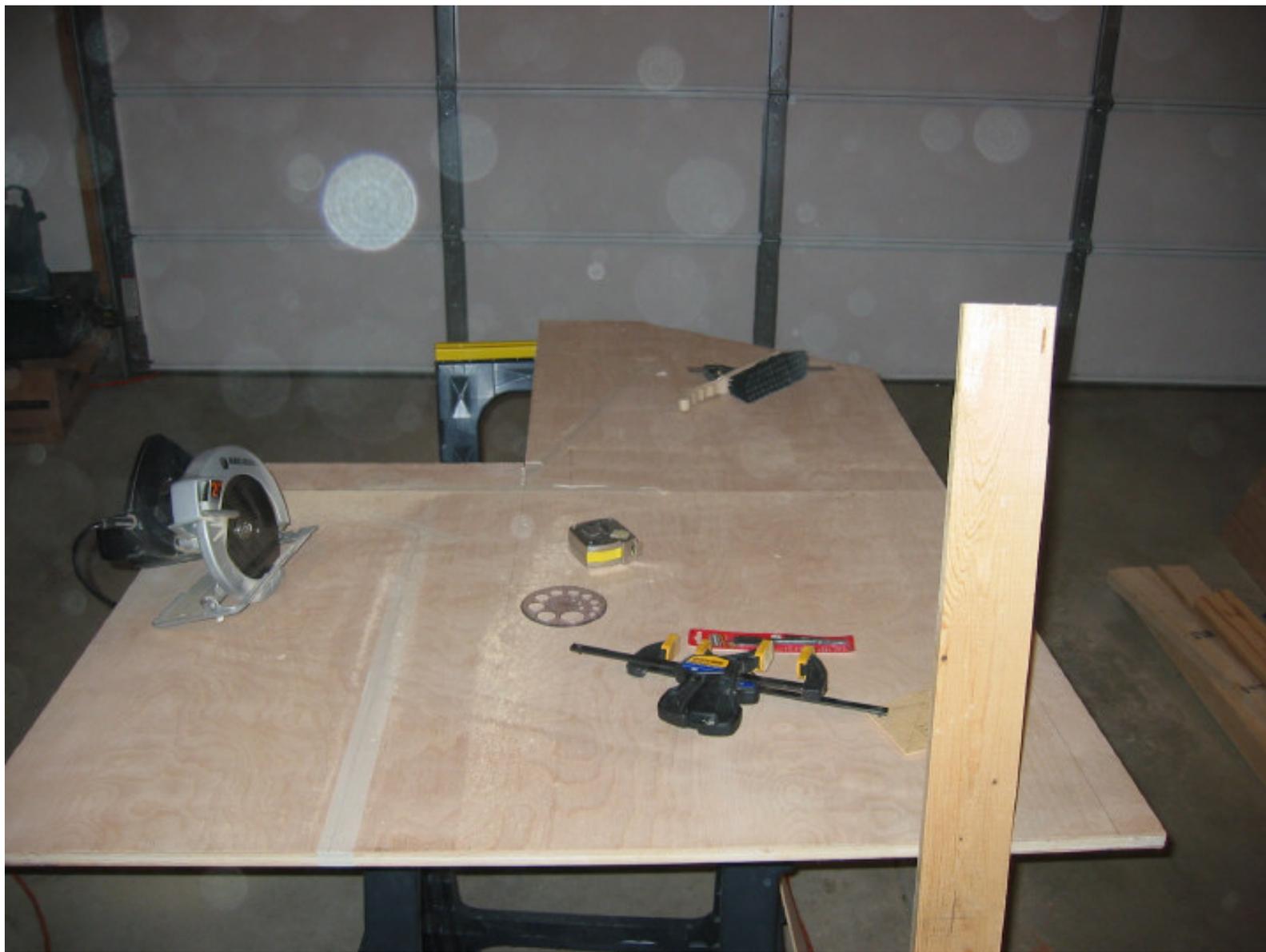












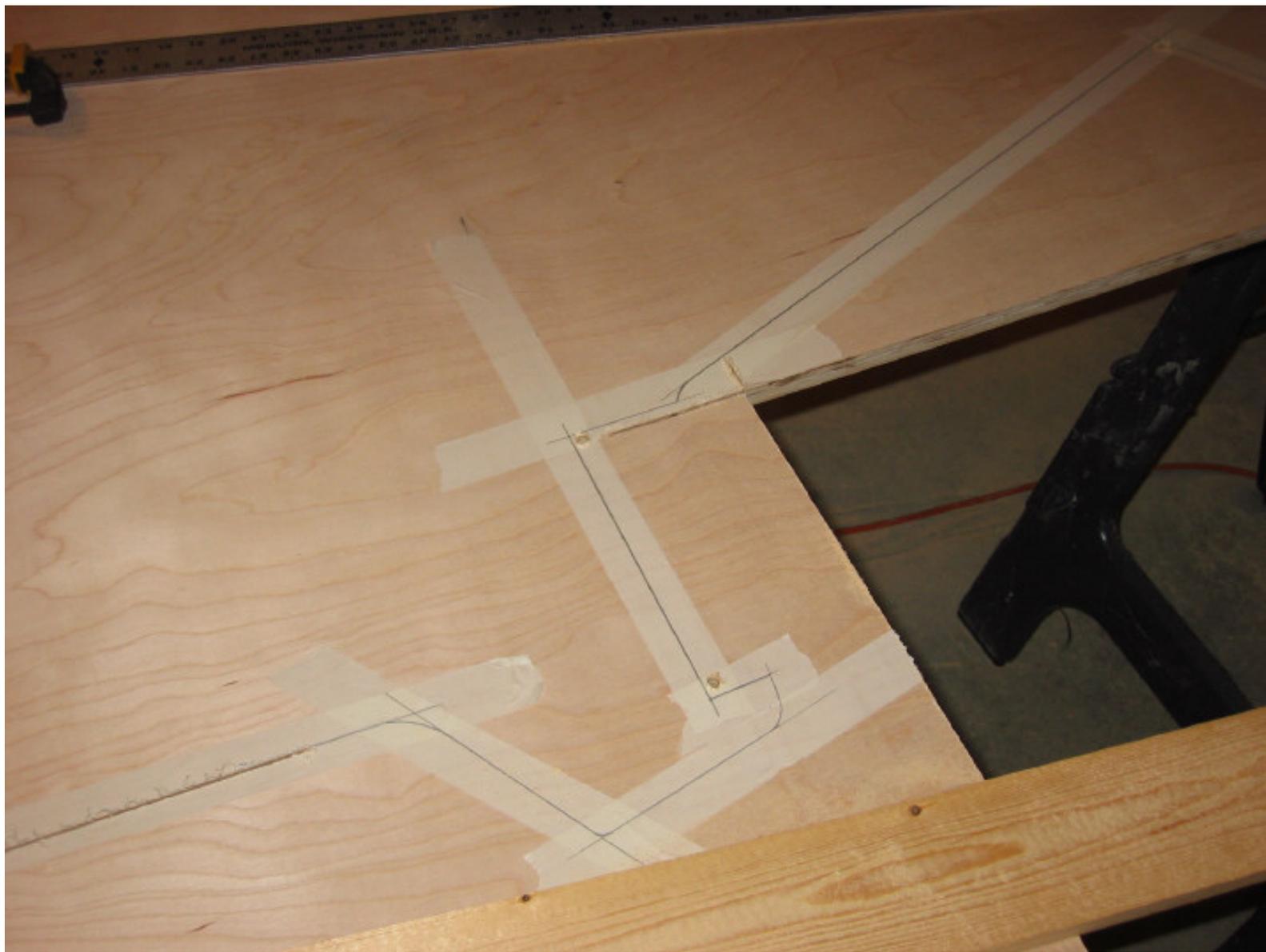






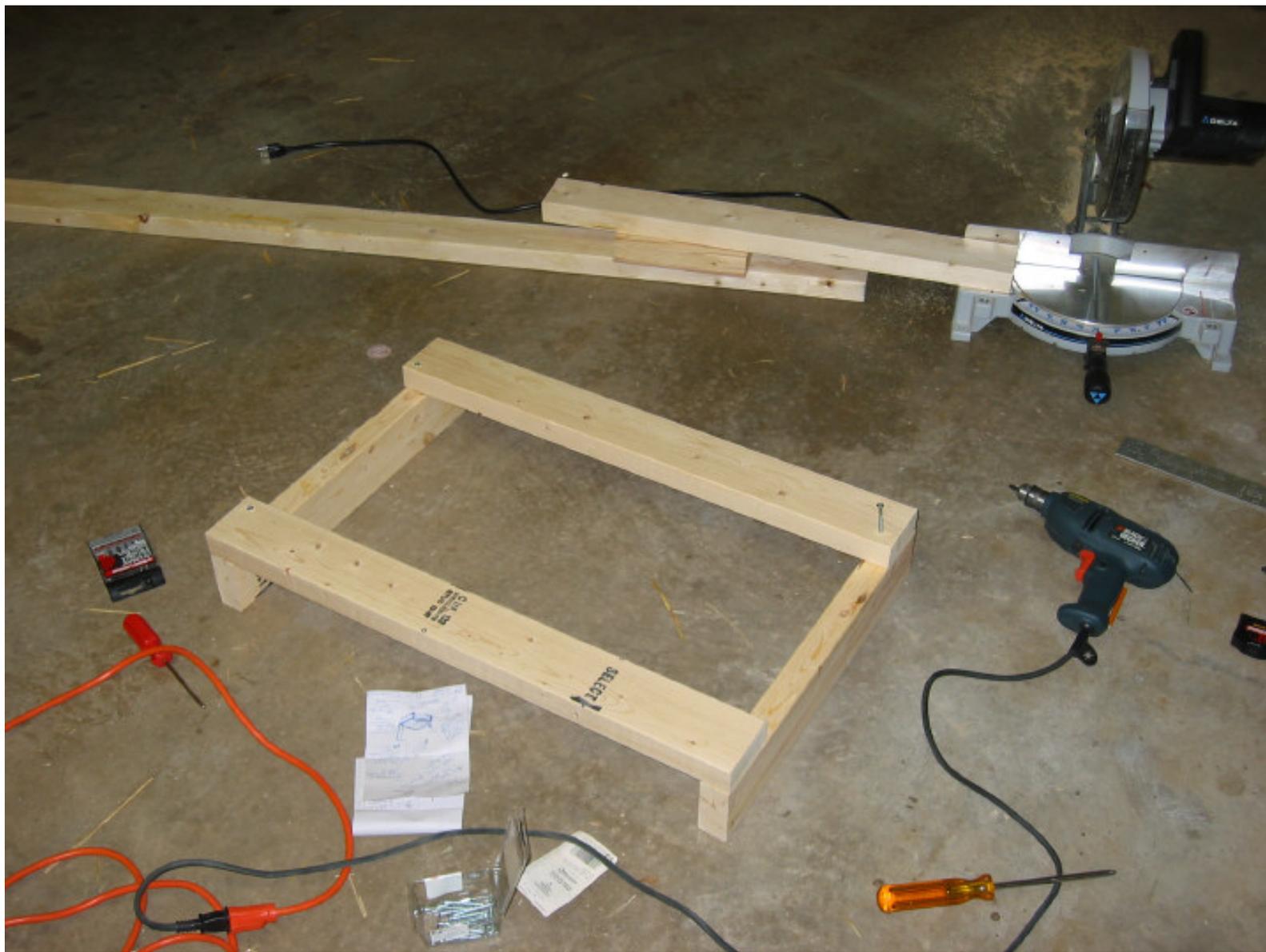
























































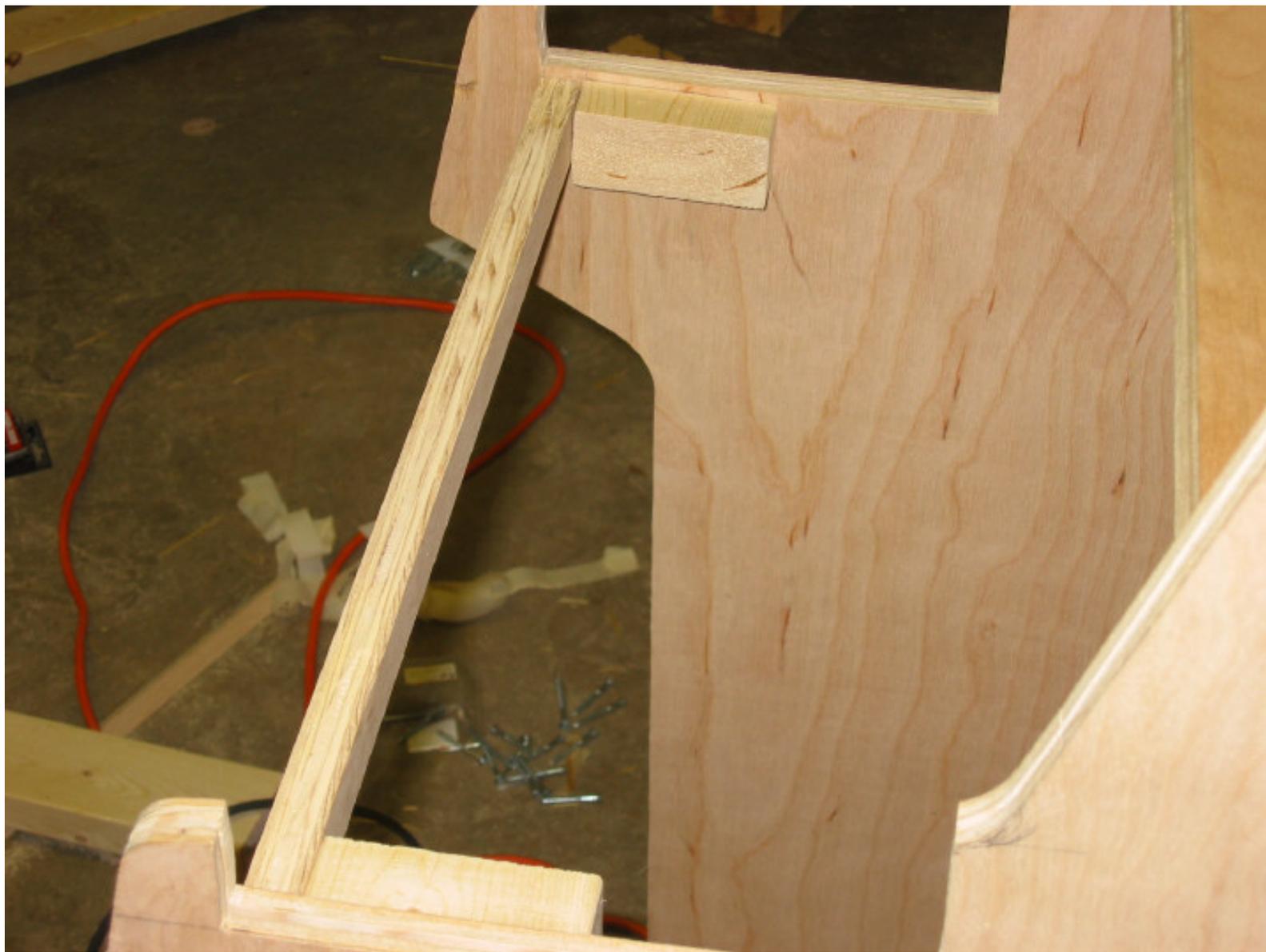


































































































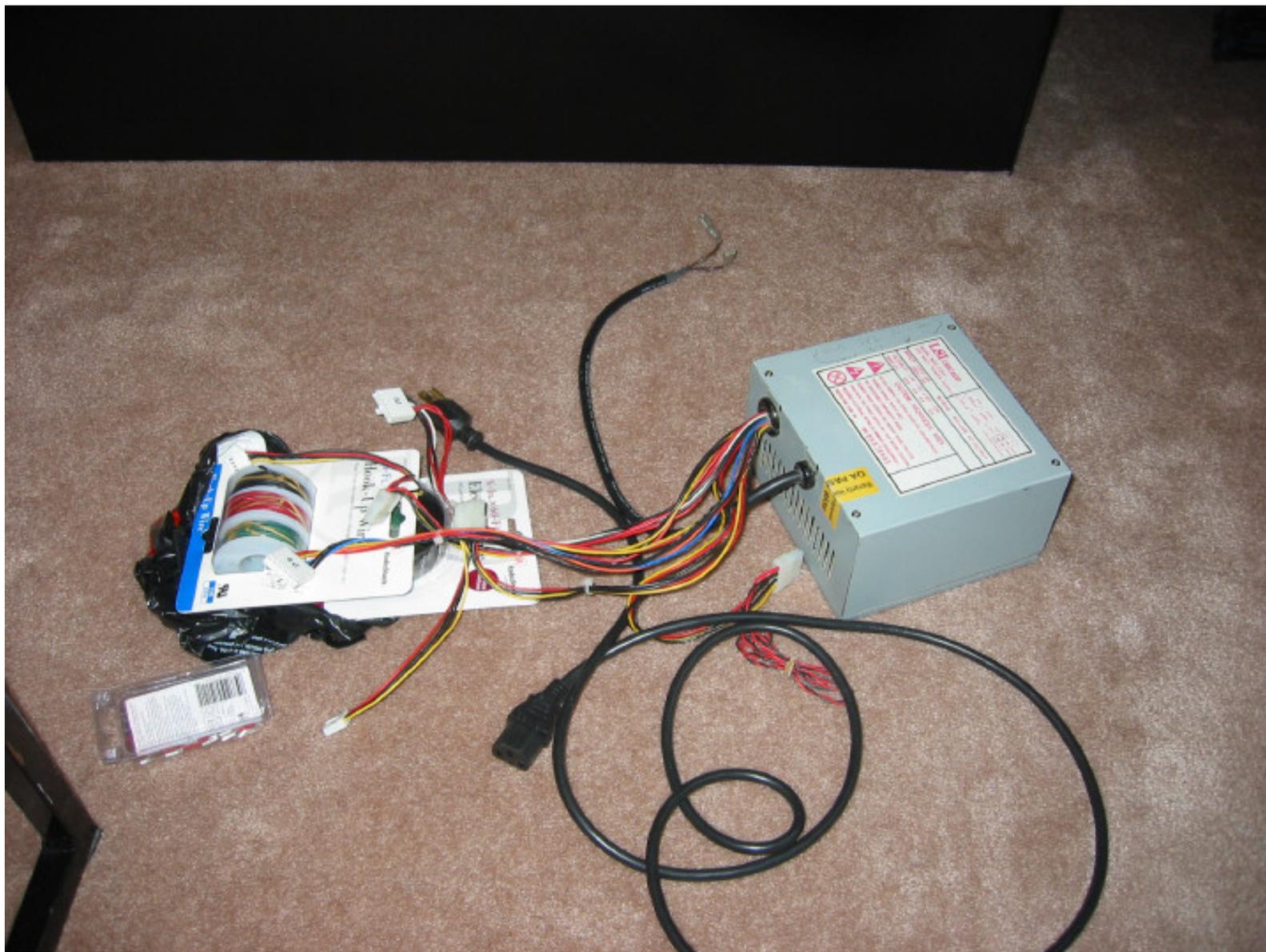




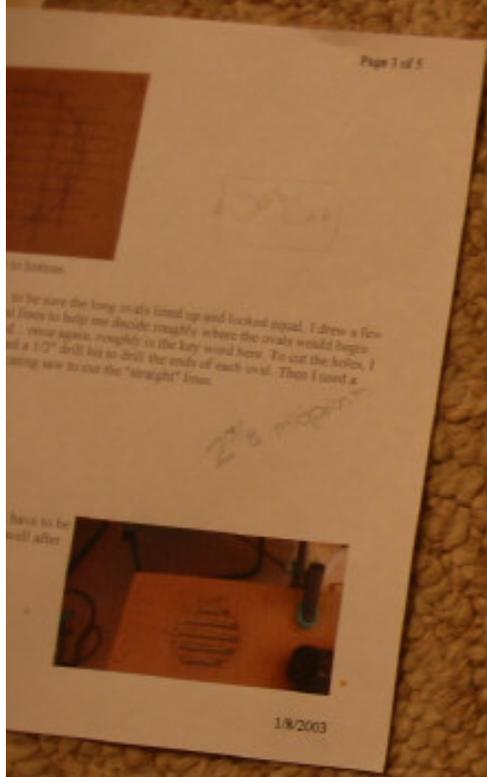
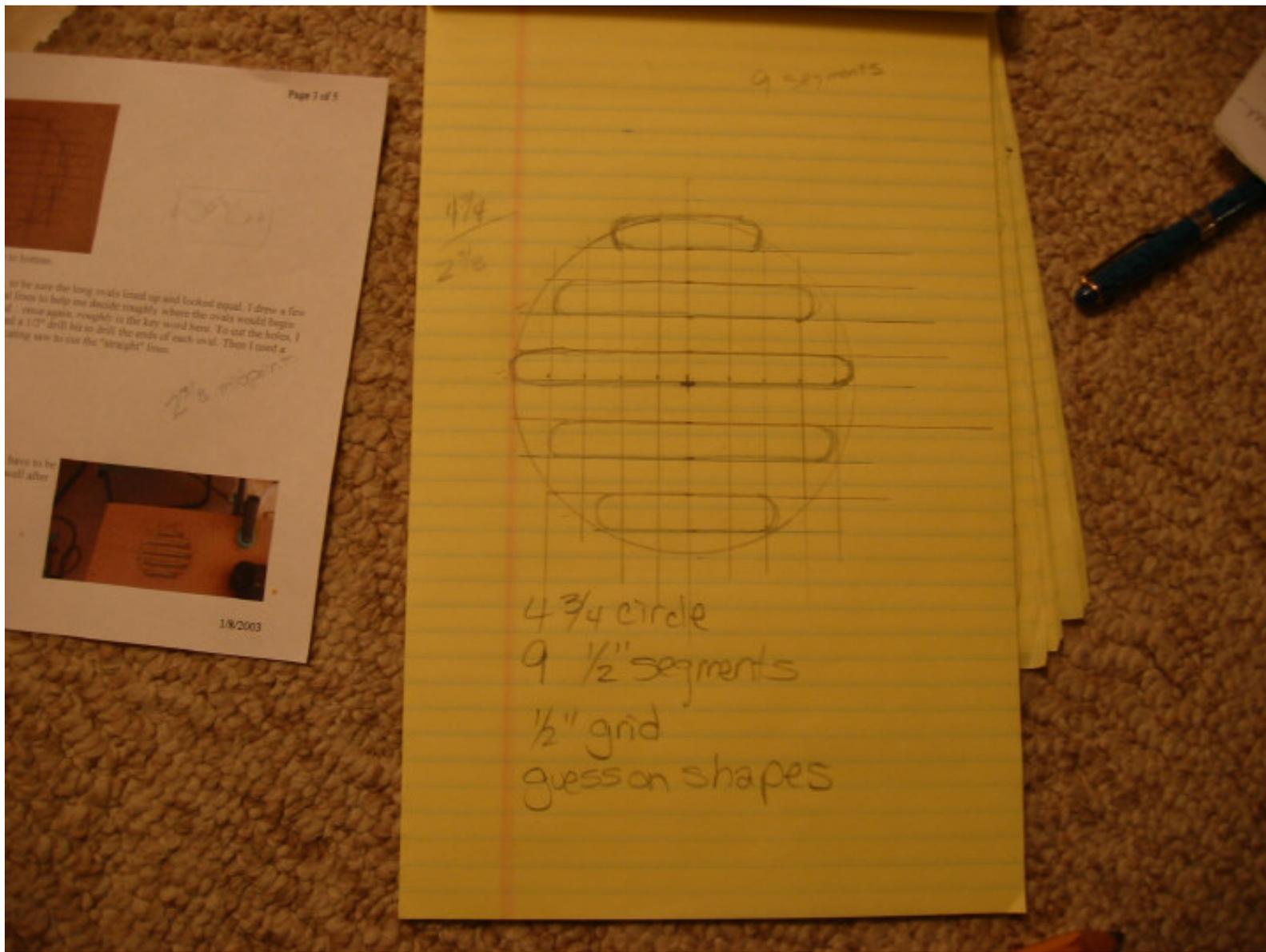




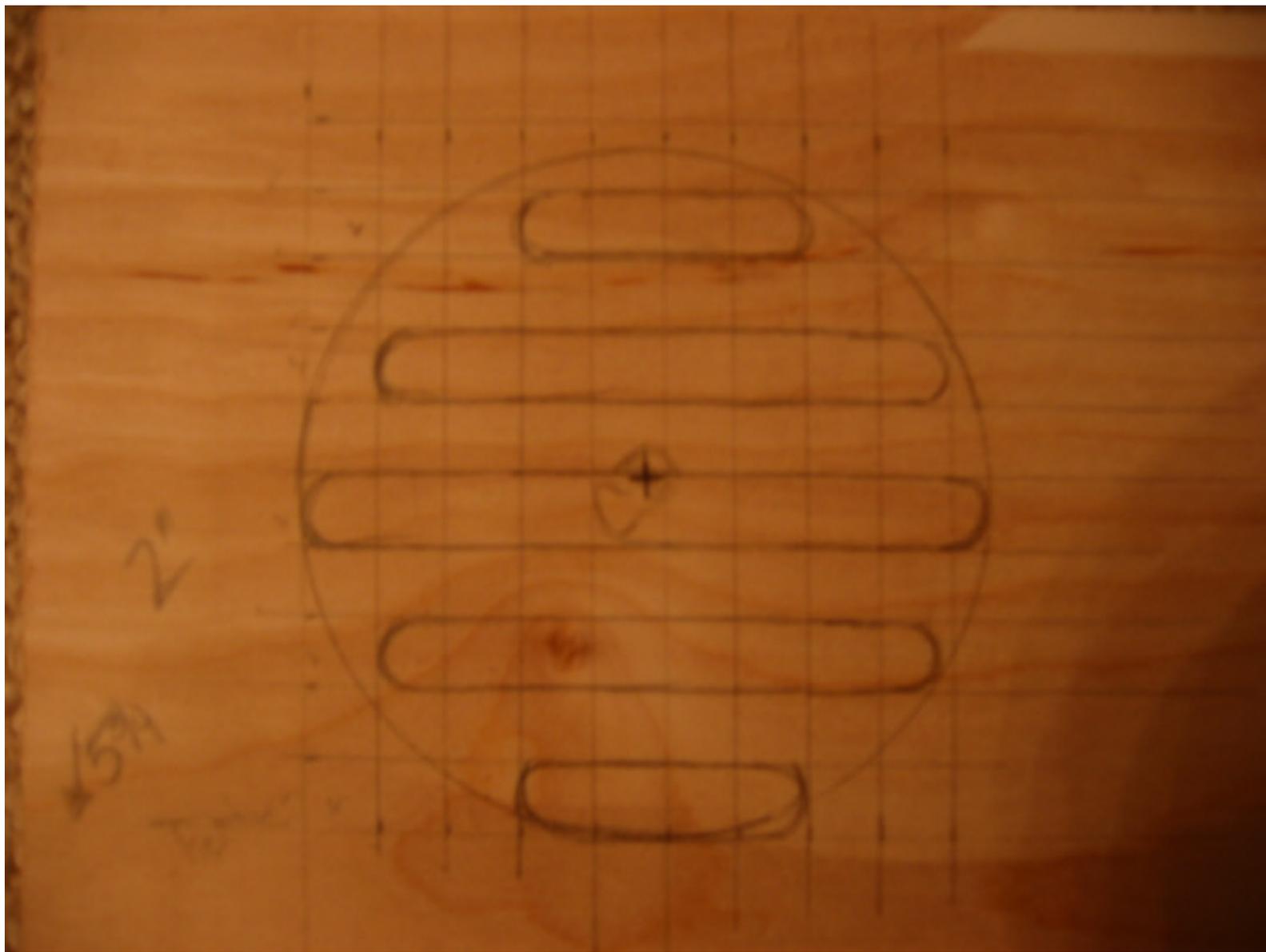






































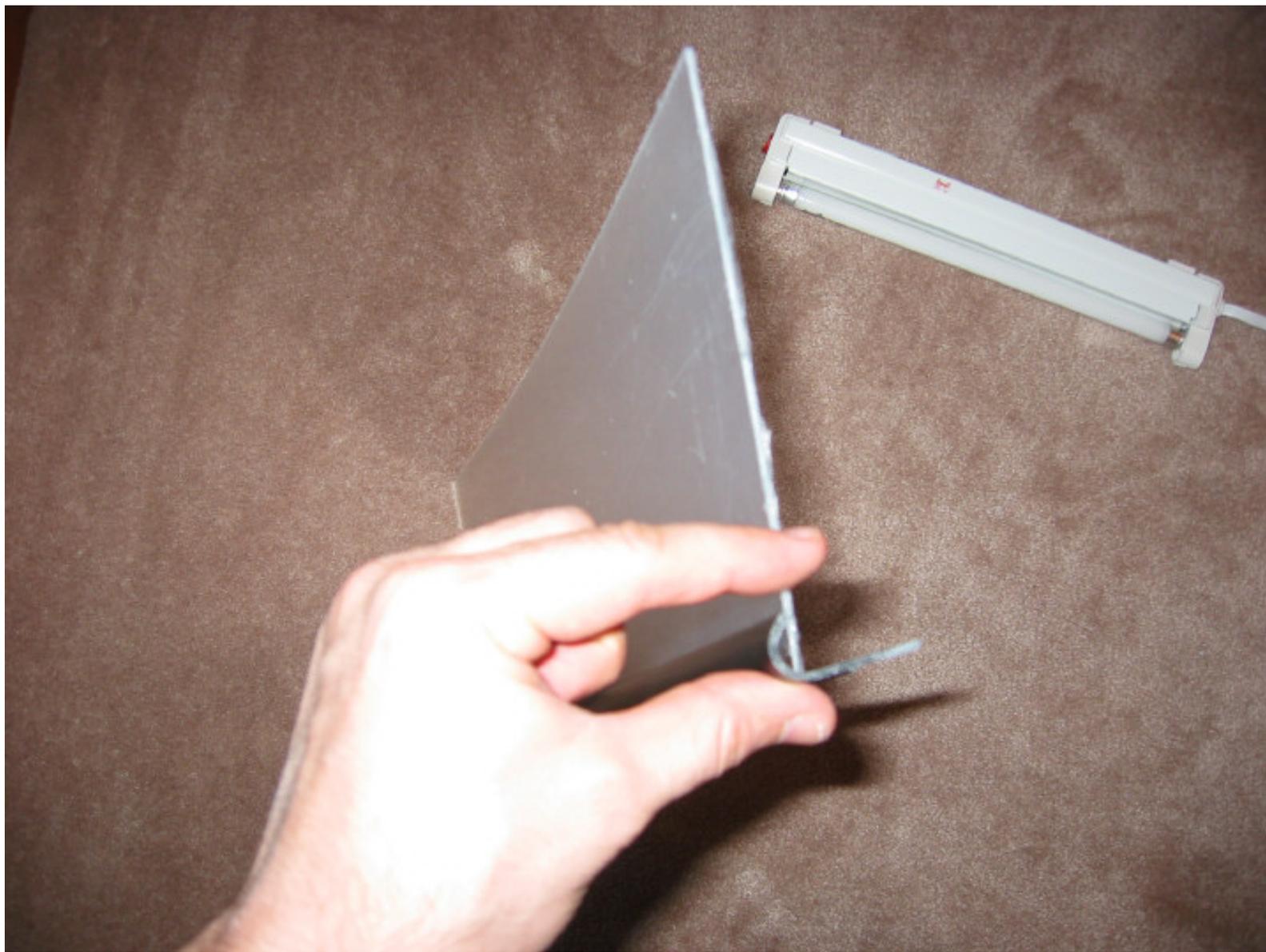


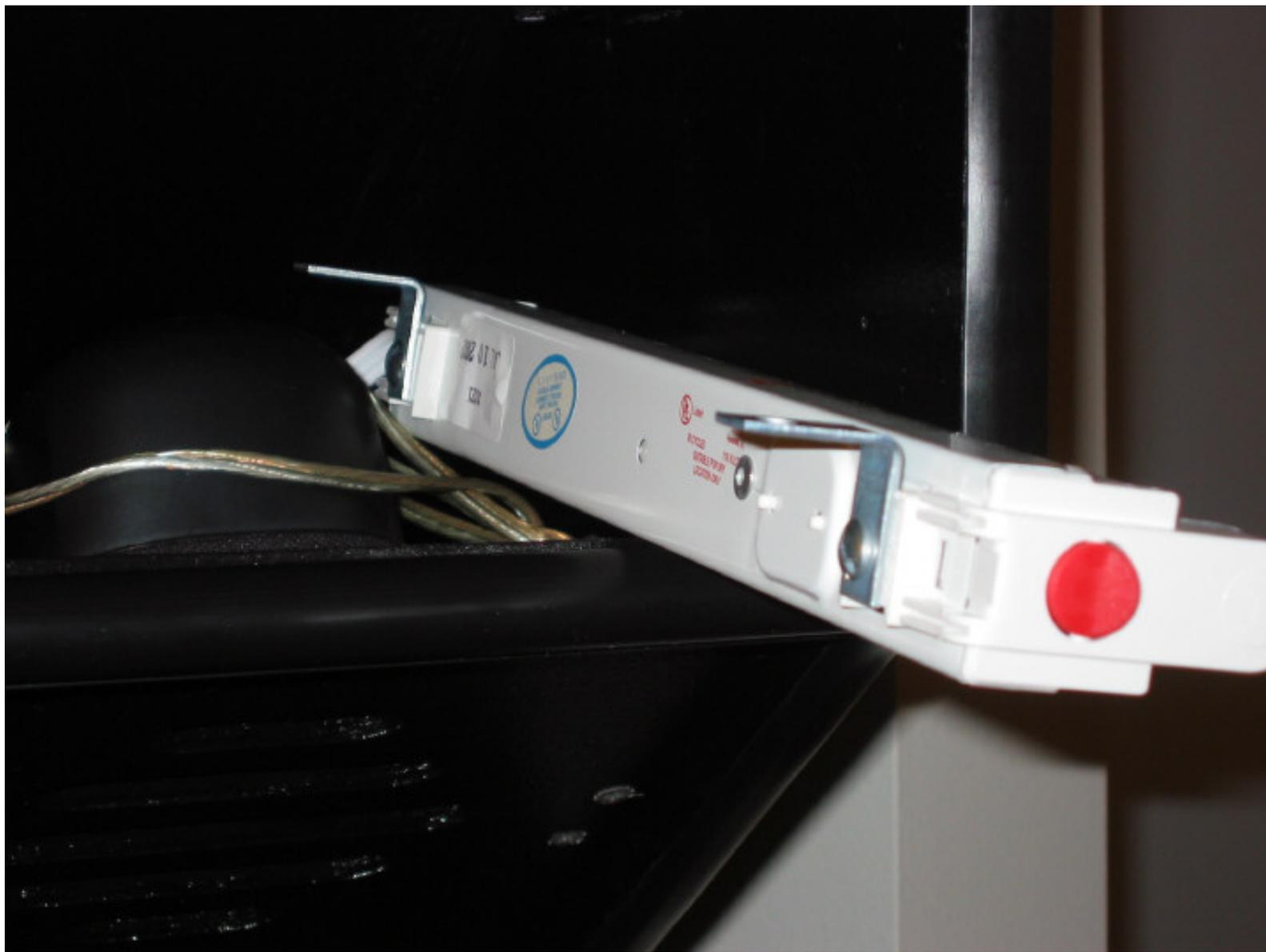
































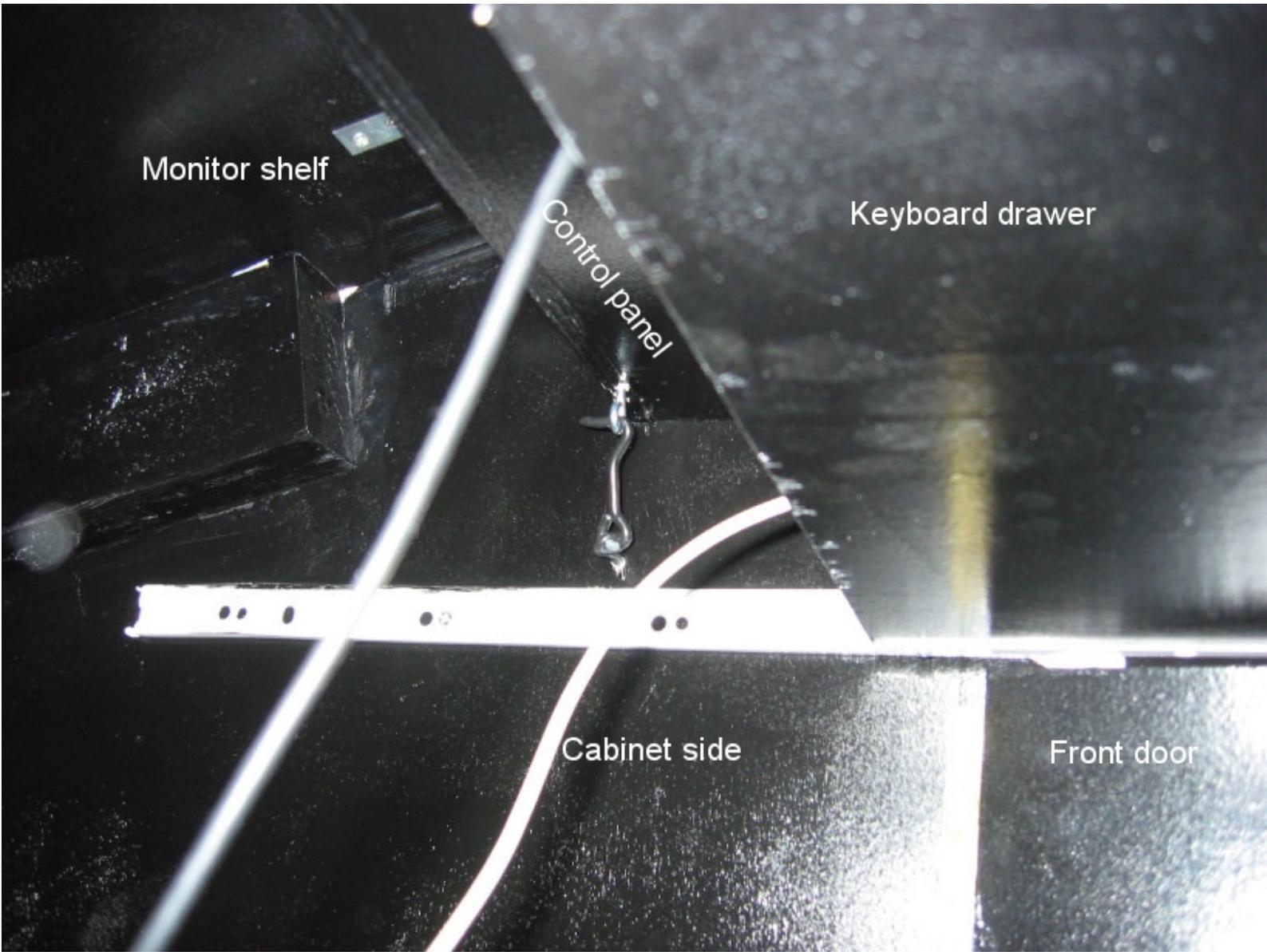


















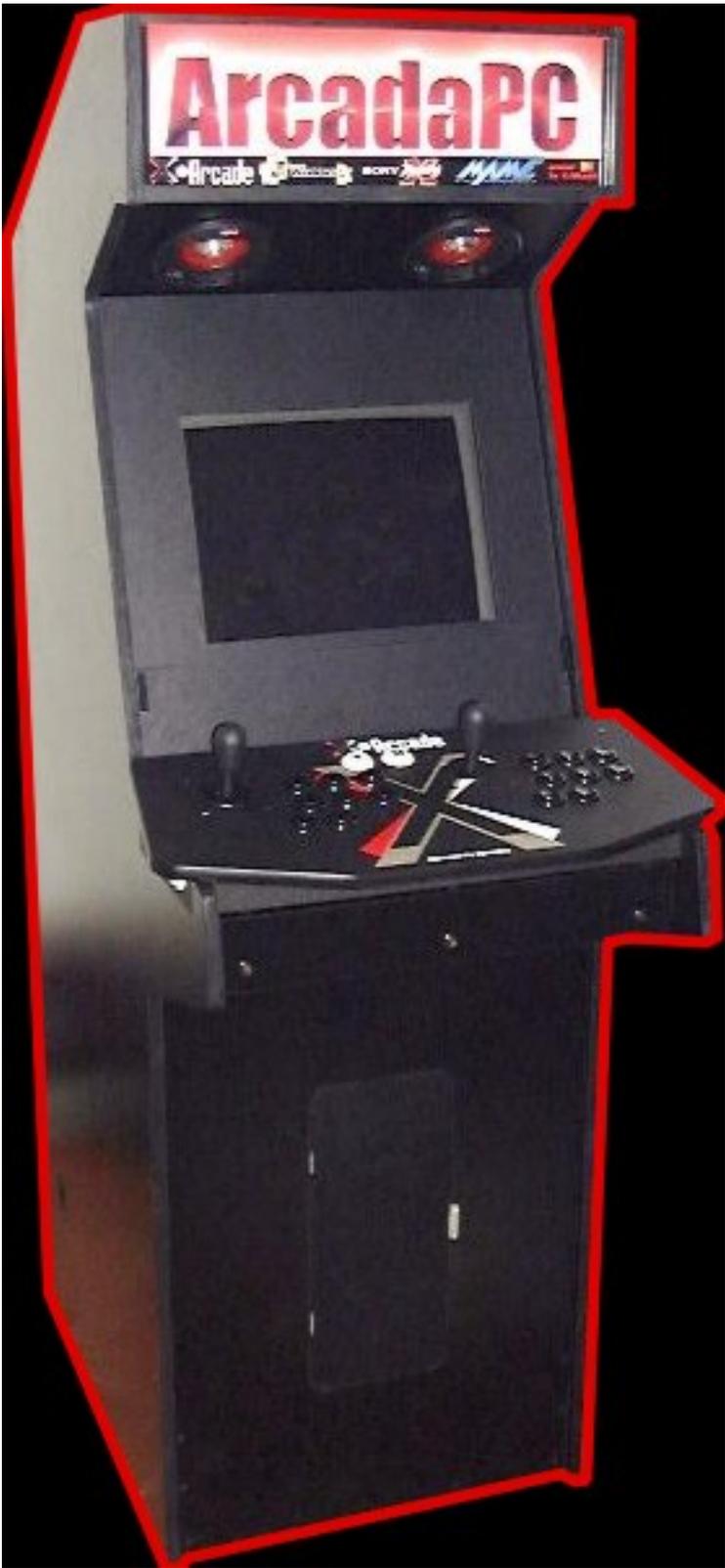


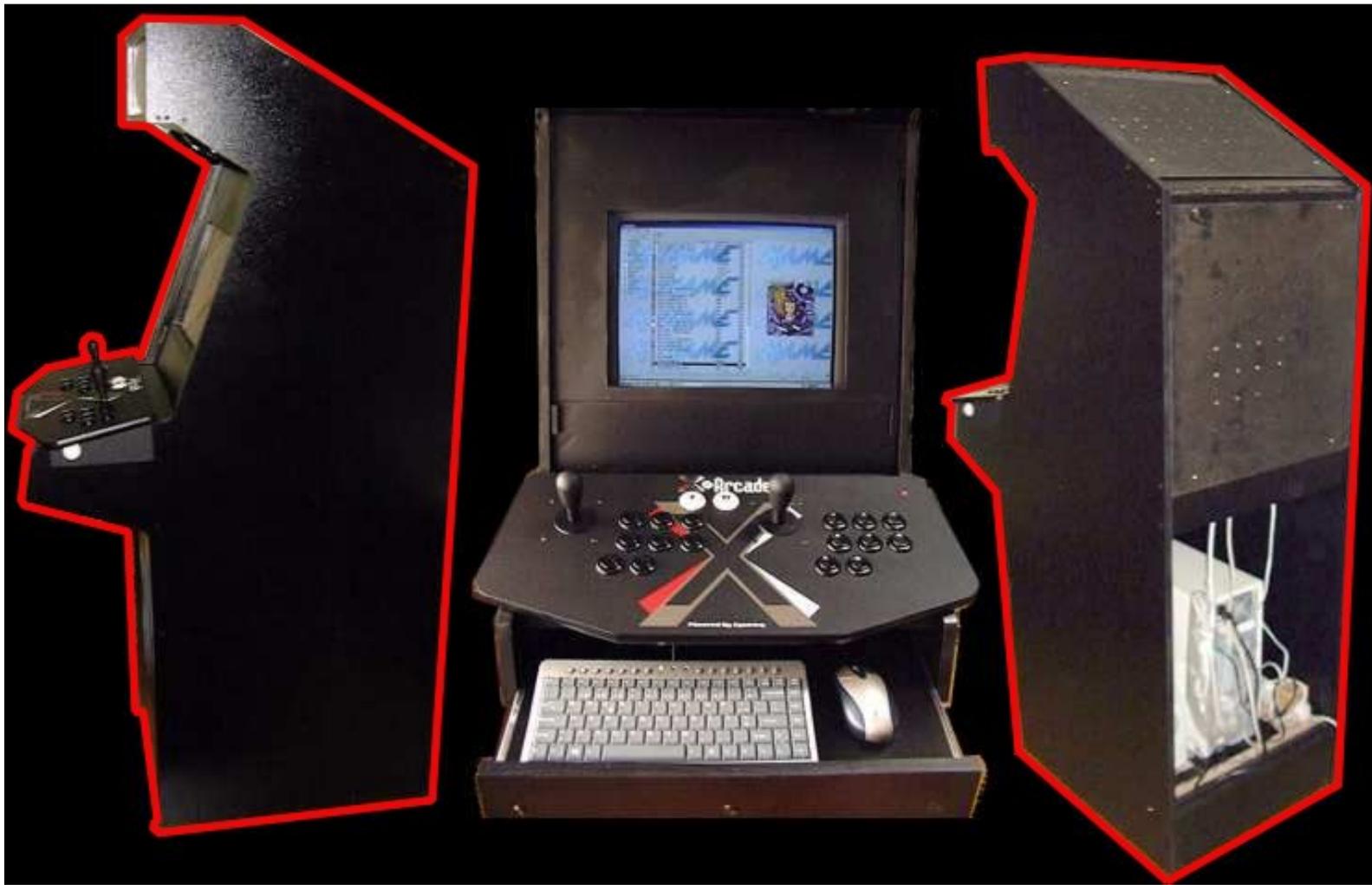


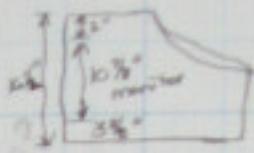
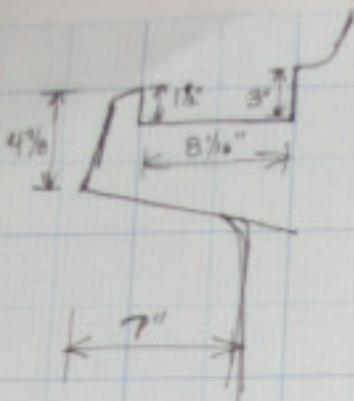












Can order depth panel to transferring to 1/4" ply

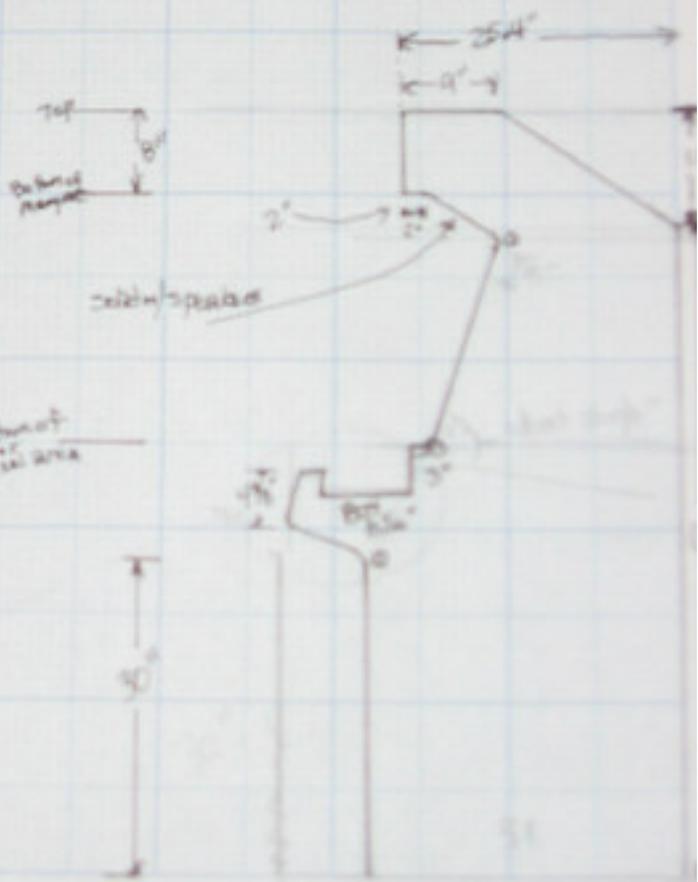
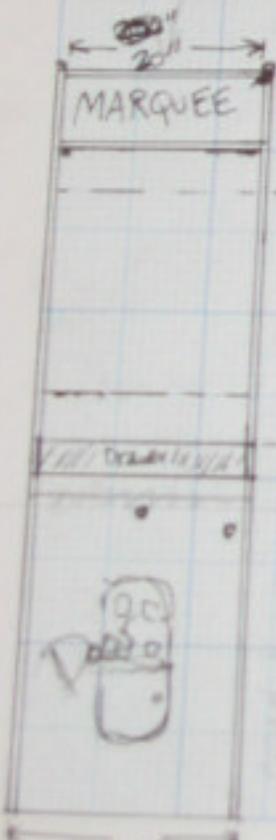
top of monitor platform is 1 3/8" above baseline

handles & recessed door open?



slip top

sides extend 1/2" out - will this make margin?



Bottom of Marquee metal area

Top of drawer

height of drawer

1 bed down

215

Monitor to 16" deep max

Control panel is unframed









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## My Custom Control Panel

### My Control Panel

I didn't want my controller to overpower the cabinet by being too large. However, I did want to include everything needed to play my favorite games. My household plays a lot of 4-way games so that control had to be comfortable to use for long lengths of time. The Oscar spinner was included for a very small pool of games so its location is not optimal for extended play, as you might notice. Overall, I really liked to way the controller turned out.

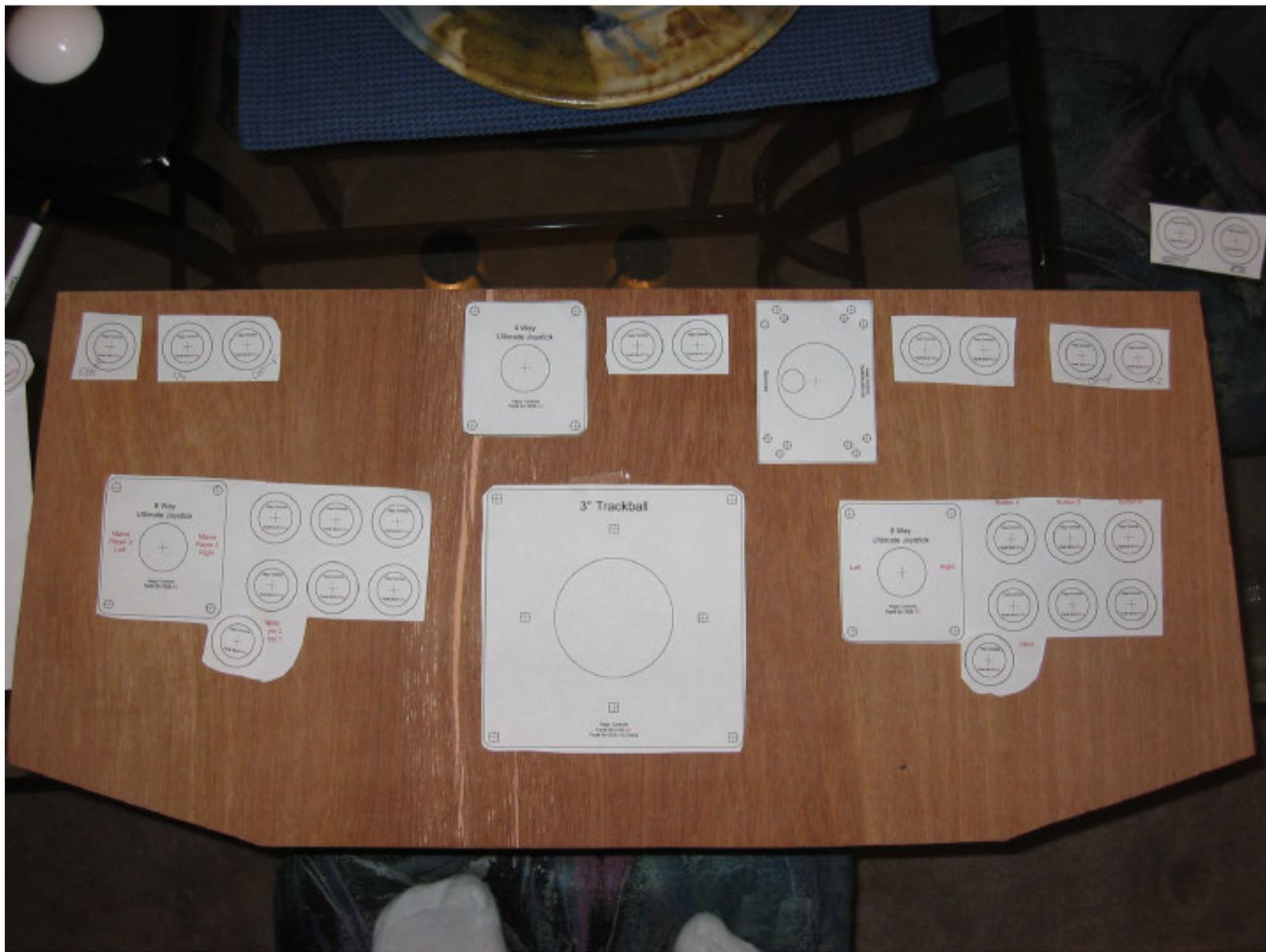
This page shows a simple progression. Click any picture for a larger view. I used an Ultimarc I-Pac2, 2 Happ Competition 8-way joysticks, 1 Happ Universal in 4-way mode, Happ Ultimate Horizontal pushbuttons, Oscar's Pro spinner, and an Imperial 3" PS/2 trackball.

Sorry for this page being so long. When I get time, I plan to change it around a bit.

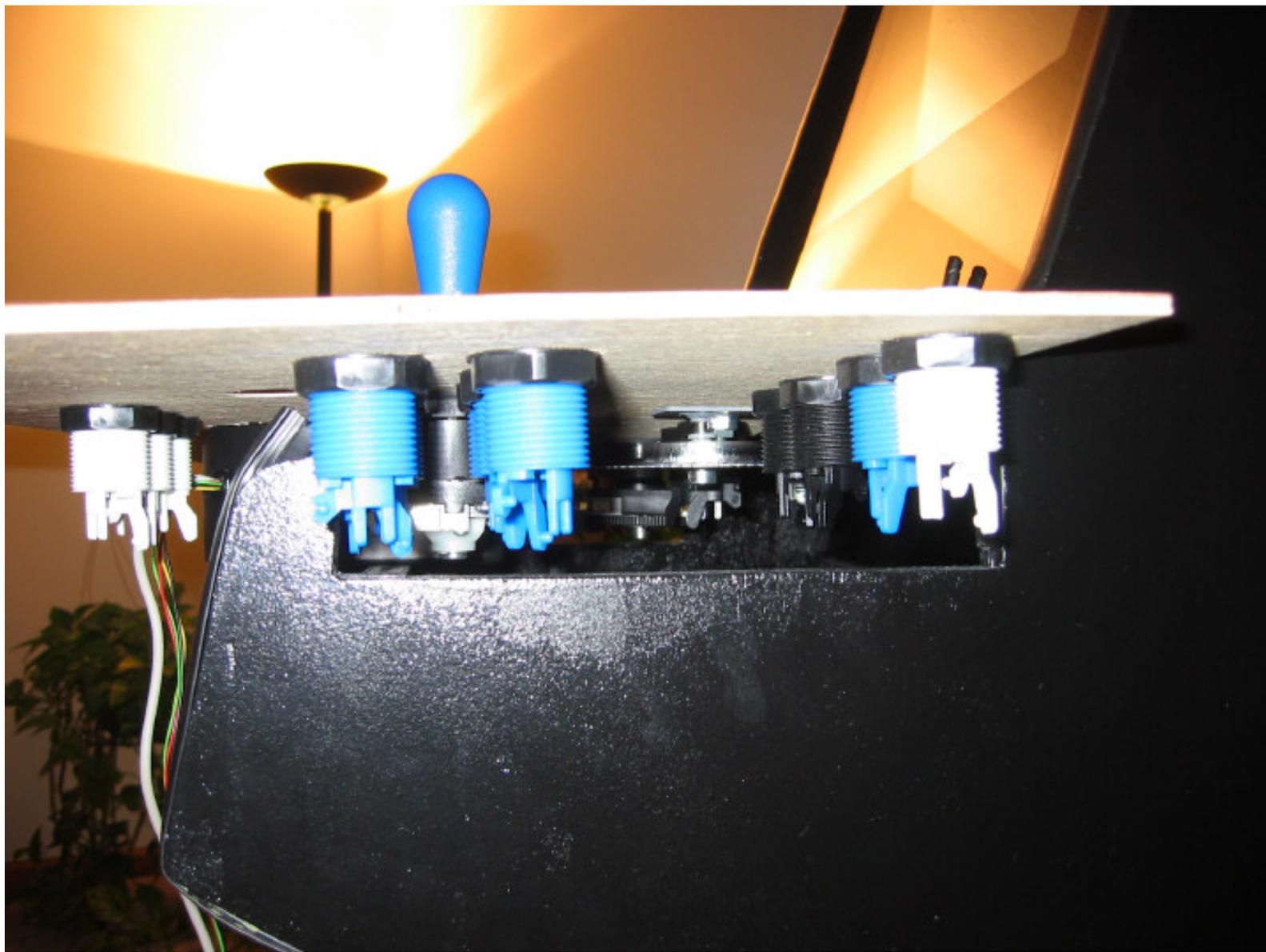
				
I laid out the templates on 1/4" plywood cut to my dimensions. Had the ply lying around the garage. I used <a href="#">this</a> for the templates.		I attached my controls and set it on my cabinet to get an idea of size and how it might eventually fit. The final design changed from this one.		I discovered that the 7th button on each side was going to give me fits connected to the cabinet, so I eliminated it.
				
I had a scrap of 3/4" birch plywood left from my cab, which was just the right size.		Laying out the control templates of the new board. I made final adjustments at this time. Note I removed the TB buttons and the 7th player buttons.		Beginning to drill all the holes. I just used a 1-1/8" spade bit, letting it cool every five or six holes. It chipped out some, but no one can see.
				
After the panel has been rough cut.		Ready to flush-cut the front face with a template my friend was kind enough to construct for us. This is the underside.		Another template my buddy made. That's him posing with the trackball template (and band-aided ouchie).
				

<p>We routed out the backside of the joysticks a little over 1/4". Not the cleanest square you'll ever see but worked well.</p>	<p>The top resting on a simple base constructed out of 1/2" birch ply. Overkill, but I wanted the same finish as the cabinet had.</p>	<p>I wanted to get an idea how large it would look in place and to also see where to make my underside cuts.</p>
		
<p>The painted CP. No T-molding has been installed yet.</p>	<p>This is the underside of the base. Note the slots that will allow it to fit onto my cabinet arms, nice and snug.</p>	<p>An inside view that shows the base slots and the 3/4" hole out the back for wires to exit.</p>
		
<p>The CP with everything installed except for the trackball. This has 3 coats of paint on it.</p>	<p>The CP in place. Black paint really shows the fingerprints with a flash. Notice how it sits nicely in place.</p>	<p>Beginning the wiring. What a mess. This was my first experience with wiring anything. This shows the hinges that allow it to open at the front.</p>
		
<p>Wiring is further along. I tried to organize it some.</p>	<p>Trying it out for the first time with a little Golden Tee II. The next pic shows how I secured the CP on the backside to keep it from flipping up during hard play.</p>	<p>I secured the CP in place with two hooks, one on either side. I first dipped the hooks in <a href="#">Rubberize-It!</a> to keep rattling to a minimum.</p>
		
<p>A picture of the cabinet in its current state.</p>	<p>The dimensions of the controller are included above. Not the prettiest but should help.</p>	<p>A top view of the controller. Left and right mouse buttons are wired as Player-1's 5 and 6 buttons.</p>

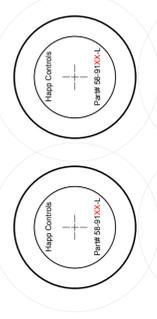
			
<p>Tiger Woods 2003 has been getting some play time. Is very easy to play with the trackball and the left mouse button.</p>		<p>Another view of TW2003. This is a serious time waster.</p>	<p>Of course, Dragon's Lair (via <a href="#">Daphne</a>) gets some of my attention. One of the reasons I built this cabinet.</p>
			
<p>Dragon's Lair again, from a different view.</p>		<p>Robotron 2084 gets a fair amount of play. It is a real adrenalin rush.</p>	<p>Robotron, again.</p>







Player 1  
(1)



Player 2 (2)



Player 1  
Coin Up (5)



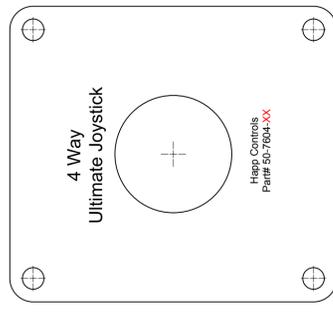
Player 2  
Coin Up (6)



Left Control



Left Alt

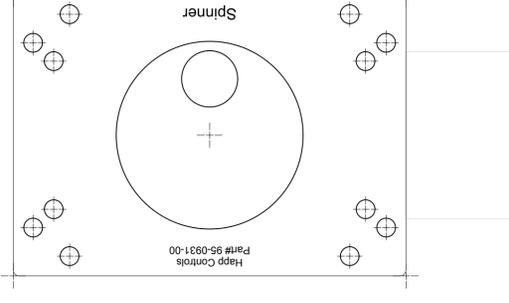
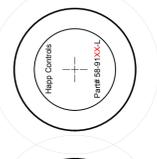
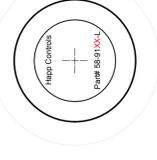


4 Way  
Ultimate Joystick

Happ Controls  
Part# 50-7608-XX

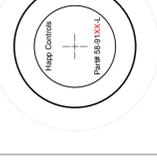
Left Control

Left Alt

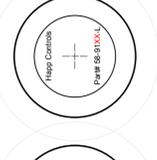


Happ Controls  
Part# 95-0931-00

Spinner



Left Control

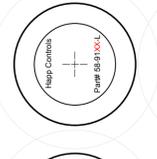


Left Alt

Enter



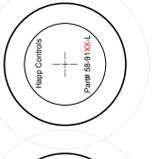
Esc



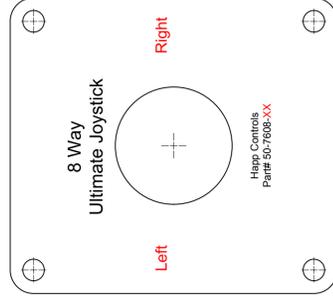
~ (Config menu)



Pause (P)



Up



8 Way  
Ultimate Joystick

Happ Controls  
Part# 50-7608-XX

Left

Right

Down

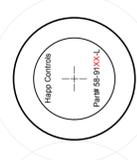
Mame  
Button 4



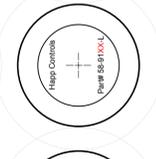
Mame  
Button 5



Mame  
Button 6



Left Alt



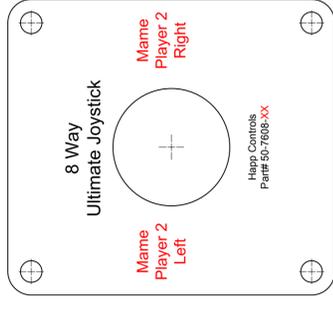
SpaceBar



Left Control



Mame  
Player 2 Up



8 Way  
Ultimate Joystick

Happ Controls  
Part# 50-7608-XX

Mame  
Player 2  
Left

Mame  
Player 2  
Right

Mame  
Player 2  
Down

Mame  
Player 2  
Button 4



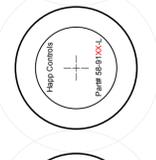
Mame  
Player 2  
Button 5



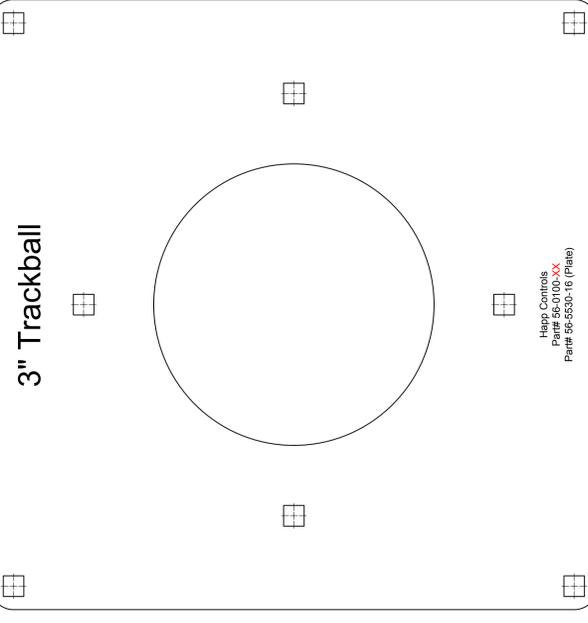
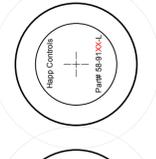
Mame  
Player 2  
Button 6



Mame  
Player 2  
Button 2

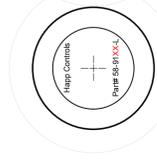


Mame  
Player 2  
Button 3

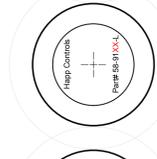


3" Trackball

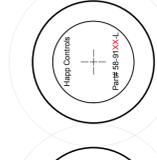
Happ Controls  
Part# 55-0700-XX  
Part# 55-5530-16 (Plate)



Mouse 1



Mouse 3



Mouse 2

17"

32"











