

How to build a Roadster Body Buck for a Factory Five Racing Roadster Roadster Kit - Ver. 2.0

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The following is a new detailed set of instructions on how to build the body buck for a Factory Five Racing (FFR) Roadster Replica kit. I am not a tech writer, so like most things you find for free there are sure to be some mistakes, so use these at your own risk. Drawings and a complete materials list, tools and supplies you will need are at the end of this document. I suggest that you take the materials list page with you when you go to the building supply place so you don't forget something (Yes, I had to make two trips).

I built my buck using a combination of several other's plans and pictures that I found on the Roadster related forums on the Internet. When I was done I concluded that a few changes, updated drawings and more detail might be useful. That's not a criticism of the fine writings and postings on this subject by others before me. About 2400 of us FFR builders have been the beneficiaries of the work, postings and pictures of people like Wade Chamberlain, Scott Brooke, John Baker and many many others. I figured for the non-carpenters or mechanically challenged people, more detail and pictures should help insure that what you create turns out to be a Buck and not a Doe.

Some of the changes in my instructions include: 1) increased stilt/leg height and reduced basic buck height to make more room under the buck for your chassis. 2) Completely new drawings. Over time, it seemed that minor errors and missing info had accumulated in some redraws that were available on the Internet. I also realized that the original FFR drawings didn't show several dimensions that us motor heads could use make the buck correctly (most of us were not geometry majors or carpenters).

Anyway, I called the factory to get a good clear copy of the original FFR spec sheet drawings that are in the back of the manual. I entered all the specs into my ESPRIT Cad/Cam software and bingo, it created a set of accurate drawings, where all the dimensions were present and the many line and arc intersect points actually met. ESPRIT was used to create the drawings at the end of this document. So that the buck drawings were as large as possible and thus easier to read, they show only the left side of Front and Rear buck faces. The right sides are just a mirror image. Yes, I work for DP Technology Corp, the developer of ESPRIT Cad/Cam software, so I need to get this "plug" in on the first page. Quite a few Racing Teams and NASCAR Winston Cup and IRL Chassis builders use our ESPRIT software so we do know a little about high performance cars. Take a look at www.dptechnology.com then click on "motorsports" on the left margin. The completed buck pictures that I included for reference in these instructions are ones I found on the various forums and Internet sites. Hopefully I didn't miss giving anyone credit.

If you are going to build only one buck, it is easier to just draw the dimensions directly on the OSB wood sheets rather than to make a full size set of paper templates. If you do want templates to survive several builds, like for your Car Club, I suggest drawing and cutting them from Tyvek. I have assumed that when there was a step that could be screwed up (like all the ones I messed up), I put down lots of detail, probably overkill.

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Getting Started

why stilts and wheels for the basic buck?

The object of the stilts is to make a buck that one person can easily roll around, is tall enough to allow storage of the Roadster's rolling chassis under it, and still be short enough so the whole thing fit through a 6' 8" to 7' garage door opening. Actually, the buck comes out about 74" without the roadster body on it, so maybe 78" (6' 6") with body on. You don't have to add the stilts, or the wheels, but making the stilts are only a little extra work.

Important Stuff about building the basic buck. When cutting the straight edges of the OSB, use a straight edge or chalk line to mark the lines and a skill saw to cut these, not the jigsaw. Straight cuts will help you end up with legs that are mounted straight up and down. This will also help hid the fact that you may have been nipping at the beer before you finished. Keep in mind that part of the purpose of the buck is so you can roll it out of the garage onto the driveway so that all the neighbors and passersby will see the cool thing you are creating and stop to ask questions. So, it better look good. AND, you don't want your friends laughing about the drunken Giraffe you built and ask you if the Roadster will turn out any better!

The pictures give you a pretty good idea what you are trying to build and what different people have done. Note that some of the bucks in the pictures have one pair of legs on the inside of an end face and the other pair on the outside of the end. I recommend that you put both pairs of legs on the inside faces so you don't have to shorten the length of the center OSB support to less than 8 ft. These instructions assume you are putting the legs on the inside of the end faces.

Read all before you start: I suggest that you read all the way through these instructions once before you start so you have a good overall understanding. The build will take 2 people about 2+ hours, not counting the time to go get the materials or any time spent drinking beer while discussing what the next step should be. It is fairly well documented that if you drink the beer during the build, it takes longer and you make more mistakes. But it is also known that after a couple of brews the mistakes don't seem to bother you much either. Everything will be put together using wood glue and course thread dry wall screws, **not nails**. Dry wall screws pull the pieces together tight so the glue will set up strong. This is important as rolling the buck around tends to loosen things up if you use nails.

There are some pros and cons to using glue the Pros are, it won't come apart easily.....the Cons are, it won't come apart easily. Don't be skimping with the glue and don't get carried away either. It is the glue that will ultimately hold the thing together. Pre-drill all screw holes through the OSB sheets, but do not drill the holes through into the 2 x 4s. These OSB holes need to be large enough for the screw to push through the OSB by hand, but not be sloppy.



Scott Brooke's buck, showing my dimension mod to height.

(width dimension, 77 in. (6'5") is the internal width not counting the legs.

The 42" height is from ground to bottom edge of buck end face)

Making the two buck ends faces. Start off by cutting 2 of the 4 ft. x 8 ft. OSB sheets down to 80 inches in length. That is the width of the finished buck end plates that the body sits on (see drawings at the end). Don't be confused by the 6' 5" width (77 in.) measurement in the previous picture. That 77 in. is the inside distance between the legs (Thus, 77 in. + 2 legs at 1 ½ in. thick ea. = 80 inches, the total outside width).



Wade Chamberlain's buck. Note he made his shelves the full width of each side of the buck.

My plans have shelves only 1 foot wide, but any width will work.

Leave the 3rd sheet of OSB full length (8 ft.). This sheet you need to cut it in half lengthwise so you end up with two pieces 8 ft. x 2 ft. Now, take one of these 2 ft. wide pieces and cut it in half lengthwise again so you get two 12" wide by 8 ft pieces from it. The 2 ft wide piece is the vertical center support that ties the front and rear OSB ends together, the two 12" wide pieces will be the long shelves, which also provide racking strength to the buck. These shelves are not yet on some of the bucks in the pictures.

Either draw out the buck end dimensions directly on the OSB sheets, or if you created full size templates, layout the "Front" drawing on one of the OSB sheets you cut to 80 inches, and draw its outline on the OSB. Before you cut, do some final measuring. Measure twice, cut once! OK, you are ready to cut. Now, do the same with the "Rear" drawing on the other 80 in. OSB sheet.

After completing both panels above, draw a centerline down the front and rear panels from the top to bottom, on both sides. (the "top" meaning the upper sculptured edge the car will rest on). These lines will be used to align two vertical 2 x 4 supports for the center vertical OSB piece. To make these supports; take an 8 ft. 2 x 4 and cut off two 24 in. long pieces. These will be attached to the Front and Rear OSB panels per the following steps.



(this design used shorter diagonal cross braces which go from the middle of the leg to the lower rail, rather than my style of braces that go from the upper rail to the lower rail. Either method works OK. I don't know if the tricycle is the official buck tow vehicle, but it seems a little underpowered to me.)

Making the center support. Making screw holes for the two vertical supports: Hold or clamp the Rear OSB end piece flat against the Front one, aligning the bottom edges. This will allow you to drill screw holes in both at the same time. Now, drill a single line of holes for the 1 5/8 in. drywall screws 1 inch from one side of the vertical line (doesn't make any difference which side of the line you use). Space the holes about 5 inches apart and make sure you drill through both sheets.

Now put wood glue on the flat side of one of the 24 in. 2 x 4 vertical supports you cut in the previous instructions. Hold it up to the line you drew on the inside of the Front buck OSB sheet and screw in the 1 5/8 in drywall screws from the outside of the OSB sheet. Align the bottom of the 2 x 4 with the bottom edge of the OSB sheet. Do the same with the other 24 in. 2 x 4 support on the other OSB end sheet. Remember that these front and rear vertical 2 x 4 supports' positions mirror each other on the inside faces (the holes you drilled are a mirror image which is why we drilled both sheets together).

You are now ready to connect the two ends of the buck using the vertical center OSB piece (the 24 in x 8 ft piece as shown in the below picture), connecting it to the vertical supports you just attached to the end sheets. If you have a third pair of hands for a couple of minutes this will help. The center OSB sheet simply screws into the 1 1/2 edge of the two vertical 2 x 4 supports you just attached, use glue and pre-drill the vertical OSB support sheet. Make sure that the bottom edge of the OSB center piece is flush with the bottom of the OSB end pieces.

The basic body buck shape is now done. The next steps are to make and install the legs.

The Legs and Rails.

Making Legs: First, turn the basic buck you have just completed upside down so the sculptured edges are down and the straight bottom edges are up. To begin, cut the two 10 ft. 2 x 4s in half so you have four 5 ft pieces. These will become the buck's legs. You will later trim off the top of these legs to the correct height. Notice in the earlier picture that you want to have about 42 inches of open height under the buck so your rolling chassis will fit under it. We have to put a line across each leg 42 inches from the "ground". This line is used to align the bottom edges of the buck ends. Your mark will therefore be at 42 inches less the height of the wheels. Some people put an 8 ft. 2x4 flat along the bottom of the bottom rails (see pics). I don't think these are necessary as they add more weight, but you decide. If you do add these 2x4's you have to subtract that 1 ½ inch from your 42 inches also.

Attaching Legs: To attached the legs to the front and rear OSB ends, pre-drill holes for the 1 5/8 drywall screws in the vertical edges of the OSB about ¾ of an inch from the outer edge, then glue and screw the legs on. The bottom edges of the buck ends line up with the 42 inch line. Yea, I know, I know, this may seem very obvious to you sawdust wizards, but to some people this may not be completely obvious, and I want everyone to end up with it done right the first time. And yes my friends do tell me I sometimes over explain, over explain, over explain.....



Picture of Scott Brooke's buck

(Scott's shelf for storage and racking strength is not yet attached. Note this

buck has an optional 2x4 attached flat under the bottom, between the lower rail and the wheels)

Attaching the horizontal rails. These are full length 8 ft 2x4s. Drill two screw holes about 2 inches from both ends of all 4 rails. Using glue and the 2 ½ inch drywall screws, attach them to the outside of the legs as shown in the picture.

BEFORE you actually tighten the screws on the rails, use a carpenter's square to check that the legs are square with the rails. That is, you have a right angle at the joint of the leg and rail. If you don't have a square, you can use a box or another piece of wood to hold next to the corner of the leg and end to see if they are square. If you don't square this up and then tighten the screws, the whole contraption will look like a drunken cow, it will wobble when you move it, and it will confirm to all your visitors that you were already on your 2nd six pack at this point in the build!

Diagonal Cross Braces are to provide racking strength for the legs (not shown on all pictures). You are attaching these with the buck still upside down. You need to attach at least a couple of cross braces (I used only one on each side of the buck, some others use two on each side). Make these about 4 1/2 feet in length. These will go diagonally (about 45 degree angle) from the upper to lower rails. These go in the inside of the rails (same side as the legs). Attach these in the same manner as the rails, screws and glue. Check the legs-to-rails angle again for square before you tighten the brace screws. These cross braces will keep the whole assembly from racking fore and aft when you push it along. Remember that with the body on it, the buck will weigh 250 + lbs.

Wheel installation. You can either do this with the buck upside down, or roll the buck onto its side. Position the wheels on the end of the legs and mark the 4 screw holes. Drill small pilot holes for the #14 screws into the ends of the leg/rail ends so the wood doesn't split when you put in these large screws.

For those not familiar with determining pilot hole sizes: Make sure the pilot holes are no bigger in diameter than screw shaft at the valley (bottom) of the threads. You can check this by holding a drill shaft along the side of the screw, hold it out at arms length. For screwing into wood, if you can just see the full depth of the threads sticking out beyond the drill shaft on both sides of the screw, the drill is the right size. If you can't see the full depth of the threads, the drill is too large in diameter.

Screw on the wheels and don't over tighten, this is soft wood!! You are now ready to turn the buck right side up, so you will probably need some help. Lift it up far enough so you set it down gently onto its legs. Don't let it crash down on them as will loosen the still damp glue joints and might break off the wheels.

Shelves. These are the two 12 in. by 8 ft. OSB pieces you cut earlier. From the remaining 2 x 4s, cut about 8 pieces, 8 inches in length each. These will be the under-shelf supports, 4 used on each shelf. You will place one on each end of the shelves and the other two along the vertical center OSB piece, spaced about evenly from the ends. Position these flat against the OSB so their bottom edge lines up along the bottom of the OSB. Pre-drill holes in OSB and then screw and glue the shelf supports in place. Now, set the 12 in x 8 ft. OSB shelves on top of these supports and screw and glue the shelves down to the supports. If you intend to put heavy items on the shelves, you can run a 2 x 4 x 8 ft support underneath the outside edge of the shelves (see pics). But be careful about putting too much weight on these shelves as it will make the buck heavy, hard to push, and could break off the wheels or legs. Cut off the upper end of the legs that are sticking up above the OSB on each corner of the buck.

The Foam Pipe insulation goes along the top sculptured edge on end faces of the buck where the body will rest. Open up the slit in the foam pieces and slip it in place. These will mold to the shape of actual body when it is on the buck. To keep the foam in place, drill holes every 18 inches along

the sculptured edge, about 2 inches below that edge. Put the zip ties over the foam and through these holes to hold the foam in place.

Congratulations, you are now done, GOOD JOB, Go get beer.

Gentlemen's Rules Note: It is specifically against the officially unwritten FFR Car Builder Rules to open any champagne until after your kit arrives in the big Stewart Transport Truck, you get it unloaded and onto the buck)

One last item before you open the BEER (or the trip to get more). At some point before putting the FFR body on the buck you will need to make the body support piece for the FFR body. This wood brace piece is to keep the body cockpit from flexing when you pick it up off the FFR frame and put it on the buck. This is described in the FFR manual in the "loading" section.

Credits, thanks and disclaimers

Thanks, recognition and well deserved credit to the many buck writers and builders who came long before me and the many forum posts where I found information and pictures on bucks, basic FFR build info, and examples of other people's buck designs and kit builds.

Particular recognition and credits to:

Wade Chamberlain, <http://www.quickkeys.com/Roadster/Default.htm>

Has fantastic pictures of his build, very good close up pictures of detail.

John Baker, another great build site. <http://Roadster.spintime.org/>

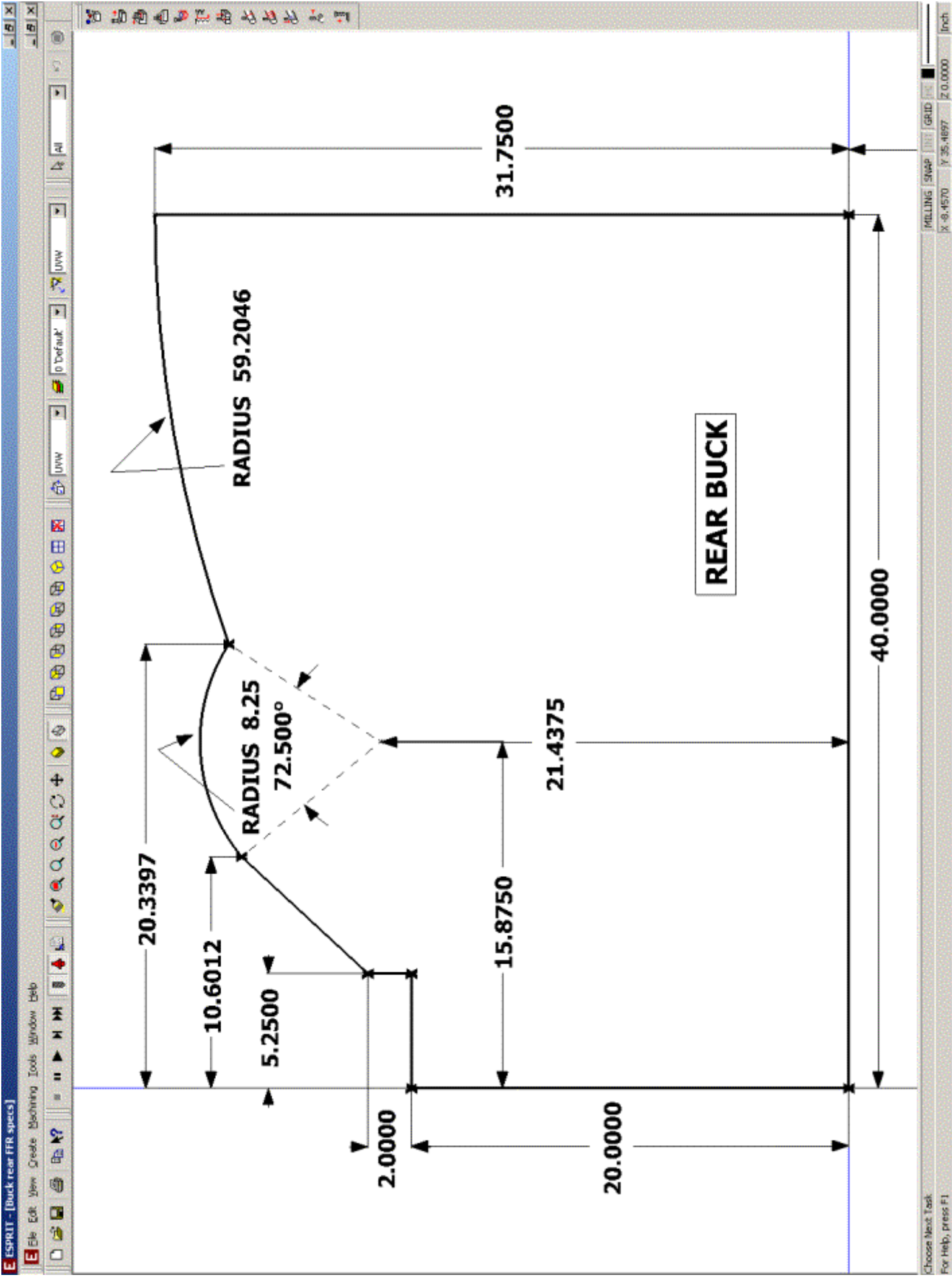
Scott Brooke <http://www.thebrkes.com/scott/Roadster/>

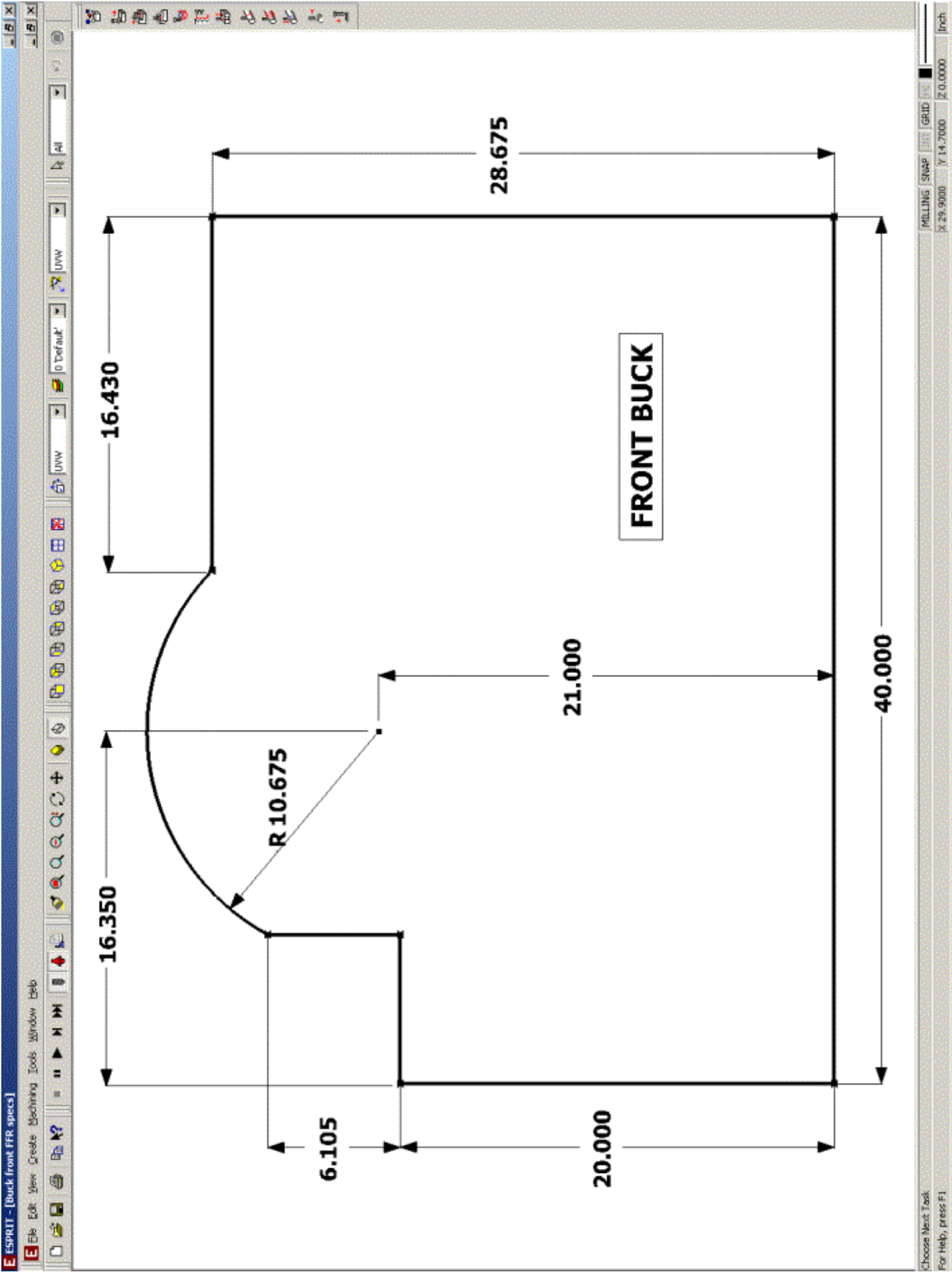
DP Technology Corp, ESPRIT Cad/Cam software www.dptechnology.com .

My Dad, who helped with my buck. My son-in-law, Allen who is helping with the car build.

And my wife Claudia, who accepted the completely illogical reasoning behind my need to build a Roadster. Only a spouse can be that generous.

NOTE:





Tools & supplies needed:

2 saw horses.

Tape measure, 12 ft

Chalk Line is handy for marking the OSB sheets for cutting

Skill saw

Jigsaw, use course blade

Electric or battery drill (for holes and putting in dry wall screws)

Phillips head bit for the drill

Carpenter's Wood Glue, the good yellow stuff, NOT the cheap "all purpose" white stuff.

Carpenter's Square and something you can use for a straight edge for drawing (2 x 4 will work).

Beer, preferably Bud Lite (I was unsure if this is a tool, required part or medical necessity, so I put it on both lists, feel free to buy it twice.)

Parts list: All of this will cost you around \$100 or less including the wheels.

1. **3 sheets of OSB 4 ft. x 8 ft.** . This is the stuff they use on houses for shear wall sheeting. (I used ½ inch thick and it worked great. Some others used 5/8" thick, but indicated it seemed thicker and heavier than needed.) This OSB stuff is usually under \$8 a sheet. You could use plywood, but OSB is much stronger, easier to get good cuts on and won't warp easily.
2. **Ten** 2" x 4" x 8 ft . You will only need 6 of these, unless you add the extra shelf supports and the long pieces under the legs and rails.
3. **Two** 2" x 4" x 10 ft - these get cut in half and become the legs.

4. **4 each caster wheels**, recommend about 3 inch diameter or larger, total height including swivel about 4 inches or more. Don't go smaller as they will not roll well at all.
 5. **Five each, 4 ft foam water pipe tubing** insulation (usually comes in packages of 4 at Home Depot for about \$4.00).
 6. **10 inch or larger zip ties**, about 16 of them, to hold foam insulation in place, or you could use some wire instead.
 7. **Small box - 1 5/8 in.** course thread dry wall screws.
 8. **Small Box - 2 1/2 in.** course thread dry wall screws.
 9. **16 each - #14 size x 1 1/4 inch wood screws, philipps head**, Check size of holes in wheel swivel.
 10. Beer, optional (necessary), for back pain, best used when all above steps completed.
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