



Sometime in 2013, while visiting Half Moon Bay to watch the day's sun fall into the Pacific Ocean and hoping to see the Green Flash, I noticed a couple sitting in their folding chairs on the bluff next to a small funny looking trailer. They were enjoying their glass of wine as they watched the sun drop out of sight on the horizon.

The trailer was intriguing. It was small, but large enough for the couple to sleep the night. The back was open and there was a small galley with a small sink and two-burner stove.

I interrupted them to learn more about their trailer. They were eager to show it off and gave me a tour. They said it was a teardrop trailer and was large enough for a few days camping and small enough to go almost anywhere. I thanked them and thought to myself I'd like to have one of these.

Well I forgot all about teardrop trailers for a couple of years until a year ago while driving along the coast on Highway one we pulled into an overlook at a spot with a terrific view of the ocean and the possibility of seeing a passing whale. Watching the wild surf break over the rocks and onto the sandy beach a Porsche 911 drove in pulling the cutest little teardrop trailer.

The Porsche door opened and out stepped this beautiful young woman dressed to the nines including some of the highest high heel shoes I'd ever seen. She walked to the back of the trailer and lifted the hatch revealing the cutest little kitchen containing two burners and a sink combo. She pulled out a coffee maker and fired it up.

As the coffee started to percolate, a couple of European travellers walked over to talk to her about her trailer as I had done that evening in HMB. We observed the whole scene for a while as she conversed with the two gentleman travelers who were listening intently. I wasn't sure whether it was the trailer or the beautiful woman that captured their interest though.

Traveling the highways I'd seen a couple of these small trailers. This photo is a Classic Teardrop.

Classical Teardrop Trailer



Again I thought someday I'd really like to have a teardrop trailer and again I forgot all about it until this past May when I was browsing the Harbor Freight catalog. They were advertising a foldup trailer on sale for \$330. When I saw that trailer ad the thought of a teardrop trailer slipped back into my head.

I looked online and found that there were a number of people that had built small teardrop trailers using this 4x8 size trailer as the base. After a little more research I decided not to let this opportunity pass and I would buy the trailer and start investigating the possibility of building one. My teardrop vision looked something like this:



I've always liked building things and this project looked just challenging enough. Turning raw material into neat things has always interested me. So I headed off to Harbor Freight to buy a trailer.

It was 6:30 when they loaded two huge boxes into the back of our Land Rover. I backed up to the garage. The boxes were too heavy for me to get out so I opened them in the car and started laying out the parts on the garage floor. While unloading the pieces my Son Michael called. We chatted as I unloaded the SUV and laid out each of the parts on the garage floor in the order they might go together.

I finished unloading about the same time we said goodbye. I tossed the empty boxes into the recycle bin and went to bed. Next morning I took off for a few days so I didn't get back to the trailer for three days.

I took a quick look at the trailer instructions and started putting it together. At the end of the second day the trailer was almost complete. I went back to the instructions to check out the wiring plan. It was then that I noticed to my horror that I had just built the wrong trailer. The trailer I bought was the heavy-duty 1720-pound trailer. The trailer they loaded into my Rover that night was the 1150-pound trailer. Thankfully my receipt showed I had paid for the heavy-duty trailer. The Harbor Freight manager couldn't believe what happened but said please return the trailer and they'd give me the right one.

I connected my almost built trailer to the car and towed it back to the store. The manager was polite, took the trailer back and again loaded two very large boxes into the Rover. Again I unloaded the boxes on the floor of the garage and started building the second trailer. It did go a little faster this time. I still wonder who the lucky guy was that bought the mostly built trailer I took back.

Now that I had an assembled trailer it was time to take the next step, building a platform or floor for the house that would sit on top of my little red 4 x 8 trailer.

The trailer is advertised as 48 inches by x 96 inches (4 x 8). In reality it measures 48 5/8 inches making it a tiny bit wider than a standard 4 x 8 plywood sheet. So I had to buy two sheets and cut them in half and piece them together – no worries it's just time and money.

The base frame floor is ½ inch plywood framed with 2x2 inch pine and a 2x4 across the middle where the two pieces fit together. These were all glued and screwed. I then used the trailer to go buy and carry more supplies.



All the trailer parts



Parts Assembled – Jack added



Platform floor on trailer base

Before permanently bolting the floor to the base I turned it over and sealed it with road tar. This stuff is just awfully messy but makes a good seal to protect the bottom.



Upside down floor with road tar sealant



Underside insulation w/straps

The underside insulation was glued, screwed and strapped. It also shows clearly the 2x2 framing. The floor was flipped over and bolted to the trailer frame. Ready now to start building the house on the base foundation.

I hooked up the trailer again and headed to Home Depot to purchase two pieces of $\frac{3}{4}$ inch 4x8 birch plywood sheets to be used for the side-walls.

After considerable research looking at different teardrop trailer shapes, I decided on my own. Diane insisted on having as much head-room inside as possible. Traditional Teardrops have a big slope at the rear. Below I show the layouts for my design and the curves. If you look closely at the left image you'll see that the radius is 23 degrees which seemed like a nice curve for the front. The middle picture shows the driver side wall on top of the passenger side-wall with front and back curves cut as well as the border edge.



Drawing the front curve



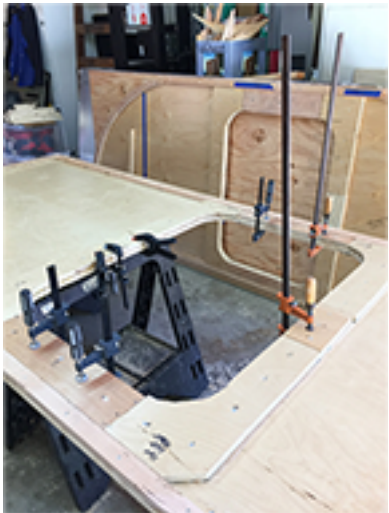
Back curve and edge border



Blue separates Galley

The picture on the right above shows the perimeter border, the proposed separation of the galley and sleeping area and door placement.

The border around the outside perimeter of the wall is for strength and an edge for the insulation. You can see the insulation in the background on the picture on the right. Next I had to decide on door placement and approximately where the sleeping quarters ended and the galley area started. I allowed 73 inches for sleeping. The paper template was used to mark where the door would be and the blue tape-line is the sleeping area/galley separation point. The 1x2 inch along the bottom leaves just enough overlap for the wall to fit over the base edge.



Reinforce the door



Bob fits



House up on wheels

After cutting out the hole for the door I added edging to give it strength and an edge for the insulation. It was, of course, glued and screwed. I've discovered one just can't have enough clamps in the toolbox.

I set the house up on the garage floor to see just how I would fit. Plenty? Now for the real test - how well will the 'house' fit on the trailer? With a little fiddling and positioning I cut out the sleeping/galley partition and made sure it all fit properly.



Picture of galley area



Drivers side inside wall

Time to add the wall wiring. The left photo is of the inside wall above the door. On the opposite side will be the porch light above the door. The middle is just another shot of the porch wiring. The right photo is wiring for the inside reading light. The wiring for the two porch lights and the two reading lights run up to the roof and then will run back to the galley area.



Porch Light



Porch Light

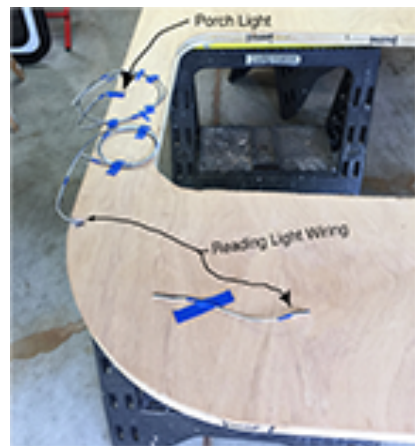


Reading Light inside

The photo below on the left shows the skin for the inside wall being glued to the frame keeping all the insulation and wiring inside. All the stuff on top is just there for weight along with the clamps to secure the skin until the glue dried. The inside skin is 1/8 inch Luan plywood which is used throughout. The photo on the right is the finished skinned inside wall with the wires for the porch and reading lights.



Gluing down the Luan interior wall



Inside Luan with Lighting Wiring

With the sides being set in place, glued and screwed, wall wiring being added and the inside wall skin being finished it was time to tie the two sides together. The spars are 1 x 2's 47 inches long and spaced roughly six inches apart shown in the two left photos below.

The wide space in the middle photo ceiling below is for the Star Gazing window. The square cutout toward the back ceiling is for the reversible, variable speed fan. Three speeds in and three out.

The photo on the right below shows the wiring in the roof going from each device to the back galley through the spars. The six devices are the two porch lights, two reading lights, the inside dome light, and the fan.



Spars attach the two sides



Star Gazing Window & Fan



Wiring back to the galley

The two photos on the left below show the inside skin being applied to the inside front wall and ceiling. The skin was first glued and secured at the bottom front. Pressure was applied as each spar was glued until the Luan skin was attached to each spar in turn. This process took several days as the glue dried as the skin was being rolled up a spar at a time. The Luan sheet wasn't long enough to cover the entire ceiling so there is a seam just behind the fan opening.

The photo on the right shows the Luan skin attached. The two red wires running from the bottom right front up to the ceiling are routed back to the galley. The battery will be housed in a battery box in the front. The battery wires run back to the galley where it will be attached to the Charger/Converter and other device wiring.



Applying pressure to the Luan curve



Inside glued + battery wires added



No way to clamp



Adding two boxes to the galley

Sticking the Luan skin on the side walls of the galley. That's a lot of sticks

Working on the galley area. The hurricane hinge is at the top. The ribs run from the hinge to the box. The box at the bottom contains the wiring, etc., on the left and storage space on the right side. There are four ribs, one on each side and two in the middle of the galley hatch.

The two photos below on the left show the cutout for the 'Star Gazing' window in the roof from the top and from inside.



Star Gazing Window from the top and inside



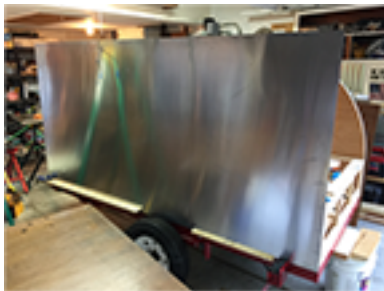
Roof – insulation + wiring

The photo above right shows the cutout for the fan in the roof as well as the insulation between the spars from above. The insulation isn't quite finished. The wiring is also visible as it runs toward the back toward the galley.

The next step was to skin the outside. Friends wanted me to use stainless steel but I decided it would add too much weight so I opted for aluminum on the sides and top. This is a photo of the 4 x 8 .032 aluminum sheets I used on the outside walls.



Aluminum 4x8 sheets



Used Contact Cement



Glued and cut to fit

Contact cement was used on the trailer walls and on the aluminum. I built a platform along the trailer bottom to support the aluminum as I set it in place and rolled it up the wall and pressed it on. The middle photo shows the temporary base along the bottom. If you have ever worked with contact cement you know how difficult it is. Once it's spread on both surfaces and is tacky, not wet, there is only one shot at getting it positioned correctly. Once in place it cannot be moved. Period. Luckily we got both walls covered in one shot. Missed a little on one wall where the porch light poked through but it was easily corrected.

With the aluminum siding glued in place it was time to do the trimming. This worked extremely well with a small hand-held router. Makes a hell of a mess though with aluminum chips everywhere.

With both sides skinned and all the installation installed on the front and roof it is time to close up the front and the roof.



Ready to skin the roof



Added diamond plate



Skinned the roof

Upper left photo is last look before closing up the roof. The original plan was to cover the spars with Luan before adding the aluminum skin. But with the placement of the spars and not wanting to add any more weight I decided to skip the Luan and lay the aluminum directly on the spars.

In order to add a little character to the trailer I decided I would use Diamond Pattern aluminum on the lower front and also a short piece on the lower back of the galley. The photo shows gluing the aluminum on the roof from the diamond pattern to the Hurricane hinge in the back. I glued it several spars at a time with the help of the house roof. It takes a lot of weight to hold it down while the glue dries. I used four Come-Along straps in order to secure the curve and a lot of weight on the rooftop.



Diamond Plate Front



Diamond Plate Back



Two boxes with hinged lids

The photo above left shows the trim that runs across the front where the diamond pattern meets the roof aluminum. It is screwed in place and then covered with a vinyl insert trim.

In order to match the front I decided to use the diamond pattern on the back as well. The middle photo also shows the two, hinged lids that cover the galley boxes. The photo above right is a close up of the galley. The wood along the bottom is used to hold the aluminum in place till screwed.

Ready to install the doors. Decided to use two doors instead of a door on one side and a window on the other side. Feels a lot like more room. The doors have windows and open with screens and are lockable.



Door out of the box



View from inside



Door from outside

I needed a battery box up front and I found this diamond pattern box for the battery and other misc. stuff. It was cheaper to buy the box than to make it. The box is bolted to the frame and the battery wires run in through the back. Bottom left shows the box.

The two photos bottom right show the variable three-speed, both directions ceiling fan.



Battery Box

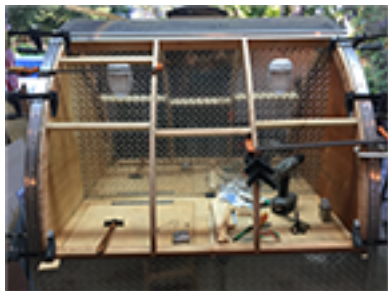


Ceiling Fan outside



Ceiling fan inside

Time to stop putting off working on the scary hatch lid. The following photos show the construction of the hatch lid. Shown in the left photo the lid ribs are fit to the walls of the galley. There is space between the lid and the walls to accommodate for edge molding. As you can see the ribs are held together by a few spars. The middle photo the finished hatch lid skeleton before adding the inside Luan skin. The right photo shows the inside Luan skin being glued to the hatch lid skeleton.



Spacing the Ribs



Adding all the spars



Gluing the inside Luan

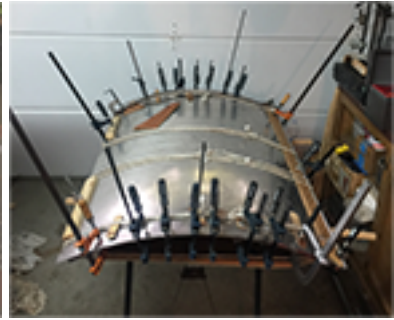
The photo bottom left shows the hatch lid set in place with backing reinforcement for the two hatch lid handles and the hatch lid light at the top. Now the insulation can be cut and set in the hatch lid. The bottom right shows the aluminum skin being glued to the hatch lid exterior.



Looks like a good fit



Lets add insulation



Button it up with Aluminum Skin



Adding the 'T' molding



Another shot – Clamp City



Finished product

The final step in completing the hatch lid was to add the 'T' molding on the both sides and the bottom. Of course, it was glued and screwed. The 'T' molding was fitted and painter's tape was used to mark where the glue would go without making a mess. The 'T' molding was clamped at one end and screwed and bent along with clamps and screws. The photo on the right shows the inside hatch lid with 'T' molding installed.



Finished Hatch Lid



Spring Prop



Inside view

The photo on the left above shows the end result. I was talked out of installing the air hatch lid props for the spring type. They were easy to install and they work great.

Everything was going along pretty well, but then I receive a letter from Harbor Freight stating that the tires on my trailer were being recalled. So I jacked up the trailer, pulled off the tires, put them in the RV and off to the store. The lower left photo shows the axel without the tire. The middle photo shows the tires in the back of the Rover and the photo on the right shows the new tire installed.



Axel



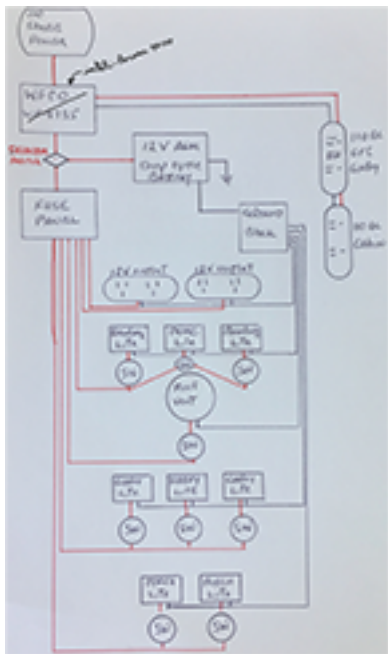
Bad tires



New tires

Adding the electrical was challenging. I wanted a porch light over each door, two reading lights and a dome light inside, a ceiling fan and at least two galley lights. I needed to accommodate a 12 volt battery, a battery charger/converter (requires 110), wiring and fuses.

The photo below left shows the initial electrical plan and is close to the final implementation.



Initial Plan



Battery box w/Battery



Closeup

I found a battery box that fit on the trailer tongue as shown in the middle photo above. It was less expensive to buy the box rather than build it. I purchased a batter and installed it in the tongue battery box as shown in the photo above right.



Red battery wires



Wiring through ceiling spars



110v shore power input

Above left shows the battery wires going from the front (tongue box) up the front, through the ceiling spars, and down to the galley box. The middle photo from above shows all the wiring and the photo above right photo shows the plug for the 110v shore power.



Left galley box containing all electric control

The photo on the left shows the a box in the back where 110 comes in. The silver box is the charger/converter and requires 110 power. It charges the battery, converts 110 to 12v, and distributes 12v to the devices through the fuses at the back wall. To the right of that is the positive and negative distribution block. Each device has positive and negative wires.



Interior shelf & Heater



Shelf close-up with 110 & 12v



Vinyl Floor

Above left is a shelf photo with an electric heater on the left side and the right side is 110 and 12v. The middle photo is a close up of the electrical. The photo on the right is the vinyl flooring. The same vinyl is also used in the galley.



Vinyl floor & reading light



Mattress



Mattress close-up

The two photos above right show the mattress. The mattress is made so it folds in two from the front to the back and therefore double as a seat.



Galley complete



Galley closeup



Galley hatch lid

With the end in sight I finished the galley except for one light in the inside hatch. Diane suggested I use the diamond plate as the back splash which ties everything together. The two lights may be too bright so I'll look around and maybe change. The backend shows the two handles for the hatch lid and the retro bumpers.

This project was started with the purchase of the Harbor Freight folding 3x8 trailer on June 22, 2017. Never having done this before I was a little optimistic on how long it would take. The original estimate was Thanksgiving, then Christmas, and then St. Patrick's Day. For all practical purposes I'd say March 17, 2018 was completion day.

A tremendous amount of time was spent researching materials to be used, where to find them and how to apply them. I didn't anticipate all the steps involved when using glue. Each session required waiting a day for the glue to set before stress it. I didn't keep a log of how much time I spent, but I only worked in the afternoons and not every day.

The other question I get asked is how much did it cost? I did keep receipts of all the purchases:

\$481 = Trailer, DMV & Misc.

\$2,552 = Doors, Windows, Mattress, Tongue box, Vinyl floor, Fan, etc.

\$1,511 = Aluminum, Wood, Insulation, molding, etc.

\$588 = Glues, sealants, polishes, etc.

\$629 = Electric wires, Battery, charger

\$354 = Hardware, etc.

\$753 = Tools – in most cases they are longer lasting

\$6,868 = Total

So the answer to the cost question is under \$7k.



Our real tow vehicle