



Carl Weyl and the 'Spirit' at the end of a successful day of racing. They won every heat they flew in. Not bad, considering the model made its first flight about an hour before the race! Carl is tipping the model up to show that the grin on the 'Happy Face' pilot is as big as his.

THE SPIRIT OF ST. LOUIS

BY GUS MORFIS

The Quarter-Midgets have really taken over in the Northrop M.A.C. Most have been built with sport-flying in mind, but with a number of similar class models in the air each weekend, impromptu races are very common. Some of the fellows worked up a match between our club and the Orange Coast R/C Club to be held at Mile Square Field, and then the interest really began to pick up.

Carl Weyl wanted to enter, but it

was tough to find something that would carry his older, bulky radio gear. We did a lot of wild sketching but nothing was working out right.

Eventually, we came to the conclusion that we had to go back to basics, and we took to the "aerospace systems analysis" approach. We drew in the servos as tightly as we could, tucked in the receiver and then spotted in the minimum cross-section called for in the rules. Right away we

could see that we had to find something with a big square fuselage, preferably with the cockpit faired in. The best location for the wing seemed to be on top of the fuselage where it would be out of the way of the goodies tucked inside. The first sketches indicated that a Mr. Mulligan might do the job, however, it wasn't too long before it became apparent that the big flat cowling up front was going to cost too much drag. What was

**AN UNLIKELY LOOKING CANDIDATE.
NEXT TO ALL THOSE SLEEK, STREAMLINED QUARTER MIDGETS,
THE SPIRIT OF ST. LOUIS JUST KEEPS ON WINNING RACES**

needed was something with a "pointy" nose and a "boxy" fuselage.

Well, it wasn't too long before the sketches looked more and more like the Spirit of St. Louis. After all, the "Spirit" was a famous racing plane --- didn't Lindberg win the prize money for being the first man to fly from New York to Paris?

Actually, the "Spirit" idea started as a gag, but the more we sketched, the better it looked. When you stop to study it, the "Spirit" makes an excellent prototype. The nose sections are very clean, permitting a good airflow around the prop and the fuselage lines are very smooth. The worst you can say is that the center and aft fuselage sections are too square and those corners can cause vortices to form. But it did fit the radio gear neatly and it looked simple to build.

The guys in the club were sounded out and, while they all thought it was a weird idea, none of them came up with an objection and agreed that it fit within the letter of the rule, at least. (If not the "Spirit" -- HAW!) The consensus was that the Quarter Midget event was going to be kept a loose-hung "fun" event with as much spectator appeal and novelty value as possible. While most had been thinking of Goodyear Midgets originally, it seemed that broadening the outlook might help.

The design took about a week to work up, working during lunch time and a little in the evening. Carl, who

works nearby, would come by daily to get a progress report and second-guess the drawings. Finally the design was done and it was up to him.

You can guess the degree of difficulty in building this model when I tell you that he started building after Thanksgiving, with the race scheduled for December 5th. Like most well conceived projects, the first flight actually took place in the morning of December 5th, just before the race!



Actually, the model was ready for its first flight on the 4th, but that day was just too windy.

BUILDING YOUR MODEL

The first thing you want to do is lay your radio, tank, servos and engine out over the plans and make whatever revisions you require to accommodate your gear. You fellows with the new small gear should have no trouble, but the bigger servos will leave you with a real snug fit. If you feel you want more room, just go ahead and widen the fuselage as you want, but remem-

ber to revise all the bulkheads accordingly.

FUSELAGE:

Fuselage construction is very simple, but remember to use enough glue to do the job well, and be careful not to over-do it, especially near the tail. Remember, it's a lot easier to add weight if you are too light than to add lightness if you are too heavy! The fuselage is strong enough to stand all normal flying loads; if you are concerned about the 1/16" sheet construction, go thicker at your own risk! It won't make the model fly better, but it will make it easier to handle.

The nose contours are quite easy to achieve. First, build the nose up square; then using a sanding block chamfer the nose until you can get a circular contour at the spinner, using 1/4" sheet stock. Glue these pieces on well and, when they are dry, sand the contours in. The contours are just a progressive series of radii from full at the spinner to zero at bulkhead #3.

Notice that we show the 1/16" side plates running forward of bulkhead #3 on the outside of the 1/4" nose blocks. This makes it slightly tricky in assembling the fuselage, but those side sheets are the only thing holding the nose in place! If you prefer to butt-join the nose on the fuselage, go ahead, but you better reinforce the area by wrapping with some glass tape.

EMPENNAGE:

This is all cut out of 3/16" lightweight balsa. Remember to fit the





The Spirit of St. Louis can be "cleaned up" by using nylon wing hold bolts if you so desire.

rudder with your favorite steerable tail wheel. Notice that the stabilizer has a slight amount of incidence shown on the plans. Test flights indicated the need for "down-elevator" trim. (This was the only adjustment required, by the way). This is to be expected when you have a zero angle thrust line and a high flat-bottomed wing. The drag is up high where the wing is and, in addition, the wing down-wash acting on the horizontal tail makes the model want to nose up.

If you find you have to constantly carry elevator trim, I suggest that you go to the extra trouble to re-install your tail so that you use very little trim at all, for **trim is drag**.

WING:

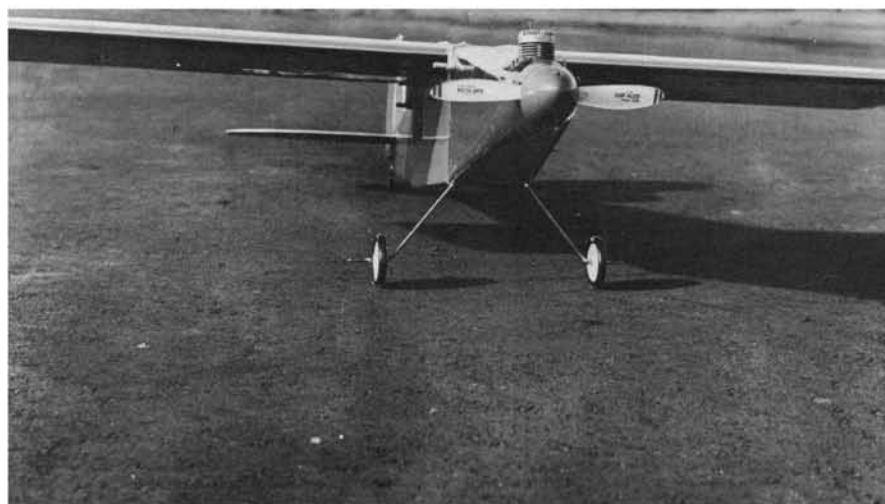
The wing is a real cinch, the top and bottom are made of

1/16" x 7" x 36" sheet stock. If you can't find 7" stock you can cut 8" to fit, or edge glue a 3" and 4" wide together to make up the size. Note that the leading edge piece sticks out 3/8 of an inch so that your chord length is 8-3/8". The wing area works out to 312.88 square inches, which includes the wing tips.

The wing is built flat with no dihedral and no twist. I was concerned about tip stall, but there has been no evidence of any tendency to fall-off at all.

LANDING GEAR:

The landing gear is simplicity itself; bend up 1/8" diameter rod to the shape shown and J-bolt it to #3 bulkhead. Personally, it is my conviction that this wire gear is less draggy than the bent up sheet metal jobs



which are so popular now. We started flying using Williams Bros. "old timer" wheels for scale effect, but they just didn't hold up, and Carl changed to a pair of regular wheels for the final heat. There wasn't any apparent difference in speed.

COVERING:

The entire model was MonoKoted Aluminum with the exception of the nose section forward of the wing which was Chrome MonoKote. The markings were all Black Trim-Film and the name "Spirit of St. Louis" was done in India ink on the nose and covered with a piece of transparent MonoKote to protect the ink from the effects of glo-plug fuel.

This doesn't sound like much of an exciting color scheme, but the model **did** stand out among all the red and yellow and purple and orange . . . etc. competition. Of course, the high wing was distinctive, too. Oh yes, we had a pilot on board, in the form of a yellow "happy face" sticker which looked kinda cute.

TRIM & ADJUSTMENTS:

By careful wood selection and neat building, the "Spirit" weighed in at 2.55 lbs.! Balance was at the quarter chord, as shown on the plans. The control throws worked out as follows: elevator total travel, 3/4"; rudder total travel, 1 3/4"; aileron total travel, 3/8".

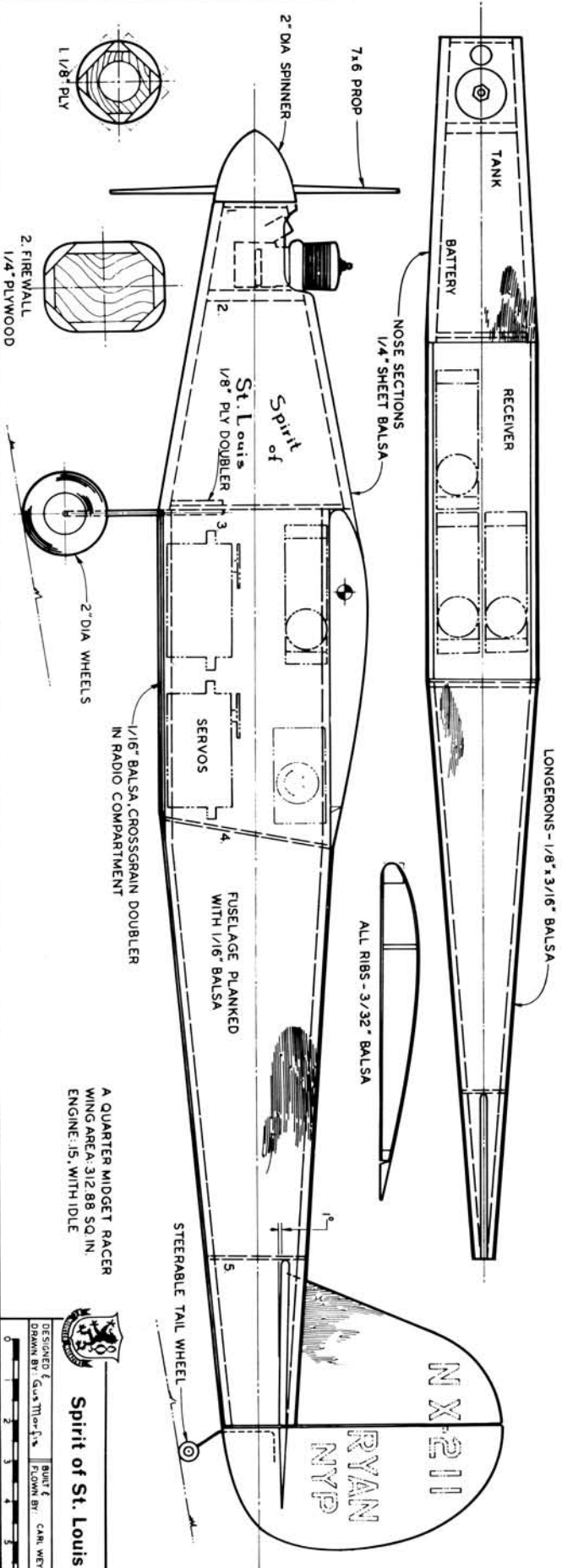
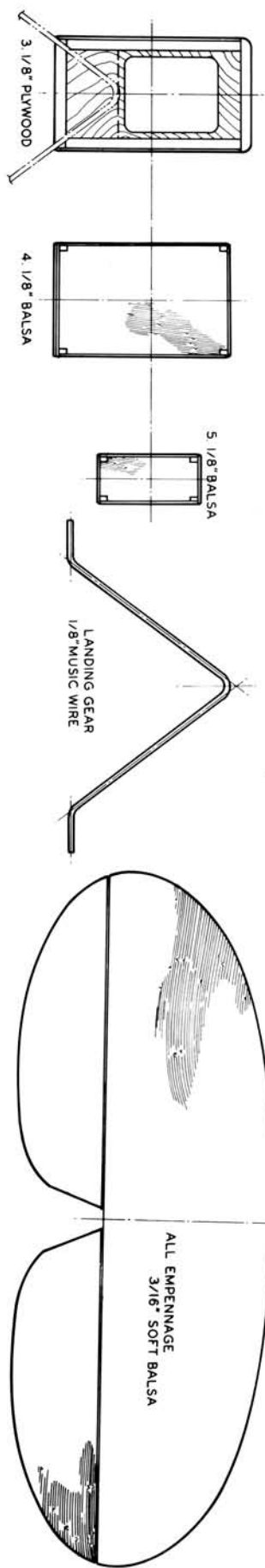
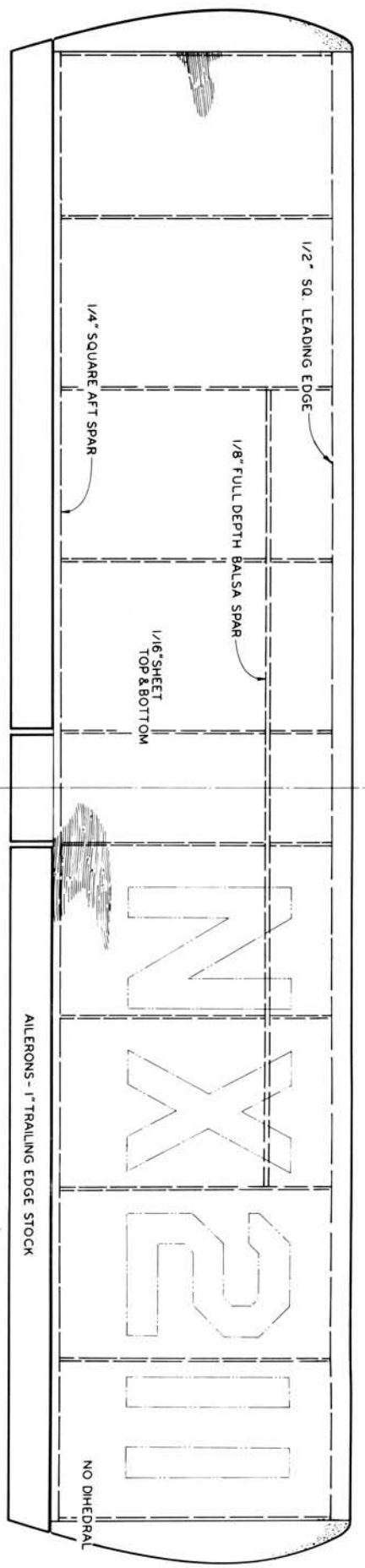
FLYING:

There isn't too much to say here. The model is viceless with a good smooth straight-ahead stall. It has shown no tendency to fall off, no matter how hard the pylon turn is. As was mentioned earlier, the only "problem" was that it needed down elevator to trim out. A little down thrust took care of that on the original. I think that rigging the stabilizer as shown on the drawings (with 1° incidence) will take care of that satisfactorily. The engine was also given about 1° right thrust. I haven't shown this on the drawings since everybody seems to have his own special setup that works well for him.

So there it is. A simple, honest, quick building model which won the first race it entered, even with having the handicap of greater frontal area because of the bigger radio gear.

The "Spirit" isn't a magic model, however. Carl Weyl is a darn smooth flyer and that is the combination that did the job. The "Spirit" can win for you too, but you have to learn to fly a good tight course and don't let yourself be 'spooked' by the competition.

That's the "Spirit"! □



A QUARTER MIDGET RACER
WING AREA: 312.88 SQ IN
ENGINE: .15, WITH IDLE



Spirit of St. Louis

