

How to Build a "Samson Classic" Retro Chassis

By Dennis Samson



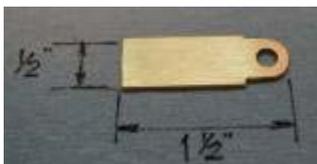
1. Motor Brackets: This is probably the most important part of the frame, and there are many different styles available nowadays, so choose which one you like, either regular or hypoid. In my case, I often use home-made brackets like this one. You can fit a single piece of $7/32$ " diameter tubing through the bracket and cut it later, or cut smaller lengths and solder them in place using a piece of $3/16$ " aluminum tubing inside them to maintain alignment:



2. I cut a nosepiece from .062 brass plate that is as wide as the bracket, and 1" long. I use 1" wide strip for this. Scribe a center line along the length of the nosepiece to help with alignment later.



3. For a guide tongue, there are also a number of alternatives, from using a Slick 7 steel piece to making your own, as I did. Once again, from .062 brass.



4. I make side pans from .032 by $3/4$ " wide brass sheet. The length of the pan is dependent on the wheelbase of the frame you are building and on your own ideas about how much weight is needed at the back of the car. These pans were $3 3/4$ " long, but nowadays I use 4" long pans, with a $3/4$ " by $3/8$ " cut-out for the front wheels.

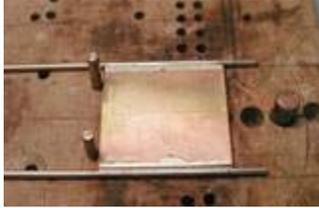


5. Assemble a scrap motor can to the bracket and set up the rear end in the jig of your choice with jig wheels of your choice to maintain the desired clearances. When you use a non-hypoid bracket, this will mean that only the front of the motor will touch the jig surface and the bracket will angle upwards to the rear (see the second photo).

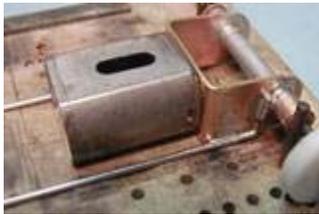


6. Decide on your guide lead dimension and set up a post for the guide, then place the nosepiece in position and bend the inner rails of the frame. Rail thicknesses depend on:
 - a. How many rails you want to use
 - b. How flexible or stiff you like your frames to be. The frame in this article was built with one .055" and one .047" rail each side, with a .055" gap between them. This gives a very forgiving frame that is easy to drive.The length between the rear axle and the guide pivot also affects how the frame will work:
 - c. Shorter lengths make for a faster-turning but less stable car
 - d. Longer lengths give slower reactions and more predictability.

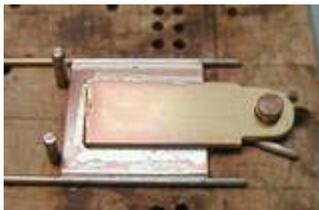
Solder the nosepiece to the front ends of the inner rails. If you use different thicknesses of rails, put the thicker ones on the inside to get stronger joints with the nosepiece and the bracket.



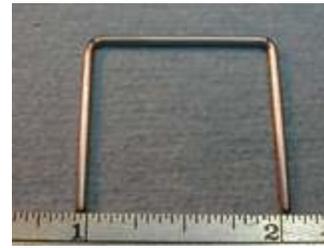
7. Solder the rear ends of the rails to the bracket along the entire length that the rail touches the bracket. It is important to get a good strong joint here. In my later builds, I have used longer rails to get the bend behind the axle tube. Leave the front ends of the rails longer than needed, as they will be trimmed off later once the whole front end is done.



8. Solder the guide tongue to the nose piece, making sure that you maintain the right clearance under the guide tongue. I normally use a piece of .062 aluminum rod, but some jigs have special spacers for this. If you are using a brass tongue, then you can solder everything flat, but if you are using a steel tongue, it is a good idea to angle the front end of the tongue upwards by about .010 at this point.



9. This is the rear bracket brace and rail spacer, made from .055" wire, bent so it fits snugly on the outside of the inner rails and has legs that are about 1" long.



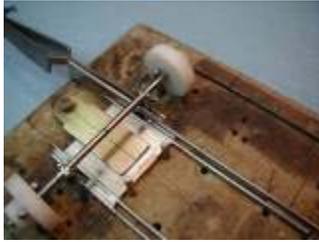
10. Solder the brace in position on the inner rails, with the legs of the brace extending to the bend in the bracket. Don't let the rear section of the brace get too close to the bracket as this might limit the size of gear that will fit.



11. Now you can add the outer rails, using a piece of .055 wire to space them away from the inner rails. Solder the rails to the bracket brace and to the opposite side of the axle tube from the inner rail.



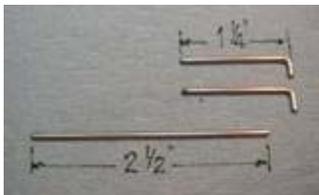
12. Now let's work up front. I use a non-rotating axle, cut from a 2 7/8" long piece of .093 piano wire, and polished until it shines. I mount it in position in the jig at the chosen wheelbase (usually somewhere between 3 7/8" and 4") with jig wheels to get the necessary front end clearance. 4 pieces of .055 wire, bent 90 degrees are used to hold the axle:



Note how I angle the axle mounts outwards, to make a stiffer, stronger front end assembly. Also, although it's not shown here, I usually wire-wrap these joints and solder the wire up as well. Some thin bare copper wire or steel wire used for hanging pictures works well for this.



13. Bumpers: These are the parts for the well-known "Pepe" bumper, invented by Philippe de Lespinay back in the 1970's. This is a system that works well to prevent major damage to the other pieces of the car by being the first parts to give way in a wall shot. All made from .062 wire.



14. Trim off all the excess rail wire and front axle mounts so they are level with the front of the nosepiece, then position the parts of the bumper for assembly. I use an Engineer's square to get the whole assembly nice and square to the frame. Solder all three pieces to each other and to the nosepiece of the frame. Cut off the excess bend on each of the bumper bars after soldering using a cut-off disc in a Dremel (remember the eye protection!)



15. Front hinge tubes: These are cut 3/4" long from a piece of 1/16" outside diameter brass tubing. Cut 8 at a time, as they will be used for the pin tubes too. Put a drop of oil inside each tube before soldering them in position to ensure the tubes do not fill with solder. Two tubes go up front against the bumper,



And two tubes go at the rear along the outer rails:

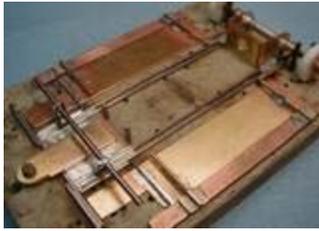


16. The hinge pins are pieces of .032 wire, bent with 3/4" legs that enter the hinge tubes and 13/16" legs that lie along the pans. Bend a little "kick-up" into the hinge pin so it lies flat along the pan. Make sure your pans are positioned correctly for both fore-and-aft position and for the overall width you want, then solder the hinge pins in place. This photo also shows the body pin tubes, which are the other four 3/4" long pieces you cut, mounted on top of a piece of 1/16 square tube to get some height between the bottom of the body and the pin hole, which makes for a stronger body mounting.



17. Repeat this process for the rear hinge pins and the rear body pin tubes. On my jig, I have a set of "fences" to control the chassis width, as well as jig tubes to position the pin tubes in the same spot every time I build a frame. This allows me

to easily swap bodies from one frame to another.



18. This is the famous “Steube” split bite bar. Mike Steube was the first to come up with this design in an attempt to isolate the frame flex from the bar that holds the pans up. It’s a very simple and effective way of doing this. These are bent from .055 wire, and soldered between the main rails about 2/3 of the way to the rear of the pans, with about .020” of clearance between the pan and the outer tip of the bars.



19. Pan hangers are probably the worst things to bend successfully, but that’s another topic altogether! Make sure when you solder them to the pan that they are not too close to the end of the bite bars that they might slide off in a crash.



20. If you have a tumbler, now is the time to use it. If not, then a good scrub with a “Brillo” pad, steel wool or Scotchbrite under running water will wash off all traces of acid flux and keep things loose. An old toothbrush and some scouring powder also works, but rinse it off well. Remember to re-oil the hinges!

21. Now for the running gear. Front wheels are normally (for me) JK 8742PF wheels modified by naching away the inside to get a tire width of just on 1/4”. I use JK 3/32 wheel retainers to hold them in position with about .020” sideways play, and take out the setscrews so they rotate independently on the axle. Don’t forget to oil these wheels often during racing.



22. My cars all get my logo and a serial number; other people like to engrave their name or other bits of graffiti – that’s all up to you.



23. And now for the motor, gears, tires and guide of your choice, and you’re done! (Well, other than a body of course!)

