Log House Construction

by Paul Kahle

In 1974 I took a course offered by the University of Washington's Experimental College called "Log Construction". It was taught by a man named Skip Ellsworth, one of the few truly original characters I have ever met. This guy was living on a five acre ranch near Redmond, Washington surrounded by log structures he had built for demonstration. He only had one completed structure but it was sure pretty. He was an amazing teacher, an anarchist of the first water, a prodigious collector of strange artifacts and a sly and generous soul. I can really say he changed my life.

He told us that all a person had to do to secure their own destiny was to build their own house. Without the burden of a mortgage to suck up a person's money for 30 years and tie them to a job and a bank, real freedom could result. He taught us how to do this by building log cabins but his message was really much bigger than that. His class was about how to build freedom.

Now I didn't run out and build a log house, but I followed his advice using stick construction. Many years later I'm sitting pretty, so I thought maybe I'd try and spread the word a little bit. I've also finally gotten around to building my own log cabin so if you want to follow the links, I'll take you through the steps.

Skip passed away in 2008 while he was living in Daanbantayan Cebu, in the Philippines with his new family. But Steve White and Skip's son Ellsworth have taken up the challenge and are teaching classes for the association and they are pretty interesting guys too. They teach the class from Skip's later constructions, a series of finished houses located north of Duval, Washington including his enormous "cabin" that was used in filming several "Northern Exposure" scenes. Just looking around the house is worth the price of admission, you might just look them up.

To Skip's Page - The Log House Builders Association of North America

To see my cabin plans, elevation, floor plan and water system.

To go through the building process step by step.

Getting Started

We bought this property in the summer of 1992. The idea was to build a recreational cabin so we have been in no great hurry to get things done. We put a trailer on it in 1993 and built a shed roof to keep the snow load from crushing the trailer. The next few years we spent putting in the septic system, leveling the building site and developing a water supply. During the winter of 1996-97 I worked with an architect named Tom Veith on the design of the cabin. We submitted the plans to the Kittitas County Building Dept in January 1997 and got them approved by March 1997.

This photo was taken in late May 1997 when the snow had finally melted away and we could actually begin construction. The first step in actual construction involves the use of batter boards to establish the exact location of the foundation. This method has been used as far back as ancient Egypt in exactly the manner I show here. A few feet outside the expected foundation square, three posts are driven in at each corner. A horizontal member is screwed to the posts (use a portable drill and self tapping screws). These horizontal boards or "laterals" are all level to each other. You can use a simple eye level to get them true to each other (the Egyptians used a pan of water) or a transit, if you can get one.

Once the laterals are in place, you tie four strings between each opposing lateral to form a square. The strings should be tight but slideable along the laterals. Measure diagonally from the places where the strings cross. Adjust the strings until the sides are the length you want and the two diagonals are equal. Then mark the places on the laterals where the strings are tied so you can take the strings down while you're working and put them back up later when you need to measure.

This should give you four corner points level and square. Use a plumb bob to measure down from the strings to the ground.

Digging

We had originally planned to use a simple pier block foundation but three things conspired against us. The first is the soil. Ours is pure clay, like for making ash trays. Clay doesn't support as much load as other soils so our piers got bigger. Then we had snow load. Increased due to the heavy snows of 1996-97 we had to support 89 lbs/sq ft or approximately 180,000 lbs. So the piers got bigger. Finally, the Kittitas County Building Dept. now considers it important that a house is built to support its snow load during a magnitude 5.6 earthquake. This made the piers too large to pour by hand.

We changed our design to a continuous foundation plan with short plinths where the pier blocks would have been. Because of the increase in complexity we decided to hire out the work of digging, forming, framing and pouring the foundation.

This is a picture of the foundation hole (which was dug in late June in a complete downpour).

Forms

We hired a local fellow, Steve Landis, from Ellensburg. It took him and his daughter and one hired hand three weekends to set up the forms. I had all the structural steel bent at Yakima Steel Fabricators.

The Pour

We couldn't get the truck down next to foundation so we ended up pumping 20 yards of concrete over my trailer down to the foundation. The process took 6 hours but we had the foundation done by July 14, 1997. A full three months before we had planned. That meant we could start looking for logs a whole year earlier than we thought.

Backfill

So this is what we ended up with. A continuous footer and small walls called plinths sticking up like tombstones. One immediate advantage to this method was that the back filling could be done by a small bobcat (seen on left) which could just fit between the plinths

Foundation

In only six weeks we have gone from batter boards to a graveyard. I also put in my sewer connection and inlet for water before back filling (sewer to the right, water on the left). The cleanout for the septic tank can be seen on the far right.

I have no electric power at this site. Whatever electricity I have will have to come from solar to start with. Because of this I have to set the cabin up to freeze when I'm not there, pipes and all. To accomplish this without breaking things I am running all my lines 3 feet deep (my frost line is 24") and putting shut off valves below ground outside the foundation.

I plan to run all my pressure side plumbing like drain lines, sloping gradually up hill. I also have installed a drain out from under the foundation. I should be able to shut off the supply, open the drain valve and all the taps in the house and have the whole system empty itself. I even dug a french drain under the soil and perforated the outlet pipe in case the actual outlet of the drain pipe freezes closed.

The fire

So here I am on the hottest day of the year tramping around in the Tyee burn of 1994. There were three huge fires in 1994 in Eastern Washington and the government in its wisdom had decreed that the trees could be cut in the summer of 1997. Finding a logger who can actually supply the needs of a cabin builder can be tricky and tiring. Many small time operations simply don't have enough logs of the right quality at the time you need them. Its takes some patience, but it's important to remember that there's still lots of trees being cut in this country and that you can afford to pay more for a tree than a lumber mill that's gotta spend a whole bunch of time and energy turning half of it into sawdust.

So, to make a long story short, I finally found someone who could get me some of the Tyee's lightly toasted log

Log Delivery

I got side tracked with one logger who couldn't deliver on what he promised and that cost me two months but I finally got hooked up with Louis Brender of Levenworth (509)548-5374. Louie took 4 weeks to fill my order so here I am getting my first shipment of logs on Sep 28 1997. The final load came on October 6th.

We had one spud party but since these logs came from the fire, most of their bark had already fallen off or was so loose it was no challenge to remove. The logs are fully cured so my only concern is that I get them under cover before they begin to show significant signs of dry rot.

The Lifting System

Here's the real secret of cabin building if there is such a thing. Everyone wants to know, how do you lift the logs? I cut four dying white firs off my place and buried the butt ends 4 feet in the ground. I put a triple block on each one and supported them with cheap polypropylene crab pot lines strung diagonally. I figure that I get a 5 to one advantage on each corner. The whole setup cost me about $400.

First Log

Here we're lifting the first log onto the foundation. There is 5/8 inch rebar sticking up out of the foundation blocks so we have to predrill the log with 3/4 inch holes. We also found it was a good idea to grind the top of the rebar into a dull point so that they followed through the holes better. Once the log is down and resting on the sill plate we take a sledge and bend over the rebar to clamp the log in place (earthquake requirement)

Note: Through years of experience it is now recommended to use ½ inch rebar for the entire project.

VERY IMPORTANT: Notice the 2 inch wooden plate on top of the concrete pillars. Underneath the wood plate is a ½ to ¾ inch thick felt strip

Also note the first course of logs are placed on each side in advance. Each course afterward should be laid out.

First Row

Once the first row is done you go back and spike the corners horizontally. We use 1/2 inch rebar ground to a dull point. We predrilled a 9/16 inch hole through the first log and then use a sledge to drive the rebar in 6 inches or halfway through the lower log (for vertical spikes). You can see from the corners that we are using the butt and pass method. Having gotten this far maybe you're even ready for a discussion of log cabin construction issues.

Note: now it is recommended to not sharpen the rebar because it the log to split. To save yourself a little work… you can use an impact driver to drive the rebar spikes in (Assuming you have power or air).

First Season

This is about as far as we got before the snow closed us out for the winter. We actually were lucky to have been able to work as late as we did, usually the snow comes earlier.

Notice how the lifting poles help keep the walls nice and straight (and plumb) as they are going up.

Lifting

We managed to get started again in early May but heavy spring rains slowed us down until mid July when the furnace finally turned on and we started having to hide from the sun. These pictures show our progress as of July 7th. More importantly it demonstrates how we learned to lift the logs one end at a time. We can tail the line around an over dangle (as in the foreground) or around the hitch on our car if it is safer or a better angle on the block.

The tricky part is establishing the proper rhythm. One person pulls down and out and then a second person tails the slack away.

Once we have raised the first end and set it on top of the wall, we move the straps down the log and lift again. Repeat until the second end is inside the over dangles and can be raised. For folks with more room around their cabins, you can simply use the car to do your pulling for you, we're not so lucky.

This operation works best with three people. One up on top to move the strap, one pulling, and one tailing away the slack.

The Log Box

This shows the completed walls (the log box) as it was the 25th of July 1998. You will notice the top logs on the left and right are the largest so far in the construction, they also stick out both front and back to support the rafters. Because we want an over-hanging roof in the front, the top wall logs needed to be 19" in diameter at the point they leave the structure. The logs were so heavy we didn't even try and lift them by hand but a car winch and two snatch blocks did the trick. But if you think those are big logs just wait til you see the ridge pole!

The weather was so hot over there we ended up spending most of our time at the local swimming hole and up at the famous Table Mountain Star Party only six miles away (as the crow flies)

The Ridge Pole

Our ridge pole is the largest log in the entire structure (approx 1 ton). To support it we bolted two ridge pole support logs (RPSLs) to the front and back walls. Then we temporarily clamped two lifting poles to the RPSLs to give us lifting points. In this shot our friend Rick is riding the pole up the wall as it is being lifted by a 2 ton chain hoist I rented for the occasion. Now it's not necessary to ride the pole up, Rick is just the sort of guy who likes to add a little flare to his life.who likes to add a little flare to his life.

With our handy truck winch attached to the other side we were able to pull the log over once it overbalanced and get it seated on top of both walls. We kept sliding the log down until it was in position and then we moved our lifting points up to our temporary lifting poles.

Between the truck winch and our chain hoist it went up easy as pie. We had been smart enough to predrill the holes for the rebar and mark the rafter positions before we lifted the ridgepole. This made things a lot easier later on. It took an entire day but amazingly everything worked as advertised.

Rafters

Once the ridge pole is in place you get to go up and play with the rafters. You raise the rafters next to one of the lifting poles, bolt them together and slide them out to where you want them. It turned out a spud was the perfect tool for wedging out these large log rafters. Once you have them in position you spike them to the ridgepole and wall logs.

The Ridge pole and top wall logs are notched a little for the rafters. Once the rafters are in place 2x4's are nailed to the top log and between the rafters. A bird blocks (to keep birds and critters out) will be nailed to the 2x4's later after the roof is completed. Bird blocks will be discussed later on.

Roof Decking

When all the rafters were in place it was time for the roof and time was running out. It was late September and winter comes early to the mountains. With the help of many friends I put up almost 2300 square feet of 2x6 Tongue in Groove fir planking. We finished the underside of the planks while they were still on the ground.

I called everyone I thought I could beg or trick to come out and we worked in two crews on each side of the structure. There are actually very few times that having a lot of people is really a good idea. Most of the time they just get in the way. Spudding the bark, making shakes (if you use wooden shakes), nailing seams to hold the chinking and putting on roof boards seem to be the times you can use all hands. Make it a party. But don't hand out the beer until all the hammers have been turned in.

And what is better than a wife who's actually willing to go up on the roof and pound on planking with her husband? We finished the planking and put up a layer of tar paper to protect things until we can begin work again next summer. Next year, who knows, maybe even a floor and a door?

You can save a ton of money if you make your own planks and lumber. A small mill that you can fit your chainsaw will provide you with all the dimensional lumber. Procut Portable Sawmills.

The Roof

Because we wanted to keep the bottom of the roof visible, we had to put another roof on top of the 2x6 fir to hold the insulation and keep out the rain. The first step was to provide a moisture barrier which we accomplished with tar paper. The cabin weathered the winter with just this cover to protect it. The next summer was a wet one and we couldn't start working on the roof until July.

Over the tarpaper we put rows of 2x2s from ridge to eve on 2 foot centers screwed down to the TnG roofing. Use lots of screws because this is the anchor for your entire real roof and the actual snow load.

TnG=Tongue and Groove

(Photo above) We added 2x10 rafters all screwed and toe nailed to the 2x2s so that we could transfer the loads down to the 2x6 fir which is our structural roof.

We added 2x8 blocks between the rafters to stabilize the roof. The roof was designed to ventilate from eve to peak over the top of the insulation and over the blocks

(photo above) R-30 batt insulation is installed inside the box structure and a second roof of plywood covers over the top. We had to use 3/4 inch plywood here because of the snow load in our area. We could have used closed cell foam insulation and reduced the thickness of our roof but this method proved to be quite a bit cheaper.

Finally a second layer of tar paper is laid under the actual roofing, in this case snap-lock metal roofing. This is an expensive and redundant way to make a roof and the only reason I used it was to leave the log rafters and car decking exposed inside. It does have the advantage that the entire roof is worked from the top so no scaffold work is necessary.

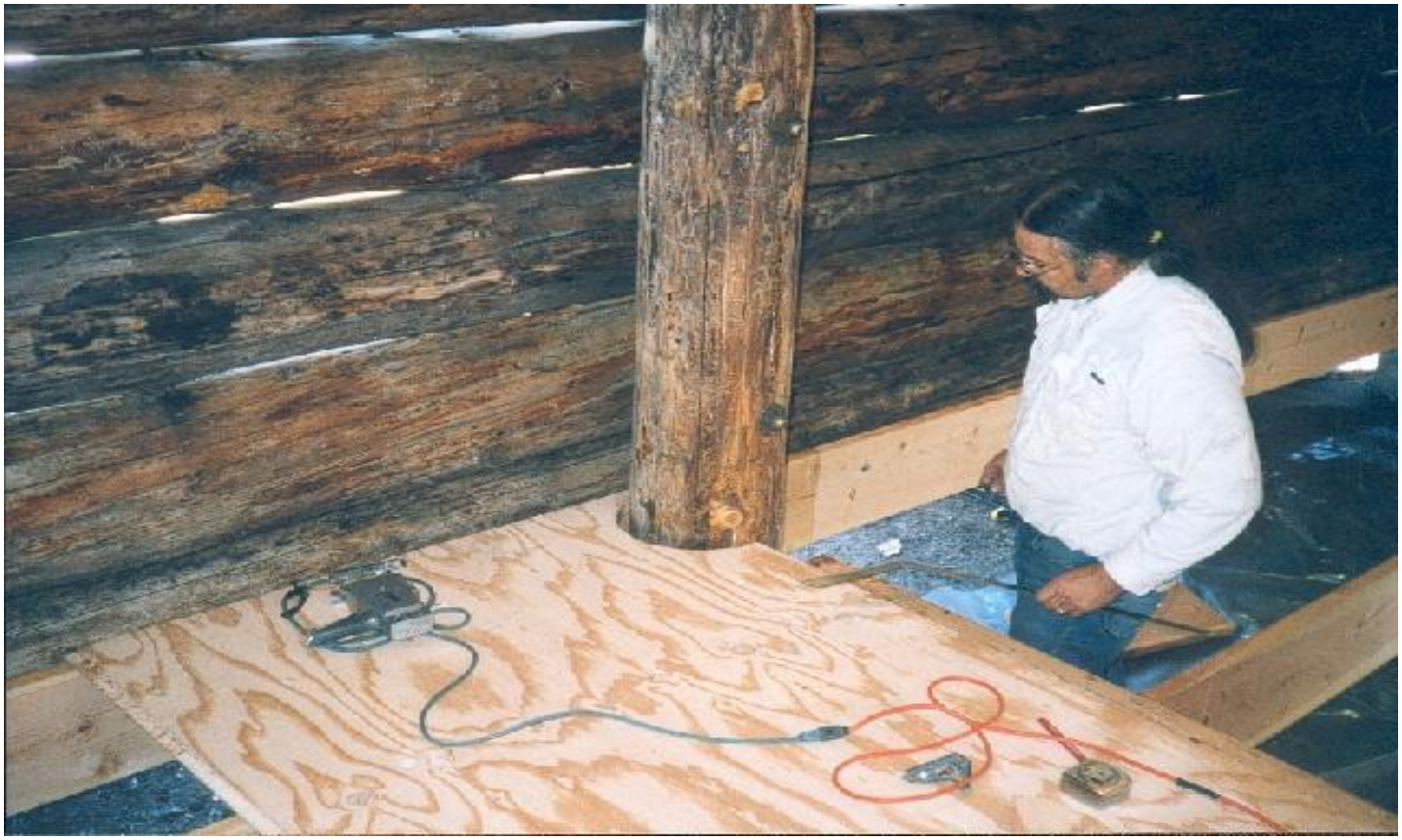
When people talk about building a log house, they usually get all bound up in the price of the logs. In actual fact the logs are the cheapest part of the house. We were able to reduce the price of our roof by using log rafters and reducing the pitch of the roof which reduces its size and cost. But even so, our roof cost us almost 50% more than the logs.

Main Floor

To put the floors in you need to suspend them from the logs. This is done primarily with dimensional lumber and so it doesn't vary much from the way a regular frame house would do it.

I started by using a chain saw to flatten out the inside of the two bottom side logs (on the far side to the left in this picture). This just makes it a little easier to fix the floor joists to. I used lag bolts to fasten 2x12 rim joists flat against these logs and also to the front and back bottom logs. The front and back rim joists don't take much load so I didn't bother to flatten the logs (on the far right side to the right in this picture). There is a 6x12 beam running down the middle of the house between the ridge pole support logs that supports half of the floor load. It rests on the same piers as the Ridge pole support logs as well as three more separate piers that form a line running under the ridge pole through the center of the house. I troweled mortar into the crack that

remained between the rim joists and the logs so as to make absolutely sure there was no room for critters to come in.



From that point it was just like framing any other floor (any other floor that isn't quite square anyway). I used hanger brackets on the side logs and the central floor beam on 2 foot centers. I was going to use 2x6 TnG for this floor too but decided to use standard flooring TnG plywood instead. There were a couple of reasons for this; first, the quality of the TnG is not what it used to be and there would be a lot of holes in the floor as a result (have I told you about how many mice I have around here?), second, the plywood is a lot cheaper. Anyway, I both glued and nailed the plywood to the floor joists to cut down on squeaks.

The flooring doesn't have to come right up against the logs since the crack will be covered with a base board later on. The crack is often used to run electrical wires in since it's pretty hard to run them in the walls.

We will eventually cover the plywood with something else to make it look better. Wood and Purgo are the two biggest contenders so far but it'll be one of the last things we do so at the rate I'm going it may be years before we have to decide.

Central Beam

After we finished the roof and the main floor, we had to put in a log to act as the front beam of the second story loft. I could have put it in during the wall construction but for various reasons I thought it would be easier to do later. Amazingly, this turned out to be true. All we did was cut two holes in the walls in the places that we wanted the log to sit. We planted one of my old lifting poles in the ground 15' from the wall and rigged it up with two lifting systems (you can see them both in this picture). We used the jeep winch to do the actual lifting and a rope system to hold the log in place while we moved the lifting point. Then a come-along to pull the log into the hole. Once half of the log was inside the house we switched to lifting off the ridge pole and put the come-along on the top of the far wall. We were very surprised how well this worked.

This is what the interior looked like after we got done hefting in that log. Even in this very dark photo, you can see how nice the underside of the roof looks. This is why we went to all the trouble to put the insulation on top. We finished the 2x6 TnG with a clear satin sealer before we nailed them up because they're much harder to work on from the bottom side.

The loft log will form the front edge of the second floor. The area to the right of the log (in this picture) will remain open to the ceiling. The area to the left will be the loft and will have a railing to prevent small children from falling and spoiling everybody's fun. The area we're looking at right now will become the kitchen

Second Floor

During the summer of 2000, we started out working on the interior of the cabin, setting up the second floor. We added a simple 2x4 frame wall to hold up the middle of the floor. It is the only load bearing interior wall. As seems to happen more often than not in this project, as I was getting ready to build the wall and deciding I really didn't know how to frame a bearing wall, a stranger walked up to look at the cabin and provided us with all the information we needed to do the job. It turned out that he was a retired carpenter and he told us about sleepers and sampson posts and headers. I suppose I could have purchased one of those books on framing but I'm getting a little weird about figuring everything out for myself. Besides, what else would retired carpenters do on their holidays if they couldn't seek out guys like me and pass on their accumulation of knowledge.

To start the process I rented a laser transit. We decided exactly were we wanted the second floor to sit in the cabin and used the transit to provide a level line all around the walls and the central floor beam. We built the central wall and cut a narrow log to use at the end of the wall. It wasn't really necessary to support the central floor beam because the wall itself takes all the weight of the second floor, but it looked pretty. We used brackets from Simpson Strong Tie cut into the log walls to secure the outer edge of the floor. We supported a 2x6 TnG floor on 4x12 beams on 4 foot centers. This not only gives us a properly massive look but plenty of room to fit the stairway between the beams.

We blind nailed the boards to the beams and glued them too so they wouldn't squeek. Blind nailing means driving the nails into the edge of the board over the tongue so that no heads are visible. This will allow us to sand the floor smooth on top and it looks prettier too. It's nice that the kids are getting large enough to help with the tricky bits

The finished floor here is very rigid but it is porous to liquids. The cracks between the boards make it hard to sweep clean but easy to vacuum. Sounds travels through it easily because we have no sub-floor. All things to keep in mind when deciding to use this style. Since this is a sleeping loft, we don't seem to have any trouble with it at all.

Thinking About Chinking

It's time to start talking about chinking. We can't really start the chinking process until we cut out and frame all the windows. But two seams were going to be covered by the second floor and we figured since they would be partially hidden they might be a good place to practice and experiment. The chinking method we decided on can be seen in this photo. We filled the gap between the logs with a small bead of insulating foam. Then we follow that with a row of galvanized finish nails. These are pounded only into the bottom log at about 2 inch intervals. They are pounded in at an angle and then bent up so they are straight up and down and nearly or barely touching the upper log. Finally, mortar is spread over the nails and pressed against the foam. You can put it in convex or concave depending on the look you're going for and the tools you have.

In the foreground you can see one of the notches we cut for the metal brackets that hold up the floor beams. You can also see the blue chalk line we placed around the cabin with the laser transit. The surface of the second floor will sit 5 inches above this line. We used the level line to make sure all the brackets were at the same height and square to the floor.

The corners get a little more difficult with butt and pass construction because the holes can be almost large enough to stick your fist through. Fortunately, foam & mortar fill these gaps easily. Nailing can get a little creative and you need to use about 4 different sizes of nails to cover all the different widths of cracks. We found out you need to wait until the foam is fully cured before you apply the mortar, otherwise, it can push the mortar out as it expands when it dries.

There are many issues with the mortar involving appearance, insulating properties, expense, structural strength and speed of application. The method we use here is very cheap (about $250 for the whole cabin), looks good for a long time and is about as time consuming as you can get. The foam gives it a fair to middling insulation level. The mortar is very strong in compression and adds structure to the log walls, especially between windows and doors. It takes a while to get the hang of spreading in the mortar but it's a pretty satisfying activity. If you're going to use mortar, you need some sort of filler between the logs to press the mortar against. If you don't, you'll just end up pushing your mortar through the crack. Almost anything will do. Foam is

easy to over-apply. So be careful. Pink fiberglass stuffed between the logs works. Even boiled newspaper fits the bill, although it would tend to trap moisture inside the seam.

The other most common method is some form of latex chinking, like Perma-Chink. This tends to look good for a few years but many types split and peel eventually. It has a good insulation quality, especially if applied over solid foam strips. If you apply it yourself it isn't too expensive but most people hire professionals which raises the costs considerably. Perma-Chink conducts classes for do it yourself types

Windows and Doors

During the summer of 2001 we finally started to work on the windows and doors. Cutting out these holes in the cabin is very nerve wracking. You can't change your mind, ever! Measure 57 times and cut once I always say (especially after I almost put the door in the wrong spot). I used lathe to outline the edges of the windows both inside and out. You can see them through the seams and line them up and use them as cutting guides. I used my handy (and light) electric chain saw for all delicate cutting. Make many small shallow passes first from the outside then from the inside. Don't try to just go through in one cut.

Also belay the logs as you cut them out, this keeps them from binding on the saw when they begin to sag and dropping on your toes when you cut through. That's what the man in the black shirt is doing (no, he's not the supervisor).

The walls were between 13 and 15.5 inches thick, so the window frames needed to be custom jobs. I made them out of 2x 8s and 2x10s glued, doweled and screwed together. You can build the frames in place if you want to but if you have a window whose top or bottom ends in a seam instead of against a log, this way is easier. Once the frames were built, I used a rubber mallet to pound them into position. You may have to go back and forth with the electric chain saw, cutting out small amounts of wood from the hole as well.

Actual pioneer cabins tended to have very small doorways and no windows to speak of. Part of this was to make the cabin easier to heat and part was to make it more defensible against attack. When you decide to make your cabin more modern looking by putting in huge windows you automatically violates these principles. The butt and pass method has this as a weakness (you knew there had to be one). The walls are very strong when left in one piece but they loose a lot of their structural integrity when you cut the logs in two. The rebar is not strong enough to keep the columns of logs from moving outward with downward pressure. For that reason, it is necessary to add structural elements to keep the logs in line. Here we are installing 2 x.1/2 inch steel bars into a channel routered into the end of the logs. The frames will cover these bars and add additional support. Mortar chinking also adds structure and maintains the spacing between the logs.

Slide (or pound) the frame into the hole and seal around the outside so no moisture can get in against the cut ends of the log. Be sure to nail the sides of the frame into the ends of the logs to help support them in alignment. The frames are measured to cover the log that sticks out the farthest and the log that sticks in the farthest. As you can see from some of the other pictures, this can get real extreme especially for cuts in the middle of the wall.

You place the windows in the middle of the frames and "stop" them with cut strips inside and out. Doors are normally mounted on the extreme inner or outer edges of the door frames so that

they can swing completely open against the wall. We purchased our windows from Inwood Industries of Woodinville, Washington. Wood windows are a bit pricey but I just couldn't see putting anything else into a log cabin.

Here I have to confess to making an error. As you can see, most of my windows terminate top and bottom in a seam between the logs. This is not the best way to do it. The windows should terminate half way through the logs. The reason this happened is that I planned my windows and put in the order before I built the house and had any idea where the seams would be. Also, designs like this doorway required that the windows be at the same height as the doorway, no matter where that falls. If I had to do it over again, I'd have measured and ordered the windows after the house was built.

Gables

The time had now come to close up the cabin for good and proper. I tried to build doors out of the same TnG material I had used on the roof and second floor but I found that I could not keep them from warping. It turns out that you need to find boards with the grain running across the short axis of the board and not the long axis (quarter sawn). But I could find no such boards. So we mounted standard doors and was done with it.

The gable walls in this design are not load bearing so we don't have to worry about headers above the windows although if I'd had the space I probably would have put them in anyway. The purpose of the wall is really just to keep the birds from flying through and to hold the windows

up. I used 2x6 on 24 inch centers but you can see that framing around logs can make such exactness seem like madness.

After having been wide open to the sky for so long, the birds took awhile to get used to the fact that they couldn't fly through anymore.

I skinned over the outside of the framing with exterior grade plywood cut as closely as I could to the ridge pole and top wall logs. I put cedar shakes on the outside eventually. I'm not worried about shakes up on the gables from a fire danger point of view. If the fire gets that far, the shakes are the last thing to worry about.

You can also see our new chimney in this picture. I learned, to my dismay, that I should have put the chimney in while I was putting the roof on. With normal metal roofing this is not an issue, but with snap lock roofing, the screws are hidden and you have to take up half the roof to get to a center panel. I was most worried that the snow would shear the chimney off when it slid off so I knew I wanted to mount the chimney as high on the roof as possible. It ended up about 4 feet farther uphill than it would have been had it been directly over the wood stove. But that allowed us to put the flashing up under the ridge cap, so it was not necessary to pick up any of the panels. I killed two birds with one solution but I ended up with an offset in my chimney inside the house. So I tell everyone that, "More heat gets out that way you know."

Add a little R-19 insulation with a moisture barrier and Voila! I used the polystyrene expanding foam to make a seal against the logs and to fill a few of the smaller weird shaped spaces. Make sure to only use one moisture barrier (in the picture I have craft paper and plastic but I torn the plastic off, eventually). With two moisture barriers you can get problems with condensation in between them, just inside the interior wall.

Of course, this suddenly made the interior of the house very dark and we began looking for ways to brighten things up a bit.

We did our interior walls including the gable ends with sheetrock painted white to increase the amount of light in the house. Wood paneling would be nice but we've got plenty of dark woody spaces as it is and we'll need the light more.

I was able to find a man that lived close by to do the sheet rock and painting. He was very big on taping off all the logs so they wouldn't get any over spray.

We used cedar shakes to finish our gable ends. It is more common (and easier) to use a board and batten technique. Board and Batten involve using wide planks (often rough cut) mounted vertically with a small gap between each (1/2"). Then these gaps are covered by smaller boards (battens) also mounted vertically. The boards and battens are only nailed down the center line so that they can expand and contract without cracking. You might also take notice of the snow shedding capabilities of our snap lock roof. Without any screw heads sticking up to hold the snow, it all slides off even with a shallow pitch roof. Of course, one of the things we hadn't counted on was that these piles of snow would get so large as to engulf the lower over dangles. I don't want those rotting so I'm going to have to figure out some way to protect them, hmmmm.

Bird Blocks

There was only one more opening to close up for winter. The gaps between the ceiling and the top wall logs needed to be filled with bird blocks. But while most bird blocks are up in the attic, these lead into the main cabin space so they have to look nice.

When cutting around the logs in hard to reach spaces, it's nice to use pieces of cardboard to make templates so you only have to cut the plywood once. For the little pieces on top of the ridge pole and the bird blocks this is especially true. I found I could even reuse the same pieces of cardboard several times as I moved along.

They ended up fitting pretty well and what doesn't fit exactly I sealed with foam from the back side. The bird-blocks are nailed to 2x4s which I installed BEFORE I put on the roof. I should have snapped a chalk line to make them all line up with one another since I had to move a few of them. Inside, on the top, I screwed in a 2x6 so the bird-blocks will be more vertical inside the house whereas outside they are perpendicular to the roof. The irregular size also allows me to stuff in a little more insulation which can't hurt.

Now for more about chinking!

Using a simple flat cement tool, a mortar board and a tuck pointer, you can make the chinked seams in your cabin look great. Mix the mortar dry where it is supposed to hang in large amounts (like in the corners). Mix it wetter where you are smoothing a seam like this. You'll get better at it as you go along so do the parts that will get covered up first (Like behind the kitchen cabinets). The nails should be placed so you cannot touch them with the tool when applying the mortar.

Get the mortar smoothed in and then come back later when you are done with the row and smooth out any tool marks. The seams here are slightly crowned outward. You can use tools made with various type of black plastic pipe to create seams that are crowned inward. I didn't like these because the edges of such seams are harder to control and get right. When the seam has cured, you come back with a small bronze wire brush and clean up any cement that gets on the log. While the seam is still green, you can easily clean up many problem. Once it fully cures (and turns gray), it is much harder to modify but it is still possible. I found that with some care I could get the seams to be quite smooth. You have to be careful with the wire brush to not mess this up.

There has been some controversy about how to wire inside these seams. My State electrical inspector called me and told me that it would be OK, to do it this way, with the Romex inside the mortar. However, we'll have to see if it actually passes inspection

The wires come out through the mortar wherever you need to place an outlet and I use exterior boxes screwed into the logs above and below the seam to mount the fixtures. The boxes are small enough that they still don't stick out as far as the logs above and below them..

That means you can move furniture up against the wall and not hit the outlet. If you don't like running the wires inside the chinking, you can use the rigid conduit between these boxes, running in the groove created by the chinked seam.

The finished wall looks very nice with a kind of organic feel to the chinking that you just don't get from a perma-chink wall. I think this is because the PC walls use precut foam chunks to back them and so they have a more standardized size. Some seams are very tiny and some are quite large but it doesn't really take that long to learn how to handle them all. Of course, this sort of hand work takes some time. Putting in the nails is the longest part of the job (and the least rewarding). It's best to have a whole bunch of folks show up and do this all at once in a party. However, a bad nailing job can really cost you extra time during the mortaring process so make sure you don't hand out the beer until every person has finished their seam. The nails should be as far into the seam as possible, they should be in an even row and they should be perpendicular. The nails can slant sideways but they should never lean outward.

I've also recently discovered that a small palm nailer with a finishing nail attachment can make the job go a lot faster. You use larger size nails (6d) everywhere and just set them in whatever distance you want.. Then come back later with a hammer and bend them up.

There were 88, 30 foot seams in my cabin or 2,640 feet of chinking. That's a half of a mile.

As I said before, sand blasting destroys mortar chinking so once you've put this stuff in you're better to sand the logs than to blast them. You can clean up the mortar after it has hardened by using a small brass wire brush. This will clean off any stray swipes or globs for up to several weeks after the mortar is in place. After that it gets too hard to do anything with.

Sheet rock and interior framing

Now strangely, one of the more interesting topics building with logs has to do with ordinary interior sheet rock walls. Inside our cabin we need to have as much light as possible (did I mention we have no electricity?) so we need to have painted sheet rocked walls. And we also need a place to run electrical wires and plumbing. Why electrical wires when we have no electricity? Because the code guy tells me he's worried about the next fellow who lives in this house. It would be tragic if he had no wires in his walls. Go figure.

The interior walls are just normal 2x4 framing. The only tricky bit is how to make the connection with the log walls. There are a couple of philosophies to that. One is to saw a 9/16" grove in the logs that the sheet rock or paneling can slip into. If you have built a chinkless house or any other method where the logs will settle, this is the method you must use The other is to cut the sheet rock close and cover up the gap with some sort of flexible trim. (like nice white nylon rope about 3/4" diameter) Plumbing and wiring goes into these walls just like in any other house. Passing from floor to floor can be a bit of a challenge.

In my case, I tried a little different approach. First we taped the logs with blue masking tape and plastic so the sheet rock just barely overlapped the tape. This will allow us to spray texture and paint on the sheet rock without getting anything on the logs. Then we scribed and cut the sheetrock to fit as closely as we could and nailed it to one side of the 2x4 wall.

After the first side was done, we went around to the other side and filled in the gaps with short pieces of 2x4 and 1x4 and foam. The foam was cut off flush so we could have good support for the sheet rock that went into these chinking grooves.

The second side was sheet rocked the same way as the first. Then we laid a bead of caulking (paintable) into the remaining crack. The wall was then textured and spray painted and then the masking tape was cut away where it intersected the wall. Bingo! A flexible airtight fit. But you can only do this if the logs are not going to settle anymore. Dan Blanchard, the fellow who did all this work, didn't believe me when I was telling him they wouldn't. He was shaking his head the whole time. I figure since the logs have been in place for 8-9 years already it was a safe bet. I guess we'll see.

Other Stuff

Now the miscellaneous stuff begins. Most of the tasks that remain on the house are the same as for any other house. Plumbing and wiring goes mostly inside my 2x4 interior walls or under the floor. Cabinets work the same as in any house except you might occasionally have to mount one on a uneven wall or build it to a special height to match the crown of a log. This means that if you're tired of doing it yourself at this point you can hire normal contractors and they should be able to take it from here (but what fun would that be?)

The basic decorating motifs for a log cabin are; logs, massive wooden beams, rock, black iron and dead animals. At least that's what I see in most of them. I'll try to post anything that might be of interest here.

Our one and only stairway was going to be made out of split logs but I got tired of waiting for my miller to get around to it. This version is made out of 4x12 (following the "massive wood" guideline above). I couldn't figure out how to do the turn at the bottom so I went with plywood for the base. It certainly has a nice solid feel. Unfortunately, while we have been slowly

building our house, the code people have been busy changing the codes. Although this stairway was approved in the original drawings, it no longer passes muster. We worked out a deal with the code people that wouldn't require us completely rebuilding the house but you need to make yourself fully aware of the stairway codes and then give yourself some leeway in case they change their minds again.

Turns out that we need a 36" high guard railing with a continuous hand rail at 36". Makes you wonder how Abraham Lincoln survived living in those rustic shacks without the code people to tell him how many inches long a man's legs have to be. Gorilla glue turns out to be perfect for constructing hand rails but cutting the twits and turns in a real excise in geometry (buy extra material, you're going to screw up once or twice).

The foundation needs to be critter-proofed, so after I insulated my floors and pipes, I used 1/4" cement backer board to fill in the gaps. I screwed a 2x2 to the bottom of my lowest log and then dug down to my foundation sill. The board is screwed into the 2x2 on top and the bottom is buried into the dirt so nothing can dig underneath. Then I caulked the whole shebang with concrete crack filler.

Now it's time to make those plywood floors look like something. The problem is that most wood flooring is hardwood and that looks weird in a fir cabin. So I found a place out in Forks, Washington that remills old fir beams and makes it into flooring. Old growth flooring without cutting down any spotted owls. Can't beat that.

The young man in this picture is Bobby MacIntyre. He is one of the little children you see cavorting around the early construction pictures of the cabin. He laid down these floors in the summer of 2006. He died suddenly of unknown causes on May 29th 2007 at the age of 20 years. We will always miss him.

Looks pretty cozy as the snow begins to fall outside (and it isn't even Halloween yet). Problem is, the floor looks so nice, Vanessa makes us cover it up with rugs.

We put in iron railings to keep people from falling out of the loft, finished mounting the electrical fixtures, added a handrail and trimmed out the walls. This rail will allow us to add a small log on top as decoration but that's a job for years to come.

We added kitchen cabinets from Ikea (they were cheap). A gas stove and refrigerator (Dometic). It's very hard to find a stove that doesn't use electric ignition these days but I finally found one on-line (Oasis Montana). I finished the gables and added stairways outside and they signed off my permit on September 18, 2007. The fact that it took me 11 summers to get to this point is a mite embarrassing but it sure was fun doing it. All tolled, we spent about $93K on the cabin which works out to be about $68/sq foot and the costs will continue to rise as we continue to work on things. We didn't work cheap but still, you find a house you can buy or build for $68 a foot and my hat's off to you.

There's still much to do. I need to build decks outside the cabin but they will need to be fireproof and, so far, I haven't seen any good plans for such. I will be selling my trailer and turning that structure into a garage that will house my solar power generation site in the next few years. After all, they made me spend many hours to wire the place, I might as well figure out how to provide electricity. Vanessa is making Roman shades (see kitchen picture) to provide maximum insulation properties for the windows.