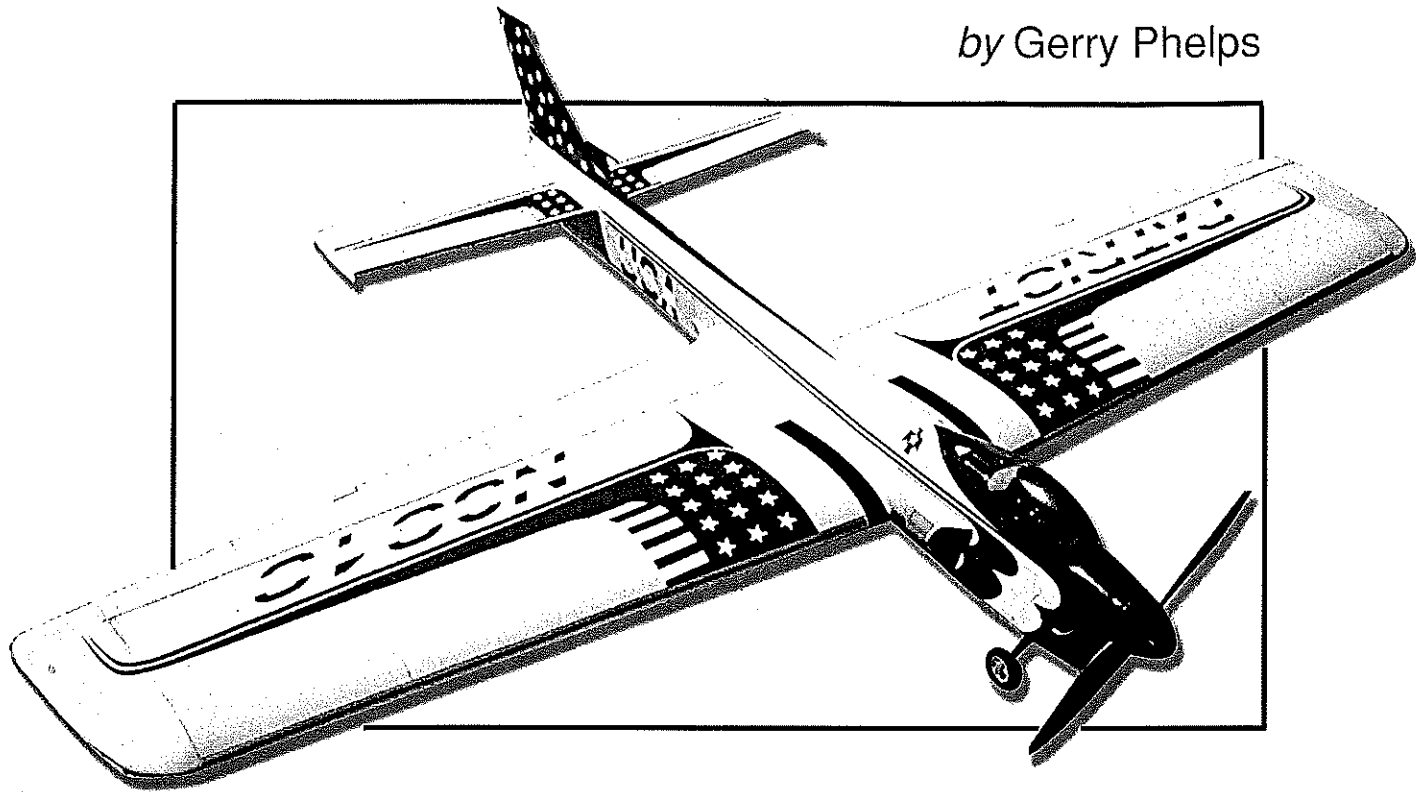


958

by Gerry Phelps



# PATRIOT

CL Classic Stunt model boasts World Championships heritage

**DID YOU EVER** have a great piece of balsa wood that you just couldn't bring yourself to use, because once you used it, it would be gone? How's that for warped logic?

I have such a piece of balsa. It's a light block, approximately 4 inches square and roughly 40 inches long. I've had it since the late

1960s, and I have carried it with me from location to location as I've moved a few times through the years. I was away from modeling from 1973 through 1987, and I still kept lugging that piece of balsa around with me.

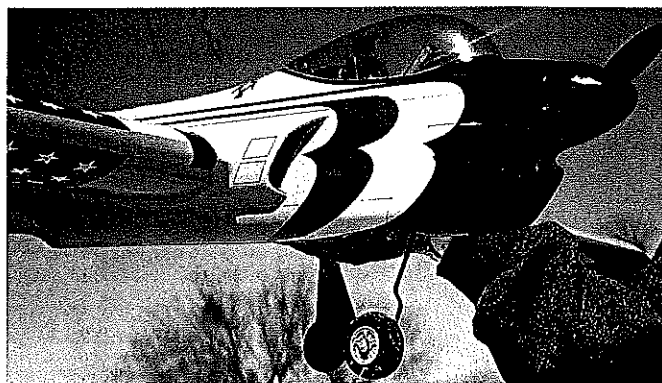
However, this article is not about an old block of balsa. It is about a Stunt-model design that I flew from 1969 through 1971: the Patriot. I mention the balsa story only because of the parallel I can draw in deciding when to recreate the Patriot design.

Since getting back into flying Stunt in 1988, I planned to re-create the Patriot someday, but I figured that once I had built it, I had built it. I would no longer have the project to look forward to. And what if it didn't fly as well as I remembered the original two models of this design flying? I felt that I would be disappointed. *Boy, was I wrong!*

I began remaking the Patriot in the fall of 2001 and finished it in time to take it to the March 2002 Vintage Stunt Championships (VSC) in Tucson, Arizona—unflown, I might add. I had more fun that week than I had had in a long time. The engine (a Randy Smith AeroTiger .36) ran great, and the airplane flew wonderfully right off the board with no adjustments. That's rare.

The airplane drew quite a bit of attention, and I received many positive comments from the other contestants. I was wrong not to have built this Classic design sooner, and I regret waiting as long as I did.

You know what? I'm going to use that light balsa block the next chance I get—perhaps on another Patriot.



The nose's sleek, jetlike looks are more than cosmetic. Simulated air intakes add torsional rigidity to front end.

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**Design Origin:** In the fall of 1968 I began thinking about what I might build during the winter for the next flying season. Having built several Fox .35-powered I-Beam airplanes and Noblers throughout the years—and based on what was becoming a trend toward slightly larger airplanes—I wanted something a little bigger.

At that time, several of my friends were having success with the venerable McCoy .40 in the somewhat larger designs. Although the McCoy .40 did not hold up well if exposed to even one extended lean run, it did appear to offer the best Stunt-run characteristics and power for that displacement. So a McCoy .40 it was.

Several jet-type designs showed up during that time period, and Jim Kostecky's were the most inspiring to me—especially his Formula S. With what I thought to be the Formula S's best appearance characteristics in mind, I drew a set of plans. I incorporated the forward canopy, the air-intake scoops at the wing root, and the jet-style fin and rudder into the design.

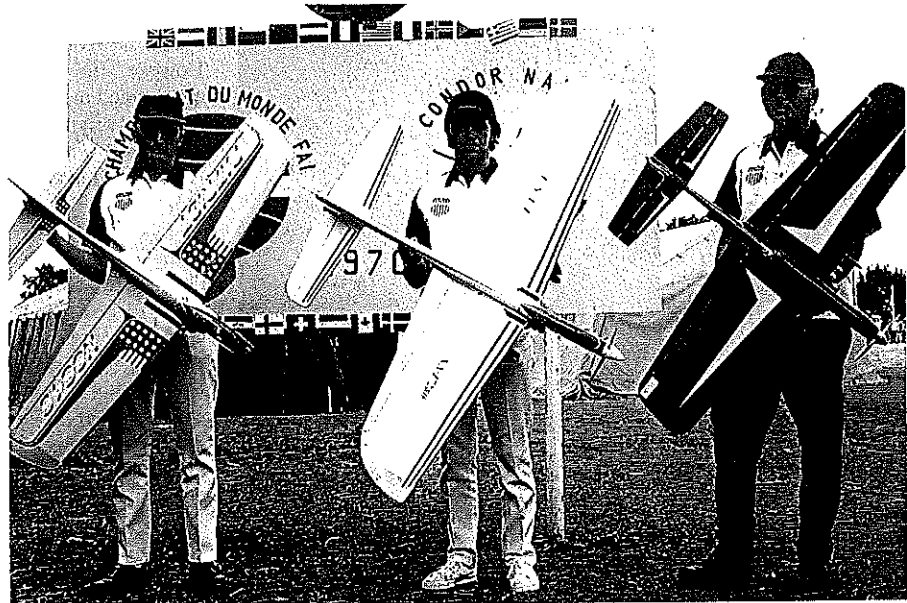
When I finished the first airplane built from those plans in the spring of 1969, it was adorned with a Thunderbird paint scheme but did not have a name. It weighed 43 ounces and performed quite well. However, I regretted having made equal wing panels for the initial design.

The model began life with a 56-inch wingspan, but I had enough leadout material exposed to significantly extend the inboard wing, and I did just that. I removed the inboard tip and added 1.5 inches to the span, bringing it up to 57.5 inches.

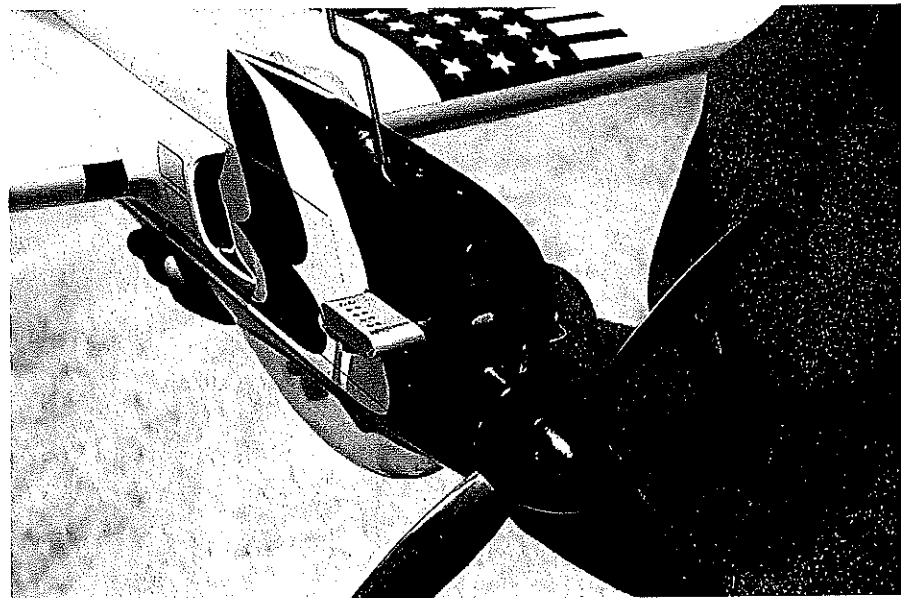
Hoping that I wouldn't be asking too much from the McCoy .40, that modification turned a good airplane into a great airplane. It grooved well, turned well, and stayed out on the lines. What else can you ask for? The model was definitely the best thing I had built up to that point.

I flew the airplane successfully at local meets that year and finished third in the Open classification at the Philadelphia, Pennsylvania, Nats behind Al Rabe (second) and Bob Lampione (first).

At the beginning of the 1969 flying



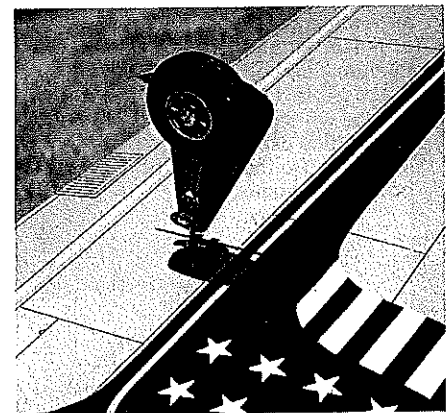
The winning 1970 United States F2B team (L-R): the author with the Patriot, that year's World Champion Bill Werwage, and Bob Gleseke.



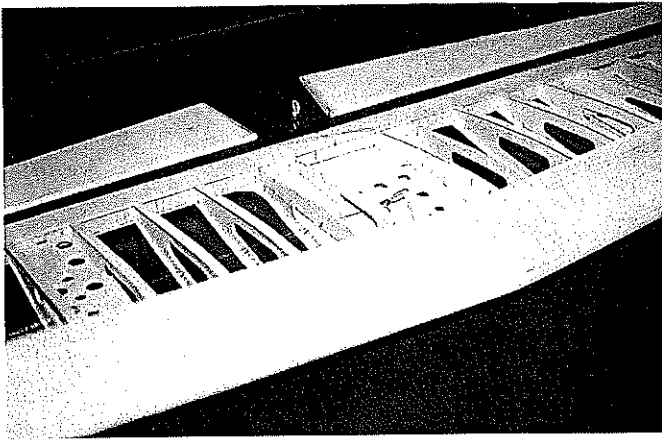
Plenty of cooling air gets to the head of the engine through that massive scoop! The "chip"-type muffler and hole allow engine prime in the venturi.



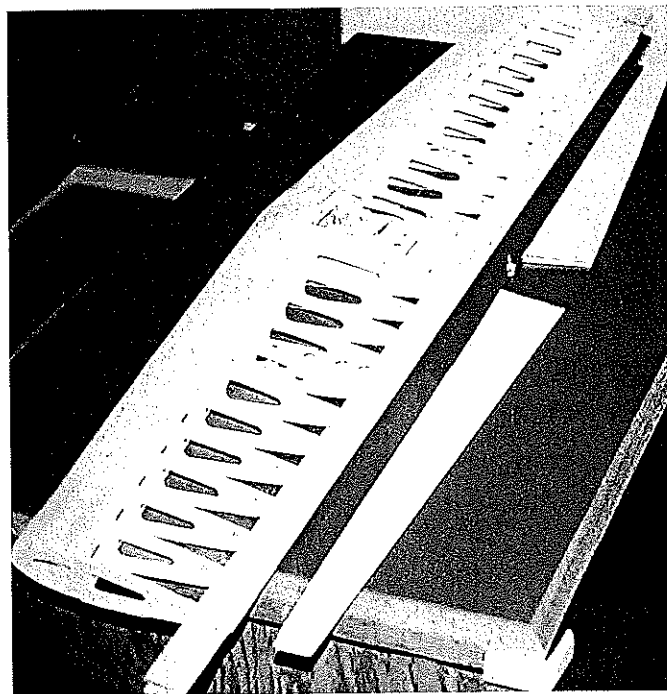
"Aggressive" might be the best word to describe the aesthetics of this competitive model. The author does outstanding paintwork!



Wheel covers are attached to main landing-gear struts with small machine screws. Wide gear placement yields great ground handling.



You can see the bellcrank mount and landing-gear mount plates. Check out the lightening holes! Save weight where you can!



The flaps are made from stiff 1/4 balsa and joined with the flap horn. They are shown ready to be hinged to the wing.

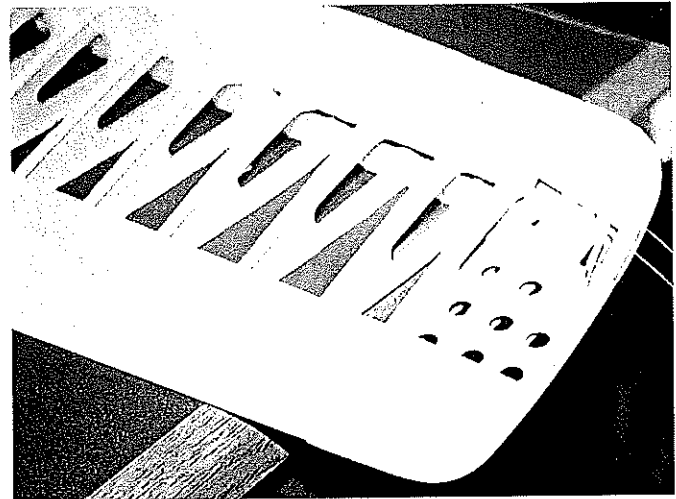
season, I had no intention of trying out for the FAI team that would attend the World Championships in Namur, Belgium, in 1970. However, Bob Gieseke approached me at the 1969 Nats and encouraged me to attend the Team Trials. He told me that based on how I was flying that year, I had as good a chance at making the team as anybody. Not only did I make the team, but I placed first in the team-selection competition. That was my "shining moment" in CL Stunt.

Once I made the team, there was never a doubt about what I was going to build for the 1970 world competition. It would be the same design, but with a splashy paint scheme that represented the good, old USA. I chose the name "Patriot." With a light-blue base coat, I added stars and stripes to my liking.

The 1970 airplane also flew great, and its handling characteristics were almost identical to that of the 1969 airplane. The Patriot and I ended up in fourth place at the 1970 World Championships. Bill Werwage finished first, Bob Gieseke finished second, and Czechoslovakia's Gabris nudged me out of third place by 11 points (1,897 to 1,886). The US team finished in first place. It was a great experience.

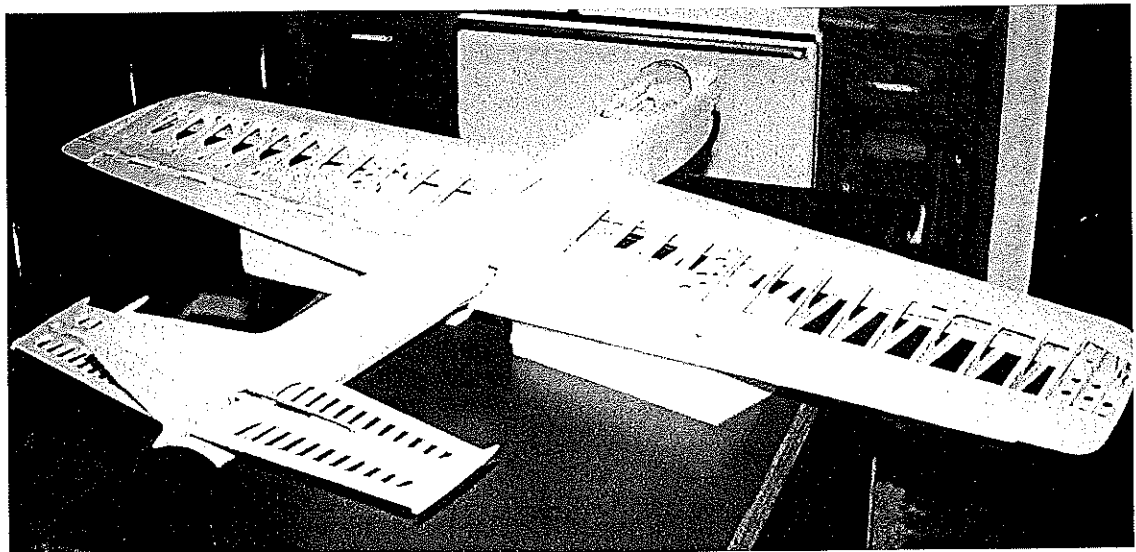
My 2002 model has the exact paint scheme I used on the 1970 airplane that went to Belgium. Using the original trim, name, and AMA-number stencils I made in 1969/1970, I re-created the colorful trim as accurately as possible. I even duplicated the cockpit detail accurately based on plan detail and an old close-up photo of the 1969 airplane cockpit that I got from Jack Sheeks a few years ago.

When I finally flew the new airplane in Tucson, seeing it out there



Adjustable leadout guide is installed in the wingtip. Note clearance slot in spar and lightening holes in tip plate.

The completed airframe is ready for finish. Strip of .02-ounce carbon mat on the TE of the stabilizer provides extra strength. Do the bottom the same way.



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on the end of the lines was like coming home. It was no secret that I was a happy camper. Bob Hunt even dubbed me the "Happy Patriot" while we were at the VSC.

### CONSTRUCTION

If you want to end up with a light model, you have to build light from the start. Use only contest-grade balsa (4- to 6-pound density). Where plywood is used, try to lighten it significantly by drilling holes in places where its strength is not a factor. Refer to the holes in the wing landing-gear platforms and the nose doublers in the fuel-tank compartment on the plans. You should also drill out the engine rails in the tank-compartment area to eliminate weight that isn't really doing anything for you.

When you use cyanoacrylate glue or epoxy, remember that you get what you put in. These bonding agents do not lighten as they dry, as do acetone-based glues (such as Sig-Ment) or aliphatic-resin glues (such as Sig-Bond, Titebond, or Elmer's carpenter's glue). Choose the proper glue for the application, and try not to use excessive amounts.

As far as the actual construction, you should have no trouble with this project if you've built a Nobler or any similarly constructed model.

**Wing:** The wing is a conventional D-tube design with a 1/16-inch planked LE and a 3/32-inch planked TE. The D-tube spar is 3/32 balsa notched for the ribs like a Nobler (first rib top half, second rib bottom half, etc.). The LE is a 1/4-inch spar. For strength, the LE is subplanked with 1/16 balsa through rib number 3. The center-section itself is planked with 3/32 balsa.

The TE is finished with a 1/8 balsa cap. Before capping the LE with 1/8 or 3/32 balsa, plane the planked LE flat, removing stock until most of the glue joint between the planking and the LE spar is removed. Then cement the cap in place.

When giving the LE its final shape, make sure you achieve a radius no less than 1/4 inch. I like to make a small sanding block from balsa with the desired radius, and this also

# PATRIOT

**Type:** CL Classic Stunt

**Wingspan:** 57.5 inches

**Engine:** AeroTiger .36

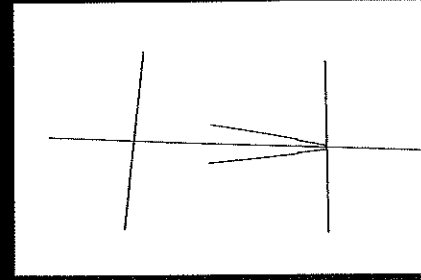
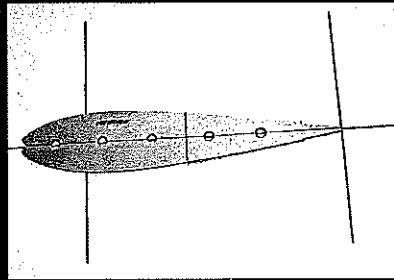
**Flying weight:** 46 ounces

**Construction:** Balsa and plywood

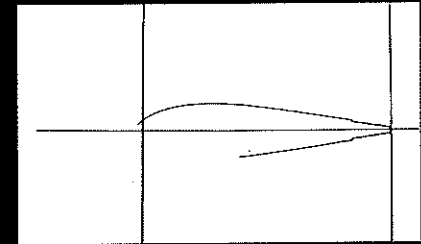
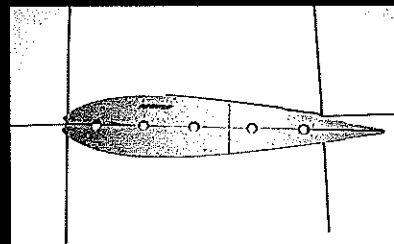
**Covering/finish:** Tissue and dope

# PATRIOT

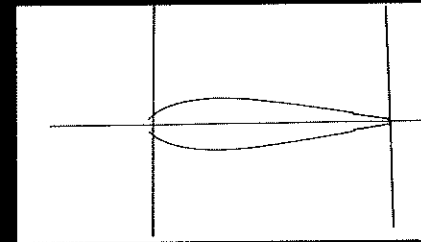
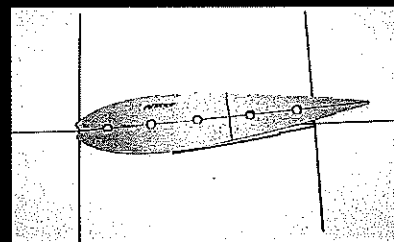
## Rib-Making Procedure



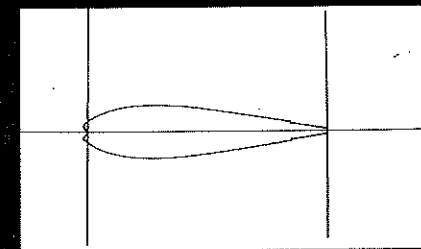
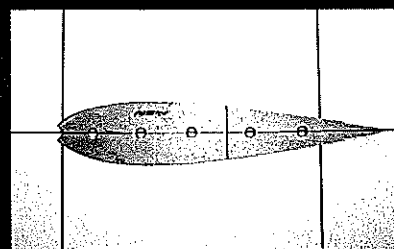
Left: For the first cut, position the master template in line with centerline on the rib material. Make sure the TE of the template is positioned at one "rib length" mark. Cut all the way around the TE of the template, but only as far forward as the vertical line on the template. Right: Result of the first cut.



Left: For the second cut, slide the rib template back so that the inside of the LE notch lines up with the other "rib length" mark. Using the point of a compass (or similar device) positioned in the notch, pivot the rear of the template downward until the top of the template is tangent with the first cut. Cut from the LE back to, and connecting with, the first cut. Right: Result of the second cut.

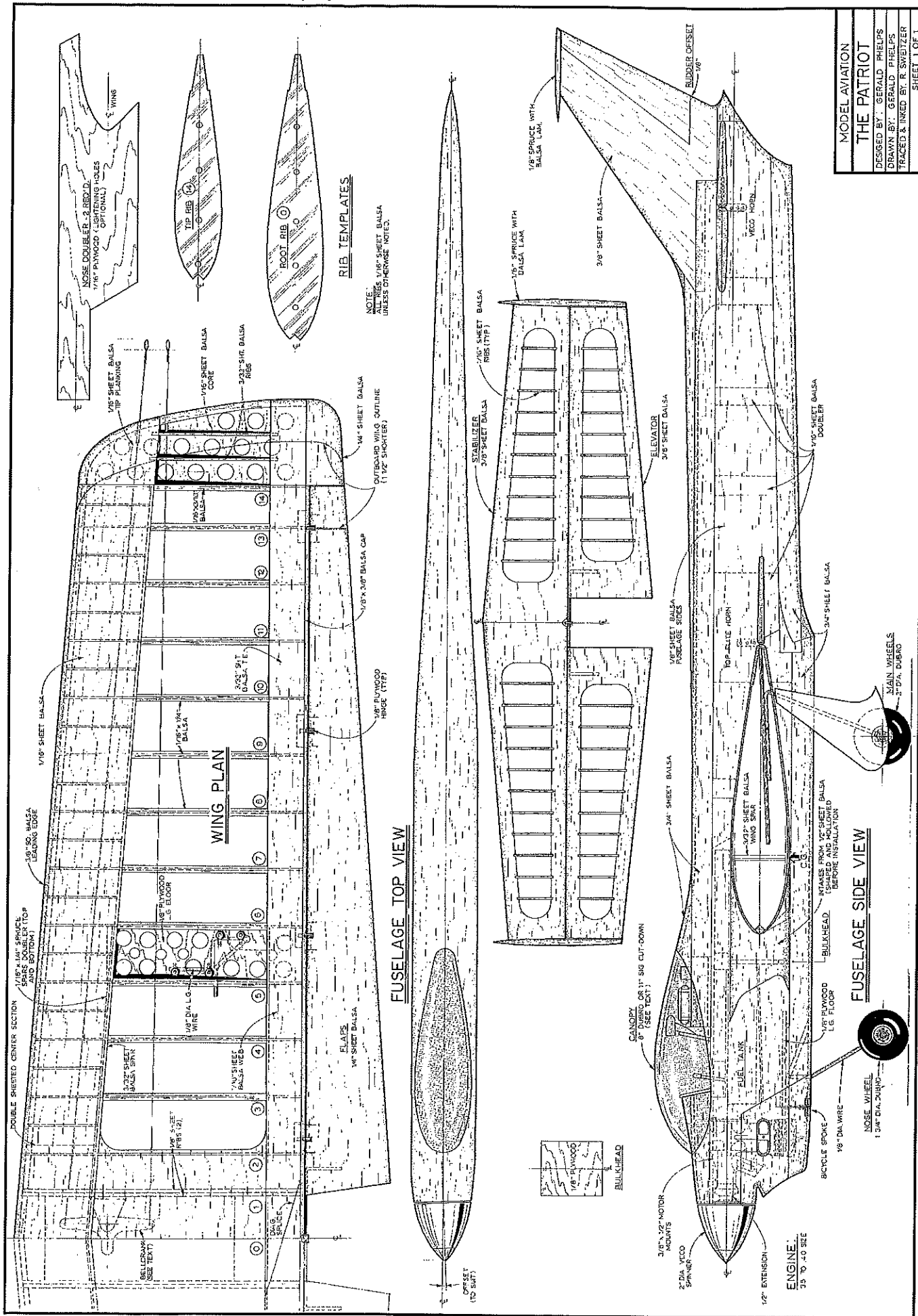


Left: For the third cut, pivot the template upward until the bottom of the template is tangent with the first cut. Cut from the LE back to, and connecting with, the first cut. Right: Result of the third cut.



Left: For the last cut, pivot the template back up so that the centerlines match. Complete the two small cuts at the LE notch. At this point, the basic rib shape cut is complete. Right: Result of the last cut.

MODEL AVIATION  
**THE PATRIOT**  
 DESIGNED BY: GERALD PHELPS  
 DRAWN BY: GERALD PHELPS  
 TRACED & INKED BY: B. SWITZER  
 SHEET 1 OF 1



ensures that the whole LE is consistent in shape.

The procedure for making this model's ribs is a bit different from what you may be used to, so I have presented it in a sidebar. The photos depict laying out a representative rib on a piece of white card stock. This was done to allow good definition for the procedure. In actual practice, the ribs would be laid out on the actual balsa rib stock.

The wingtips start as a piece of 1/16 balsa (see plans for location of holes to lighten) with edges laminated with scrap 1/4 balsa, top and bottom. Once cemented in place, you can notch the laminations to accept 1/16-inch planking at the LE and 3/32 inch at the TE. Leave the wing TE planking long during wing construction, and then simply pinch it together and cement it in notches in the wingtip edge laminations.

Before I install the wingtip ribs, I like to contour and taper the rest of the tip laminations so that they blend in with the end wing rib. To accomplish this, I use a large sanding block and a straightedge to check for surface continuity. I also try to attain an approximately 1/4-inch rounded edge along most of the tip's perimeter. Then I can install and block-sand the tip ribs to match the rest of the tip surface contour. Although the 2002 model has a tip weight box and an adjustable leadout guide, these items are optional.

The original models had 3-inch bellcranks, but I chose a Brodak 4-inch nylon bellcrank this time around. (Modern thinking, you know.) Installation is conventional with a plywood floor. For added strength I support the top of the bellcrank bolt with another section of plywood running to the first inside panel rib and reinforced appropriately to the spar and center-section planking.

Make the flaps from 1/4 balsa, and taper them to approximately 1/8-inch thickness at the TE. I make my own control horns, but there are enough quality products on the market from which to choose if you elect to purchase these items. The original models also had handmade plywood and piano-wire hinges, as shown in the plans. I chose tissue taffeta hinges (100% polyester) for the 2002 model to achieve a totally sealed hinge line. Conventional nylon hinges are another option.

*If you use cloth hinges, make sure they are*

*100% polyester.* Even if you purchase material that is labeled 100% polyester, test it before you use it. Apply a few drops of thin cyanoacrylate on a test piece and allow it to dry thoroughly. Once it has dried, bend the test area back and forth several times and tug at it to make sure it will not fatigue and eventually fail.

**Empennage:** Cut the stabilizer and elevator from 3/8 balsa sheet, shape them to achieve the cross-section foil shown, and then hollow them as shown on the planform. Then add the 1/16-inch ribs.

I covered the original versions with medium-weight silkspan, and that provided adequate strength for the stabilizer. However, I covered almost the entire 2002 model with light plyspan (Sig Japanese tissue). Because of that, I covered the stabilizer with two layers of medium plyspan to achieve the needed strength.

Another method of increasing this fairly fragile stabilizer's strength is to cement thin unidirectional carbon tape to the inside of the cutout area before installing the ribs. Run the carbon out from the center approximately 5 inches before installing the ribs. On the new model I applied a layer of thin carbon mat on the top and bottom of the stabilizer's TE, but I'm sure that did not provide as much strength as the unidirectional carbon tape would have.

The rudder and fin are also made from 3/8 sheet balsa and covered with thin carbon mat for strength. I also used carbon mat on the flaps for rigidity and on the model's nose for durability.

**Fuselage:** The fuselage also uses fairly conventional construction, with 1/8-inch sides, 1/16 plywood nose doublers, and adequate bulkhead placement. However, the bulkheads are built up.

Glue 1/16 balsa that is approximately 1/2 inch wide vertically to the inside of each fuselage side as indicated on the planform. Invert the fuselage sides and place them on a flat building surface for further assembly.

Using a centerline on the building surface, complete the tank-compartment area as the first step in joining the halves. Cut and install horizontal bulkhead stringers in the remainder

of the fuselage (where the 1/2-inch vertical bulkheads strips are located), achieving the appropriate width as indicated on the planform. These horizontal stringers can be made from 1/8 or 3/16 balsa, and they only need to be roughly 3/8 inch wide.

Temporarily remove the fuselage side sections under the wing for wing installation. Employ top and bottom blocks to achieve desired shapes, and then hollow them to a wall thickness of approximately 1/8 inch.

Build the cowl from sheet and blocks, and then shape and hollow it. I continue to use one of the oldest cowl-hold-down techniques on most of my models: a bicycle spoke and a spoke nut. It works well and presents well.

I cut the canopy from a Sig 11-inch bubble and soaked it in blue Rit dye to achieve desired tint intensity.

**Finish:** I finished the 2002 model with Brodak dope and was extremely satisfied with the results. As a matter of fact, the model won the pilots' choice award (Concours award) at the 2002 Vintage Stunt Championships.


Much has been written about finishing, so I won't elaborate on my technique in this article. Whatever approach you do use for the finish, I can't stress enough the importance of your keeping the weight down.

**If you do** build this model, and you build it light and straight, you will absolutely love the way it flies. Have fun, and let me know what you think of your Patriot. *I think I hear my balsa block calling me.* **MA**


Gerry Phelps  
4175 Sacramento Blvd.  
Medina OH 44256

*(Editor's note: Gerry is one of those rare CL Stunt pilots who flies his models in a clockwise direction [when the model is in the upright position]. Because of that, his control system is set up with the leadouts running out the right wing.*


*His plan drawing depicts this preference and shows the right wing panel as the longer of the two. For those of you who fly the other way, you will need to build the left wing as the longer wing and reverse the control system as it is depicted.)*



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