

# MAX FAX



Journal of the D. C. Maxcuters

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Editor: Allan Schanzle

March/April, 2004



## COMING ATTRACTIONS.

MARCH 7, 2004

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MARCH 27, 2004

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MARCH 27, 2004

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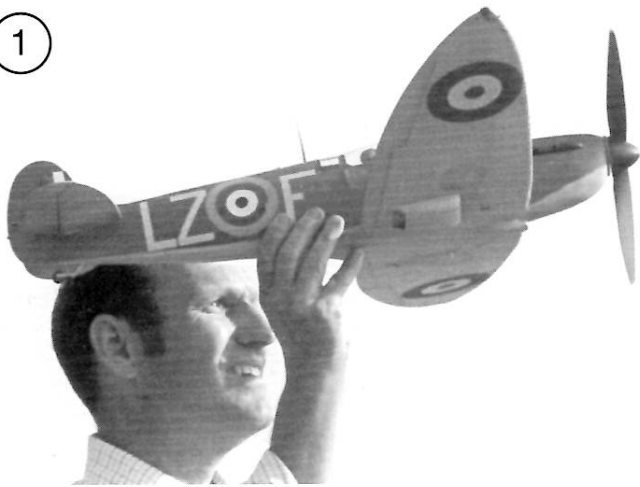
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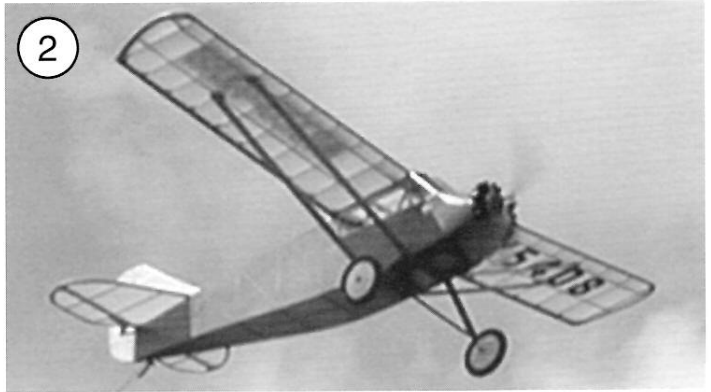
*EASTERN US FREEFLIGHT CHAMPS INGLESIDE, MARYLAND.*



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Photo by Bob McLellon



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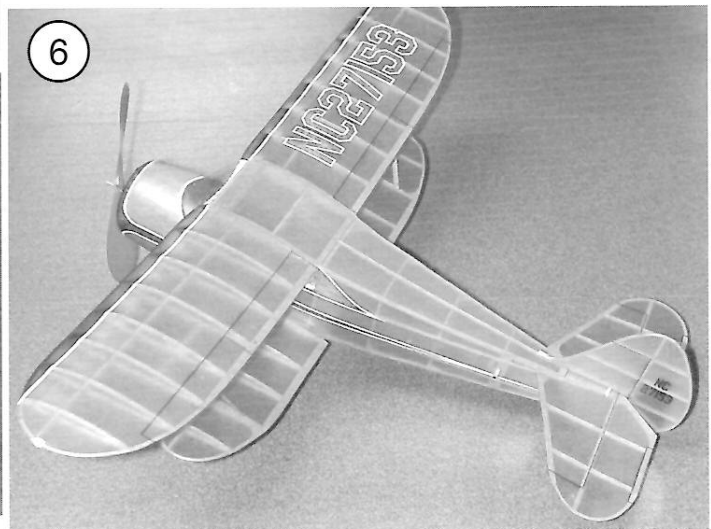


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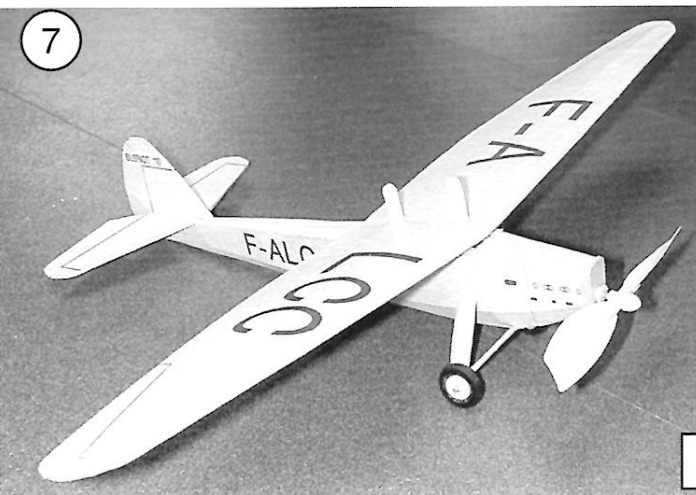
Photo by Nestor Shoerder



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Photo by Jiro Sugimoto



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## AN ISSUE DEVOTED TO THE SPARTAN C2-60

Allan Schanzle

If you've already looked at the plans for this issue, I'm sure you are convinced that either the editor or the printer got confused. Let me put it this way. Have you ever felt like the world was a tuxedo and you were a pair of *brown* shoes? New technology is a wonderful thing, but it can introduce new problems. Allow me to explain.

My intention for this issue was to present the feature plan of the Spartan C2-60 as a full sized foldout, which we used to do on a relatively consistent basis back in the 80s and early 90s. I intentionally drew the C2-60 plan so that it was composed of two self-contained pages, each 11 x 17, which I could tape together without having to "connect lines". This would render a full sized foldout of 17 x 22. With this format, you could go to your local Staples or similar facility and copy the plans using readily available paper, avoiding the cost of having to pay for an expensive 17 x 22 copy.

In the old days, the copies of the 17 x 22 plans were made by an Ozalid machine at minimal cost by a different printer than the one who does the rest of the newsletter. But the economic downturn over the past few years forced the closing of our old Ozalid printing company and new technology has apparently eliminated the Ozalid process. In addition, the entire issue was typed and ready for printing (assuming 16 pages of text with the full-sized foldout) before I learned about the unavailability of Ozalid copies. So I took Editorial License and you see the result: two unattached 11 x 17 pages inserted into the center of the newsletter. This will allow you to see the whole plan (the same benefit of the full sized foldout), and at the same time minimize copying costs.

### THE FRONT AND REAR COVER PHOTOS

The editor took digital photos of the Spartan and gave them to Don Srull, who produced the outstanding color results you see. Many thanks, Don. The photo on the front cover was taken in conjunction with a diorama built by the editor. The materials are predominately model railroad supplies. This is the second of these that I've built, the first being shown

in the Jan/Feb 2003 issue featuring the Fairchild 95. The secret is to create the "illusion of depth". If sufficient interest is shown, (meaning more than one positive response!) an article about making dioramas could be included in a future issue.

### OBTAINING A CLOSE APPROXIMATION TO INTERNATIONAL ORANGE

The article in this issue discussing the model of the Spartan C2-60 notes that the editor was fortunate to photograph the aircraft replicated in this issue. The colors are black and orange, but the orange has a strong red tint, suggesting that the restoration of this aircraft used International Orange paint.

In the process of covering the model, I noticed that anywhere I overlapped one layer of orange tissue with another layer (as was done on the edges of the tail surfaces,) the result produced a much deeper orange color that more closely approximates International Orange. I've checked some of my older models using yellow tissue and indeed, the overlapped tissue colors are significantly deeper and richer. I doubt that you would want to double-cover an entire airplane, but you may find that double covering is a technique you can use to obtain more realistic trim colors.

### PHOTOS AND CAPTIONS FOR PAGE 2 Tom Schmitt

1. Our editor with his Spitfire, circa 1978.
2. It may be Schoolyard Scale, but it sure is pretty. Hurst Bowers' Stinson.
3. A great seldom modeled P-40C by Bob McLellon.
4. Our dapper member, Ed Zapolski, with his ten-center Burd Caudron.
5. Nester Varela Shoerder, one of our long time members in Mexico City, sent this picture of his Farman Coconut enlarged from peanut plans by Bill Hannan and Bob Clemens.
6. Dave Mitchell's Waco E as seen at a recent Maxecuter meeting.
7. Stefan Proski's Bleriot Long Range Monoplane waiting for a test hop at College Park.
8. Another great Peanut model from across the Pacific, a Potez 36 by Jiro Sugimoto.

# THE SPARTAN C2-60

Allan Schanzle

## AN INTERESTING EXPERIENCE

What? You've never heard of a Spartan C2-60? Don't feel alone. Neither had I until about seven years ago. It's another of those aircraft that I enjoy replicating in model form because it has seldom been presented to the F/F community.

My initial exposure to the Spartan C2-60 was a color photograph of the full-sized aircraft in the book *VINTAGE FLYERS*, by Eric Presten (Prewar Publications, 1996). The black and orange colors were different, and the wing looked exceptionally long with a constant chord. My first reaction was that the aircraft appeared to be a powered glider, and would probably make a good flying model. The caption for the photo stated that the plane was based at Hood River, Oregon, and gave the name of the owner. It just so happened that we had a vacation planned for that area of the country for the coming summer, and by searching on the Internet I got an address and phone number for the owner. Letters were sent and phone calls were made, but there was no response. The possibility of seeing and photographing the actual plane seemed remote, but here the story begins to get amusing.

When we arrived at Hood River, we drove to the address and found the house with a couple of hangers in the back yard. But there was no access to the home via a driveway. I wondered if this guy went to get a loaf of bread by simple walking out his back door, strolling to the local airport, (which was about 500 yards behind his house), and hopping in his helicopter for a trip to the local grocery store parking lot. After driving back and forth on the street looking for a sneaky entrance but finding none, I decided to go to the airport and ask if they knew where the owner could be found. They said he spends every summer in Alaska, but they *voluntarily* gave me directions to his driveway entrance (at least 1/4 mile away from his house) and also provided the code to open the lock for the gate!!! All of a sudden I began to like this place called Hood River.

We entered the driveway (I didn't see the sign that was covered by tall weeds that said "Private Property, No Trespassing") and approached the house. Just as we got there an individual walked in front of us and asked whom we were. I

introduced myself and asked if he was the owner, as I had written letters and left phone messages concerning my interest in one of his planes. Without introducing himself, he said he had seen my envelopes, and asked which plane I would like to see and photograph. I said "The Spartan C2-60". He said, "Well, come on over here". I followed him to the door of a hanger, which he opened. I walked inside and nearly dropped to the floor to kiss the concrete. Within 10 seconds I saw the C2-60, an American Eagle Eaglet, Curtiss Robin, Bhul Bull Pup, Aeronca C-3, a Curtiss Pusher, and others I don't remember. Every one was in immaculate condition. He then said he was an employee of the owner and I was welcome to photograph anything I want. When we were leaving, he got a bag and went to several apple trees and picked about a dozen tree-ripened beauties for us. As we drove out the driveway, I began looking for the first real estate office to check on home prices in Hood River.

So for the C2-60, in contrast to my two previous designs, (Fairchild's 21 and 95) there is no question concerning colors, as I saw and photographed every portion of the plane. As I'll describe later when discussing the colors and markings, even color photographs can be misleading.

Several months later I was telling this story to Dave Stott, and he mentioned that he thought the C2-60 was kitted and advertised back in the '30s, so I began searching my 1930, '31, '32, etc., issues of *MODEL AIRPLANE NEWS* until I found an advertisement in the September 1934 issue of *MAN* for a kit of the C2-60 made by the Tropical Model Airplane Company, which is about as well known as the C2-60. A copy of this advertisement is on page 11 of this issue. So, to the best of my knowledge, this Spartan has been offered only once before to the F/F modeling community.

## HISTORY OF THE C2-60

In 1925, a fellow named Willis Brown became deeply involved with aircraft development. The press cleverly referred to his first plane as "first biplane built by Willis Brown", although Brown called it the "Spartan". Its first flight occurred on October 25, 1926, with Brown as the pilot. He was initially reluctant to go into manufacturing of air-

craft, but in the spring of 1927, encouragement from his backers and associates led to the creation of the Tulsa, Oklahoma based Mid-Continent Aircraft Company. His initial plane was then called the C3-1 Spartan, the "C" standing for "commercial", the "3" representing the capacity of the plane, and the "1" initially designating the design number, but later this number denoted the engine type. One reference I found suggests that the "3" was used so that potential buyers would not think this was his "first" design.

In the fall of 1927, William Skelly, president of the Skelly Oil Company, learned about the Mid-Continent Aircraft Company. He felt it was a good company with a bright future and would be worth acquiring as a business investment. The offer was too good for Willis Brown to turn down, so the sale to Skelly was completed in early 1928 and almost immediately the name was changed to the Spartan Aircraft Company of Tulsa, Oklahoma.

Production of the C3 series of aircraft was continued through 1930, but the depression began to take its toll. About this time, the company founded the Spartan School of Aeronautics. In addition, design and development of two high wing cabin aircraft (the C4 and C5) continued, but there was a need to fill the cheaper sportsman market. The C2-60 was Spartan's attempt to compete with Aeronca, Rearwin, Fairchild, Taylor, and others for sales in this arena.

The C2-60 was built and first flown in 1930. The Civil Aeronautics Authority granted ATC No. 427 on July 1, 1931, but sales did not live up to expectations, and by the end of the year, the production line was shut down after 16 (or perhaps 20, the exact number is not known) aircraft were completed and sold. Several of these went to the Spartan School of Aeronautics to serve as trainers, but not at the advanced level of teaching aerobatics. There is a story told that one of the students decided to see just how much the aircraft could stand. He announced, "I'm going to pull the wings off this plane", and donned a chute, climbed into one of the ships, and took off. He proceeded to "wring out" the C2-60 until the wings folded, and then safely parachuted to the ground. The plane was a total loss.

### REFERENCES

Considering the obscurity of the C2-60, there are quite a few good references that have been very useful in designing this model.

1. **SPORT AVIATION**, August 1967, Vol. 16, No. 8 (Text for restoration and flight testing of NC 11908, 3-view, color photo of NC 11908).
2. **THE SPARTAN STORY**, by Peek and Goodhead, Aviation and Heritage Library Series. (Text, photos, specifications, repeat of flight test data given in Reference 1).
3. **AVIATION CLASSICS from AVIATION QUARTERLY**, 1984 (Many color photos of NC 11908 in original factory colors with specific photos for details of cockpit, landing gear, etc., text, 3-view, four drawings of Jacobs engine. A GOLD MINE!).
4. **U.S. CIVIL AIRCRAFT**, Juptner. (Text, photos, list of known production aircraft with registration numbers, factory colors).
5. **VINTAGE FLYERS**, Eric Presten, Prewar Publications, 1996 (Color photo of NC 11016, which is based in Hood River, Oregon and the aircraft replicated here).
6. **AIRCRAFT YEARBOOK for 1932** (Text, 3-view).

### THE 3-VIEW

Just about every article discussing the C2-60 has included the same 3-view drawing, which is shown on page 12 of this issue. As far as I can determine, the 3-view first appeared in the 1932 **AIRCRAFT YEARBOOK**. Many years ago, I was told by Rolf Gregory that quite often the yearbook 3-views were drawn by whomever happened to be walking past the office of the company's Chief Designer when the need for a 3-view arose, so it isn't surprising that they may not accurately represent the actual aircraft. On other occasions, the draftsman might have accurately represented the prototype, but the production version may have had a significant number of changes. I have attempted to replicate the plane I saw and photographed in Hood River. This aircraft has undergone at least two restorations; the first noted in Reference 1, pg. 5, and the second by the current owner. Considering all these factors, it would not be surprising if variations occurred between the original 3-view and the plane I photographed. The following variations from the published drawing are based primarily on my photographs, but also from photos in some of the references.

1. The shape of the fin and rudder.

2. In the top view, the sides of the fuselage just forward of the wing leading edge up to the cowl should be straight, not curved.
3. There are no louvers below the main longeron that lies at the base of the cockpit opening.
4. In the side view, the bottom of the fuselage from the rear of the wing to the back of the fuselage should be straight, not curved.
5. In the side view, the bottom of the fuselage under the wing should be nearly straight and parallel to the main longeron, not curved and sloping upwards.
6. In the front view, the fuselage sides behind the cowling should be vertical from the main longeron down to the second stringer, and then tucked in only slightly at the bottom longeron.
7. The cockpit opening and windshield on the model replicate what is on the plane in Hood River, which is slightly different from the 3-view and photos of other restorations.
8. The tail wheel is replaced by a tail skid.

It's worth noting that the down thrust shown on the 3-view is clearly visible in all profile photos. The full size aircraft used a Clark Y airfoil (reference 4, pg 81), which I've incorporated in the plan presented here.

In addition to the above changes to the outlines of the model, there is one very obvious variation for this particular restoration from the original factory production, and that is the color. My photographs (and the one shown in Reference 5) show the plane is orange and black (details given later), whereas the factory colors (noted in References 1 and 3) were all maroon or a maroon fuselage with orange wings (yuck!).

## CONSTRUCTION

Looking at the 3-view, one can only conclude that this should be a relatively simple airplane to model. I'm sure it could be. However, having seen the aircraft and taken photos has provided many details of the full-scale construction, and consequently, the opportunity to pass along some information for those wishing to build an accurate replica.

### THE FUSELAGE

Begin by constructing two sides for a standard fuselage framework using 1/16-inch square

balsa and wing saddles F1. Glue the rear posts together and add the top formers F14 down to F7T along with the bottom cross braces. Note that the notches in the formers that fit on the upper longeron are 1/8-inch wide. Later on, a second 1/16-inch square strip will be glued onto the side of the upper longeron, thus filling the entire 1/8-inch notch. Note also that the bottom cross braces (solid lines in the top view) are 1/8 inch shorter on each end than the overall width of the fuselage. This will produce the tucked-in taper for the bottom of the fuselage. Glue the bottom formers F8B and F7B, which have only a 1/16-inch notch for each bottom longeron. Add the stringers on the top from F9 to F14, noting that the stringers butt joint on F14, thus eliminating cutting notches that are very close together. Glue the stringers on the center line from F7T to F8T and F7B to F8B. Now add the two additional 1/16-inch square balsa strips to the sides of the main longeron and sand these to form a taper at the rear post. Add 1/32-inch sheet balsa from F7T back to the inside surface of F9 and from F7B to F8B. Finally, add the two 1/32x1/16-inch stringers to each side of the fuselage as shown on the side view.

Now let's tackle the cowling on the front of the fuselage. The following may appear as a contorted technique to make this portion of the model, but it worked very well. Start by cutting out F6, but don't remove the center circular section at this time. Mark the cross representing the center of the circle and use a pin to punch a hole at the cross mark. Place a drop of CA glue in the hole to harden the wood.

Next make the F4 former from 1/32-inch thick plywood. Mark the cross and drill a small hole the same size as the pin you used for F6 at the cross. To make the F5 former, take a piece of 1/2-inch thick balsa (or laminate pieces to get this thickness) and cut it so that its height and width are at least 1/4-inch larger than the dimensions of F6. Sandwich the F5 block between F4 and F6 (making sure the outside edges of F5 extend beyond the contour of F6) and push a pin through the hole in F4, through F5, and out the hole in F6. F5 will be sanded to shape shortly.

Now make a temporary circular former the size of F2 from 1/32 plywood, mark the cross, and drill a hole. Finally, to make F3, laminate balsa sheets to give a piece 5/8 thick and again, make the outside dimensions somewhat larger than the size of the dimensions of F4. Sandwich F3 between the temporary plywood F2 and F4 and push

a pin through the hole in F2, through F3, and out the hole in F4.

Next take a piece of music wire about the thickness of the pin and slip all the formers over the wire, line them up, and tack-glue the pieces in place. Now you can sand F3 and F5 to shape. When completed, use a pencil to lightly mark a straight line on the bottom from F3 to F6 for future reference in lining up the formers. If you're using a CO<sub>2</sub> engine, dissolve the tack glue holding F5 and F6 to F4 and use a Dremel to grind out holes in F5 and F6 to allow insertion of the tank.

Mounting the CO<sub>2</sub> is a matter of your choice. My technique is shown in a schematic on the plan.

The simulated Jacobs cylinders were made from a combination of Williams Brothers material and lots of home made parts. For example, telephone wire stripped of its insulation was used for the valve lifters and spark plug wires. The plugs themselves were simulated with white insulation over the wire. The valve springs were hand-wound around a small piece of music wire using thin, soft, aluminum wire. The collector ring is former F2, and the exhaust pipes connecting the cylinders to the collector ring are aluminum tubing. The main exhaust pipe below the fuselage was made from 1/8-inch reed. The result is shown in one of the photos on the rear cover.

All this engine detail added about 4 grams of nose weight (not counting the Brown CO<sub>2</sub> engine and tank), but past experience suggested it would probably be necessary to obtain the proper balance point.

## THE WING

This is standard construction with two exceptions. First, the wing tips taper up from the bottom and down from the top, as is done on the full sized aircraft. The outermost rib is designed to accommodate this feature. Second, there are two wing ribs where the landing gear inserts into the wing. All the rigging on the landing gear of the real plane was there for structural reasons. On page 13 of this issue you'll find my rationale for choosing elastic thread to simulate the rigging. The problem with this material is, however, that it is not structural in any way, so the anchor for the front strut was designed to be a little on the beefy side by using two ribs with pieces of balsa between them and into which the struts could be glued. Don't forget to include the balsa anchors for the wing rigging.

## THE LANDING GEAR AND TAIL SKID

This is a task for the masochist! As noted earlier, there is substantial rigging on the bottom of the plane that connects the two landing gear struts, the wings, and the fuselage. After looking at all of my photos and those in the references, sketches were made to define exactly where all the cables should be attached. These drawings are included at the end of this text.

The landing gear struts are really a pain because the full scale plane used tubing with lots of curves. The main struts (the forward vertical portion with the horseshoe shape at the bottom) were designed to be sufficiently strong to survive a landing in the grass. Each gear used brass sheet, solder, reed, balsa, cyanoacrylate glue, and a little epoxy. No doubt you'll find a better and simpler method!

The first thing is to determine the wheels you are going to use, as they will determine the shape of the fork at the bottom of the front strut. It turns out that the one-inch diameter turned balsa wheels I purchased from Old Timer many years ago are just about perfect scale.

All landing gear strut outlines are shown in the lower left hand portion of Plate 2. Cut a 1/8-inch wide strip of very thin brass sheet for the horseshoe portion of the front strut. The shape was obtained by bending the strip around a brass tube of the appropriate diameter. You should allow some extra length for the ends of the fork, as there is a need for something to hold when drilling the small holes for the axel. The ends of the struts can be cut to the proper length once you have the entire front strut completed. The upper vertical portion of the strut was also made from brass sheet (albeit a bit thicker) with a short bend at the lower end to facilitate soldering to the horseshoe portion. After soldering the two pieces of brass together, add 1/32-inch balsa to each side of the upright portion of the strut and to the top of the fork. Use very soft (4 to 6 pound maximum) "A" grain balsa for the fork so that it can be bent around the curvature without cracking. Then sand the balsa to an airfoil shape.

Next, go to your local craft store (Michaels is the local source around here) and get some "reed". It is usually sold in huge rolls of different diameters, but you may be able to talk the salesperson into selling just one foot of each available diameter. Soak the 1/16-inch diameter reed in hot water for 15 minutes and it will easily bend as required. Use three pieces (another horseshoe and

two straight strips) to make a structure as shown on the plan. Consider using a tad of epoxy glue for these joints. Drilling holes in the ends of the reed for the axle was a challenge, but squeezing the ends of the reed with a pair of pliers produces a flat surface that can then be easily drilled. Add a drop of cyanoacrylate for strength.

Now use the side view of the fuselage to make the rear "V" portion of the strut that connects the top of the front strut to the rear of the reed and then back up into the wing. Sand strips of 1/8x1/16-inch hard balsa to an airfoil shape (except where they are joined) for these two supports prior to gluing them together. Then glue the "V" structure to the reed and the top of the front main strut, making sure all is properly aligned. Use Ambroid for this so that acetone can be used to soften the joints and realign if necessary. Coat the joints with a thin layer of epoxy after testing that the two landing gear struts are properly aligned when inserted into the wing. Then saturate the 1/8 x 1/16 rear struts and reed with CYA.

If you plan to use elastic thread for the rigging, see the separate article in this issue for a few suggestions.

The tailskid was made from very thin brass and replicated the "leaf-spring" structure photographed in Oregon. See the plan for details.

## THE STAB AND RUDDER

The stab and rudder are relatively conventional structures using laminations for the curved portions. On the full-sized aircraft, these are *flat* surfaces with rounded edges. Check the side view on the plan and you will see a note that there is a gap between the bottom of the vertical fin and the top of the horizontal stabilizer. This space was used on the full-sized plane for trim adjustment.

Only one unconventional construction technique was used for this portion of the model, and that is the use of a scale-like connecting rod for the two elevators. A round jeweler's file was used to create a recess along the front portion of the inboard leading edges of the elevators, and then a 1/16-inch diameter pine dowel was embedded as the connecting rod.

The only other item of note is that the stabilizer surface was enlarged to give about 23 percent of the area of the wing, and this produced a rather long horizontal stabilizer. Consequently, outline contours used three laminations of balsa along with one of basswood, whereas the rudder

used only two laminations of balsa and one of basswood.

## COLORS AND MARKINGS

Because I actually saw and photographed this particular airplane, I can say with authority that it is black and orange, but the orange has a strong hint of red, which means that the restoration probably used "International Orange".

The following colors are for the aircraft modeled here and shown in Reference 5:

### Black

Fuselage, rudder, fin, landing gear structure, registration on wing, support for main exhaust pipe, aileron and rudder control horns, and rigging.

### International Orange

Wing, stabilizer, elevator, registration on rudder, and stripe on fuselage.

### White

All turnbuckles and the pinstripe outline of the orange stripe on fuselage.

### Silver (or Aluminum)

Exhaust collector ring, wheel hubs, prop, and exhaust pipe.

### Steel Gray

Tail skid.

Note that there is no helmet or "Spartan Head" on this restored aircraft.

In the January/February 2003 issue of *MAX-FAX*, Dan Driscoll cautioned about color determination from "color" photographs. If you have Reference 5, look at the photograph on page 86 and note the apparent colors of the wing registration. It appears that they are black outlined in red. Wrong! I'll guess that the red outline is a result of some lighting phenomenon that is beyond my comprehension. This also occurred in a couple of my own photographs of the registration on the left side of the rudder. When my picture was taken from a position forward of the stab, the registration appears as orange with a red outline, but when my photograph was taken from behind the stab, the registration appears as a pure International Orange (the true color). So much for definitive color documentation from color photographs!

If you want to replicate a factory color scheme, check reference 3 for NC11908.



## FLYING

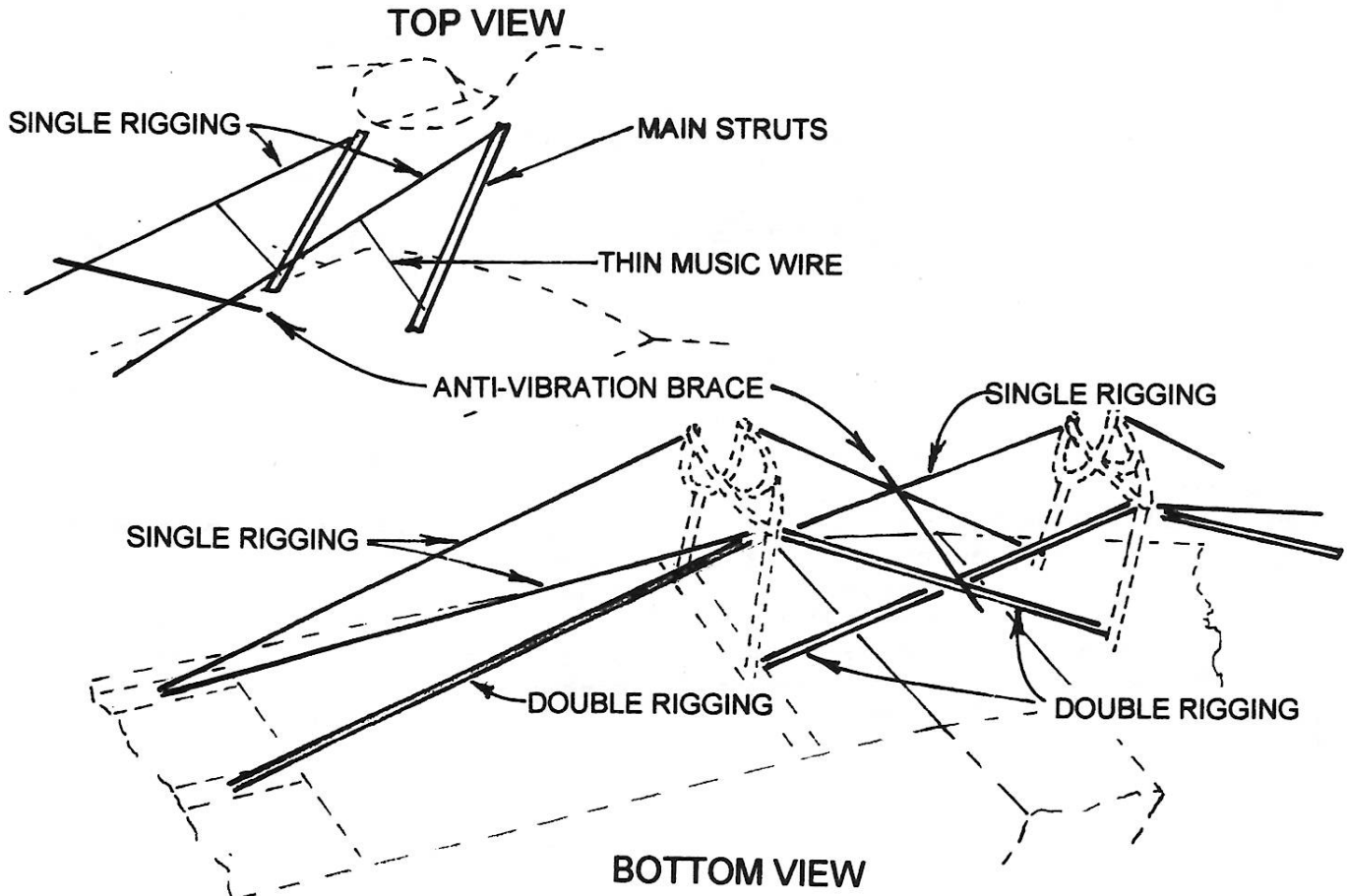
The finished weight with prop, engine, and empty tank was 1.5 ounces. When I first checked the C/G location by lifting at the wing tips, I quickly realized that I should have included webbing between the upper and lower spars, as the wing began to flex under the weight of the plane. I suggest that you include this feature (or the use of carbon fiber) if you build this model.

The initial test flights were made in late evening over the proverbial field of tall grass. Being the devout coward that I am, I took the model to the field without the landing gear and before I had added any rigging, even though I was confident the landing gear would hold up under test flights.

The initial low-powered "extended glide" indicated a nose heavy condition, so a bit of clay was added to the tail. The next flight indicated a straight ahead extended glide, so a touch of left rudder was added. Two more flights, each adding just a tad of power, began to show desirable results. With a bit more power, the plane began to

slowly climb in a nice circle. Up she went, to about 25 feet, and then, at about 5:30 in the evening, she found a *flippin' thermal*, and up she went to at least 150 feet! All I could think about was how I wish I had taken some photos before these first flights. Don Srull was at the field and I heard him shout something like "holy crap". But this was to be my lucky day, as the model popped out of the thermal and ran out of power at about the same time, but it was drifting toward the area of trees, telephone poles, telephone wires, fire hydrants, a field full of bovine meadow muffins, and who-knows-what-else. To my great glee, it circled around all the obstacles and landed in the grass on the other side of the road leading into the field. I picked the model up and put it in the box. It never left the house again until photos had been obtained.

By the time I got around to finishing the model, the weather turned to winter, so no additional flying "in full regalia" has been attempted. But based on earlier flights, there should be no serious problem getting this model of a classic antique to fly just like its full-sized companion.



The following text was part of an article by George Goodhead presented in the August 1967 issue of  
**SPORT AVIATION**

### **FLIGHT TESTING THE SPARTAN C-2-60**

*By Gene R. Chase, EAA 10522*

4634 S. Urbana, Tulsa, Okla. 74135

My entry into the picture came one afternoon at the office, when I answered my phone and heard a friend's frustrated voice bemoaning the fact that his plane was finally licensed by the FAA and ready to test hop this very day, but that he had to work late and could not get to the airport in time. This, of course, was George honoring me with a request to make the initial flight.

I assured him I would be delighted to fly the plane and suggested that we meet over a cup of coffee so that he could tell me what he knew about the plane and operation of the engine. I felt this briefing would have merit because I had never even seen a C-2-60 all in one piece, and George had at least logged time in one as recently as 30 years ago!

I learned that the engine develops 55 hp at 2,125 rpm and that the plane has no shock absorbing system except what the tires provide. Armed with this knowledge, I proceeded to Tulsa International Airport, where I spotted the beautiful little maroon and orange bird sitting proudly on the apron in front of one of Spartan School's shop hangars.

After a thorough walk-around inspection of the plane, I telephoned the watch supervisor of the Tulsa Control Tower to get permission and instructions for getting off of and back onto this busy airport with a non-radio equipped (naturally) antique airplane. Archie Howell was on duty and was most cooperative with us. I requested a take-off on runway 17R and permission to leave the pattern for 15 minutes, returning to make a low pass down the runway for all the camera fans before making the final landing. Archie agreed to all of this, so all I had to do was watch for light signals from the tower.

I donned my flight coveralls, helmet and goggles and climbed aboard. Soon the three cylinder Jacobs was running smoothly and I started the long taxi across the field to the take-off end of 17R. At the same time, I noticed a robin's egg blue Boeing 727 proceeding north across the field for a take-off on 17L, and I thought to myself that as much as I would like to drive a 727 around the sky, I wouldn't have traded places with that Braniff crew on this day.

Two young fellows in a Cessna 150 followed me out for take-off, and after completing my run-up and giving them a thumbs-up, they obligingly radioed the tower that I was ready. I immediately received a green light and soon was rolling down the runway. The take-off was smooth and the climb-out exceeded my expectations.

I left the pattern and climbed to 3,000 feet where I played around with some slow flight, steep banks, power on and off stalls, then silently thanked George for allowing me all this fun in his plane. After making some appropriate remarks on my knee pad relating to power settings, air speeds, temps, pressures, flight characteristics, etc., I lowered the nose and headed back to the field.

Noting the position of the evening sun, I reasoned that a normal traffic pattern entry would put me between the sun and the tower and I would never be spotted. So I entered from the northwest, congratulating myself that my timing was working out OK, as I had been out of the pattern exactly the prearranged 15 minutes.

As I mentioned earlier, all I had to do was watch for lights from the tower, and this I was doing, as well as keeping track of other traffic. But I was only 1.5 miles from the airport boundary before I got the green light, and I found out later that my two friends who had been following me in the 150 alerted the tower that I was approaching. The tower operators had not seen me until this time.

The low pass was made at 1800 rpm indicating a "blistering" 68 mph that gave the shutterbugs plenty of time to get pictures. While on downwind for the final approach I decided that I would make a wheel landing because of the tendency of the left wing to drop sharply in the stall.

A green light greeted me from the tower as I turned base, and remembering my pre-flight briefing over a cup of coffee earlier that afternoon, I set the plane down gently and taxied back to the line.

What about this flight? Some may wonder why I even took the time to write about it. It may not have been exciting. And sure, the airplane

was a little out of rig, and the engine had a rough spot between 1100 and 1500 rpm. Straight and level flight could only be accomplished by holding considerable back pressure, moderate right rudder, and a little left aileron. But all of these can be corrected and this little Spartan will provide many hours of the best kind of flying.

In case you haven't guessed it by now, I'll admit that I love to fly old airplanes and I wouldn't trade a single minute of my experience in them for any amount of time in modern aircraft. And the fact that a good friend of mine allowed me the pleasure of making the first flight in his newly restored antique, one of my most memorable flights was made today. Antiquers and antiques are the greatest.



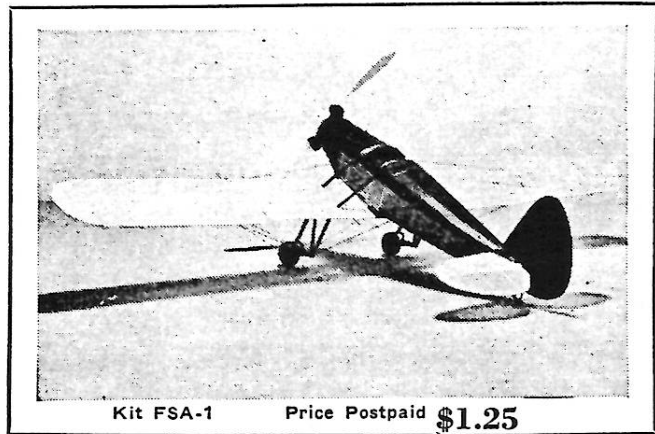
My plane ran out of gas in the middle of a desert, but near by was a gasoline dealer who had only 8 gallons left. He promised me half of what he had, provided I could measure accurately the 4 gallons.

The only empty containers he had were a 5-gallon and a 3-gallon measure, and of course the full 8-gallon measure. How did I successfully measure the even 4 gallons?



# TROPICAL INTRODUCES

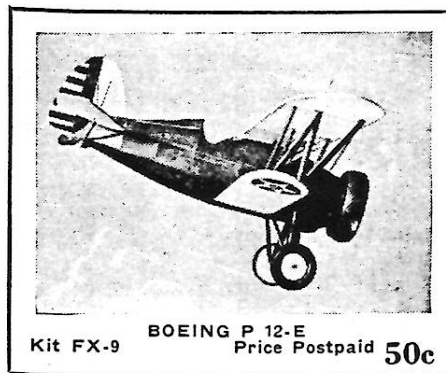
In Kit Form for the **FIRST** Time, the **SPARTAN C-2-60**



Kit FSA-1 Price Postpaid **\$1.25**

This is an exact 3/4" to 1 foot flying scale model designed with Tropical accuracy and completeness from the true airplane. Span 25"; Length 14-13/16"; Weight 1.5 oz.; Color yellow and black. During the test flights, this model consistently flew 250 feet and climbed to 30 feet, from a standing start. Inherent stability and remarkable speed, combined with real beauty mark this as the greatest fuselage model ever offered.

**THIS KIT CONTAINS:** Full size plans with printed instructions, clearly printed balsa, 1 oz. dope, 1 oz. cement, colored Jap tissue, center drilled prop block, turned balsa air-wheels, formed wire fittings, washers, eyelet, balsa strips, wax paper, sand paper.



Kit FX-9 BOEING P 12-E Price Postpaid **50c**

### A Special

## 12" Flying Model

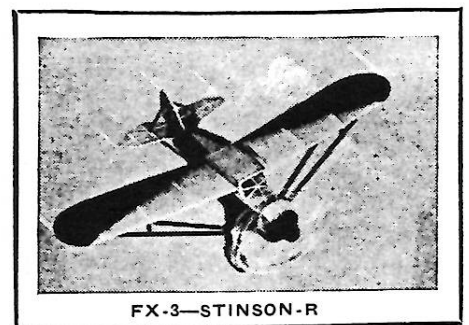
Many features which are exclusively Tropical are offered in this superb flying model. Also minutely detailed plans and instructions, generous supplies of dope and cement, colored dope and tissue, turned wheels, drilled prop block, formed wire fittings, balsa strips, insignias, wax paper and sand paper.

### 12"- 35c pp. FLYING MODELS

These kits are complete and carry the Tropical guarantee.

- |                  |                  |
|------------------|------------------|
| FX-1—Pfalz Scout | FX-6—Waco A      |
| FX-2—Camel       | FX-7—Eagle-rock  |
| FX-3—Stinson-R   | Bullet           |
| FX-4—SE-5        | FX-8—Stearman-81 |
| FX-5—Fokker D-7  |                  |

Full size plans, printed balsa, dope, cement, colored Jap tissue, prop block, formed wire fittings, turned wheels, insignias.



FX-3—STINSON-R

**SEE** our ad next month describing the Curtiss Sparrowhawk. A finely detailed 1" to the foot flying scale model.

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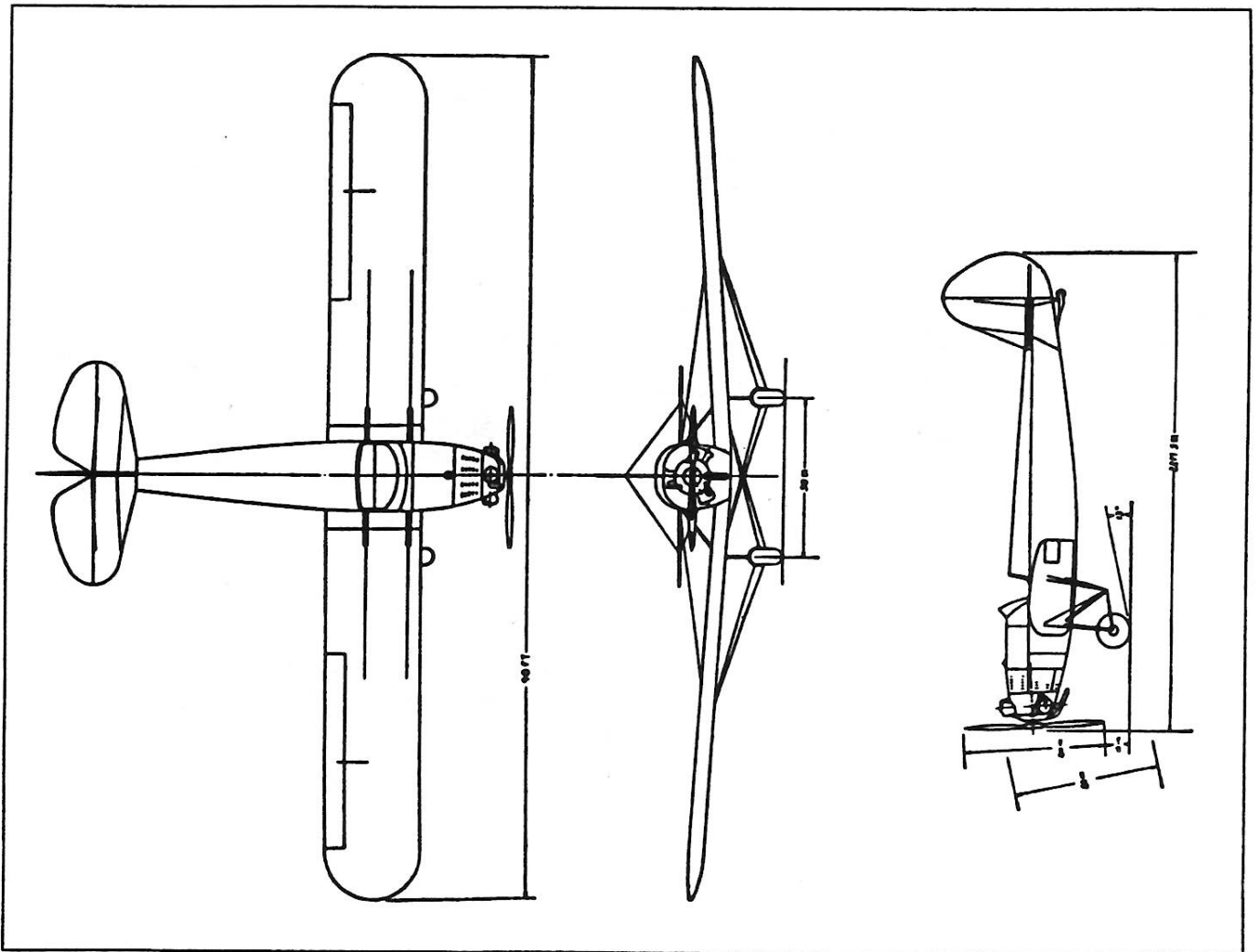
131 N. E. 1st Street, Miami, Florida

## APPLYING LIGHT COLORED TISSUE OVER DARK COLORS

The fuselage of the featured plane is black with a trim stripe that is orange and outlined in white. If you use orange tissue for the trim strip, the black will show through and distort the orange color. To make the orange tissue opaque, simply paint the back side of a piece of orange tissue (slightly larger than necessary) with white paint. To add the white edge to the orange stripe, use a white ball point pen to create the edge or use an old fashioned drawing pen along with white paint to create the edge. Cut the tissue to shape, wet the stripe, place on the fuselage, pat dry with a paper towel, and hold in place with thinned white glue applied just to the edges of the orange tissue.

## MOUNTING WINDSHIELDS

An easy trick I used to help glue the windshield to the fuselage of the Spartan is to cut a piece of scrap 1/8 inch thick balsa into a triangular shape. Make one of the angles correspond to the tilt-back of the interior of the windshield. Tack glue this piece of balsa with Elmer's along the centerline of the fuselage and located at the proper fore-and-aft location so that the forward point corresponds to the windshield location on the centerline. Hold the windshield in place and put a small drop of Elmer's at the base of the windshield along the centerline. Let dry completely. The balsa scrap will now hold the windshield at the proper angle while you bend the windshield and place additional drops of glue to hold it in place.



Three-view, Spartan C-2-60.

## A TECHNIQUE FOR RIGGING WITH ELASTIC THREAD

Allan Schanzle

There are several materials that I have used for rigging on models. Three that come to mind are monofilament fishing line, regular sewing thread, and elastic thread. Each of these has its advantages. Monofilament fishing line can be purchased in almost any thickness, which facilitates selecting the proper size for the specific model being built. It can also be colored as desired by simply using a wide tip permanent felt marker. Cyanoacrylate glues work well to hold these in place. Normal sewing thread also works well and is available in a wide variety of colors and diameters.

These two materials are great for rigging between wings or on the tail surfaces. The only disadvantage is that they don't like to "give" when landing in a field that has prickly grass or weeds, and that makes them less desirable for rigging that is likely to get caught on ground materials. This is exactly the situation with the Spartan C2-60, where there is an abundance of rigging below the wing and around the landing gear. This feature led me to choose elastic thread for the rigging.

I got my elastic thread at a fabric shop called Jo-Ann's, which I think is a nationwide chain. I bought both black and white spools. They can be "unbraided" if necessary, but that produces one strand that is rather kinky, while the second strand appears normal and is good for simulating smaller diameter rigging. I used the smaller size for the rigging on the tail surfaces.

Some elastic thread I've used in the past works well, but after 6 months or so, it may lose its elasticity and become saggy. It is this characteristic that led me to use Elmer's white glue to attach the end of a piece of elastic rigging whenever possible. This particular glue has several advantages:

1. Even after drying, it can be dissolved with water, allowing you to repair saggy rigging. Simply soften the glue at one end of the thread with water, remove the thread, cut, and replace. You have to be patient and let the water soften the joint.
2. The hazy film of glue around the joint can be removed with a cue-tip soaked in water. This is a distinct advantage over acetone-

based glues, such as Ambroid, where softening the glue usually ruins the finished surface around the joint.

3. It dries clear, avoiding the visual appearance of a blob of junk holding the rigging in place.

An unrelated benefit to Elmer's is to use it as a means of tact-gluing tail surfaces for initial flight testing. If you're like me, you won't remember where you put the small spots of glue, so simply use a small paint brush to apply water all around the joining surfaces (such as the stab to the fuselage) and wait a few moments. As the glue softens, the joint turns opaque, allowing you to see exactly where the glue has been applied.

Here is the approach I developed for rigging the Spartan.

1. When building the framework, glue small sheets of balsa to the substructure where thread is to be anchored.
2. After covering the model, make holes thru the covering and into the balsa structure where the ends of the rigging will be attached. Use a small drill or a typical pin, which I found to be a perfect size for the thread I used.
3. Pick two points where rigging is to be attached and cut a piece of elastic thread about 3/4 of the distance between the two points.
4. Apply a light coating of cyanoacrylate glue over approximately 1/2 of an inch at each end of the thread. This will stiffen this portion of the thread and make it relatively easy to insert into the drilled holes.
5. To produce the illusion of turnbuckles on a very small scale, dip about 3/8-inch of the ends of the thread in the appropriate color paint. It may take several coats to build up a little thickness, but the earlier use of cyanoacrylate makes the thread less porous and helps to minimize the coats of paint.
6. Now try inserting the thread into one of the holes. If the hole is too big, simply apply another coat or two of paint until you get a tight fit. I found that with a bit of work, I could get the thread inserted into the holes at both ends in the stretched position and it would hold itself in place without glue. This makes it easy to apply a small drop of Elmer's at each end of the thread using the point of a pin.

## MAKING LOUVERS FOR THE SPARTAN C2-60

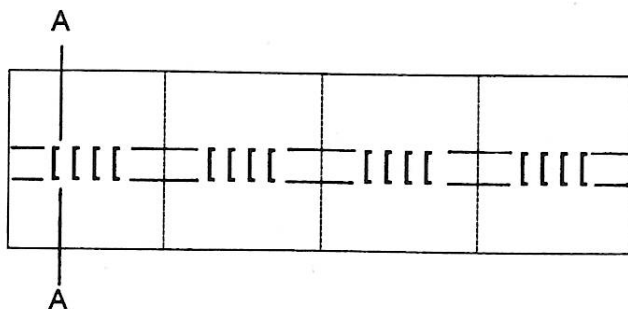
Allan Schanzle

Louvers have always been a task that befuddled me. I've tried many different techniques, but none of them worked very well. However, I think I've found a relatively simple and quick way to represent these features on the Spartan. Some of the simplicity evolves from the fact that I covered the fuselage with black tissue and sealed the covering with clear lacquer. No additional paint was applied. If you've painted the fuselage, the same technique should work, but it may require that you first spray-paint a piece of tissue the color desired for the louvers.

The Spartan has four sets of "four-in-a row" louvers that need to be black and all of them are the same size and shape. Consequently, all four sets were made simultaneously.

Begin by determining the size of each set of the four louvers. For the Spartan, each set was about 0.2 inches wide and 0.4 inches in length. Since I needed four of these, I cut a piece of black tissue about 4 inches long and one inch wide. The excess will be cut off at a later time. Tape the tissue to your cutting board, which should be a smooth surface. A piece of glass is ideal for this particular purpose.

1. Use a pencil to draw two parallel lines near the middle of the tissue whose distance apart is the same as the desired width of the louvers. These will act as guidelines to produce all louvers with a uniform width.

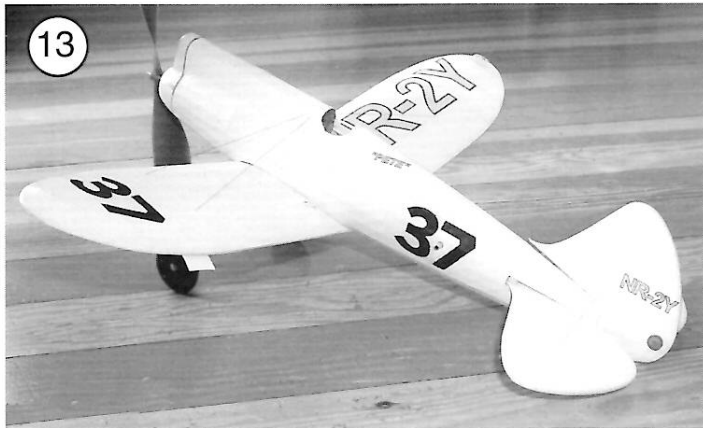
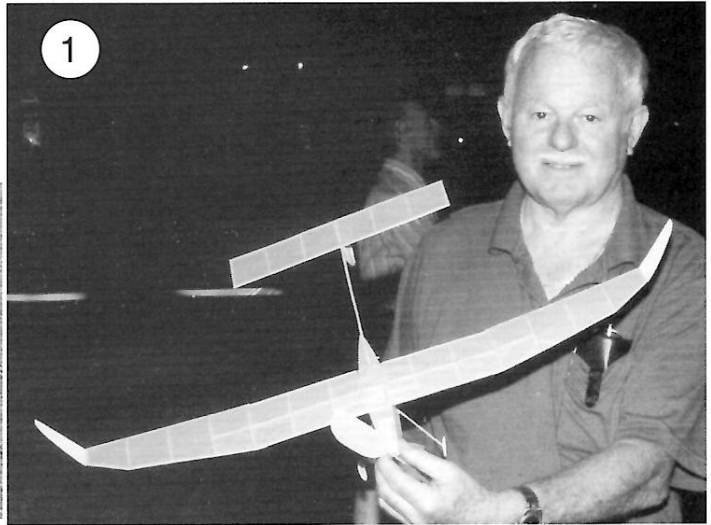
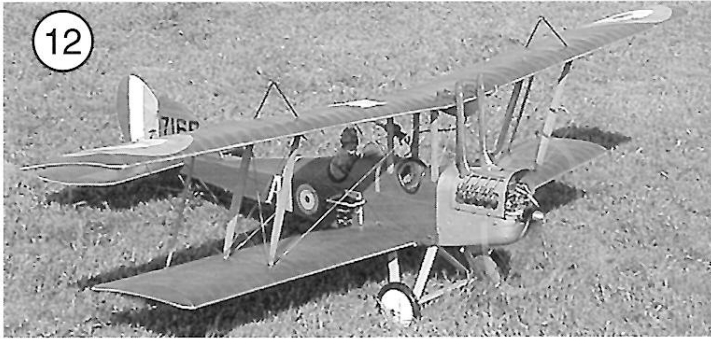
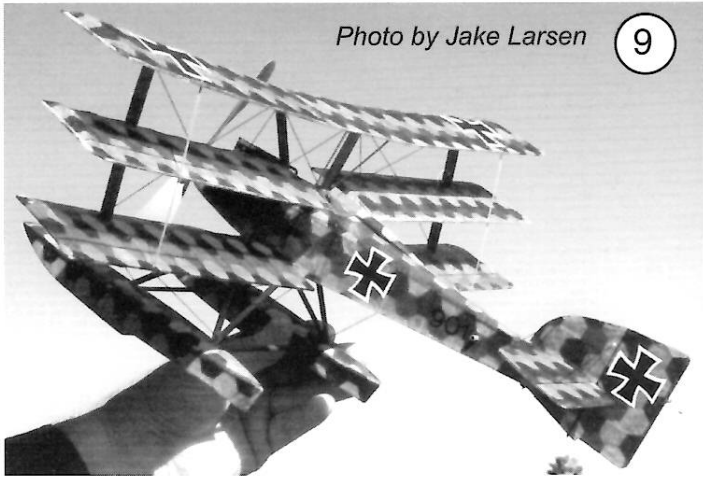


2. Draw the lines representing the louvers, being careful to use equal spacing between the louvers.
3. Using a new number 11 XACTO blade and a straight edge, cut along the louver lines.

4. Place a straight edge, such as a piece of thin metal, along the line A-A. Use a small pointed wedge, such as a jeweler's screwdriver, to raise the first louver and crease the tissue. When you remove the straight edge, make sure the raised portion of the tissue remains above the glass surface, but don't worry about all the louvers being raised at the same angle. That can be taken care of later. Move the ruler to the next louver and repeat the process.
5. When all louvers have been raised, apply two thin coats of clear gloss lacquer to the entire piece of tissue, including the bottom of the raised louvers. My experience was that the tissue didn't stick to the glass undersurface, but you may want to remove the tape from one end of the tissue and raise it until the lacquer is dry. Then remove the tissue completely from the glass and apply two coats of lacquer to the bottom of the tissue.
6. Now cut out one set of the louvers leaving about 1/8 to 1/4 inch of excess material from the edges of the louvers.
7. Apply water to the location on the fuselage that you want to apply the louvers. Set the tissue louver on the water and slide it around until located as desired. Pat dry with a paper towel and apply a small amount of thinned Elmer's White Glue just around the edge of the louver. When dry, press the louvers down or up to give a uniform angle.

## PHOTOS AND CAPTIONS FOR PAGE 15 Tom Schmitt

9. A beauty by Jake Larson, an Ikara-Sablatnig SF-4.
10. Tom Hallman's ten-center Arado.
11. Dan Belief, seen a couple of years ago at the NBM, with his "Washingtonian".
12. Don Snull's BE2 waiting for takeoff.
13. Another pretty model by Dave Mitchell, his Pete, which will (hopefully) be a future Maxecuter plan.
14. Another great Nate Sturman design, his "Judy".
15. The "Aristocrat" flyers at the Kudzu meet last year. The designer, Dave Rees, with two clones by Frank Rowsome and Wally Farrell.



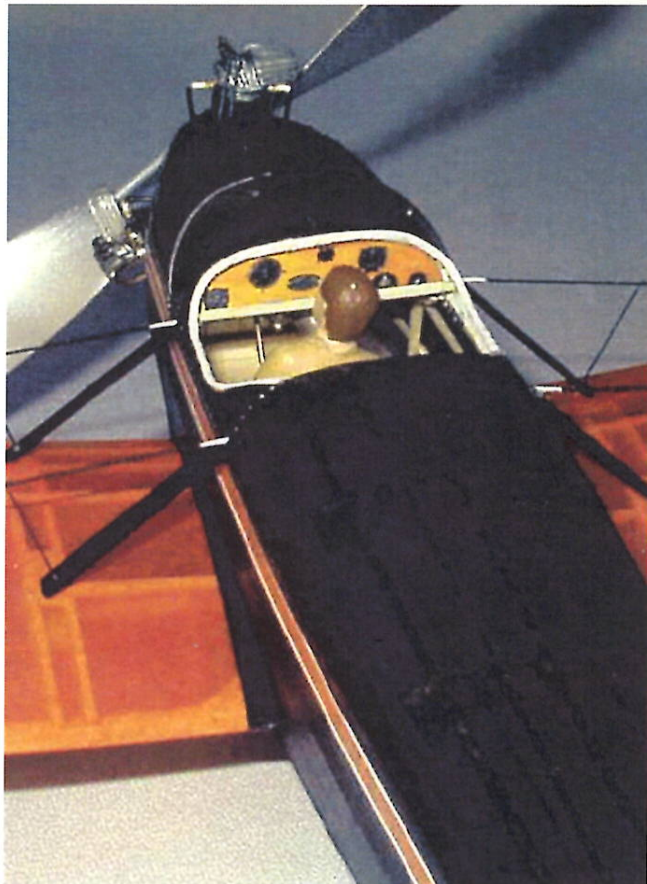


PHOTO CAPTIONS -

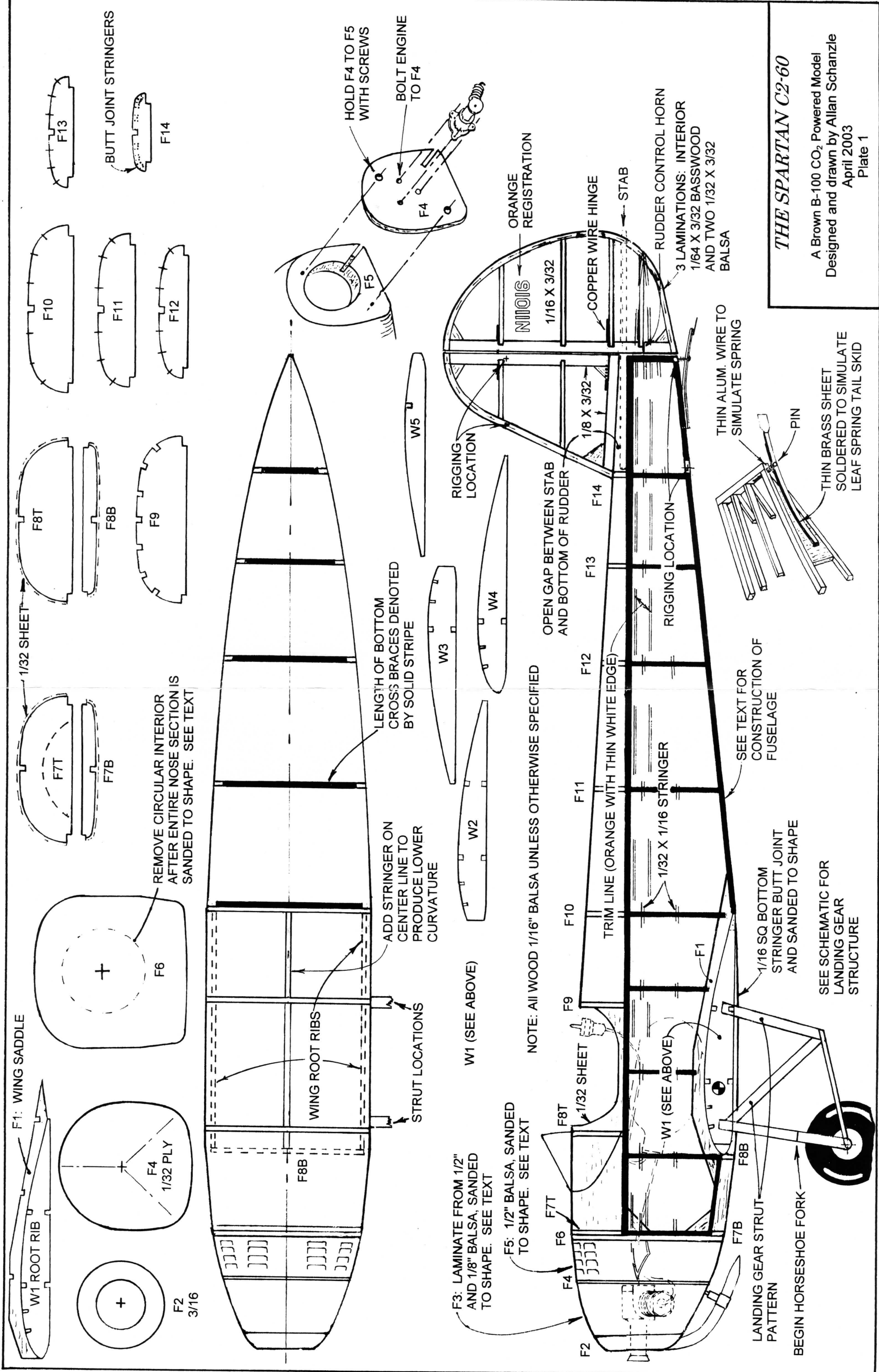
**Top Left:** The front end of the Spartan. Note the Hamilton Standard logo on the prop, and the louvers.

**Top Right:** The cockpit and instrument panel, (shown to the right) was photographed in Hood River, Oregon. Allan's photo was manipulated by Don Srull to give a straight-on view and adjusted to the correct size for the model. Make a color laser copy and use it in your model.

**Bottom:** Do you enjoy building landing gears and putting on rigging?







**THE SPARTAN C2-60**

A Brown B-100 CO<sub>2</sub> Powered Model  
 Designed and drawn by Allan Schanzle  
 April 2003  
 Plate 1

REMOVE CIRCULAR INTERIOR AFTER ENTIRE NOSE SECTION IS SANDED TO SHAPE. SEE TEXT

LENGTH OF BOTTOM CROSS BRACES DENOTED BY SOLID STRIPE

ADD STRINGER ON CENTER LINE TO PRODUCE LOWER CURVATURE

NOTE: ALL WOOD 1/16" BALSAM UNLESS OTHERWISE SPECIFIED

F3: LAMINATE FROM 1/2" AND 1/8" BALSAM, SANDED TO SHAPE. SEE TEXT

F5: 1/2" BALSAM, SANDED TO SHAPE. SEE TEXT

SEE TEXT FOR CONSTRUCTION OF FUSELAGE

SEE SCHEMATIC FOR LANDING GEAR STRUCTURE

THIN BRASS SHEET SOLDERED TO SIMULATE LEAF SPRING TAIL SKID

THIN ALUM. WIRE TO SIMULATE SPRING

1/16 SQ BOTTOM STRINGER BUTT JOINT AND SANDED TO SHAPE

3 LAMINATIONS: INTERIOR 1/64 X 3/32 BASSWOOD AND TWO 1/32 X 3/32 BALSAM

ORANGE REGISTRATION

OPEN GAP BETWEEN STAB AND BOTTOM OF RUDDER

TRIM LINE (ORANGE WITH THIN WHITE EDGE)

RIGGING LOCATION

RIGGING LOCATION

HOLD F4 TO F5 WITH SCREWS

BOLT ENGINE TO F4

LANDING GEAR STRUT PATTERN

BEGIN HORSESHOE FORK

STAB

RUDDER CONTROL HORN

COPPER WIRE HINGE

NI1016 1/16 X 3/32

1/8 X 3/32

F14

F13

F12

F11

F10

F9

F8T

F8B

F7T

F7B

F6

F4

F3

F2

W1 (SEE ABOVE)

W4

W3

W5

BUTT JOINT STRINGERS

F14

F11

F12

F10

F8T

F8B

F9

F7T

F7B

F6

F2 3/16

1/32 SHEET

F1: WING SADDLE

W1 ROOT RIB

F4 1/32 PLY

WING ROOT RIBS

STRUT LOCATIONS

LANDING GEAR STRUT PATTERN

BEGIN HORSESHOE FORK

STAB

RUDDER CONTROL HORN

COPPER WIRE HINGE

NI1016 1/16 X 3/32

1/8 X 3/32

F14

F13

F12

F11

F10

F9

F8T

F8B

F7T

F7B

F6

F4

F3

F2

W1 (SEE ABOVE)

W4

W3

W5

BUTT JOINT STRINGERS

F14

F11

F12

F10

F8T

F8B

F9

F7T

F7B

F6

F2 3/16

1/32 SHEET

F1: WING SADDLE

W1 ROOT RIB

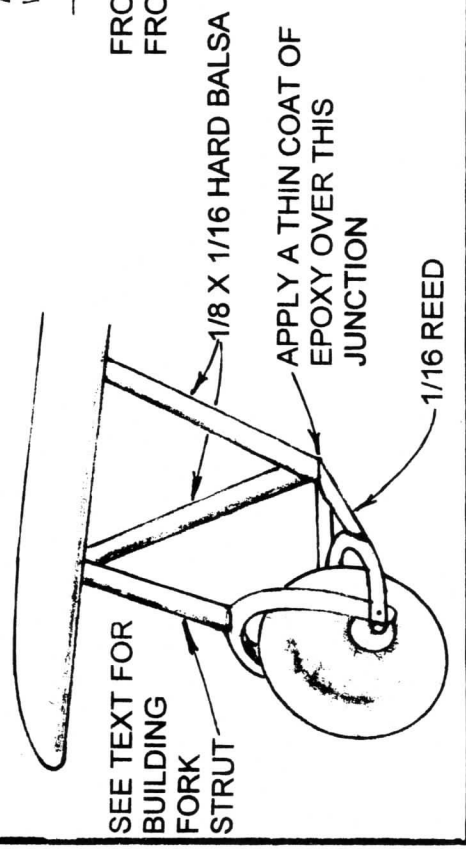
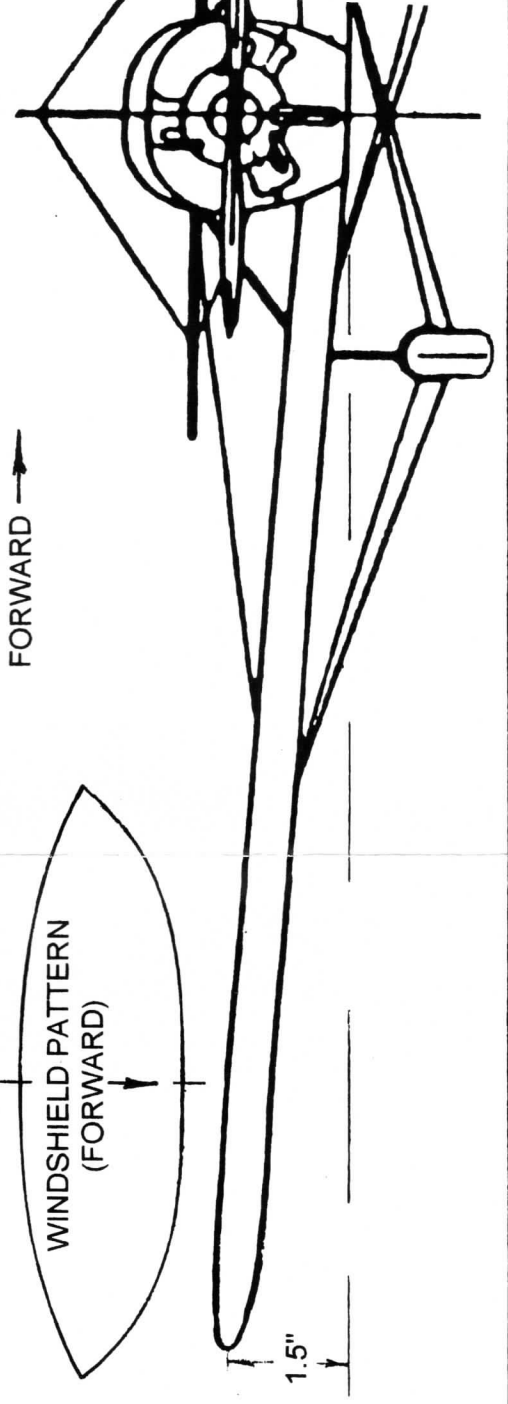
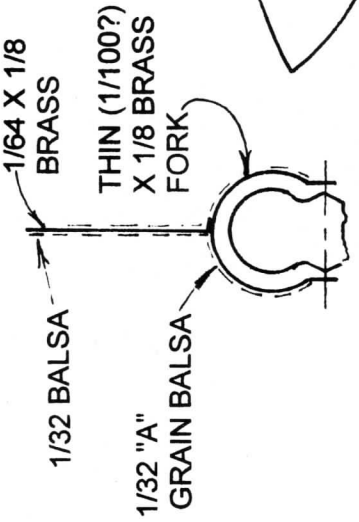
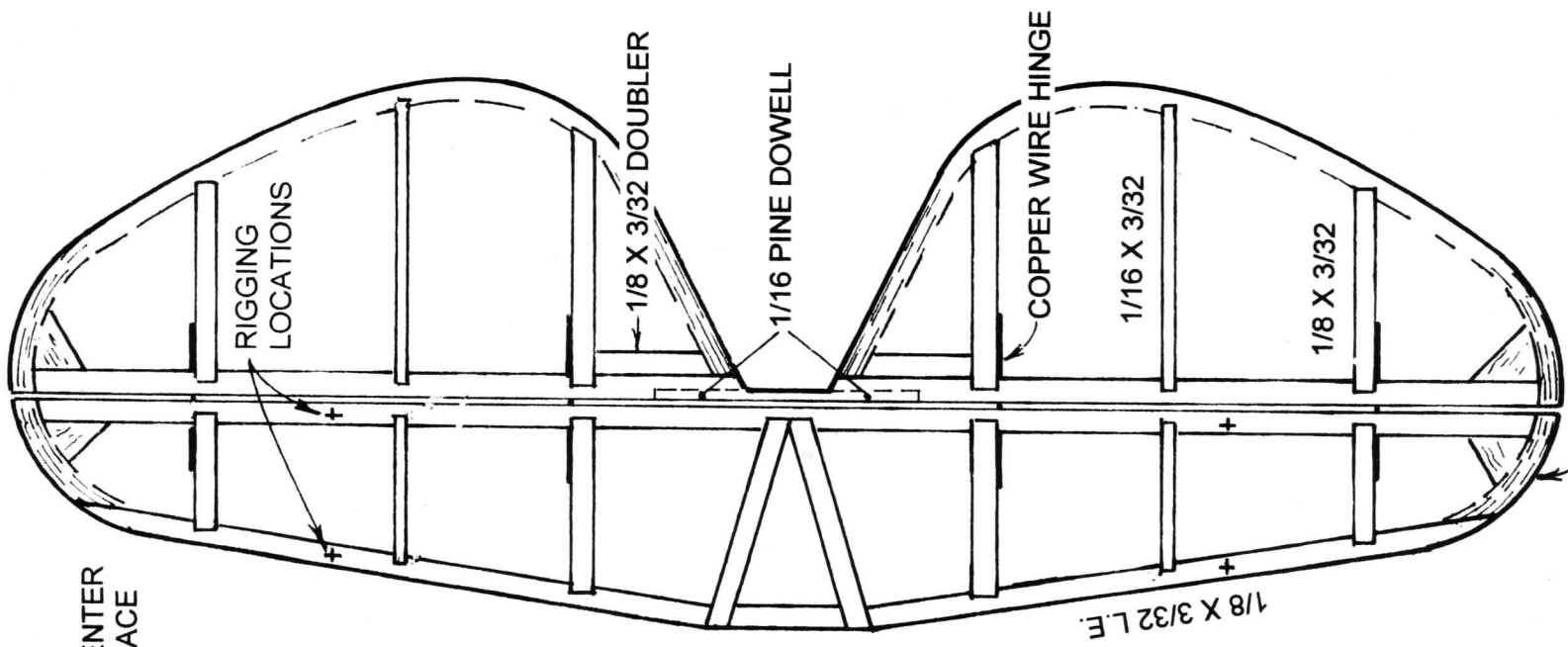
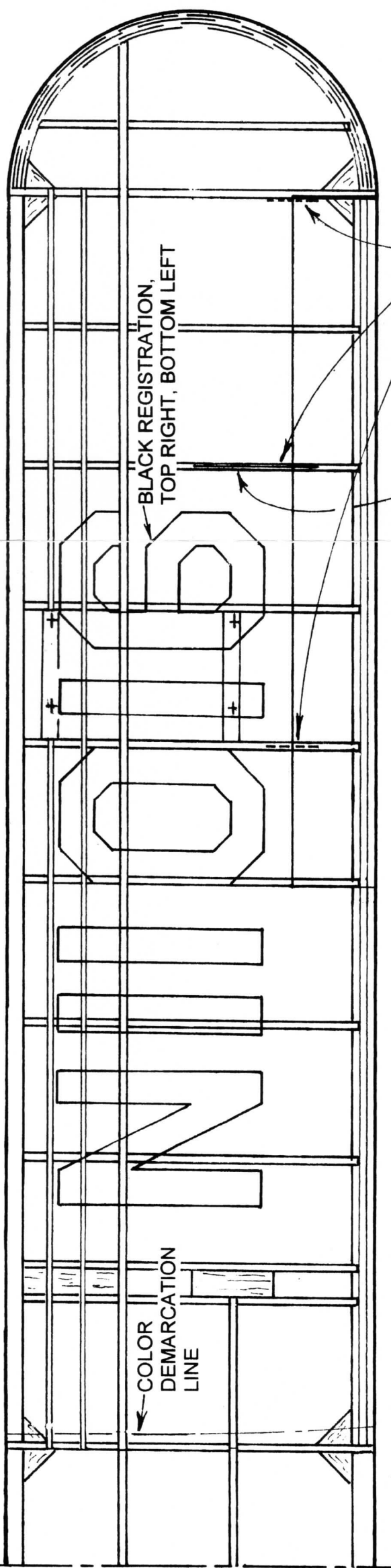
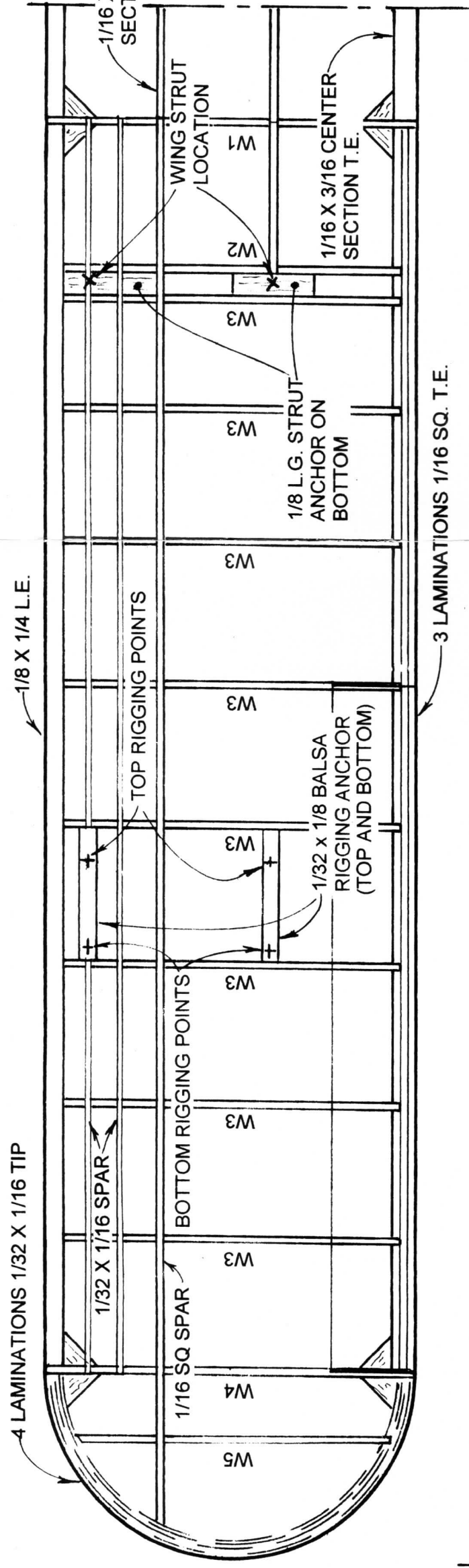
F4 1/32 PLY

WING ROOT RIBS

STRUT LOCATIONS

LANDING GEAR STRUT PATTERN

BEGIN HORSESHOE FORK



*THE SPARTAN C2-60*

A Brown B-100 CO<sub>2</sub> Powered Model  
 Designed and drawn by Allan Schanzle  
 April 2003  
 Plate 2