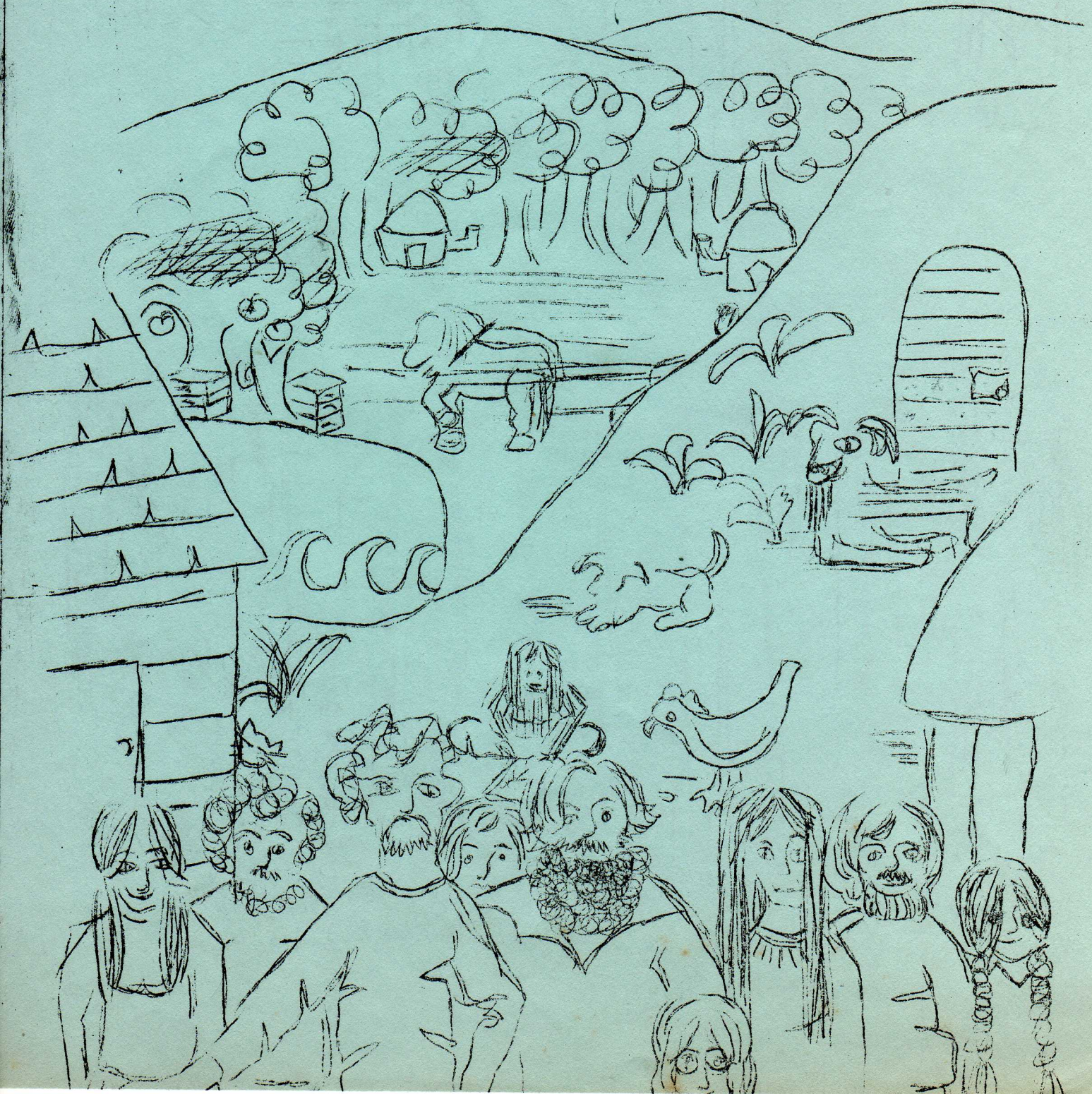
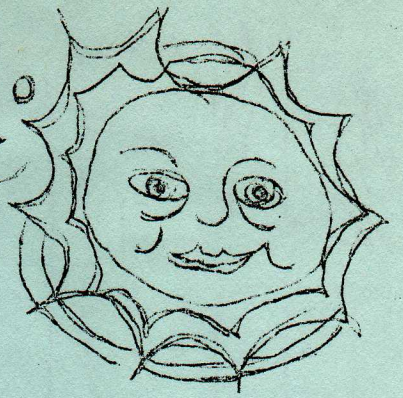
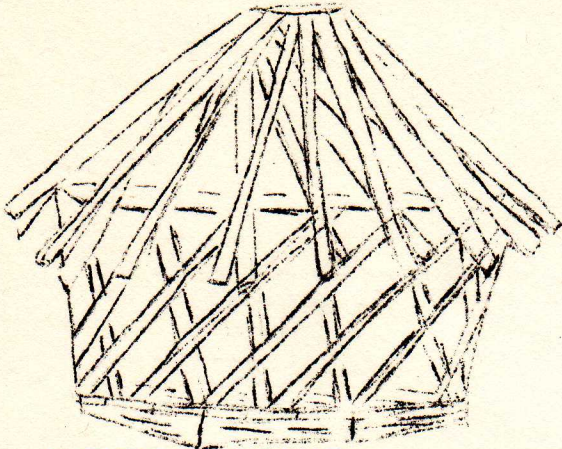


Homes where Yurt:

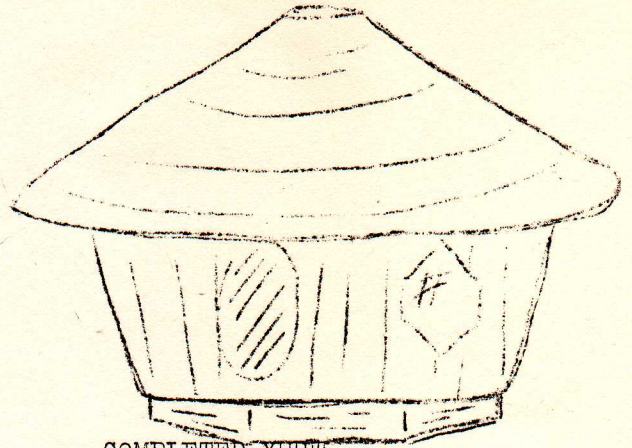


HOME IS WHERE YURT

Jim Steinman



LATTICE WORK FRAME



COMPLETED YURT

The yurt as seen in the United States today was architecturally envisioned by Bill Copperthwaite, a graduate of Cornell University, and popularized by Chuck Cox's model seen in many places in New York State and New England where he helped communities and individuals with the construction of their yurts. I've often heard Jur Bekker's name in connection with the earlier American yurts, and our commune, at Dawes Hill, was started on its "yurt" way with the help of Bill Brothers while he was doing C) work at the Cornell libraries.

Copperthwaite is said to have modeled his version on the hut of Mongolian origin (also known as a Ger or Jur.) The Encyclopedia Britannica has pictures of yurt-like dwellings in almost every country of the world. Look under primitive dwellings. These pictures may give you some ideas on building materials as well as other structural modifications.

To help you build your own yurts, I'll tell you most of the things we've tried at Dawes Hill and why we've stopped doing some things and started doing others.

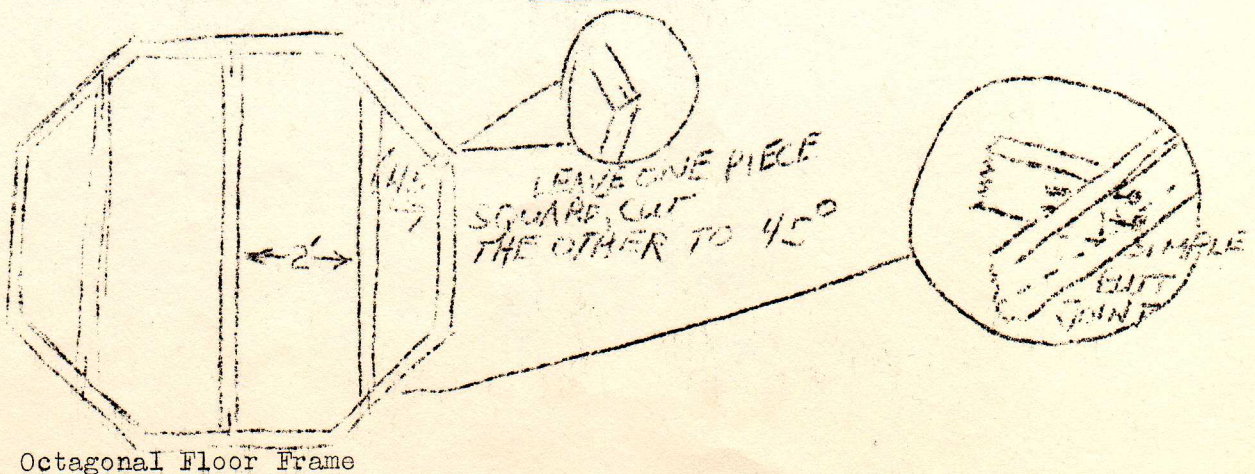
First of all, we decided to build yurts because we wanted inexpensive, easy to build, quick to build individual dwellings for one or two people. We started with almost no carpentry experience among us and hopes of completing eight yurts before winter set in (beginning in September, 1969.)

We have found that costs of yurts can vary from 50 cents, using all scrap materials and natural resources as we did for our chicken house yurt, up to 600 dollars and more using the solid board technique. Most of our yurts at Dawes Hill have cost in the neighborhood of 100 to 200 dollars.

As a matter of interest, local zoning laws have been a thing of concern. We have thus far avoided condemnation by calling our yurts "tent frames," which by definition makes them legal. Another advantage of our life style is the fact that as a commune we eat together at a central cabin. The yurts here are used mainly for sleep and study or meditation. Check your town zoning laws, but as a rule the town won't know what to do about something like a yurt, so you'll have nothing to worry about if you just go ahead and build it.

LAYING THE FLOOR

We can now frame up an entire yurt with as few as two people in is little time as two days, not counting gathering of materials. The first yurt we put up is the one my wife, Lisa, and I are living in, and it took quite a bit longer to build. Our first mistake was that of only semi-leveling the yurt-site. It is important to have a level base. We spent the first two weeks of construction laying a foundation and floor using rocks (flat pieces of slate being plentiful on our land) and commercial felt-asbestos paper and concrete. This process we find is no longer necessary in yurt construction. So far we have found it sufficient, in our more recent projects, to make a polygonal floor frame; octagons or eight sided floors are easiest to work with since all the angles are 45 degrees. We make this out of pine (2"x4" or 2"x6") wood and butt-jointing in joists (see illustration below) at two-foot intervals. The joists should be of the same materials as the octagonal frame. By the way, all but one of us has found stone floors to be pretty uncomfortable--particularly the way they retain coldness in the winter even when covered with several thicknesses of rugs. Wooden floors are twice as easy to build before the rest of the yurt than after, so altho they're somewhat more expensive to build than stone floors, you ought to think about using them before you build.



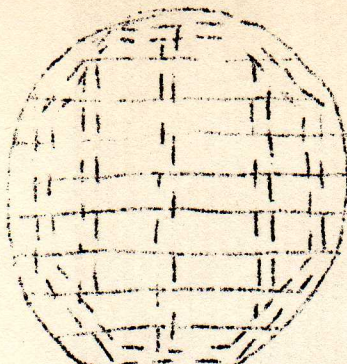
Octagonal Floor Frame

Lattice structure yurts have been built as large as 16' and maybe 20' in diameter to my knowledge. Solid board yurts have been built larger I think, but I've only helped build one of that type and will only describe the differences briefly as they arise. When you've decided how large you'd like your yurt (ours are about 15' diameter at the widest point-eye level- and 13' or 14' at the base), the length of the sides of the octagon frame can be determined by this simple formula: L (the length of one side of the octagon) = R (the radius of the circumscribed circle or the radius of the yurt floor) divided by 1.31. That is $L = R / 1.31$.

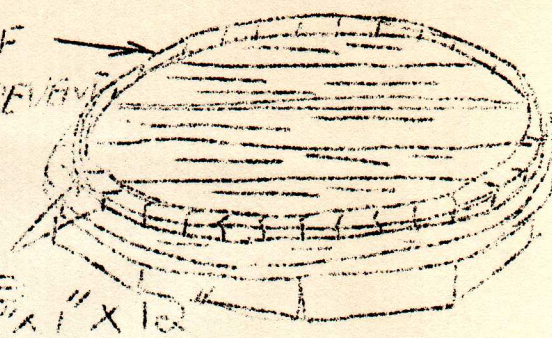
So, once you've got the floor frame all nailed together-- level it and, at the same time set it off the ground with rocks or some other non-wooden element (to prevent termites and CARPENTER ants from entering) and paint it with a wood preservative if you like. If you live in a cold or windy climate, now's the time to insulate under the floor. For free or cheap, tack tar paper or plastic to the bottom of the frame and fill with hay, straw, dried leaves, sawdust or wood shavings. Be sure to leave two or three inches of dead air space between the floor and insulation. At some greater expense, use commercial aluminum backed fiberglass insulation as we did for our walls and ceilings. It works. Unless you're really into smoothness you should try to get your lumber from the sawmill directly. We get our wood (pine) at ten to twelve cents a board foot. Your sawmill can also provide you with free or cheap sawdust, shavings sometimes and slabwood always (slabwood is the part of the log that is sawed off to square the log and is flat and smooth on one side and still has the bark on the other).

Nail your floor boards onto the frame, letting the ends hang over a good 6 inches. When you are nailing each successive board, slant the nails toward the last board to draw them more tightly together. When all the planks are nailed down securely, find the center of the floor. Make a giant compass by nailing one end of a narrow board or stick the length of the desired radius to the center of the floor. Draw the circle with a pencil held to the end of the stick and cut out your circular floor. A bow saw works well or an electrical circular saw which you can rent for about three dollars a day from United Rent-All. With that circular saw you can also rip (ripping is just cutting lengthwise with the grain) your own 1" X 2"s for the wall and roof pieces.

Now cut two inches off the end of your compass and draw another circle. Nail one foot lengths of 1"X1" or 1"X2" pine all the way around the floor on the inside edge of this circle to form a ridge or rim. This is to keep the bottom of your wall from sliding or collapsing inward. (If you're using a stone floor, ignore all this and just make sure you have a level ring of rocks on which to place the wall)



RING OF
WOOD TO PREVENT
BOTTOM OF
WALL FROM
COLLAPSING
INWARD

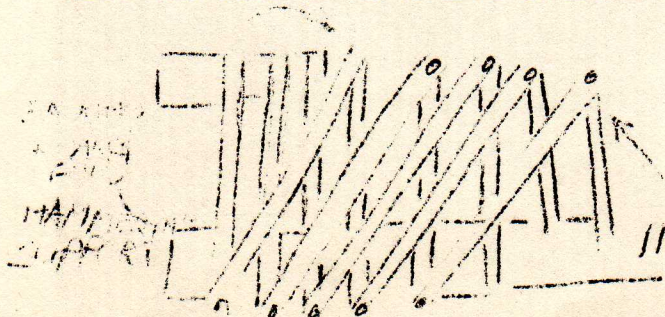


THE WALL

The lattice wall, like a folding baby's gate, is formed by laying out sticks 5' to 6' in length and either 1" x 1" hardwood (ask at the sawmill about getting old stacking spacers for free) or at least unplanned, full 1" x 2" pine without any knots (known as number one pine). Lay the sticks or wall pieces in a row with something hard (like two long broad boards) under either end. Use a number of pieces equal to twice the number of feet in the circumference of the yurt and lay down only half of them at first.

Drill holes (large enough for a 12 penny or 16 penny nail) 1 1/2" to 2" from one end of each wall piece. If the sticks are all cut to exactly the same length, do the same on the other end. If not, measure from the hole on the lower end and be sure they are all the same distance apart. Nail all your sticks into pairs on one end. Now clinch the nails by putting something under the head of the nail (like a steel plate or a sledgehammer head) and bend over the point with a hammer. Use nails that are long enough (probably 12 penny) or if you're into craftsmanship use pegs or dowels. If you have them on hand, use bolts with wing nuts.

The next step, which to some may be a little confusing, is called crossing over. The free end of each stick crosses over from one to about a maximum of five sticks (we usually cross over three) and is nailed at the top end. For instance, when you cross over three and nail at the fourth it looks like this:



CROSSING OVER 2
AND NAILING TO
THE THIRD
LEAVE LOOSE FOR
INSERTION OF CABLE

Now is a good time to prepare your cable. By the way, don't clinch the top nails yet because you have to separate the wall pieces a little bit at the top to squeeze this cable in. You should have a

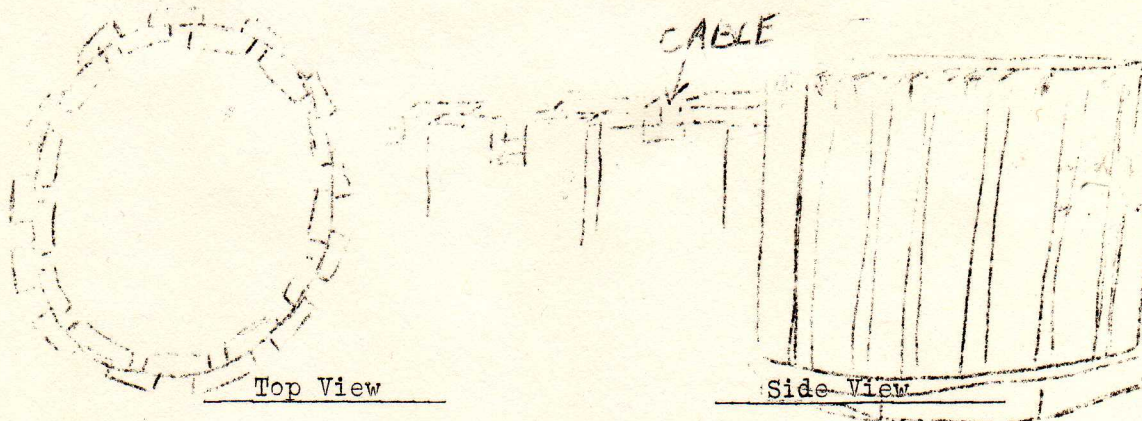
length of $1/8$ " to $1/4$ " cable a few feet longer than the circumference of the yurt and maybe a cable clamp to tie it together. Mark it off at one foot intervals with tape or nail polish or something. Back to raising the wall.

Try to get a lot of people together for this one. Stand up the wall on the edge of the floor platform. Just stretch it around and sort out the loose ends (carefully) and nail them together. Separate the pieces at the top nail enough to slip in the cable so that it rests on the nail. Make sure your one foot spacings are set at the nails, then go around clinching the top nail. Now go around spacing the pieces evenly at the bottom; usually at about 8 or 9 inch intervals, depending on what slope you want the yurt wall to have.

There, now you have a floor and a wall, the least interesting and easiest parts of building a yurt. The cable is actually the most important single functioning factor-- it forms the central ring which supports the roof.

(Option) SOLID BOARD YURT WALL

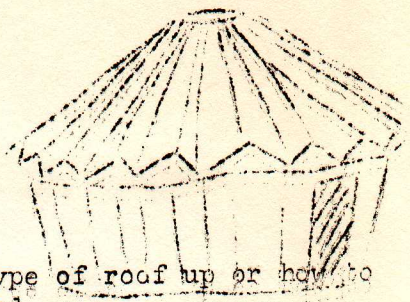
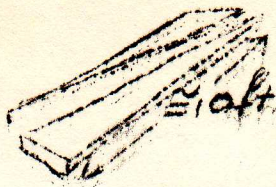
In the solid board yurt, skip the lattice wall. Just cut planks to the right length (5 to 6 feet) and nail them one at a time to each other in a board and batton fashion, if that terminology is familiar. If not, it looks like this:



Don't forget cable, especially if you want to put on a lattice-work type roof (which is the only roof I'm going to tell you how to do.) To put a lattice roof on the solid board wall, cut a 2×4 " notch on one foot intervals at the top of the boards. Make sure the cable comes out in the center of this notch so that the roof pieces can go over and under it.

If you want to put a solid board roof on (which I've never done or actually seen) you'll either have to write Bill Copperthwaite (Yurt Foundation, Bangor Harbor Maine) for a copy of his plans at three dollars or figure one out for yourself. A hint is that you split long planks diagonally and set them up something like

this:

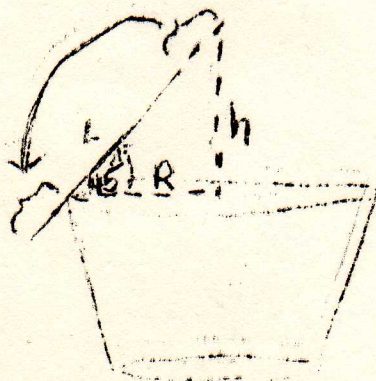


But I'm not so sure what keeps this type of roof up or how to cover and seal them other than with sod.

THE LATTICE ROOF

We've always used the lattice roof because you don't have to buy the plans (altho I've heard the 3 bucks goes to a worthy cause) or so much expensive wood. When you select the wood for your lattice roof consider your climate. We used light planed pine with too many knots at first and a two foot snowfall collapsed one of our yurts. Now we use unplanned pine of the finest grade (no knots) and rip the pieces ourselves with an electric power saw (careful-- we burned out two saws on wet wood) to a little bigger than 1" x 2". A hardwood like maple or oak is preferable, but expensive.

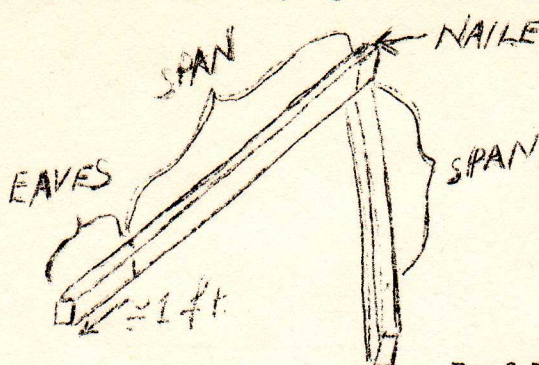
The roof structure is similar to the wall structure, but rather than putting it up as one unit, it is raised one pair of sticks at a time. You should have one pair for every wall pair. To figure out the length of the roof pieces figure the pitch of the roof to be 45 degrees. If the radius of the yurt is, say, 8', then the roof pieces should be about 10' or a little more. The extra length needed for the eaves (6"- 1') should be pretty much compensated for by the fact that your skylight will be about 13"-2'.



$$L = \sqrt{R^2 + h^2}, \text{ but for } 45^\circ \text{ } h = R, \text{ so } L = \sqrt{2}R^2$$

Drill a hole two or three inches (but always the same) from the top end of each roof piece. If you're using 1"x2" pieces, drilling thru the center of the 2" faces is probably best. Drill them about the right size for a 20 or 30 penny nail. Like you did with the wall pieces, if they are exactly the same length drill another hole about 6" to a foot from the other end. If you're not sure about the lengths, measure from the hole at the top end because it's important to have

the spacing between those holes the same in each board (Otherwise you get a wierd skylight and a weak roof.) Nail the pieces into pairs.



THE SPAN MUST
ALWAYS BE EXACTLY
THE SAME

Roof Pair

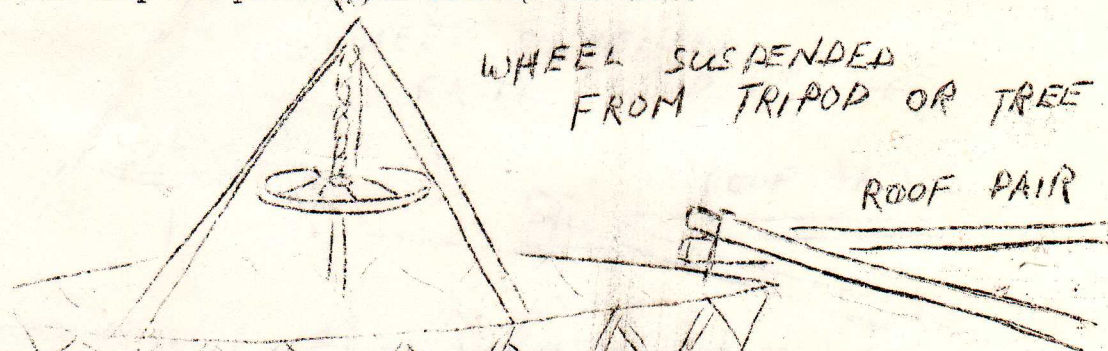
There are several ways of putting up a roof. The first one I'm going to describe is the one with which I'm most familiar and involves at least two and better three people. The roof is, in this case, initially supported by a long pole (we usually use one of the roof pairs for the pole) steadied by one of the people. When the first roof pair is spread into a V you will notice that there is a top member and a bottom member of the pair. Drive a long nail through the hole at the bottom (or wall) end going downwards through the upper member of the pair. (see above picture)

Support the nailed-together top end with the pole in the center of the yurt. The top member of the pair, at the other end, rests on top of the cable with the nail preventing it from sliding outwards. The pair is spread as many spaces as you like (preferably three to five) and the initial direction is arbitrary, but be careful to continue with the same number of spaces (that is, for example, cross over three, nail to the fourth) and in the same direction (top over bottom). The bottom member of the pair goes under the cable and is temporarily lashed into position with twine. Then put the next pair on over the first. You'll see how it works. After three or four are up you can start nailing them together at the cable (clinch the nail right away if you have trouble with the bottom piece falling) and just keep on truckin' right around till you get back to where you started. When on the way you find your roof is getting a little off center, push it around carefully-- keep the skylight as tight and circular as possible-- push or hammer pieces up into position. If the whole thing starts getting way too heavy and pulls the wall out of place, tie the wall down to the platform, and brace up the falling wall. This is the place where yurts can be the most troublesome at times. Stick in more poles where you need them. If the roof separates in the center of the yurt, which it often does, always remember that the first pole you put up is sort of supporting the rest of the roof, so lift both pieces at the point of separation (carefully) and spread them until they pop back into place. If you haven't figured out the structural principles of the yurt and the roof yet, now is definitely the time. Remember to try

to keep the skylight about over center all the time and also that the peak tends to wind up a little higher than you would expect it to (about ten to twelve feet above the floor). So when you get around to the last three or four pieces be careful about crossing over and under the right number-- unnailing is a drag. By the way, we've often found it helpful to have something like a stool or stepladder in the center while putting up the roof so you can actually get your fingers pinched in there, and besides, the best part of building a yurt is dangling from your skylight when the last piece is put into place and all the supporting poles are taken out. We call that the good feeling test.

Now, before you start crawling around on your roof always try to distribute your weight to a lot of beams) nail or lash all the cross joints in the wall and roof. Especially put in a few nails where you want your door so you can cut your way out of there since the sun is probably starting to go down about now. (It always does)

New ideas, New Ideas!!! I hear another way of putting up the roof is temporarily to suspend (somehow) a bicycle or wagon wheel about where the skylight should be and the nails sticking out the boom of the top end of the roof beams will catch on it and keep the pieces from sliding outwards.



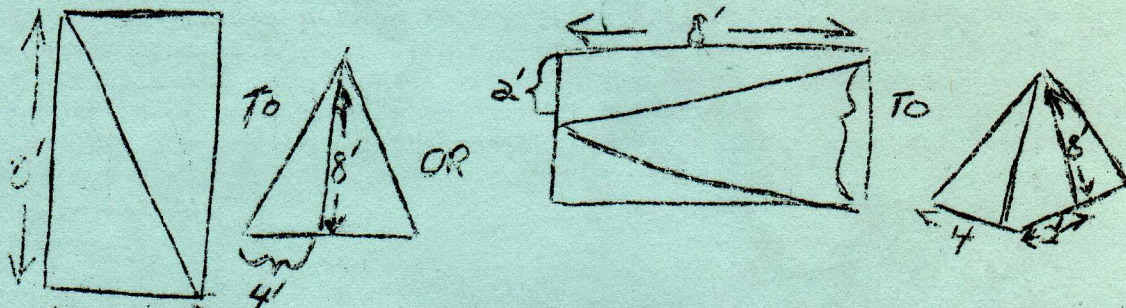
This has several advantages as far as weight distribution, not having to measure exactly for span to the eaves, and supposedly leads to the more perfect skylight. In a recent conversation with Bill Brothers I learned that this is sort of the method the mongolians used in their yurts, but their preformed rings remained a part of the roof. There were actually holes in the ring into which the roof pieces were stuck. The lattice work roof is Coorathwaite's invention, evidently.

As a last word on the roof-- the first one we put up went up and down three times before it set right, so don't get discouraged.

Back to doors and windows. It is best to make frames first out of 2"x4" wood, nail them onto the wall and cut out the lattice stuff, and find or make doors and windows to fit (we used 1/2 " interior plywood for our doors.)

Yurt covering is somewhat of a problem and is still pretty much in the experimental stage. Canvas is good in warm climates or for

summer yurts. One of our neighbors used Canvas nicely as an interior lining, although most of us have hidden our insulation with feed bag burlap because of its low cost. We're all using commercial fiberglass insulation though, and have recently learned of the insulatory qualities of hay and leaves. Some disadvantages of hay and leaves are the difficulty of application (maybe you could stuff feed bags and tack them up) and the fire hazard. Felt-asbestos paper helps cut out wind. Plastic works too, but both of them must be well covered or bound or them wind will rip them off. Some of our walls are done on the outside with slabwood free from the sawmill. We have also thatched with cattails and cornstaks, although again be warned of the danger of fire. Same goes for wood shingles, which are expensive but pretty. Mud and straw is still in the experimental stage on our chicken house yurt wall. Plywood or masonite covered with mineral surfaced roofing paper or shingles works ~~XXX~~ fine so far on the roof. 1/4" plywood bends pretty easily and when cut like this



works real good. Some of our friends who live in geodesic domes have recommended army surplus parachutes coated with polyester "fiberglass" resin. Another yurt was covered with shoe sole rubber, in one yard squares. Mongolians cover their yurts with yak hides. I could ~~X~~ go on forever I guess-- the best thing is what's best for your climate (and if you're just getting out into nature~~X~~, climates can be a little more severe than you might imagine) and your esthetic judgment. ~~insul~~ A final note on fire! We just lost one of our Yurts to fire-- the heat from our woodstove caught on to some burlap and our home went in about five minutes). We're now looking around for some more fireproof materials (just watch how fast a piece of burlap flares up). BE Careful!! Plastic works too, but both of them must be well covered or bound or them. If you run into any problems or want to send us any new ideas please don't hesitate. Send a pigeon or write like thatched with cattails and cornstaks, although again be warned of the danger of fire. Same goes for wood shingles, which are expensive but pretty. Mud and straw is still in the experimental stage on our chicken house yurt wall. Plywood or masonite covered with mineral surfaced roofing paper or shingles works ~~XXX~~ fine so far on the roof. 1/4" plywood bends pretty easily and when cut like this

Daves Hill Commune

Box 53


West Danby, N.Y. 14896

~~XXX~~ Yurts truly,

or Forever gers,

Jim Steinman with a lot of

help from my friends-- especially

Lisa, Jon, Emily, Josh, Eino and Irene, Frank, Peter, Lew, Sam, Barb, Jason, Kathy, David, Tim, Tina, Steve and Sharon, Carol, Bob and Judy, Josephine G., Josephine C, Tony and Dolly, Molly, Sunshine, Malcolm, Jude, and Mouth + LAURA, TERRY, JACK, MEYER AND  MOVEMENT

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