



Introduction

Thank you for your interest in building a miniMame half-size arcade cabinet. This document is intended to walk you through the construction process of building one yourself.

Because of the various skills required, I can't guarantee that yours will turn out or at what level of quality. I will try to communicate as many details as possible to help yours turn out to be a well-built cabinet.

You **must** be very comfortable using a circular saw. There are a few unusual cuts that must be made with it. This is a very dangerous tool. If you are not completely familiar with its operation and comfortable using it, you should not attempt this project without help.

You should plan on reading this document from beginning to end before starting your miniMame cabinet. It's very important that you have the whole build process familiar in your mind as you are progressing. This will help you avoid mistakes and actually help you get the project complete in a very short period of time.

Throughout the document I have added sections called 'Building Tip's. These are usually things I have learned along the way because I messed something up and had to do it again. Hopefully these will help you avoid making the same mistakes.

At the end, I've put some references to web sites you may want to visit to get controls and other information. I also added a cost summary for the items I had to purchase to give you an idea of the material costs.

Planning

As previously mentioned, read this document from beginning to end and make sure the whole process is clear. If something is not clear to you, feel free to email me at info@minimame.com and I will try to help clarify.

Ideally you should try to purchase everything you will need so that you don't get stuck waiting for materials. Some materials have to be ordered and will take a week or two to arrive. Most people will not purchase everything up front though, so reading the whole document will give you an idea of what you will need and when.

You should print this document out and have it with you to refer to while building.

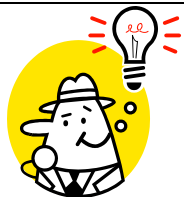
Building Materials

- Qty:1 48" x 96" sheet of 1/2" particleboard
- Qty:1 48" x 96" sheet of counter top laminate
- Qty:1 48" 2x4 pine stud
- Qty:1 48" 2x2 pine strip (these are actually about 1 1/2" square)
- Qty:12 1 1/2" drywall screws
- Qty:12 3" drywall screws
- Box of 1/2" wood screws.
- Qty:2 3" fence hinges or self-closing cabinet hinges
- (Optional) lever type lockset for the back door.
- Wood Glue
- Repositionable spray adhesive
- Qty:18 L-Brackets (appx. 3/4" tabs x 1" wide)
- Qty:4 24" long 1/2" dia. wood dowels
- 1 quart laminate adhesive
- 3" chemical resistant paint brushes
- Flat black paint
- 1 quart drywall mud

Tools

<input type="checkbox"/> Circular Saw	<input type="checkbox"/> Framing Square	<input type="checkbox"/> Jigsaw
<input type="checkbox"/> 4 or more Clamps	<input type="checkbox"/> 48" straight edge*	<input type="checkbox"/> Drill
<input type="checkbox"/> Router	<input type="checkbox"/> Slot cutting bit	<input type="checkbox"/> Laminate trim bit
<input type="checkbox"/> Saw horses	<input type="checkbox"/> Extension Cord	<input type="checkbox"/> Tape Measure
<input type="checkbox"/> Scissors	<input type="checkbox"/> Belt / Orbital sander	
<input type="checkbox"/> Laminate knife	<input type="checkbox"/> 3" laminate J-roller	

*note: you can use a 48" piece of MDF molding as a straight edge. It is inexpensive and straight enough for this project.



Building Tip

Remember the carpenters rule:
Measure twice, cut once.

A Note about Dimensions

The dimensions shown on the plans are from my prototypes. Because of the somewhat imprecise methods we are using for cutting out our pieces (circular saw) you may have to compensate slightly. Use these dimensions as a guide but you should double check by measuring your unit prior to cutting.

Section 1 – The Frame Assembly

Side Panels

[] Check to see that your 48" x 96" sheet is very close to square. They usually are but you should double check.



Building Tip

You can check that any piece is square by measuring it on both diagonals. If both measurements are the same, the piece is square.

[] Cut your 48" x 96" sheet of particleboard in half so you have two pieces each 48" x 48" in size. You should use a straight edge to get your cut square and straight.

You need to measure your circular saw's offset of the blade from the edge of the blade guide. In my case it is 1½" on one side and 3½" on the other side of the blade.



Building Tip

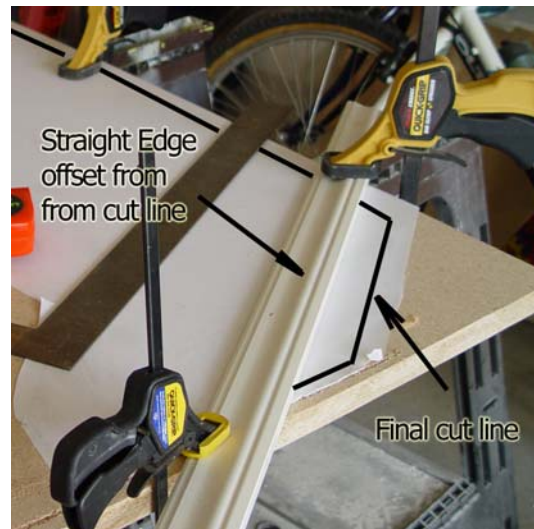
For most saws, you will want to make all your cuts from the shorter side of the saw blade guide. The electric motor sticks out of the other side and may bump into your clamps and ruin your cuts.

Measure the length of your blade offset and clamp each end of your straight edge down to use as a cutting guide. You can use a piece of MDF molding for a straight edge. A piece of molding is cheap and MDF is straight enough for our purposes.

[] Next take one 48" x 48" piece and cut three 14" wide pieces from it. Pay close attention to get the pieces straight and square. Take the other 48" x 48" piece and cut it in half.

At this point you should have:

- 2 pieces 24" x 48"
- 3 pieces 14" x 48"



[] Cut out your full-size printout of the side panel leaving about a 1" border around the lines of the panel.

Apply an even coat of repositionable spray adhesive on the back side of the printout. Don't go too light because it's difficult to stick to the particleboard but don't saturate the paper. By the way, make sure its **repositionable** adhesive or you might not be able to peel the template off of the wood when you are done.

Let the template sit for 30 seconds or so per the instructions on the adhesive can. Make sure your particleboard is nice and clean. Apply the template to a piece of the particleboard. Make sure the bottom and back edges of the cabinet drawing are along the factory edges of the particleboard. This eliminates two cuts you would otherwise have to make.

[] Clamp the piece with the template glued on onto the other 24" x 48" piece of particleboard with two clamps at opposite ends. You will be cutting the two sides of the cabinet at the same time so they are exactly the same. Be sure to clamp them with the factory edges together so that you always have one nice, square corner to work with.

[] Using your circular saw, cut away most of the excess material from around the template leaving about 1" – 1½" of material to remove on your final cuts. This makes it much easier to clamp your straight edge guide and make your final cuts. You can make these cuts by hand, no straight edge guide is necessary.

[] Now you will be making your final cuts so make them good!

Cut out all of the outside lines and angles first using the circular saw. The outside lines are the ones that are greater than 90° such as those all along the top, back and the coin door. All of these can be completely cut with the circular saw plus it will remove as much material as possible to help with cutting the inside lines.



Building Tip

Don't use the jigsaw to make your cuts. Use the circular saw. I used the jigsaw for my first one and although I stayed on the line, the bottom of the blade wanders and you don't get square cuts.

The inside angles are the ones that are less than 90° such as those around the monitor area and the bottom of the cabinet below the coin door. Cut the inside lines and angles next.

Note: All of these inside angle cuts will require the jig saw to complete. You should use the circular saw to cut as close as use can but because of the round blade, you will not be able to get all the way into the corners.

Two of the cuts will require you to 'plunge' the blade into the wood. These are the trickiest cuts. This means that you won't be starting from an edge and must press the blade into the wood from the top. If you have not done this before, you should practice on some scrap pieces a few times until you can make precise, accurate cuts. These plunge cuts are done for the monitor face and the bottom panel below the coin door.

Place the front edge of the saw guide against the straight edge holding the blade up over the wood so that when you push the blade into the wood, you are doing it into the *middle* of your cut line. As you are pushing the blade, make sure you are keeping the saw guide against the straight edge. Once the blade is all the way in, cut backward very slowly until you reach the corner, then go forward slowly until you reach the other corner.

Do this for the rest of the cuts. Once you are done, remove the straight edge and use the jig saw to complete the cuts getting all the way into the corners.

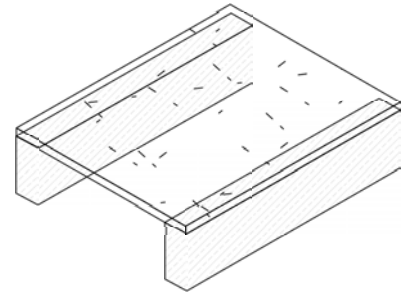
[] Use your belt sander or orbital sander to remove any blade marks from all your cutting. All the edges should be reasonably smooth because any substantial bumps will show up when trimming your laminate.

You can now unclamp your side pieces and set them aside. Particleboard isn't very tough so be careful not to break off the corners of the pieces.

Base Assembly

[] Cut 3 pieces from the 2x4 stud each 14" long. Make sure they are all exactly the same length.

[] Cut a piece 16 $\frac{3}{4}$ " long from one of the 14" wide pieces for **PANEL J**. Remember the Building Tip in the planning section and the "Note about Dimensions". This piece will become the panel labeled BOTTOM SHELF on the plans.

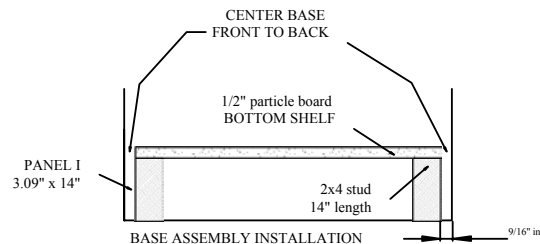


[] Screw the bottom shelf panel onto two of the 14" 2x4 studs you cut earlier as illustrated. Make sure the studs are flush on both ends and the sides. As you screw it down, **be sure the assembly stays square**. Use 3 screws on each side and screw the panel to the studs.

Assembling the Frame

[] Lay one of the side panels on the floor. Tip the base assembly on its side and place it at the bottom of side panel on the floor. The ends of the studs should be in contact with the side making the cabinet 15" wide. Center the base front-to-back on the cabinet side. When centered, it should give you about a 9/16" space on each side of the base. This leaves room for the front and back panels to be mounted about 1/16" from flush with the edge of the side.

Place the third 14" stud you cut vertically at the top end of the frame along the angled back as per the plans. This will be the top brace.



NOTE: Although some of the illustrations show the top brace at the very top of the cabinet, I have modified the plans to locate the stud on the back angled edge. This provides a lot more room for marquee lighting and speaker mounting.

The top stud should be 9/16" from the edge to allow for PANEL G to be mounted.

Place the other side panel on top. Get it lined up the same way you did with the panel on the floor. Get the base assembly centered (about 9/16" on each side) and the bottoms of the studs flush with the bottom of the side panel.



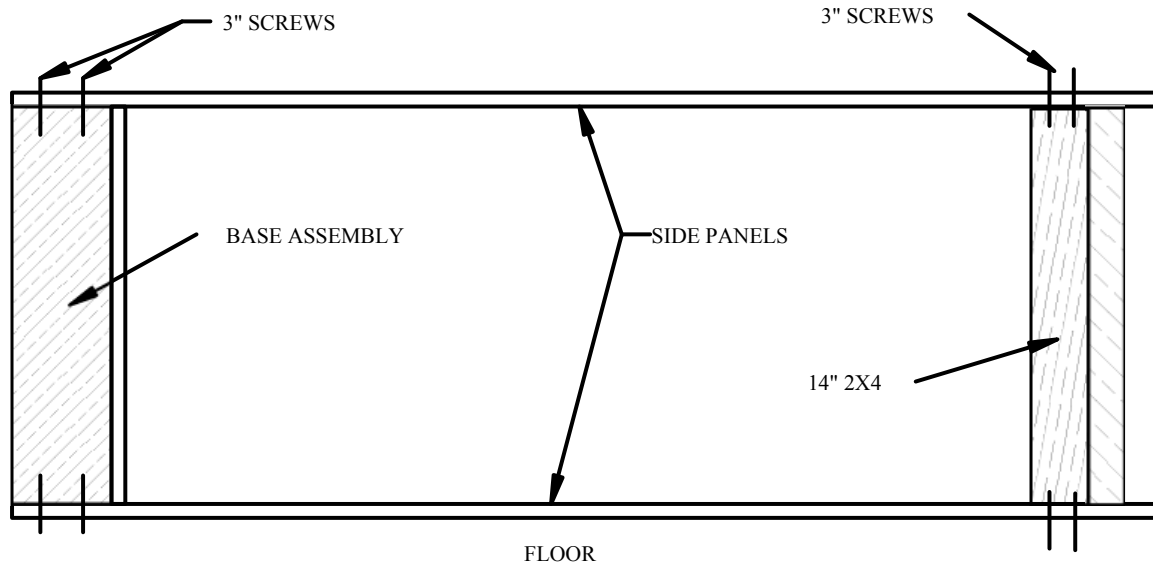
Building Tip

You should be sure to drill a 1/8" pilot hole before driving the drywall screw. The screw will split the wood if you don't. If that happens, you won't be able to get the head of the screw to sink below the surface.

Mark the side panel to indicate where the studs are. Run one screw into a bottom stud and one screw into the top stud. Use your framing square to check that the cabinet is square and not twisted. (see picture)



Once you have determined everything is square, drill pilot holes and then run two 3" drywall/wood screws into the ends of the rest of the studs. Keep the screws at least 1/2" from any edge to keep it from breaking through.



You should make sure that the head of the screw goes slightly below the surface of the side panel. Use a countersink drill bit if necessary. If the screw head sticks up it will translate into the laminate finish material and you will see a bump.

[] Now flip the assembly over and repeat to screw down the other side panel. Make sure the frame is square and is not twisted as discussed before.



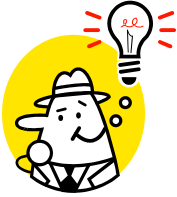
FRAME ASSEMBLY COMPLETE

(see note on top stud location change)

Section 2 – Panel Construction

You should only cut one panel at a time working your way from the front to the back. Before cutting your panel, you should double-check the sizes and angles by measuring your own cabinet and using the plans as a guide. This will ensure a good fit between panels.

Also note: **do not** permanently mount any of the front, top or back panels until after the lamination has been applied

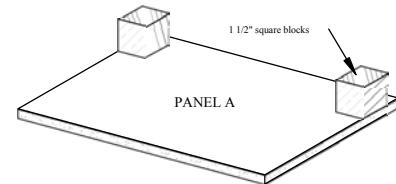


Building Tip

When you cut your panels, always use the straight edge and always double check that your cut is square using the framing square. If you don't, it will translate into your next piece and you'll have gaps where your panels meet.

FRONT PANELS A, B & C

NOTE: The prototype I built used wood blocks instead of angle brackets as shown on the plans. Some of the illustrations show the wood blocks. You should think of those as I-brackets.



At first I thought being screwed together would make the cabinet much more rigid but the base and 2x4 frame makes the cabinet very rigid.

Anyplace you see wood blocks pictured, you can replace them with L-brackets and 1/2" wood screws. Make sure your screws don't poke through the outside surface.

[] Cut out an 8" piece from one of the 14" wide pieces of particleboard. This will be **PANEL A**. Test fit the panel in the cabinet.

Mark the panel where the I-bracket should be mounted with a pencil. (see picture)

Remove the panel from the frame and screw two of the I-brackets on each side where you marked. Make sure the I-brackets are nice and flush with the edge.



Building Tip

On all the pieces that get screwed together, I used wood glue to secure the joints in addition to screwing them together. This will make the cabinet more rigid and over time the cabinet won't get loose from being moved around.

Make sure you don't glue *anything* until after lamination and you are sure it's ready to be permanently mounted.

You can now put PANEL A back into place on the frame and screw it to the side with one screw on each side just to hold it. Don't screw it all the way down and **don't put**

any glue on it. You need to be able to remove the panel to apply the laminate.
This applies to all the front, top and back panels that will get a laminate finish.

[] Next you can optionally cut out **PANEL B**. PANEL B is about 1½" long and is cut from the 14" wide pieces. Follow the same process for this panel as you did for PANEL A. Temporarily mount PANEL B also. PANEL B isn't really seen and can be skipped if you want to save time. I don't plan on using this panel for my own cabinets.

[] Cut two pieces 12" long from the 14" wide material for **PANEL C** (coin door and TV shelf).

COIN DOOR PANEL C



[] Take one of the 12" pieces and mount four L-brackets along the side edges. Test-fit the panel and mark where the brackets are. (see pictures)

Run two screws into the side panel to temporarily secure the COIN DOOR PANEL C into place. Remember not to glue it in place yet and use as few screws as necessary to hold it in place for test-fitting.

[] If you are going to install a coin acceptor, you should cut the mounting holes for it now.

Some coin acceptors that I have found that are small enough are from <http://www.happcontrols.com>. Some examples that should fit are:

40-0023-00P
40-0229-00
40-0168-00
40-1500-02

They range from around \$30 for single slot and \$65 for a double slot.

TV SHELF

[] Cut two pieces 9½" from the 14" wide material for the two **PANEL Fs**.

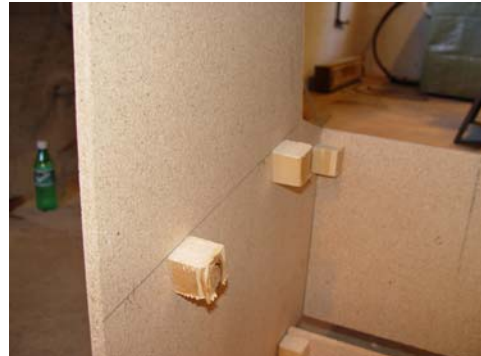
One of the two pieces is the **SPEAKER PANEL F**, where you mount your speakers. Speaker mounting patterns and sizes vary widely so you will have to determine the size of the holes to cut for them and how to mount them. You should cut the holes for these now.

The other is **TOP PANEL F** and is the top panel of the machine.

[] Using your framing square, place one side flush with the 'monitor edge' of the cabinet. The corner of the framing square should be right in the corner where the monitor edge meets the control panel. Clamp the framing square down in this position. (see illustration)



Use a pencil and mark a line along the bottom edge of the framing square from front to back. This will be your reference line for the TV shelf. Also mark a line on the inside edge of the framing square. This is how far back you mount the shelf. (about 1½")



Translate the bottom reference line to the outside of the cabinet as well so you know where to drive your screws by putting the framing square in the same position on the outside of the cabinet.

[] Screw down two of the 1½" blocks along your reference line as shown. I would recommend wood blocks here rather than I-brackets. Keep the tops of the blocks aligned with the angle of the line. Repeat this on the other side of the cabinet.

Set the **SHELF PANEL F** onto the blocks. The front edge should meet the pencil vertical pencil line along the monitor edge of the side panel. Glue and screw down one the **SHELF PANEL F** panel onto the blocks. (see picture)



[] You should now test fit your TV on the shelf. Because of the variety of shapes of TVs, you may need to place scraps or clamps to keep it in place.

At this point, you should be figuring out how you will get the TV set at the correct angle, parallel with the 'monitor-edge' of the side. In my case, I will have to prop up the back with two ½" scrap pieces. With this, the TV seems to stay securely. You will have to be your own judge for your own situation.



CONTROL PANEL D

[] Cut a 5" long piece from the 14" pieces for **CONTROL PANEL D**.

With your TV still in place, test fit PANEL D to figure out if it will need to be trimmed down from 5". The top face of PANEL D should be parallel to the angle of the cabinet and at the same level (about 1/16" down) from the edge. PANEL C and PANEL D should meet like the plans show.

[] Attach mounting blocks and translate the location of the blocks to the side panels for screwing it down later.

[] Once you have PANEL D cut to size, map out where your controls will be mounted and drill the holes for them.

SPEAKER PANEL F

[] With the TV still sitting in position grab the **SPEAKER PANEL F** panel and slide it in above the TV.

Take a piece of 1/2" scrap and hold it up flush on the marquee edge as pictured. Bring the panel forward until it touches the scrap. The bottom-front edge of the panel should be aligned with the bottom corner of the bezel edge. You can eye-ball this so that it looks right.

(See picture. Ignore the top stud location; yours should be along the angled edge, not the top edge as shown.)



If the panel won't sit between the sides and wants to fall out, put clamps under the panel to support it.

The rear of the panel should be 1/4" up off the TV. Set something about that wide on top of the TV to keep the rear of the panel lifted off.

Mark the location of the speaker panel with a pencil and remove it.

[] You should be thinking about how you are going to mount your speakers into PANEL F. Mark the locations of the speakers and cut out the holes that you will need for mounting them.

[] Remove the TV and permanently mount the panel into position using L-brackets and 1/2" wood screws. This panel will be painted black with the rest of the interior. (See picture. Ignore the square blocks; yours should be using L-brackets instead.)



TOP PANEL F

[] Using your framing square, mark a line perpendicular to the top surface of the cabinet. (See picture. Ignore the top stud location; yours should be along the angled edge, not the top edge as shown.)



This is where the TOP PANEL F and the angled back PANEL G meet.

Take your TOP PANEL F and mount four L-brackets flush with the sides and $\frac{3}{4}$ " from the front/back edges. Use $\frac{1}{2}$ " wood screws to mount the L-brackets.

Test-fit the panel but do not mount it to the sides yet.

ANGLED PANEL G

[] Cut piece $10\frac{1}{2}$ " long from the 14" pieces for **PANEL G**. This is the only piece that will get bevels on both ends so it may seem a little long. Attach your mounting blocks as usual.

Once the piece is laminated and trimmed, the bevels on both ends are easily cut with a jigsaw at a 45° angle by carefully following the laminate edge. Once you have cut both bevels, the piece should fit nicely.

BACK DOOR PANEL H

[] Cut the last piece 34" long from a 14" wide piece. This will be the back door of the cabinet. This piece will be hinged on the back with some self-closing cabinet hinges so it will not have mounting blocks attached.

You should attach one $1\frac{1}{2}$ " block in the cabinet to act as a stop.

INTERIOR PAINT

[] Disassemble any of the front, top and back panels you still have attached. The only panels that should be permanently mounted at this point are the TV SHELF PANEL C and the SPEAKER PANEL F.

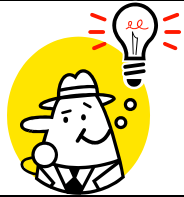
[] Smooth drywall mud onto the surfaces that will remain visible, such as SPEAKER PANEL F and along the side panels in the monitor area. Allow to thoroughly dry. Sand smooth with 100 grit paper. Apply a second coat of drywall mud and repeat. Finish sand with 220 grit paper.

[] Spray or brush all visible areas of the interior with flat black paint. Paint only what you need to because the wood will absorb a lot of paint. (see picture)



Section 3 – Applying the Laminate

[] Lay your laminate on the floor. You will be cutting it into two 48"x48" pieces so measure and mark the sheet with your pencil. Use a straight edge and your laminate knife to score the sheet **several times** on the color side. Keep scoring it until you've gone completely through the color and are well into the backing.



Building Tip

You really should use a laminate knife (available at Home Depot) because if you don't score it well, it will crack when you try to snap it.

[] Once scored, bend the sheet back against the score line. It will snap cleanly along the line.

[] Cut one of the 48"x48" pieces in half again so you have two 24"x48" pieces using the same process as above.

[] Take the other 48"x48" piece and cut three 16" wide strips.



Building Tip

You should always cut the laminate at least 1/2" bigger than needed all the way around so that you can trim it with the router.

Once the surfaces with adhesive touch, you will **not** be able to reposition the pieces or separate them!

[] Take each of the front and back panels and cut a piece of laminate for them, making sure each laminate piece is at least 1/2" bigger on all sides.

[] Working with only three or four panels at a time, lay them out face up along with their matching piece of laminate face down. Using a short bristle, chemical resistant paintbrush and brush on some laminate adhesive on both surfaces. Allow then to set for approximately 20 min. Check the instructions on the can of adhesive to be sure how long to let it set. Make the coat on your particleboard a little thick because it is porous. It will be ready once the adhesive is tacky but not gooey when pressed with your finger.

You can start applying adhesive on another piece while you are waiting for the first to set up.

[] Place three evenly spaced dowels onto the surface of the particleboard. Lay the matching laminate piece on the dowels glue-side down. The dowels keep the two pieces from sticking.

Make **sure** the laminate is covering the piece completely. Remove one of the dowels from one end and press the laminate into contact with the particleboard.

Work your way across the panel smoothing as you go making sure not to create any air bubbles.

Once you have removed all the dowels and the laminate is in place, use the J-Roller and press it down firmly (20-30 lbs of pressure) all over the piece to make sure it gets good adhesion and no bubbles.

Repeat this process for the rest of the panels. **Do not laminate the side panels yet.** Only do the front, top and back panels.

[] Once you have all the pieces laminated, use your router and flush cutting laminate bit, trim the laminate to the final shape. This is quite easy and satisfying to see the final product start to take form.

NOTE: Don't try to trim the laminate with anything else but a router or laminate trimmer. If you don't have one you can rent one from Home Depot for \$20 or less.

[] Route your 1/16" t-molding slot along the top edge of the COIN DOOR PANEL C. You won't be able to cut it after mounting. Insert the 1/2" T-molding into the slot.

[] Now you can permanently mount all of the panels into the cabinet using the 1/2" wood screws.

[] Apply the laminate to the sides of the cabinet using the same techniques you have already used. Be extra careful and use the dowels to help you with the laminate alignment. The pieces are bigger and it's easy to mess up if you aren't careful.

[] Route the edges of both side panels with your 1/16" t-molding bit. Insert the T-molding into the slot and trim as necessary.

[] Mark PANEL H and the interior of the cabinet for the cabinet hinges. Attach the hinges using 1/2" wood screws. Make sure they are not longer so they don't poke through the laminate.

[] Mark PANEL H for your lockset. You may need to glue on a 1/2" strip of scrap to give your lock something to hold on to when locked.

Appendix A – Web References

I haven't necessarily purchased anything from any of these sites nor am I endorsing them. They are just for your reference.

Controls

<http://www.happcontrols.com>
<http://www.ultimarc.com>
<http://www.wicothesource.com>

Keyboard Encoders

<http://www.ultimarc.com>
<http://www.hagstromelectronics.com/modules.html>

T-Molding

<http://t-molding.com>
<http://www.outwater.com/tee.html>

Router Bits (1/16" slot cutters / laminate trimmers)

<http://www.mlcswoodworking.com>
<http://routerbits.com>

General Info / FAQ

<http://www.arcadecontrols.com>

Mini Motherboard

<http://mini-itx.com>

Appendix B – My Expenditures

These are items I had to buy for the basic construction. This list of items pertains to the construction of the cabinet itself and doesn't include hardware, software or graphics.

This is just for your reference. I already own a lot of tools and materials. You may have to buy more and your mileage may vary. It doesn't include taxes or shipping/handling.

1	Quart flat black latex paint	\$7.48
1	Flush trim laminate bit	\$9.94
1	Laminate trimming router rental (1 day)	\$20.00
3	½" x 48" wood dowels	\$3.90
1	Quart laminate adhesive	\$5.59
1	3" laminate j-roller	\$12.98
3	Cheapo paint brushes	\$3.81
1	Laminate scoring knife	\$6.98
1	48" x 96" Marigold laminate	\$51.52
1	1/16" slot cutting router bit	\$16.00
1	48" x 96" sheet of ½" particle board	\$6.48
1	2x4 pine stud	\$1.98
1	20' black ½" t-molding	\$7.40
1	Can of repositionable adhesive	\$7.50

