SIDEWINDERS ARE THE CHASSIS THAT'RE WINNING ALL THE GOLD. . . . SO FOLLOW ALONG AND LET US SHOW YOU

how to build Keith Tanaka's CALIFORNIA SIDE WINDER

story by
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built by
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photos by
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I hope you're good at bending piano wire, because by the time you finish building this new-breed sidewinder, you'll have bent an awful lot of it. You'll also have an ungodly fast car.

Keith Tanaka, former Secretary of the USRA, newest member of Team Champion West, and the designer and builder of this car, is good at bending piano wire. I asked him if there was any special trick to bending piano wire, and he said no. You just have to take your time and make sure everything fits right. Maybe that's the "special secret" to building any good looking slot car: patience.

Keith has jet black hair, black rimmed glasses, and a quiet, almost shy, nature. He's very likeable, and once he gets to know you, he's willing to tell you almost anything you want to know. No secrets about gear ratios, armature winds or tires here!

Keith is a student at Cal State, Long Beach and a confirmed experimenter. "You don't really know something until you try it", is a phrase I've heard Keith use many times. . . And he means it!

Several months ago, during the old California Model Raceway's Pro series, Keith walked away with the championship with the help of some very unconventional plate sportscars. They were inline, with no swing arm, and basically consisted of three 1" plates soldered side by side. It was weird, but fast. And fast is the name of the game.

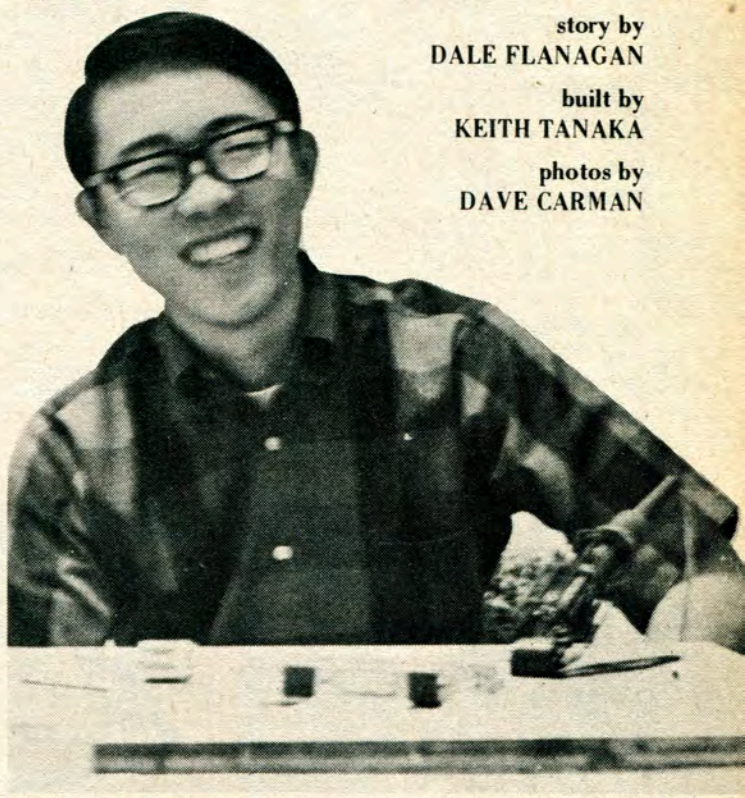
The car presented here plays the game just as it should be played. It's very fast – It's unconventional only in the fact that it is so conventional (for a Pro sidewinder)...Keith said he wanted to present a car that would go good on all types of tracks. And he just about made it (I'll have to admit it doesn't go too hot on HO tracks. . . but that's about all).

This chassis is made for motors that run fastest counter-clockwise (to the left): Thorps, Champions, Muras, etc. There are right handed and left handed sidewinders, just like people. *Make sure the motor you're going to use runs fastest in the proper direction* (counter clockwise). Ask your hobby dealer about it, if you're still not sure.

This car is set up for 3/4" front tires and 7/8" rear tires (CAR MODEL, USRA, and ARCO rules). Keith, like every Pro in LA, uses set screw tires front and rear. The 517 used in this car was geared 11/45, using 64 pitch Weldun gears. Naturally, you may have to vary this on your car to suit your track, motor, etc. If you use the more available (and cheaper!) 48 pitch gears, I'd suggest using a 9 or 10 tooth pinion and a spur gear somewhere in the 30's.

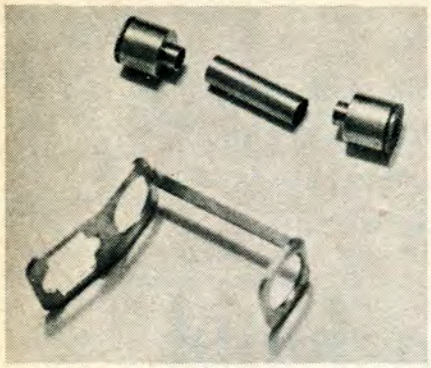
The car looks complicated to build, but don't let that scare you. If you take your time, carefully bend the parts, and follow the directions, you should have no trouble. One thing is essential, though – you must know how to solder. Keith pre-tinned just about every part on the car, used a good quality liquid flux, and worked with an iron that punched out enough heat to do the job quickly and neatly. He was especially careful not to get any cold solder joints.

Well? What are you waiting for? Grab up an armful of rod, plate, and piano wire and let's get to work on your newest jet!

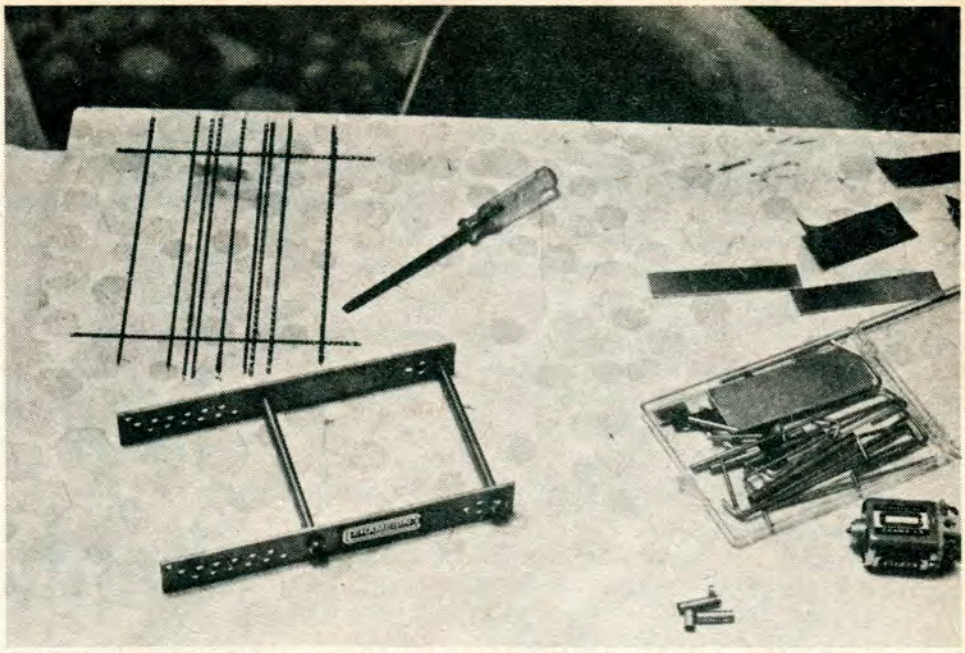


Keith Tanaka, newest member of Team Champion West and the former Secretary of the USRA. It looks like the soldering iron is already plugged in and warmed up, so let's start building!

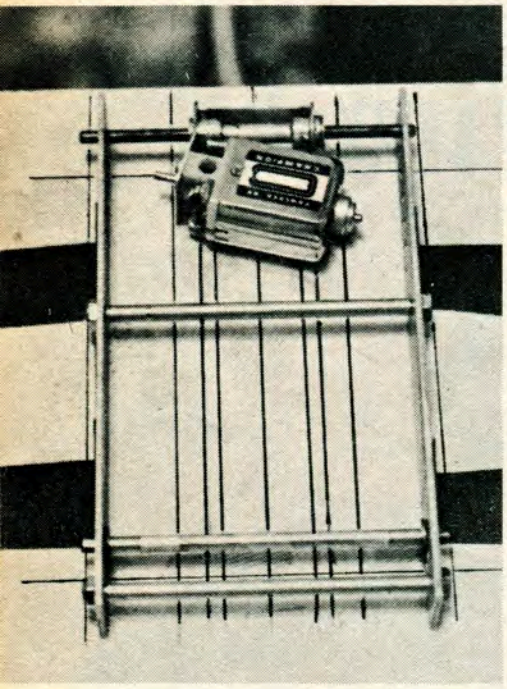
TANAKA'S SIDEWINDER



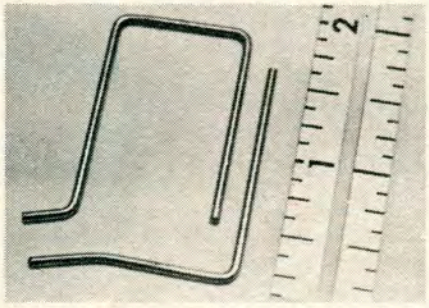
1. The basis for this particular car is Dynamic's new sidewinder bracket. The motor is cocked over about 20 degrees so you can use a reasonably sized spur gear and still get the pinion to mesh. For 69 cents, you also get an axle tube and two bearing carriers for ball or oilite bearings. Oilites were used here. Notice the motor hole in the bracket has been filed out to take the larger front bearing on the Champion 517 head.



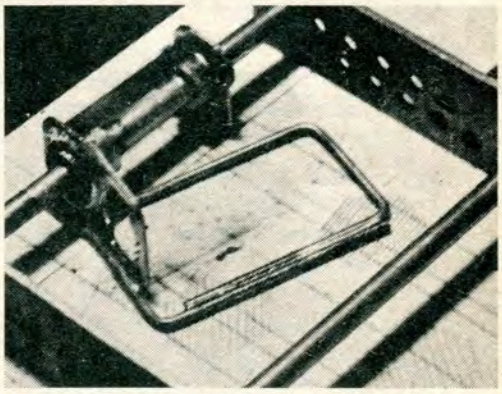
2. Keith uses a flat piece of Formica counter top as a building board. Parallel guide lines about ¼" apart are drawn on the board to help to keep everything straight. A Champion jig further assures that everything is going to come out in alignment.



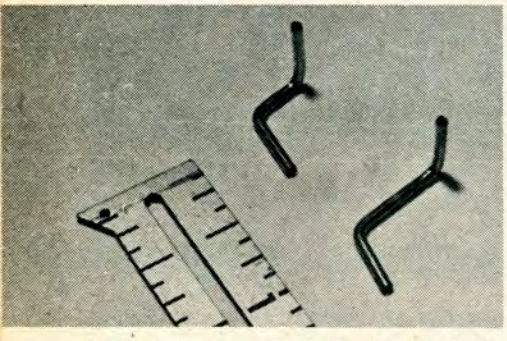
3. The jig is taped to the building board over the guidelines. An old motor is bolted to the bracket and the bracket and the rear axle placed in the jig. The bearing carriers are soldered to the axle tube and the axle tube assembly is then soldered to the bracket.



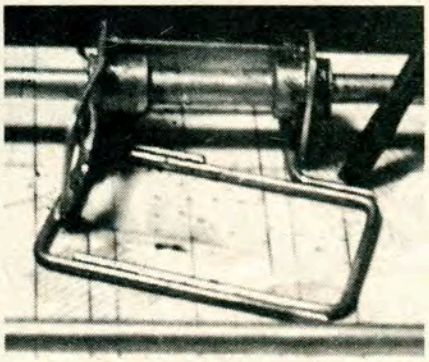
4. Now things start to get a little trickey. Take your time and bend two pieces of piano wire so they will fit around the motor. The bent leg of the **L** shaped piece is soldered to the front of the bracket.



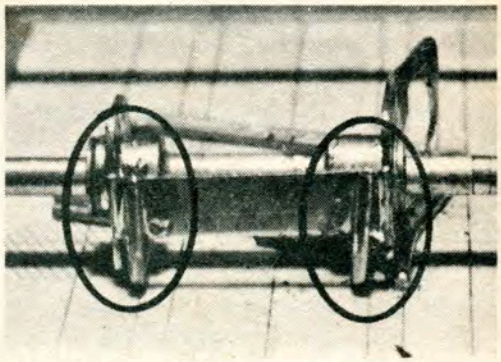
5. The **U** shaped piece is slipped in and the little bend in one leg is soldered to the inside of the bracket just under the axle carrier. Then the other leg of the **U** is soldered along side the leg of the **L**. The motor was removed from this picture so you could see how everything fit. There's no secret to bending these pieces so they'll fit right, it just takes a little time and a lot of patience.



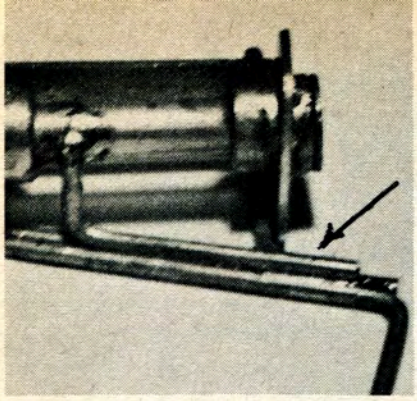
6. Two braces are bent from piano wire to strengthen the bracket and to keep things together in case of a crash.



7. They solder up along side the **U** shaped piece and. . .

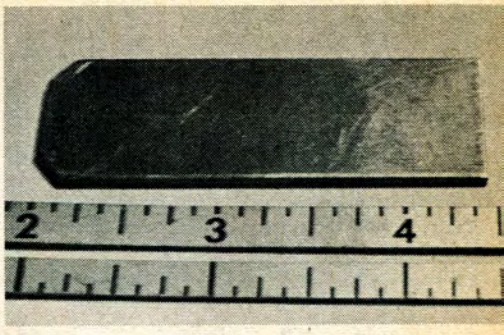


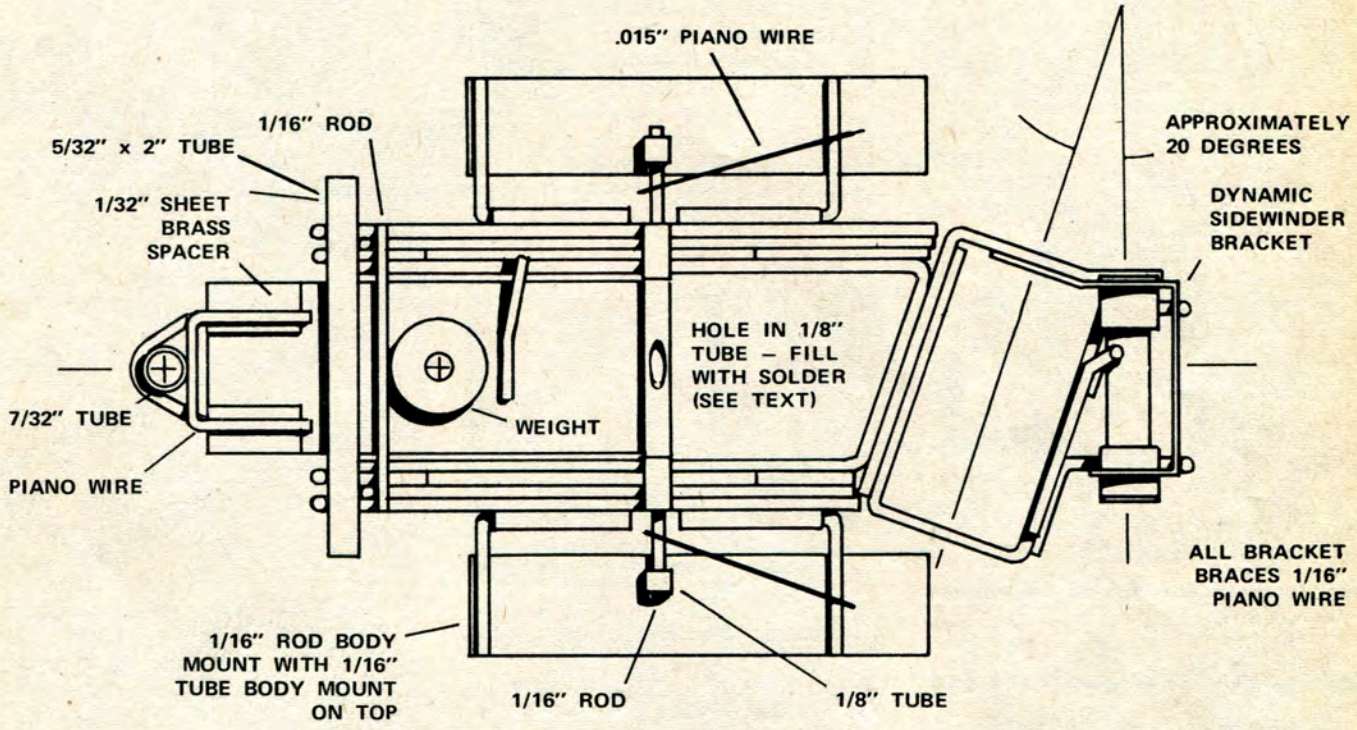
8. . . . are tacked down to the back of the bracket like so.



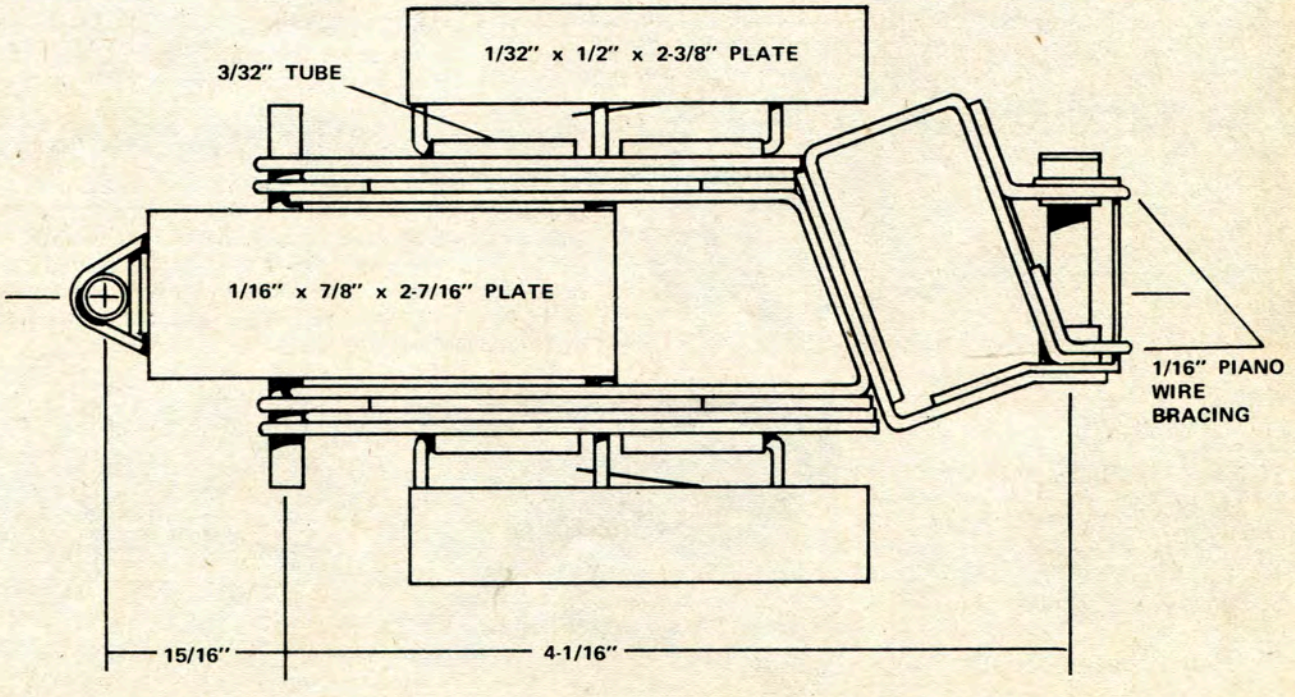
9. A third piano wire brace, this time a simple **L** shaped one is soldered on top of the **U** and to the front of the axle tube. You can't say we don't build our brackets strong!

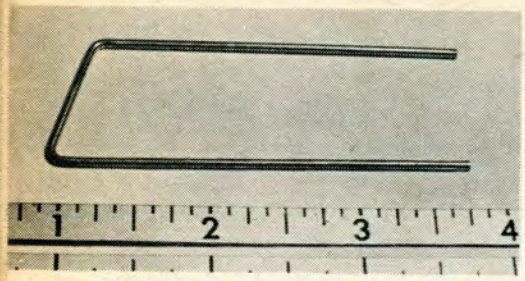
10. Next cut out your swing arm. The swing arm is 1/16" K&S brass plate, 7/8" wide by about 2½" long. If the body you're going to use has a short nose, make the swing arm a little shorter. The two corners are beveled so that solder won't flow outward and solder your swing arm pivot tight when it comes time to attach the arm to the pivot.





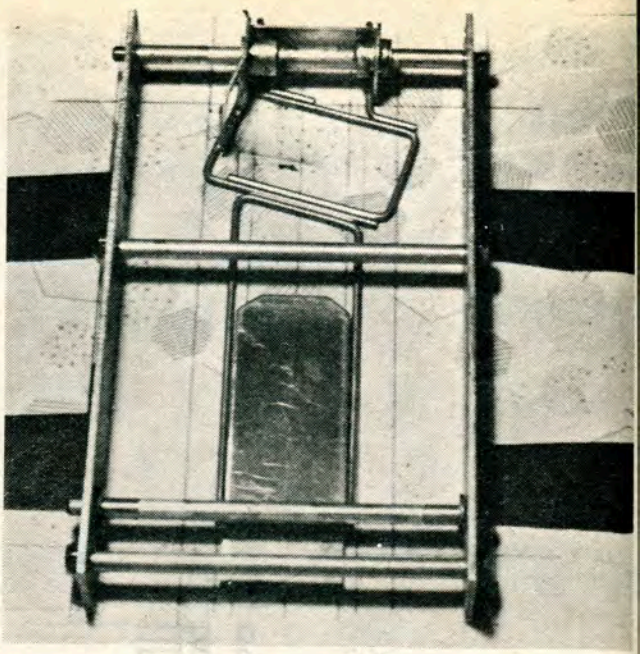
ACTUAL SIZE

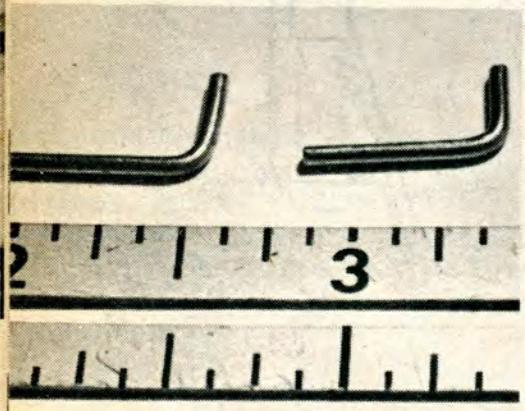




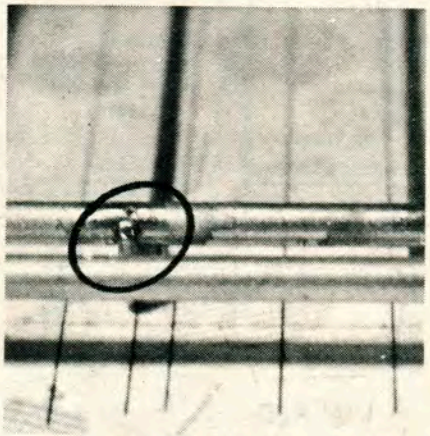
11. Now you can bend your first frame rails. The first frame rails are actually a single piece of 1/16" piano wire bent into a **U** wide enough to let the swing arm in between them. The bottom of this **U** is angled, so that it can lie against the angled braces around the motor and still allow the frame rails to extend forward at right angles to the front axle tube. If you're confused about this, picture No. 12 shows you how this works.

12. Center the motor assembly in the jig by the following method: place a spacer as wide as the gear you intend to use on the rear axle in the jig. Make sure this spacer is on the side that the gear goes on. Then place two more equal length spacers on to the rear axle to center up the bracket plus gear spacer assembly. Next, use the guidelines to center up the first frame rails in the jig and solder the frame rails and bracket assembly together. Keith had the swing arm in this picture to check and make sure that the two legs of the **U** shaped first frame rails were wide enough.

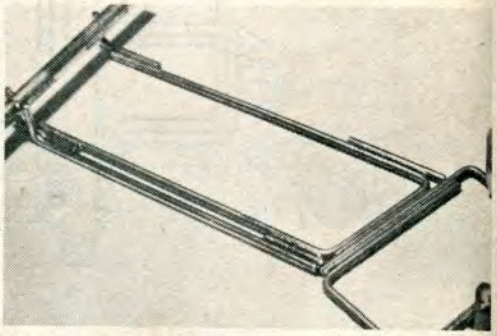




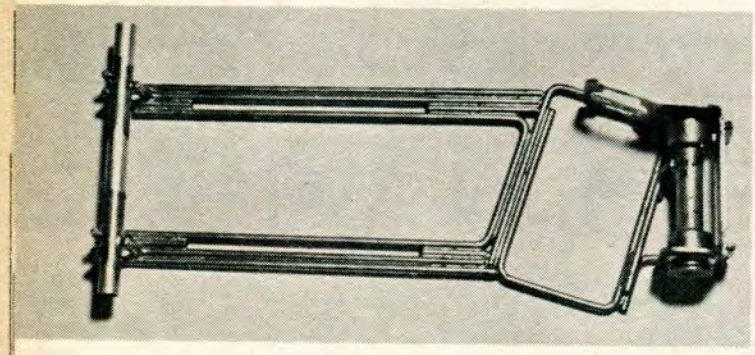
13. Two little **L** shaped pieces of piano wire come next. They solder in alongside the outside of the first frame rails and up to the front axle.



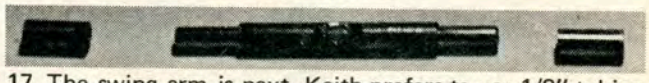
14. Here the two **L** shaped pieces shown in photo 13 are soldered into position. Notice that they're soldered to the front of the front axle tube.



15. Two small 1/16" rod spacers are soldered to the outside of the first frame rails near the bottom of the **U**. Then the second frame rails (1/16" K&S brass rod) are soldered into position. Notice the second rails are soldered to the rear of the front axle tube.

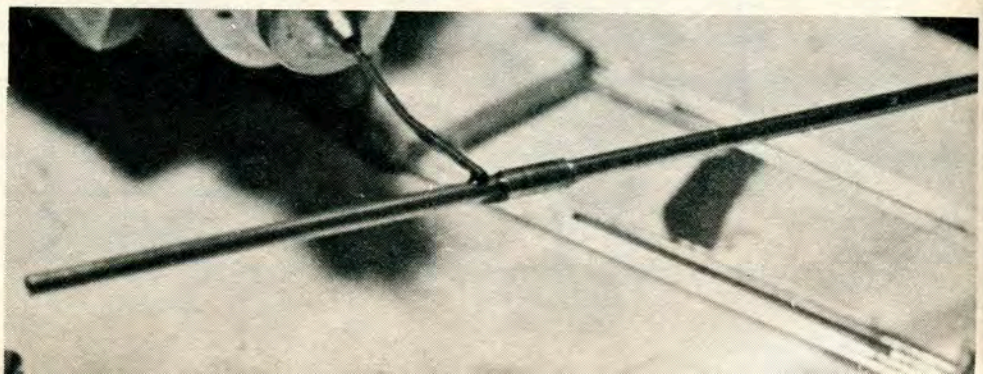


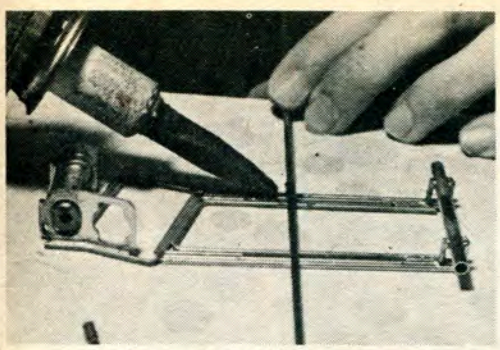
16. The third frame rails (1/16" brass rod) are soldered next to the second rails. These are soldered to the front of the front axle tube. Things are starting to shape up.



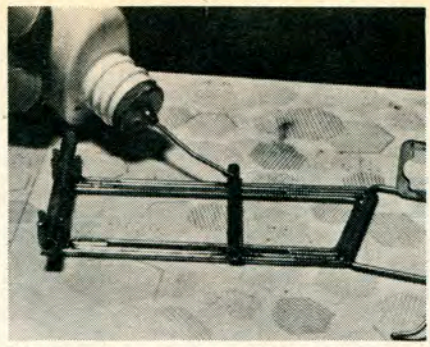
17. The swing arm is next. Keith prefers to use 1/8" tubing over 3/32 pivot. The hole filed into the center piece of 1/8" tube will later be filled with solder to lock the 3/32" tube up so that the whole swing arm rotates around the two outer 1/8" tube pieces. You end up with less slop in the swing arm pivot this way. Make sure the center piece of 1/8" tube is about 7/8" long.

18. Take one of the small pieces of 1/8" tube and place it on a piece of 3/32" tubing. Oil each side of the 1/8" tube (Keith recommends automatic transmission fluid because of its resistance to heat).

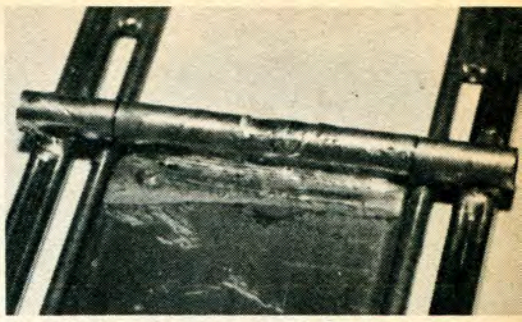




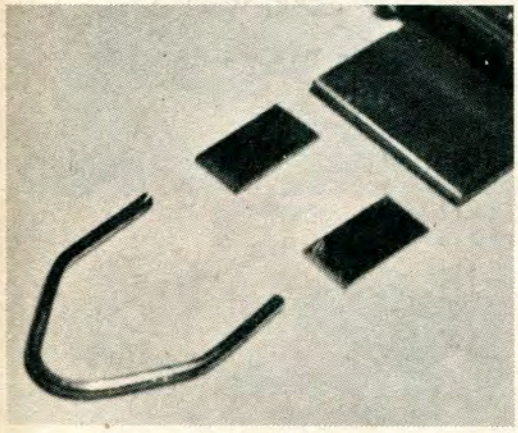
19. Solder the 1/8" tube to the chassis rails at just about the same position you would if you were building an inline car. The oil makes it harder for the solder to flow into the 1/8" tube and stick everything together tight.



20. Fit the center 1/8" tube, the 3/32" pivot tube, and the second 1/8" pivot tube. Oil the joint where the center 1/8" tube and the outer 1/8" pivot tube meet, and solder the small tube to the frame rails.

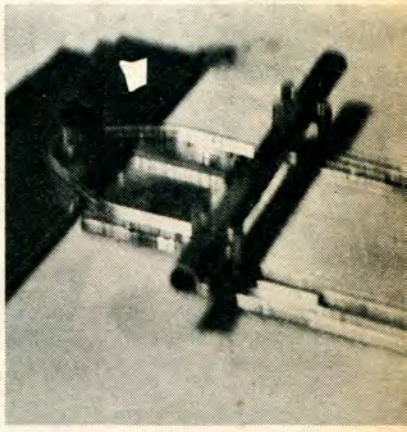


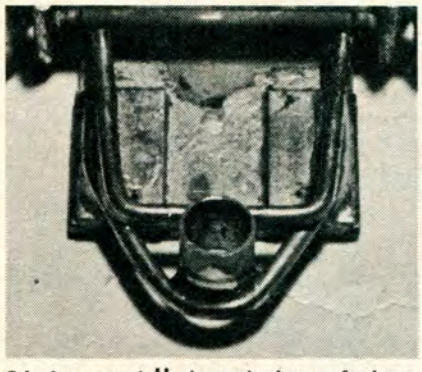
21. Slip the swing arm into the chassis and, after oiling the pivot points once again, solder the swing arm to the 1/8" center tube, and solder the 1/8" center tube to the 3/32" pivot tube by flowing solder into the filed out hole shown in picture No. 17.



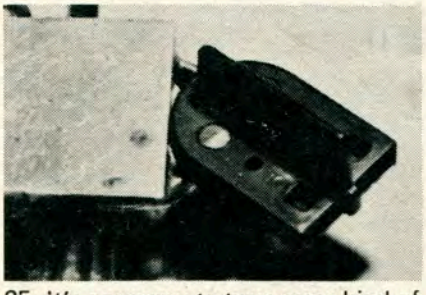
22. Make two spacing squares of 1/32" brass sheet and a **U** shaped piece of piano wire so you can mount your 7/32" pickup post tubing.

23. Solder the two 1/32" spacers to the swing arm and build up a "jig" out of whatever is handy (we used a couple of pieces of an old 1/32" body mount and some tape). Solder the **U** shaped piano wire to the spacers on the swing arm, then solder the 7/32" tube to the inside of the **U**. This 7/32" tube is about 1/4" long. MAKE SURE THE TUBE IS STRAIGHT UP AND DOWN AND CENTERED ON THE SWING ARM WHEN VIEWED HEAD ON. (Note: Keith uses Cox quick-change guides, but if you decide to use a Dynamic instead of a Cox guide, omit the two 1/32" sheet spacers).

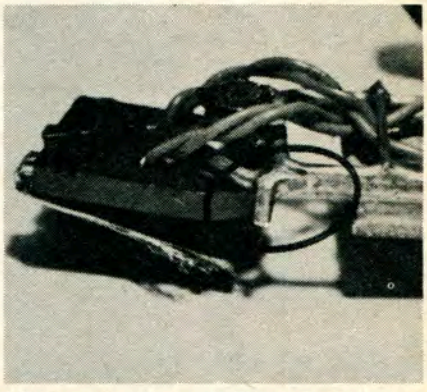




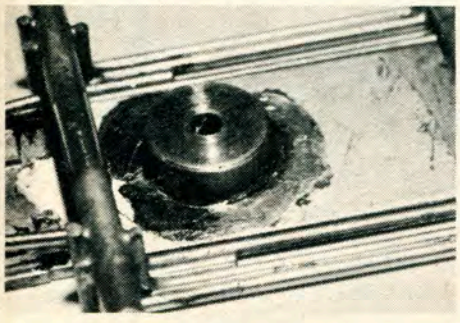
24. A second **U** shaped piece of piano wire is soldered in behind the guide tube. Keith emphasized how important it was to have a guide that moved freely and stood straight and deep in the slot. Check this carefully when it's time for the final assembly of the car.



25. It's necessary to have some kind of swing stop on the guide so the guide doesn't swing over too far in a spin-out. If the guide gets cocked over too far, you can lose a lot of time while the marshal fumbles with it. On this particular car, the edge of the plate swing arm was close enough to the guide to act as a stop. I'd like to say we designed it this way, but we didn't. Just plain luck.

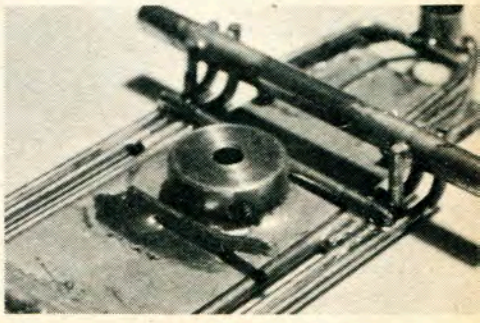


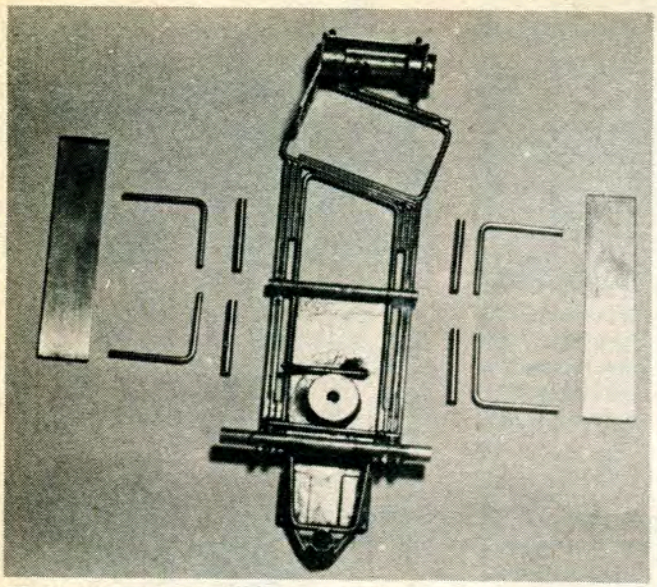
26. Just in case you're not so lucky (!), an alternate guide stop system is shown here. A length of 1/16" rod is soldered to the guide tube support where it will act as a stop, then it's trimmed down to the proper size, as shown.



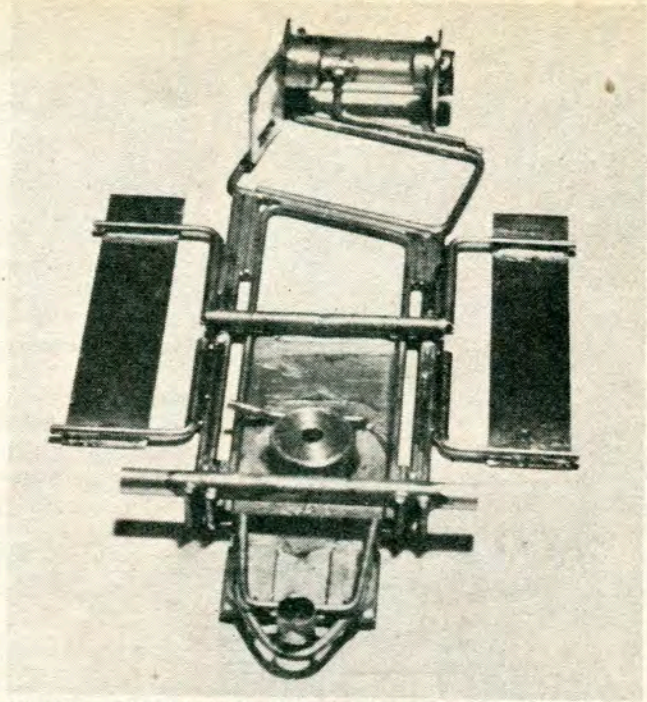
27. Chances are you'll have to add weight to the swing arm, but just how much weight you'll need depends on the track you're racing on. This is a 4 gram weight, but you might need more or less weight than this. . . Experiment!

28. A length of 1/16" K&S brass rod soldered across the chassis rails acts as the upward stop, and another piece of rod bent into a shallow **V** acts as the downward stop. Adjust the downward stop so you only have about 1/2" of swing arm travel.



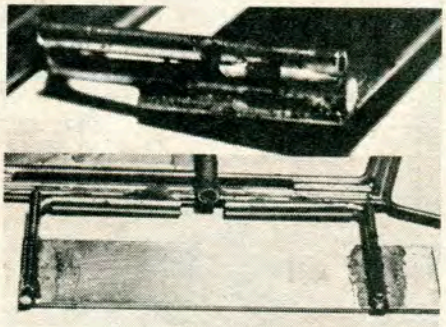


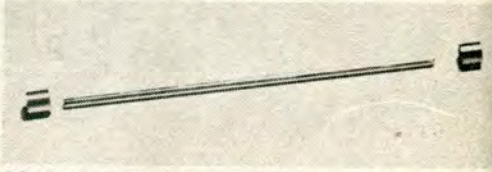
29. Now for the body mounts. Working from the outside in, we have a piece of 1/32" by 1/2" brass plate, two **L** shaped pieces of 1/16" brass rod, and two pieces of 3/32" tubing. The tubing is soldered to the chassis, the rod is slipped into the tubing, and then the rod is soldered to the plate.



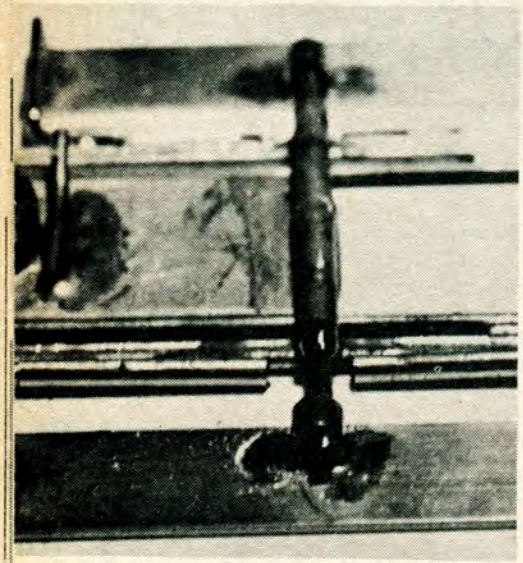
30. The width of the body mount depends on what kind of body you're using. Measure across the bottom of your body and space the plates accordingly.

31. Now solder small lengths of 1/16" tubing to the tops of the brass rods. These tubes will hold the bent pins you'll use to attach your body to the chassis. They're spaced up like this for two reasons: One, rod makes for a stronger pivot pin for the floating body mounts and two, with the body mount tubes placed up higher in the floating mounts, there's less chance of the body tearing, because the pin holes in the body aren't so close to the edge.

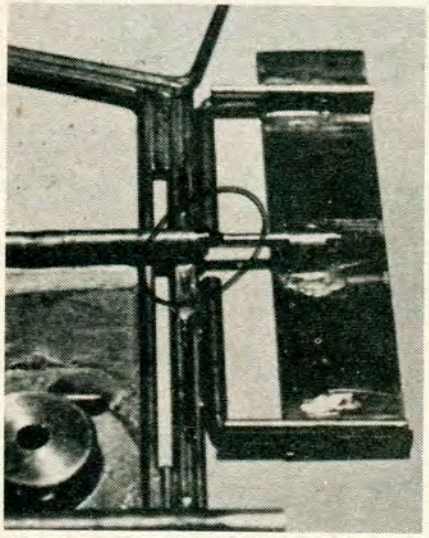




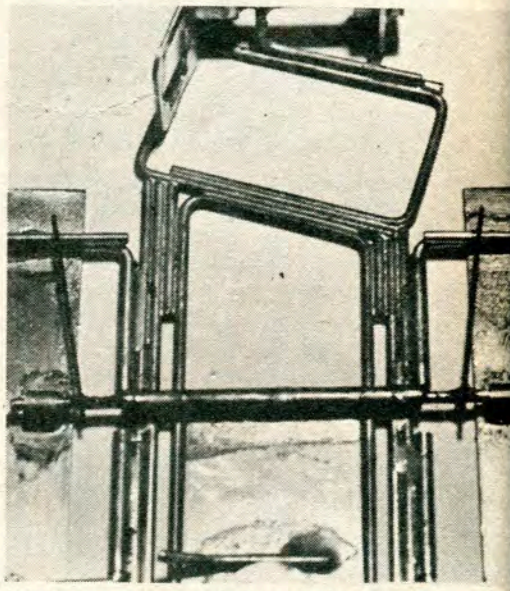
32. Believe it or not, this is your up and down body mount stops; two pieces of 1/8" tubing and a length of brass rod. This is an idea that Keith says he got from John Wessels, the West Coast chassis builder. . .



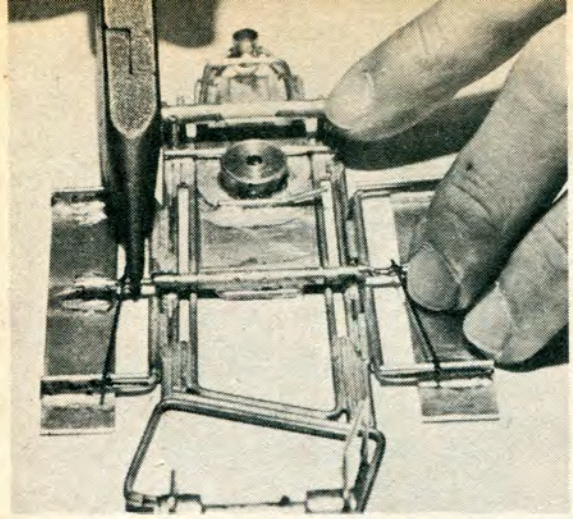
33. You put the piece of 1/16" rod through the swing arm pivot tubing. Then you slip the pieces of 1/8 tube over the ends of the rod and solder them to the brass body mount plates. Make sure the chassis is lying on a flat surface.



34. Now CAREFULLY solder the 1/16" rod to the 1/8" tube pivot point. Don't goof up here, or you could solder the whole swing arm up solid! What you want is to tie down the rod so it can't slip from side to side or rotate, yet still allow the swing arm and the 3/32" pivot tube to move.

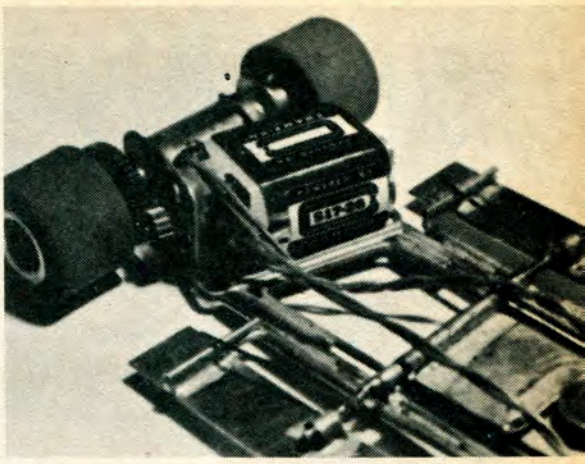


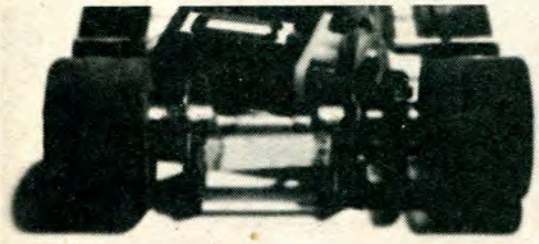
35. Small lengths of thin (about .015) piano wire are soldered to the 1/16" rod so they rest against the body mount and act as torsion bars. This keeps the body from slopping around too much and aids handling.



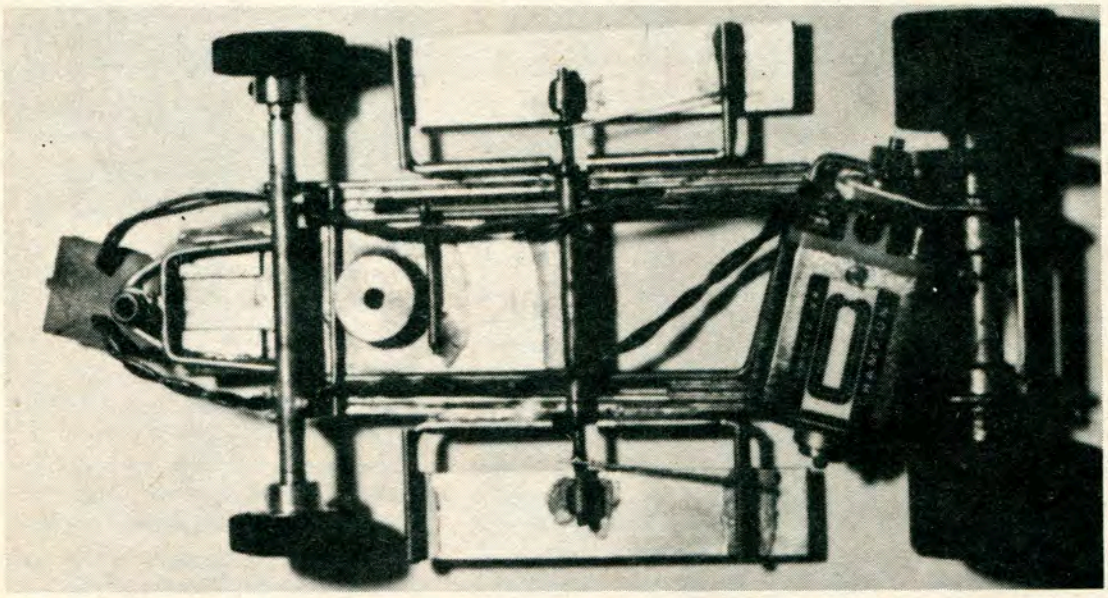
36. Now sight down the front of your sidewinder chassis and see if your body mounts droop or ride high. If they do, bend the 1/16" rod to adjust the height. You know something? You're done! Now to assemble it!

37. Fit the tires, gear and motor. Check to make sure the rear track is 3" and add spacers, if necessary. Note the double motor leads and the angled motor (about 20 degrees) to get a proper gear mesh.

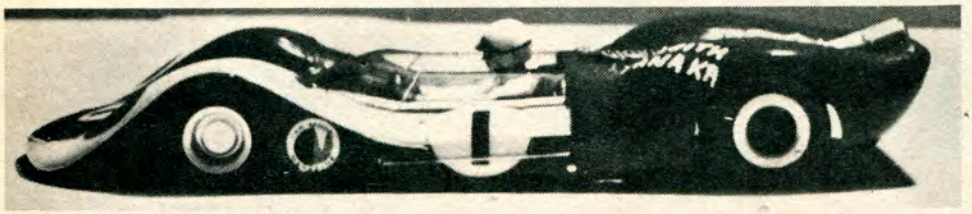


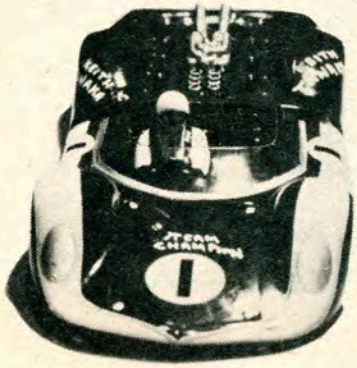


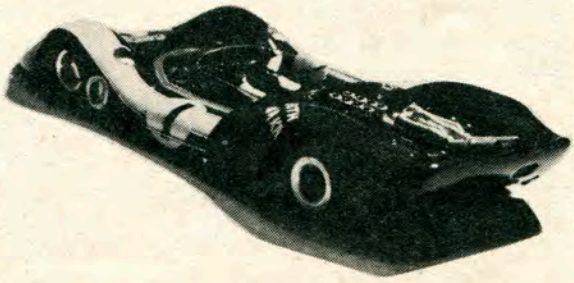
38. Keith prefers 64 pitch Weldun gears because he thinks they run better than the more common (and cheaper) 48 pitch gears. No matter what kind of gears you use, the angled motor means they have to be broken in properly. Coat the gear teeth with a thin, but complete, coating of STP and run the car slowly, bringing it in every few laps for another shot of STP. If you have a powerpack at home, the same effect can be achieved by running the motor slowly and giving the gears a new shot of STP every few minutes. Keep this up for at least 1/2 hour or so. Expect about 10 hours of racing time from a set of properly broken-in gears.



39. Keith likes to have very little sideplay in his front axle. In any case, CAR MODEL, ARCO, and USRA rules restrict you to only a 1/4" of axle slop.







40. Keith said he didn't have any special preference in bodies. For this particular car, he used a Dynamic Lotus. Make sure the body you choose is light, low, and wide (unless you like to flare!). Check that you have room for the sidewinder gear and try to choose a body that has a long nose so you can really stick the guide out. Under CM, ARCO, and USRA rules, a diaplane can be fitted to the front of the body and the guide can be located under this and shoved even further forward. The trend is to place the guide further forward of the front axle. This car has it almost an inch in front of the axle. Ready to jet! On some tracks, a rear spoiler may help handling, but this is another area you'll have to experiment with for yourself.