Hobie Hawk Notes

Compiled from notes found on the internet by Ed Dumas

September 21, 2015

CG Setup and Dive Test

By Tony Johnson

Fine Tuning Your Center of Gravity on the Hobie Hawk

This is a discussion about that mysterious subject of the Center of Gravity on the Hobie Hawk sailplane (or any airplane for that matter). If you are new to aviation or are just curious about how the location of the balance point on your Hobie Hawk can affect its stability, hopefully I can shed some light on this sometimes confusing subject so you can set the balance point on your airplane more effectively.

I do not intend to throw out a lot of differential equations at you to explain this subject as it would only confuse the issue to the point where I could possibly confuse both of us!! To set the balance point you really only need to know two things:

1. What is the skill level you are flying at?

2. What type of flying will you be doing?

The question regarding skill is important. If you move the center of gravity it will affect the pitch stability of the airplane. Generally, moving the Center of Gravity (CG) forward produces the most stable flight characteristics and moving it aft can cause complete instability and loss of control. Most airplanes have a "spread" where the center of gravity can be located and the airplane will fly just fine. Stray outside this area and a lot of undesirable pitch problems and just bad performance (L/D) will result.

The type of flying you are doing is also important. Most thermal duration contests will require an extended period aloft and good piloting skills in detecting thermals are paramount. Your airplane can help with this task when the CG is set in proper position, especially with light thermal activity. With the CG set as far aft as you and the airplane can comfortably stand, it will change pitch attitude at the slightest whisp of lift and que you to the presence of lift as the pitch will be very sensitive to external forces acting on the airplane. Of course if you are heading to the slope in at 30 knot gale this is hardly an issue!!

To understand the relationship between CG and stability we need to bring in another factor that affects stability : Center of Lift (ie. Center of upward force) or as it is also known Center of pressure. The CG and CP (Center of Pressure) interact to produce a net force that affects pitch stability. There is ALWAYS some force generated by this relationship and it is counteracted by the horizontal stabilizer. This force will try to cause the nose of the airplane to pitch down or "Tuck". In flying wings this is counteracted by the reflex or turned up portion at the trailing edge in the airfoil.

There are three types of stability : Positive, Neutral, and Negative. When the CG is at the forward limit, the stability is Positive and as it progressively moves aft it becomes Neutral and then Negative. Positive stability is when you can dive the airplane and let go of the stick and the pitch will immediately rise to recover from the dive. Neutral stability is when you do that same dive and let go of the stick and the plane keeps right on truckin' into the ground in a straight line. Negative stability is when the plane will actually decrease in pitch or "tuck" as the dive progresses. That's BAD!!!

I have made some diagrams to better illustrate the CG/CP relationship. In order for the airplane to be stable in the pitch axis it must have the center of pressure located behind the CG. If the CG moves aft past the Center of pressure disasterous pitch excursions will result as the stabilizer can no longer counteract the "tuck" tendancy and will actually work against recovery efforts. The likely flightpath of an aft CG loading would be one that would look like a series of dives and stalls resulting in the eventual crash of the airplane.

OK. So that's what happens with an aft CG. So why not keep that CG way far forward and be safe about it?? Well, we could do that but some undesirable things will be happening that you might not even notice until you see your contest standings. I've heard this a lot on the flying field, " …Dang!! Why can’t I get my nine minute flight with the same plane he has??!! This plane is a piece of crap!!!"

Piloting skills is one thing but that aside, if the CG is too far forward a lot of drag is being created by the stabilizer to counteract all of that weight in the nose. Think of it this way: You add an extra ounce of lead in the nose to give better stability. The horizontal stabilizer must now counteract the extra weight in the nose with a negative force to balance it out in flight. So now there's more weight in the nose, the stab is pushing down also and the greater negative incidence of the stab now creates even more drag and consequently a very steep L/D glide angle. No wonder it flies like crap…… Another thing that can happen with a forward CG is that at slow speed such as on landing, the stabilizer can actually stall and the nose can suddenly drop without warning!!

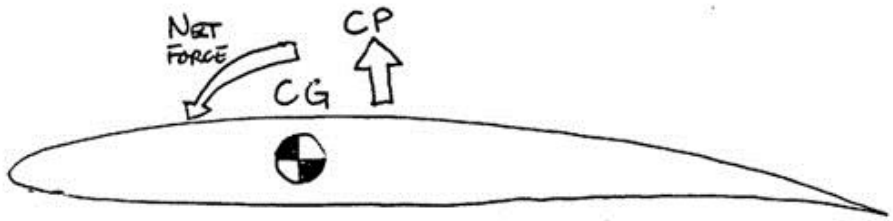
Most kit manufacturers will supply beginner and intermediate modelers with a CG location that is very much on the positive side of the stability spectrum. In other words, they have you stick a little extra weight in the nose to have the airplane fly a bit more stable so that if the novice gets into a dive or stall the airplane will be very quick to recover. If you are comfortable with your airplane and your flying skills you can move the CG to custom fit the task you will be performing with your airplane. The next section deals with the issue of "Dive testing".

Dive Testing

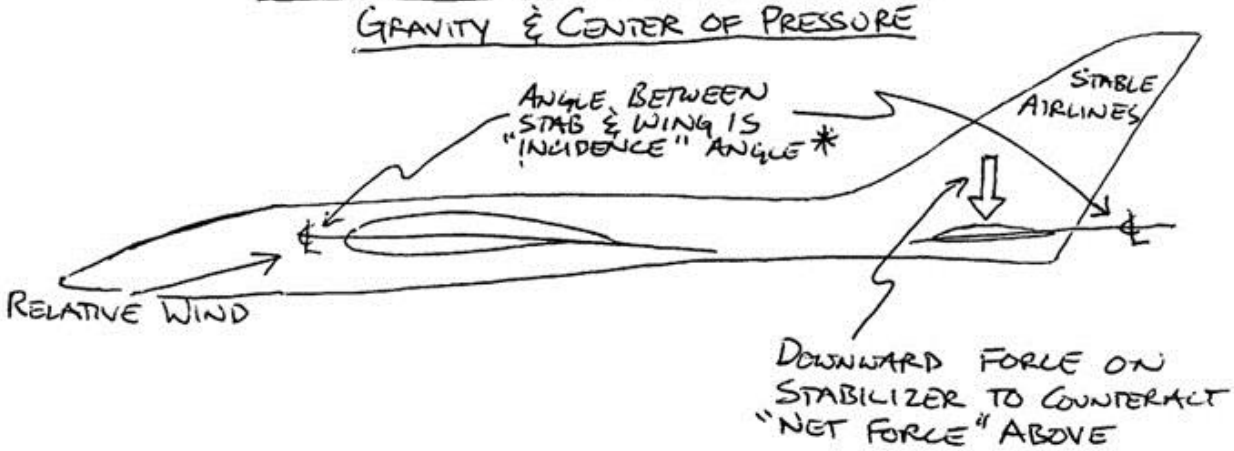
Go to any F3B contest and almost all the contestants will have "dive tested " their Sailplanes to find the "sweet spot" for their CG location. What is the "sweet spot" you ask? Ask ten guys and you might get ten answers. Most pilots will get that CG as far aft as they can for a couple of reasons. The first one is that with an aft CG the pitch of the airplane will be more sensitive to thermals as this is closer to a "Neutral " stability setting. The second reason is that they want to remove as much weight as possible from the nose of the airplane for the same reasons mentioned earlier. Depending on the piloting skills involved and factors with the airplane such as the type of airfoil, the Sweet Spot could be anywhere forward of the center of pressure.

To dive test the airplane all you need is a calm wind morning with no thermal activity yet. This is the ideal condition as few outside factors as possible will be influencing the "test". Send the airplane up on the high start or winch and be sure that the plane is trimmed to fly nice and level (hands off) at cruising speed. Start the "test" from left to right or vice-versa. This way you can better see what the pitch is doing during the recovery phase. Put the airplane into a 30 to 40 degree dive for about 3-5 seconds (be sure the wings are level) and let the controls neutralize and watch what the pitch does. If it pulls nose up real hard in a recovery, this means you've got a forward CG and most likely too much ballast in the nose. If the plane keeps going in the same pitch towards the ground than that's Neutral stability and some folks fly this way in contests. If it "tucks" and dives even steeper for the ground, this is negative stability and can be corrected by adding more weight to the nose. Remove or add weight in small increments as necessary to get the stability for the task at hand. Some airplanes that have their CG set close to neutral (such as the Hobie Hawk) might have a tendency to tuck at higher airspeeds (The Center of Pressure actually migrates aft at higher airspeeds) so be sure to set the CG where you will feel comfortable with it in the speed ranges you will be flying in. That's it!!

Here are some diagrams to help explain all of this:

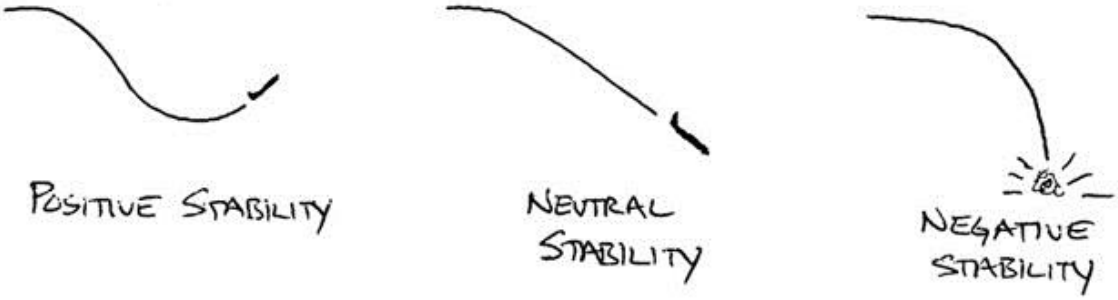


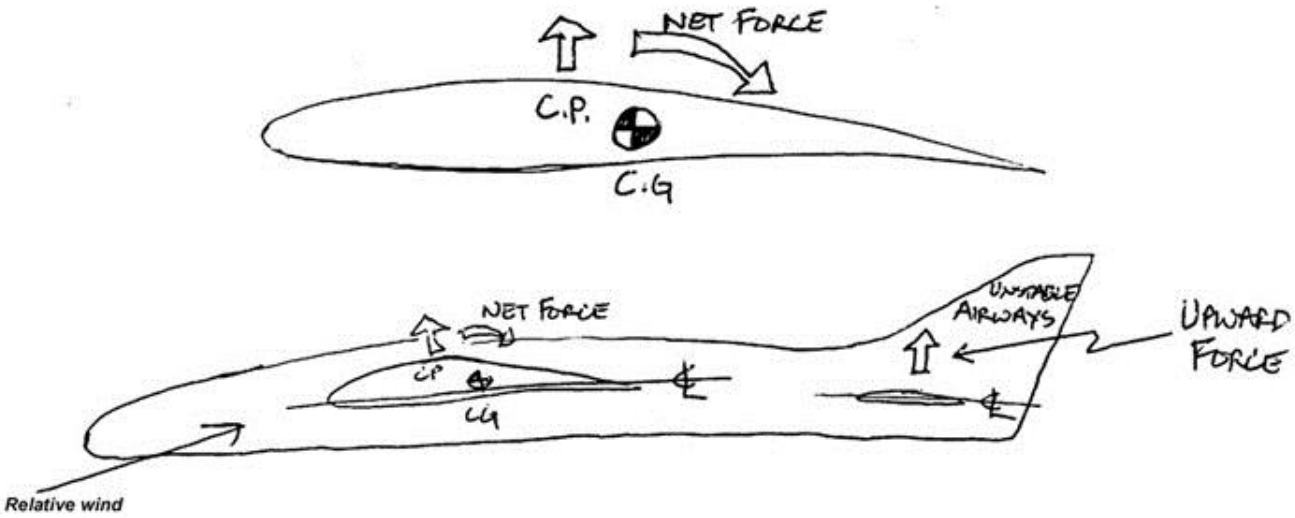
RELATIONSHIP BETWEEN CENTER OF GRAVITY & CENTER OF PRESSURE



- Note that the angle between the wing and stabilizer centerlines is slightly negative. This is called "Negative Incidence" and is necessary for a stable flightpath. The negative incidence of the tail counteracts the downward (Tuck) pitching moment created by the wing in flight and holds the wing at a positive angle to the oncoming relative wind. Without this effect, the wing could not create lift to fly and carry any load. As the airspeed increases so does the downward force on the stabilizer. At the same time the "Tuck" net force of the wing would also increase as more lift is generated. If the balance between the Tuck and the stabilizer downward forces exactly match, this is called neutral stability. For a sailplane pilot this means that there is just enough nose weight ballast to keep the incidence angles precisely in balance with as little drag as possible. The incidence angle should never be zero or positive.

Of course too much weight in the nose will produce a lot of negative incidence in the stabilizer. Translation : Lots of drag produced by the Stab in it's efforts to counterbalance all that extra weight in the nose of the aircraft. When coming in to land this could get interesting as the stabilizer can actually stall out or "run out" of elevator and cause a sudden loss of pitch control. Doooooooo....





AFT CG LOADING

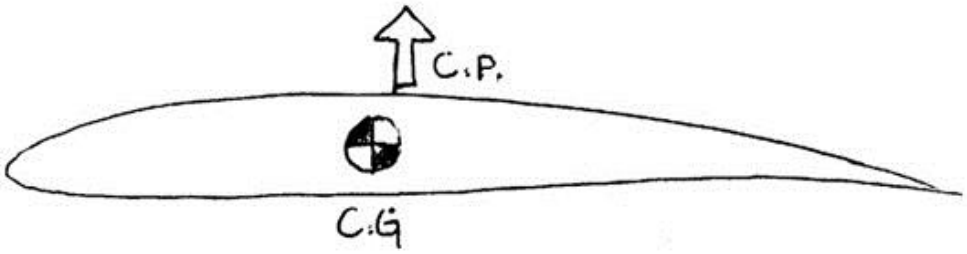
Pictured above is an aft CG situation. Note that the net force is now "nose up". This means that the stabilizer must now provide lift to keep the airplane from pitching up in flight from the net force. This is opposite of the downward force that the stable airplane had on it's stabilizer.

Now when the airplane enters a dive, stabilizer lift increases with the increased airspeed in the dive and forces a nose down pitching moment. HOLY COW!!! That would be bad.....This would only aggrivate a condition such as a dive if it is inadvertently entered. Consequently, if we put this same airplane in a stall, airspeed decreases and the stabilizer looses its lift capability and will stall before the wing. With this happening, the airplane will pitch up uncontrollably into a deep stall and guess what? Yup, that's right. It goes right back into a dive and it's curtains!!! Chuck Yeager couldn't even fly this squirrely thing!!!

OPTIMAL CG LOCATION

Now for the tough question. What is optimal? This is something that there is no hard and fast answer to as it takes us back to the first two questions I mentioned at the front of this article. If you are slope flying and into speed runs you might balance the airplane as far aft CG as possible so that there is as little pitch up in high speed flight as possible as well as excess drag from the stabilizer of an overly stable forward CG airplane. If you are flying slope and just want a stable airplane then it doesn't really matter about optimal CG location. If you're flying ability isn't up to spec with that of piloting a Neutrally stable airplane then a forward CG is best suited for a more stable flightpath. Neutrally stable airplanes DO fly differently than their more stable counterparts. They DO NOT recover from dives and stalls unless the pilot controls the airplane to do this. They can and will build up excessive amounts of speed without pitching up automatically. Some will even tuck suddenly into a dive or an inside loop at high speed. The secret is to go to the flying site and experiment with your airplane and your skills to see just where the "Sweet Spot" lies.

The diagram above shows that the best location is somewhere forward of the CP. This will be close to Neutral stability but retain a small bit of positive stability.



Hope this clears up some mystery of CG location...

Thermals,

Tony

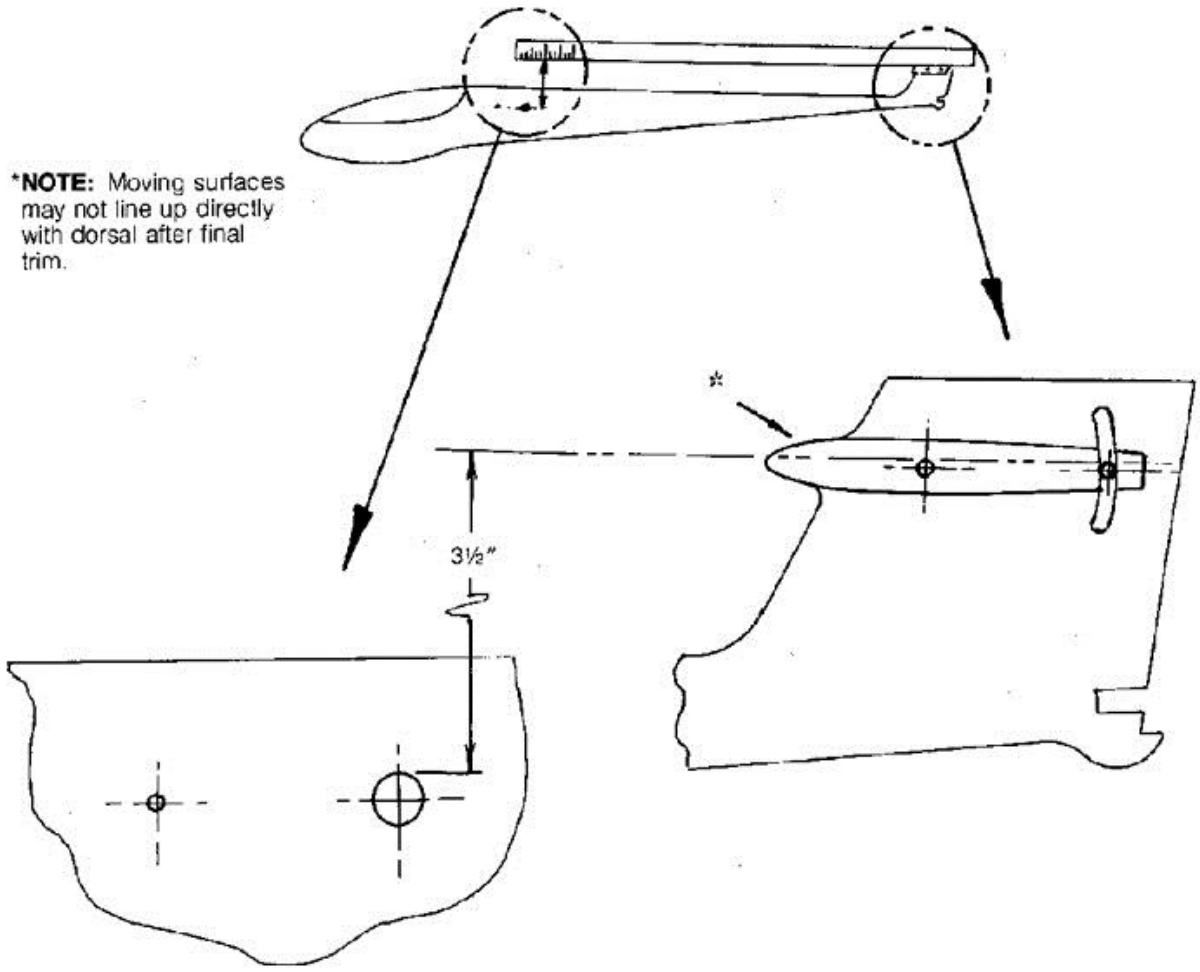
The most important things when setting up your Hobie Hawk are the following:

1) **Center of Gravity.** The Hobie Hawk uses a unique way of measuring the CG. With the wings removed and EVERYTHING else (radio, Rx, battery, pushrods, rudder, elevator etc) at least taped into position, support the complete fuselage assembly by resting the main wing rod on a table edge and balance by moving the radio gear or adding weight to achieve a **MINIMUM** distance of 19.5" from the bottom of the tail skid to the table top where the wing rod is resting. This is the MINIMUM recommended balance point, many people I have talked with go anywhere from 20" to 20.5". Once CG is at it's desired location, secure all eqt., weights etc. This is covered on page 26 of the Hobie Hawk manual.

2) **Control Surface Movement**. For initial setup use the diagram below:

After all gear is installed, the model is balanced and completely assembled, all controls as "neutral" as possible visually, check the elevator angle per the illustration below.

Turn on receiver and transmitter to seek neutral. Lay a straight edge across the tail wires and check the dimension shown below.

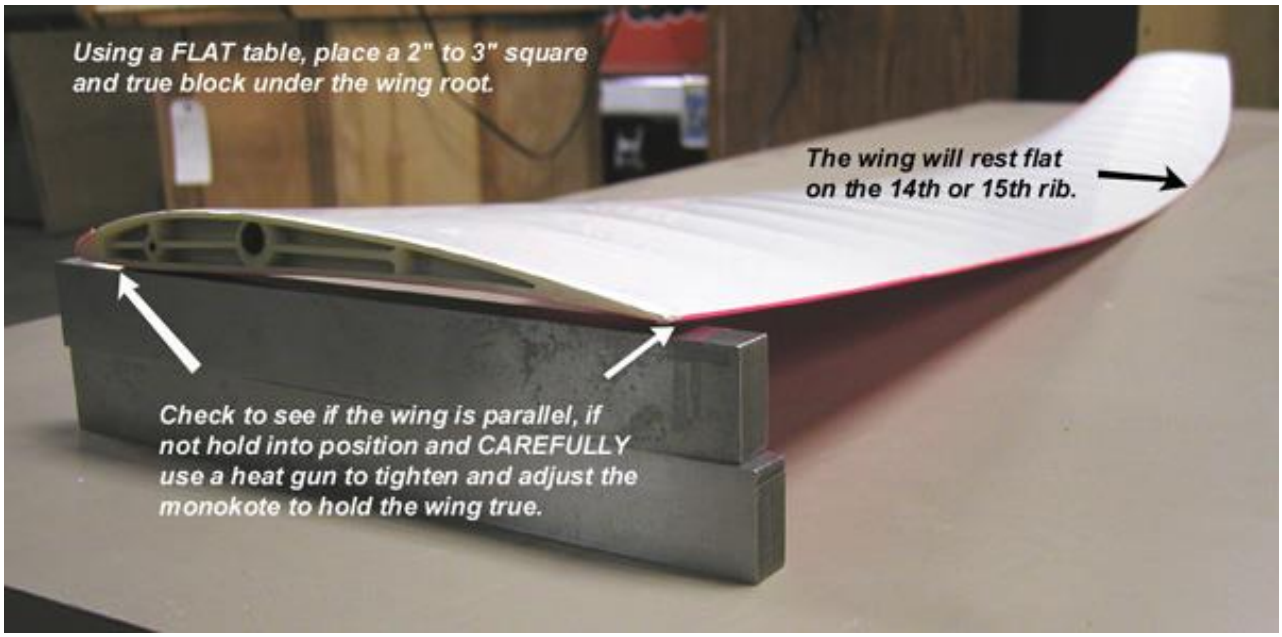


CONTROL SURFACE MOVEMENT: Rudder = ½" to ⅝" L.E. travel each direction
Elevator = 3/16" to ¼" L.E. travel each direction

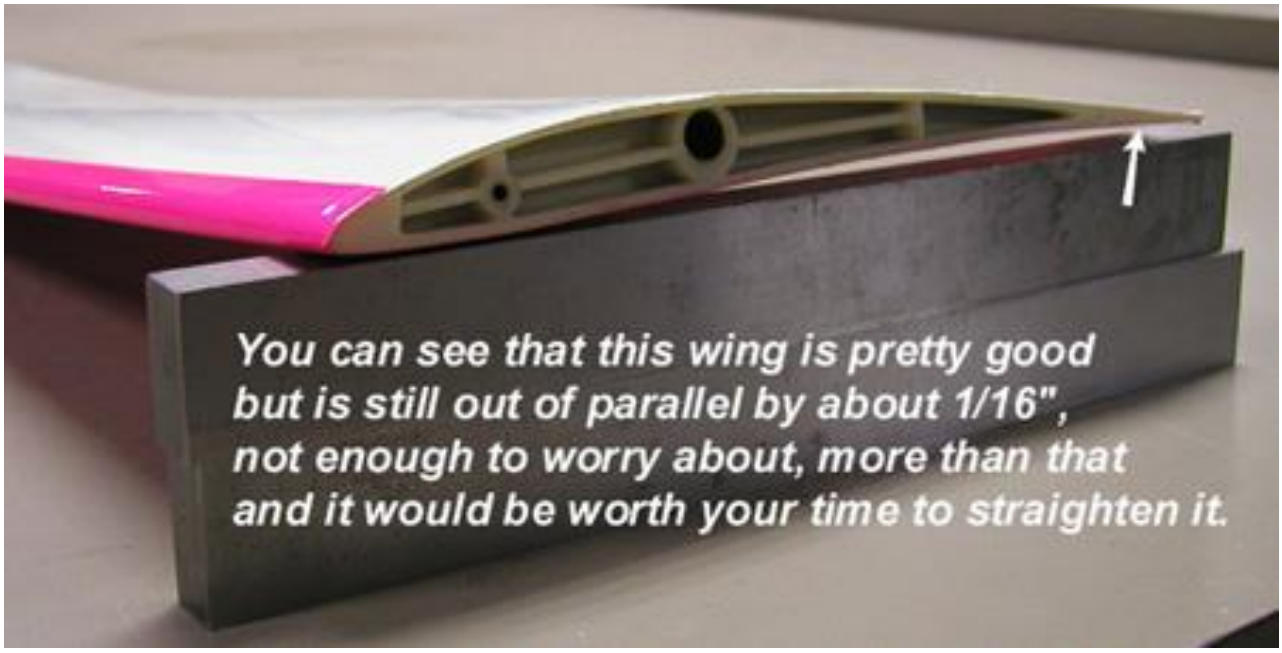
Use rudder throws per factory specification: 1/2" to 5/8" on the leading edge in each direction. DO NOT put too much throw in the rudder if you are not experianced with the Hobie Hawk. This is the problem that had many say the Hobie Hawk was "squirrely". Once you have mastered the flying characteristics of the Hawk, then go for more rudder throw. The elevator at factory spec: 3/16" to 1/4" on the leading edge each way. This is nearly max'ed, and that is where many feel is best: Max throw on the elevator. Hand toss it into a 5 to 10 mph wind to check your settings before sending it up the high start! This is covered on page 35 of the Hobie Hawk manual.

3) **Wing washout and straightness**. This is probably one of the most important steps that frequently gets overlooked. If you want your Hawk to FLY spend the time to do this step properly!. It will make the difference between a FUN Hawk or a DIFFICULT one! This is covered on page 36 of the Hobie Hawk manual.

Following the proceedure in the Hobie manual: FIRST make sure that the wing is parallel down to the 14th or 15th rib. An easy way to check this is to place a 2" to 3" high block under the length of the wing root and the area of the wing that touches the table at the 14th or 15th rib must be parallel with the root. If it is not, twist the wing in the opposite direction and re-tighten the covering with a heat gun.

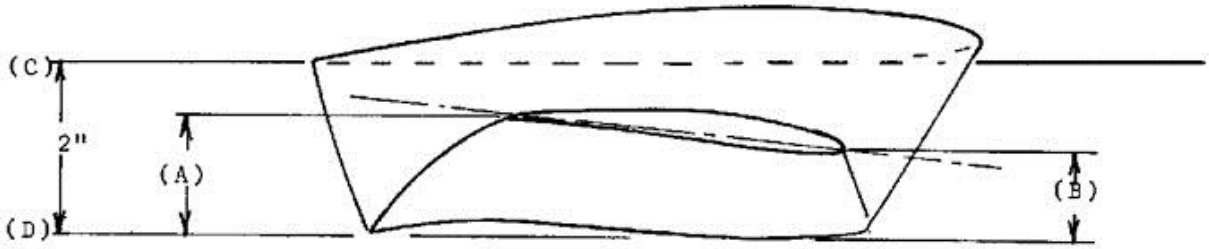


Once the wing is parallel you can THEN proceed to check the wingtip washout. MORE washout is usually better than less, as it reduces airspeed at which your Hawk will tip stall. Use the photo and line drawing below:



Check wings at this time for "wash-out" or twist at tips.

UNDERSIDE OF ROOT SUPPORTED FLAT AND PARALLEL TO MID-SPAN CONTACT ON FLAT SURFACE.



Correct any difference between (C) and (D) to parallel by holding in twist. Note monokote wrinkles resulting from twist and remove wrinkles with heat gun or iron. Shape will be retained and controlled with this method. Tip wash-out (A) to (B) should be 3/16" to ¼". Adjust similar to above. Measure from flat surface to trailing edge (A) dim. and leading edge (b).

Lay wings on flat surface with root braced up so that measurements can be made of the tip area. The leading edge should be approximately 3/16 to ¼" lower at this point.

Should adjustment of wing "wash-out" be necessary, weight the root section on a flat surface, apply heat from covered iron or heat gun to covering material while holding twisting pressure in direction desired. Check per illustration and correct as required. Temperatures, etc. may affect this condition, so from time-to-time, a visual check may be made. The acceptable range of "wash-out" is 3/16 to ¼". ***or MORE!!!***

NOTE: The wing shape of the Hawk is very complex, the tuning of the wing is **CRITICAL** to making your Hawk an enjoyable flyer. Take the time to do this step and you will have a much better time flying!

Flying your Hobie Hawk...

Well, you've set up your hawk, followed the set-up directions to the tee and now it's time to FLY this big beautiful bird!

Here are a few tips to hopefully make that first flight a success.

Rule #1: Do NOT launch your Hawk with a nose high attitude, whether hand launching, bungie launching or winch launching. You MUST build some air speed and avoid a stall during the launch.

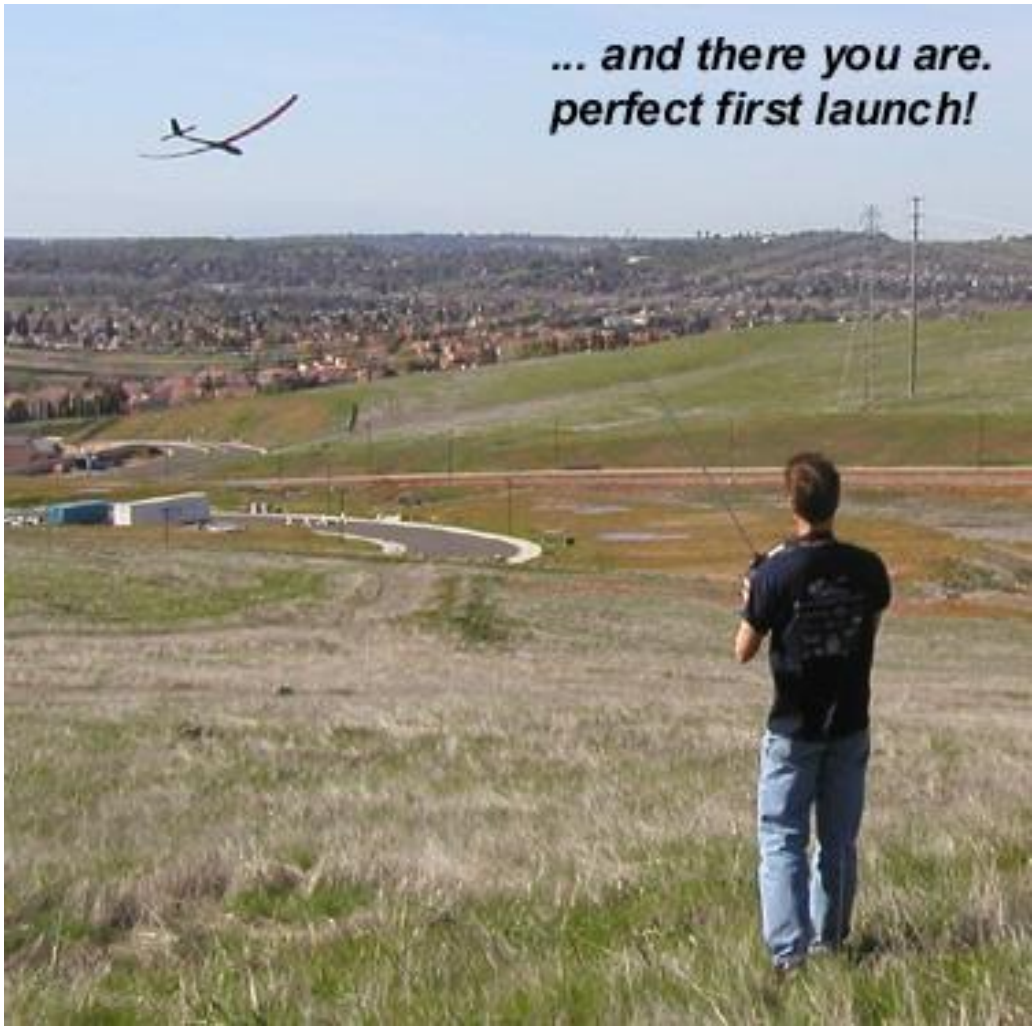
Rule #2: Make sure you have the wings LEVEL at the time of release.

Rule #3: Make sure your rudder is set up properly and DO NOT exceed the recommended amount of rudder travel or you will be prone to OVER CONTROL your ship.

Remember that the Hobie Hawk has an unusual wing incidence angle (the angle of the wing reletive to the fuselage) and flys with a noticable nose down attitude. With your Hawk ready to fly pick it up and hold the wings with a 3-4 degree angle of attack (the wing angle relative to the wind) and look at how the Hobie Hawk will be flying - this is the famous nose down attitude of the Hawk. It is un-mistakable in flight. If you try to fly with a level fuselage, you will stall your Hawk!

Here are a few photos of a good "hand launch" on a slope with a mild 10-12 mph of wind.


Good hard throw, straight forward.


... and there you are.
perfect first launch!

Modifications to Hobie Hawks

Many have talked about "Taming" the Hobie Hawk. It was touted as a beginners plane when introduced, most who have flown a Hawk would disagree. With a complex wing design that does not like to be stalled and a wing incidence angle that has you flying your Hawk with a nose down attitude, the Hawk will certainly keep you on your toes!

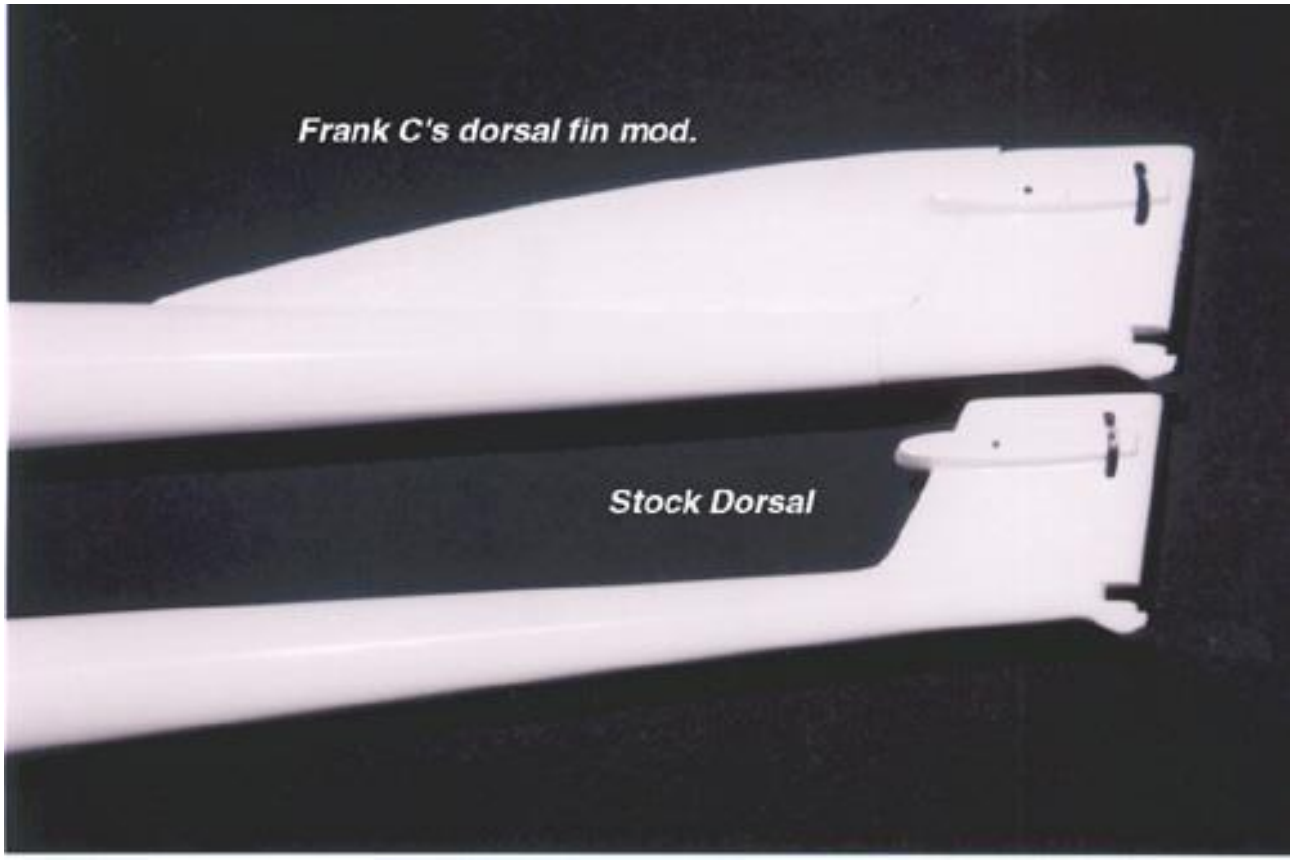
Over the years many modifications have been tried for various reasons... fins, winglets, enlarged control surfaces... you name it, it's probably been tried. I have even heard of someone who made a pitcheron or wingeron Hawk... it rotated the wings in opposite directions like giant ailerons...

Larger RUDDER: This was a good mod. Some even cut the front tip of the rudder off and affixed it to the dorsal making a full vertical fin with a conventional straight hinge rudder. Then you would increased it's overall size. It seemed like about a 15-20% increase in rudder size did nicely from those I've talked to, even if you didn't do the fin mod. This mod also is much less intrusive on the sleek appearance of the Hobie Hawk.

Dorsal Fins: One of the seemingly most successful and easy to do mods was the addition of a fin above and in front of the dorsal. This adds directional stability. Does it work? Yes. I made my own based on descriptions handed down to me and when I flew my "Black Hawk" she seemed to have much less "waggle" and just tracked more true. I just received a dorsal fin from Mr. Frank Cox which is much longer, but not as tall as mine. I will try Franks' design too and report back. Below are some photos of what I am talking about.


First launch using a small dorsal fin


Well, it's safe to say a dorsal fin doesn't hurt performance!


Frank C's dorsal fin mod.
Stock Dorsal

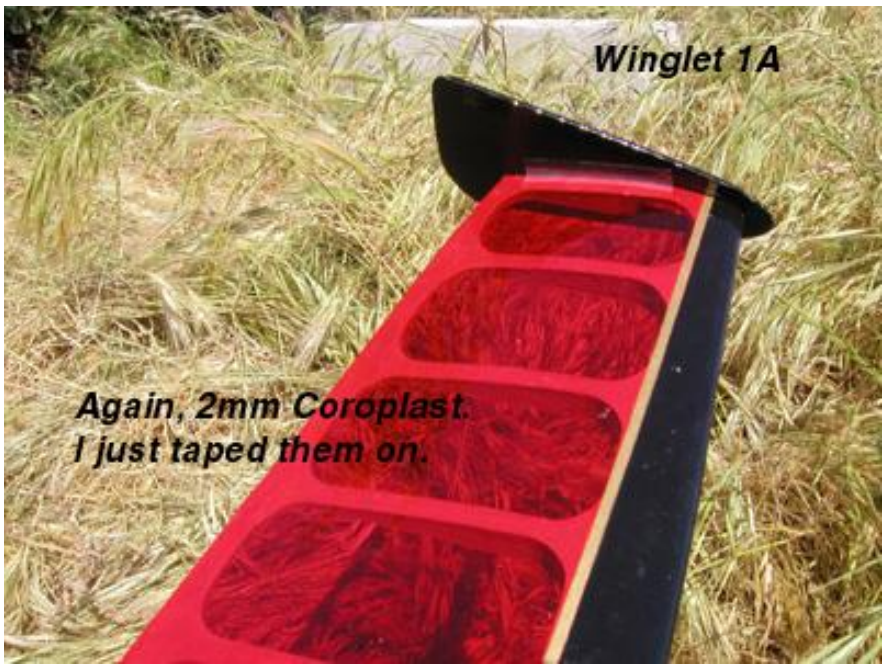

One of Frank's Hawks,
Note the fin on the dorsal.
Another nice one!

Winglets: I also fly foamie combat type wings and winglets are critical. They help a bit in preventing tip stalls and in the case of the Zagi's and XR Combat wings the winglets reduce side-slip.

I wondered if this would help the Hobie Hawks notorious tip stalls, so I again cut up some 2 mm Coroplast and strapped winglets on my BlackHawk.

From what I observed, it seemed to have a slightly lower stall speed. On my next launch I snagged a thermal and when I had plenty of altitude I did some intentional stalls. It seemed that when I would stall the Hawk it would not tip drop and try to roll as much. Of course this is all without scientific merit and the differences were subtle. I will try different shaped winglets in the future. Below are some photos of what I came up with.

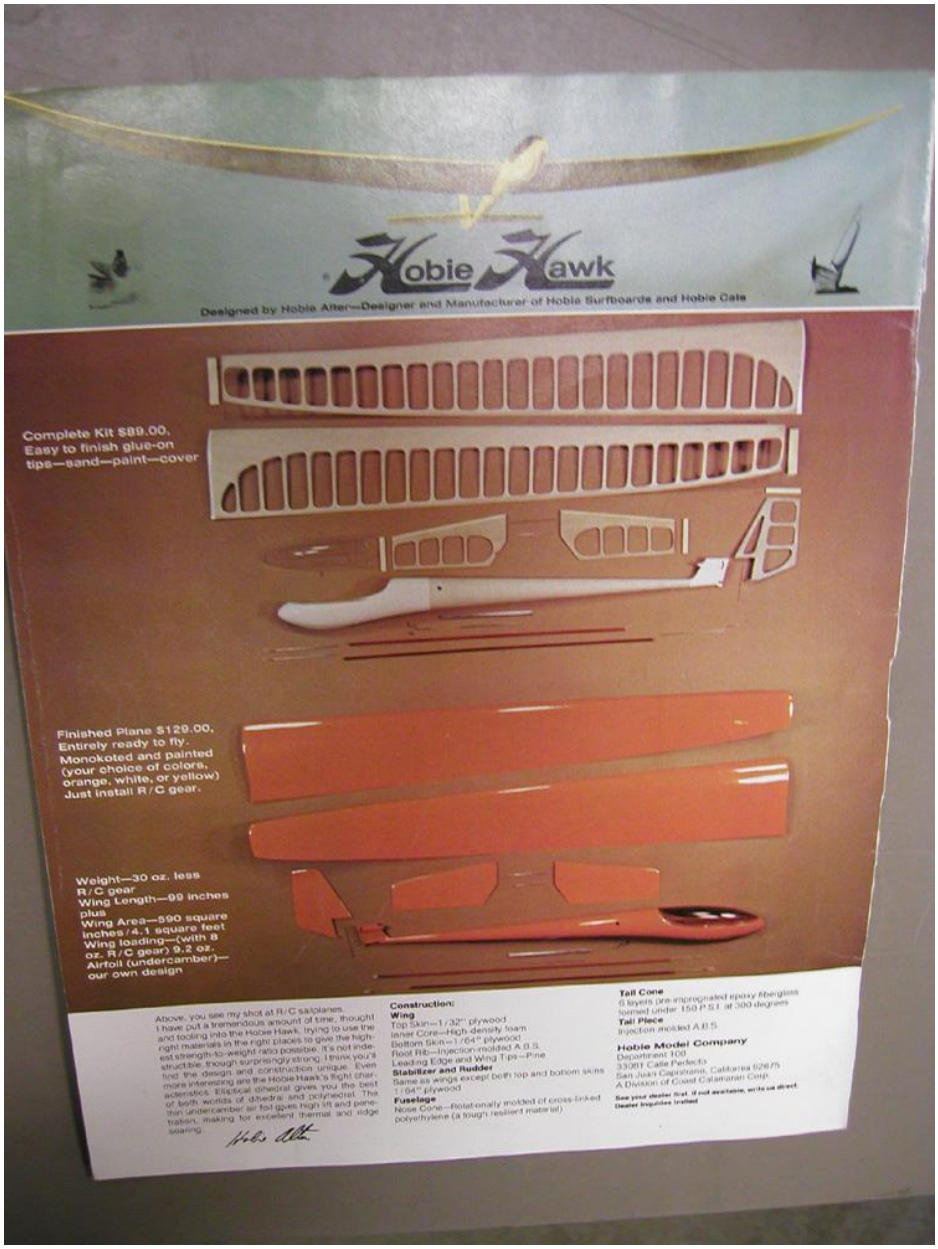
Again, these mods did not seem to harm performance...




After a successful
flight with winglets...


Well, winglets are another mod that
DID NOT hurt the performance!
This was taken at max zoom (80mm) with my digital
Olympus D-40. I specked BlackHawk out twice. Landings
seemed to be just a tad easier (slightly slower stall speed).


Nice promo banner!
HOBIE HAWK


Hobie Hawk
Designed by Hobie Alter—Designer and Manufacturer of Hobie Surfboards and Hobie Cats
Complete Kit $89.00. Easy to finish glue-on tips—sand—paint—cover
Finished Plane $129.00. Entirely ready to fly. Monokoted and painted (your choice of colors, orange, white, or yellow) Just install R/C gear.
Weight—30 oz. less R/C gear
Wing Length—99 inches plus
Wing Area—590 square inches/4.1 square feet
Wing loading—(with 8 oz. R/C gear) 9.2 oz.
Airfoil (undercamber)—our own design
Above, you see my shot at R/C sailplanes. I have put a tremendous amount of time, thought and tooling into the Hobie Hawk, trying to use the right materials in the right places to give the highest strength-to-weight ratio possible. It's not indestructible, though surprisingly strong. I think you'll find the design and construction unique. Even more interesting are the Hobie Hawk's flight characteristics. Elliptical dihedral gives you the best of both worlds of dihedral and polyhedral. The flat undercamber airfoil gives high lift and penetration, making for excellent thermal and ridge soaring.
Construction:
Wing
Top Skin—1/32" plywood
Inner Core—High-density foam
Bottom Skin—1/64" plywood
Root Rib—Injection-molded A.B.S.
Leading Edge and Wing Tips—Pine
Stabilizer and Rudder
Same as wings except both top and bottom skins 1/64" plywood
Fuselage
Nose Cone—Rotationally molded of cross-linked polyethylene (a tough resilient material)
Tail Cone
6 layers pre-impregnated epoxy fiberglass formed under 150 P.S.I. at 300 degrees
Tail Piece
Injection molded A.B.S.
Hobie Model Company
Department 100
33281 Calle Perfecto
San Juan Capistrano, California 92675
A Division of Coast Catamaran Corp.
See your dealer first. If not available, write us direct.
Dealer inquiries invited

Posted July 21, 2015 on RC Groups: What is the deal with the Hobie Hawk?

There have been many offering information here, some right and some not so right.
I could write a book trying to cover it all but here are the basics.

First and formost, how does it fly?

As stated before here on this thread....The Hobie Hawk flies differently than any other sailplane out there . It is not a beginners plane but an extremely efficient rudder elevator sailplane that was decades ahead of it's time.

As for the fuselage angle.....the wing sets the angle of the fuselage in flight and the angle of the fuselage was set by Hobie to offer the least resistance to the oncoming air, as all sailplanes are falling.

As a successful designer when I bought the tooling to the Hobie Hawk, I too was curious as to several design decision Hobie made. On many visits to my shop, Hobie and I would discuss the Hawk and he never gave me the "It looked good or I just wanted to do this or that" he always had a scientific reason for every thing in the Hobie Hawk. Too numerous to list here.

How are the wings made:
The wings are cut with a hot wire flat, but with washout. This is done on the hot wire cutting machine where the block of foam is held down with vacuum, twisted and cut. Next the cores are trimmed, grooved for leading edges, alignment holes, high density plugs inserted at wing rod termination. The molded wing roots are attached. The 1/64th bottom ply and 1/32nd top ply are die cut with alignment holes, have glue applied, aligned to the cores with Delron pins, put onto the aluminum platens that have both the bottom airfoil, the curve and washout, bagged, vacuumed down and cooked for 45 minutes in the hot box.

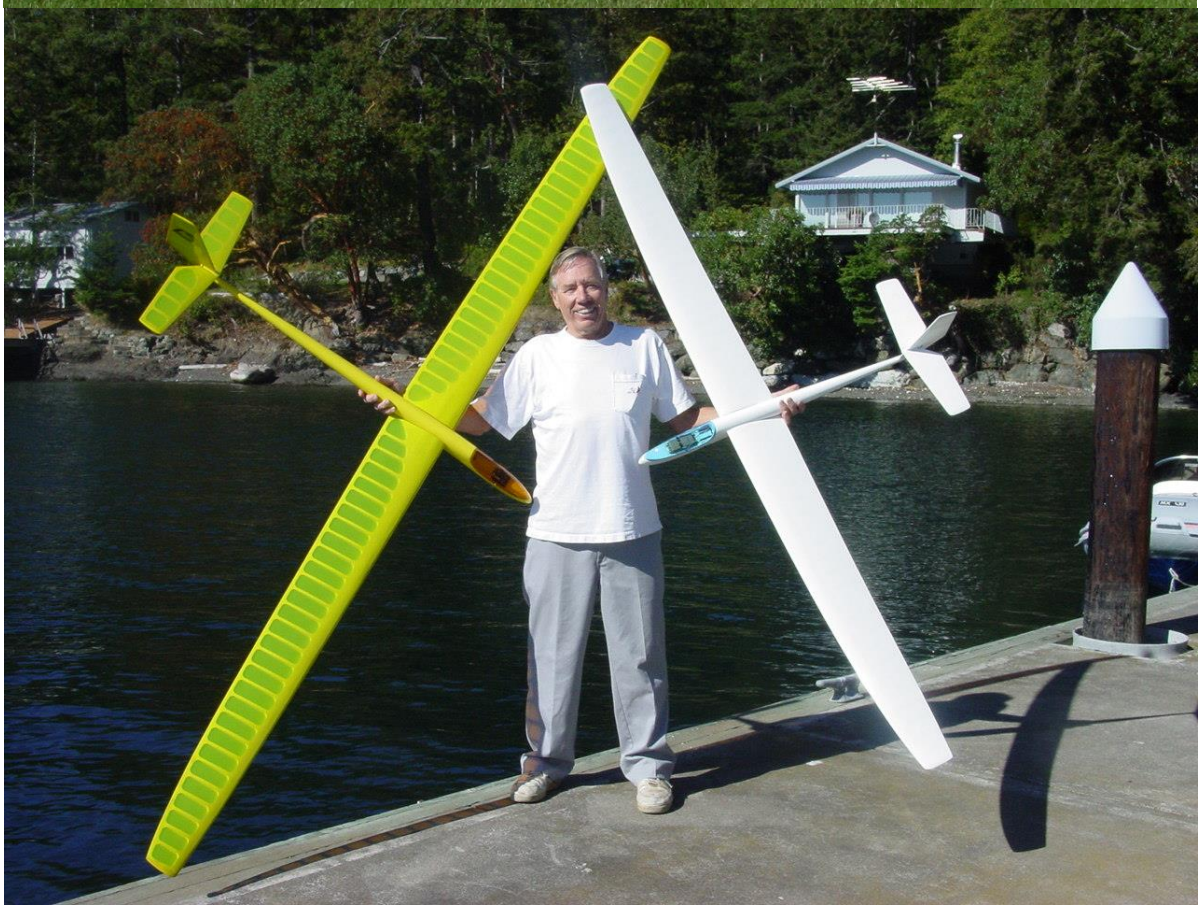
Once they come out the wing roots are drilled in a jig, the two wing panels are put into the routing jig, back to back, flattened and plunge routed. There are a number of cleanup processes next but you get the picture. Go here for pictures: http://www.hobiehawk.com/Ross.html

In conclusion, my opinion is that the Hobie Hawk is a artistic treasure, the most recognizable RC silhouette in the world and one of the finest example of an RC sailplane ever designed and with practice a great flying sailplane.

Hope this clears up your questions....
Bob Martin

Next page top: Hobie Alter and the Superhawk G2.

Bottom: Hobie Alter circa 2003 with a Superhawk G1 prototype and an original factory finished Coast Catamaran Hobie Hawk.



Hobie Alter with prototype Hobie Hawk. Two meter, flatter wing than later versions and prototype tail assembly. Probably 1974-1975 era.

Bob Martin and his "Katie" special edition Superhawk G3 at Torrey Pines.

Posted August 25, 2015 on RC Groups: **How to tame a Hobie Hawk** by Richard Shilling, LSF226

Reading posts about Hobie Hawks filled me with nostalgia. The Hobie Hawk member of the squadron of "Classic" gliders stored in our garage belongs to my wife, Barbara Henon and was manufactured by Hobie Alter. Barbara campaigned it for a year and liked it a lot. It was a very early Hawk, from either the first or second production run made by Hobie Alter. At that time, our club, the San Fernando Valley Silent Flyers (SFVSF) had an active recruitment program as well as an instructor program and we saw a lot of Hobie Hawks show up on the club field and at the slope. What surprised us was the variability between the models. Some flew like birds, some barely flew. A group of the club members - Jerry Krainock, Bill Watson, Rick Pearson, Blaine Rawdon, Ed Slobod, myself and probably several others who slip my mind, looked at a lot of Hawks trying to figure out the variations. As the then newsletter editor of the Silent Flyer, I wrote up the conclusions in an article titled "How to Tame a Hobie Hawk." I no longer have a copy, and what you read below comes from my memory of what I wrote 30 years ago, but I think I remember most of the major points.

The Wing: As some recent posts on the RCSE indicate, it is difficult to judge, or measure, a thin, undercambered, elliptical wing. In the early days there were a lot of variations. We found that while a perfect wing would fly fine without wash-out, wash-out benefited most of the models. First off, check one wing against the other to see if you might have one wing washed-in and the other washed-out. This will result in really good snap rolls, particularly on winch launch! Either neutral or wash-out is better. Secondly, the airfoil is undercambered, and as I said, hard to judge. Some Hawks had a trailing edge that drooped down, like a flap. This is easier to draw than visualise, but a good eye-ball and a straight edge can tell the difference. The flapped airfoils never flew worth a dam, so get out the heat gun. Then, in a couple of days or a week, get it out again. The plywood was tough enough that it took several sessions with the heat gun for the Monokote to overcome the pull of the plywood to warp in either the trailing edge or the wash-in. If you use the heat gun to build-in a warp, keep checking it. One final test: On a large, flat table put the two wings against each other to see if they match - leading edge to leading edge and trailing edge to trailing edge to trailing edge, tip to tip. The Hobie Hawk, or any model for that matter, will fly a lot better if both match trailing edge to trailing edge, tip to tip to determine if both wings are even.

C of G: Ours was supposed to hang nose down when balanced on the wing pin. Don't forget, it was a very early model. It's likely that the recommendation changed with time and possibly with the different manufacturers. The more forward C of G formulas are probably a good idea. A possibly squirrely model will benefit from a forward C of G. Ours always flew as balanced above. We never tried to move the C of G back from the slightly nose down position and moving it forward didn't help our model at all.

The Dorsal: I went out to the garage and looked at ours and the dorsal fin is still there, after all these years. Many of the Hobie Hawks flew very well without a dorsal fin. On the other hand, many of them benefited from the dorsal. A piece of cardboard or 1/16" balsa and some masking tape is what you need to try it. At time of writing I measured the dorsal that I added 30 or so years ago. It is 5" long and butts up against the vertical part of the fuselage at the rear up to where the rudder mounts (about 2"). It was made out of 1/32" ply glued on to the fuselage and vertical stab with silicon seal. At the time we were told that nothing would stick to the fuselage, but silicon seal, such as Household Goop, while not a glue, will tack to just about everything. The dorsal is still there and so is the silicon seal. It's a simple modification to make and easy enough to do some test flights to tell if it's a benefit or not. If it is a benefit for your model - make it permanent. If it's not - take it off. But in either case, trying the dorsal makes more sense than being dogmatic.

Control Throws: The Hawks were very sensitive to too much control throw. Some of the throws were so extreme that hard rudder would produce an instant snap roll. I don't recall how much throw we used, but again, maybe it's better to work up to large rudder throws slowly. With today's radios with expo this is probably less of an issue.

Incidence Differences between Right Wing and Left Wing: Some of the early fuselages were drilled incorrectly and there was an incidence difference between the right wing and left wing. Measure carefully.

From Bob Martin's Blog on RC Groups:

HOW A HOBIE HAWK WAS MADE

The following is from memory

NOTE: Brian Joder has a website called www.hobiehawk.com where he has collected a lot of great information about Hobie and the Hobie Hawk you will undoubtedly find very interesting. Also on this site are pictures of some of the equipment used to produce the Hobie Hawk. Every tool, jig, fixture, mold or machine was designed for one purpose...Making a Hobie Hawk and in today's dollars we are looking at over $2 million dollars investment.....Hobie never did anything that wasn't first class!

Chapter One - A Little History

When Hobie got the bug to fly an RC sailplane he was frustrated that he could not buy something and go fly that day! He thought there must be many people like him that would enjoy flying if they could just go buy something and not spend days, weeks or months building. Hobie decided to design and manufacturer the Hobie Hawk and he had two primary goals. First, he wanted a sailplane that anyone could walk into a Hobby Shop and buy that was completely built and ready to fly. Second, he wanted to make sure that if you needed a replacement part, every part made, no matter how long it had been since you bought yours, the new parts would fit as good as the original. Of course, all this must be Hobie quality.

First he had to design the Hobie Hawk and he told me that he tried many designs before he came up with the final design. Early prototypes were not the sophisticated super ship we have come to love or hate. He started with balsa wings to get the design down but knew for mass production he would have to develop new techniques. He had a legitimate reason for each of the unique design and I will try to offer those in each of the major components. I mentioned Love and Hate. Let me clarify that statement. In the mid 70's 95% of all sailplanes were built up balsa kits. They took weeks, months or longer to be built, some not so straight, were generally fragile structures the were designed to minimize sink. Generally the wing sat on the top of the fuselage which means the fuselage was pretty much showing you the angle of attack of the wing and so to fly it at minimum sink, you flew the fuselage nearly level with the horizon. This required a lot of skill in building and flying to be successful. When the Hobie Hawk sprang upon the scene, many like me saw the opportunity to buy a beautiful sailplane and not invest many hours building. Buy it, balance it and go fly! Here is where the Hate part comes in. From personal experience, Katie and I show up at the Rose Bowl, a hot bed of competitive thermal fliers. These guys were very good but they practiced and became proficient with minimum sink planes. We asked them to test out our airplane, and found they were no more proficient with the Hawk than we were as they tried to fly it like a floater. This was embarrassing and so the plane must be a piece of crap. A few years later, when I acquired the rights to the tooling, but not the rights to the name yet, I had arranged a camera set up for background on the weather report on KNBC in Los Angeles. I contacted several clubs and requested they show up and fly this small slope. The lift was very light and some of the areas top pilots showed up. One, and I will not mention his name, saw me wearing my “The Legend Returns” hat. I was not licensed to use the name Hobie yet. He says “Who cares! That is an old pig! “ I have never paid too much attention to what others think so I just ignored him. A little while later the camera man and truck from NBC arrived. These hot rod pilots were flying the latest F3B planes they were preparing to take to the World Championships and decided to put on a show for the camera. I was flying my Bob Martin manufactured Hawk and so I trimmed it up a little to get out of their way. They were zooming back and forth like a pylon race and a friend, Larry Hargrave comes over and says “Show them what the Hawk is capable of!” I put in a fair amount of down and the Hawk accelerated and soon I was running with these F3B ships. They were full house so their turns were more crisp than mine but I had altitude on them and was keeping up with them. After 15 or 20 minutes the camera man said thanks, this is really cool and he left. When we all got ready to leave, this gentleman that was so rude earlier said, “For an old plane, it is not bad!” I am sure that was hard for him to say. There were many more situations where I saw people trying to fly the Hobie Hawk the way they thought it should fly and it would bite back. If you fly the Hobie Hawk the way it was designed, fast and smooth, with the nose down you will fall in LOVE, if you fly slow with the fuselage nearly level you will HATE it.

When Hobie sold his company to Coast Catamaran in 1977 the Hobie Hawk division was not carrying its weight for the square foot it occupied, so it was sold to Midwest Model Products. This was too sophisticated for the guys in the shop at Midwest and they had wings that delaminated and the quality was such that they never were able to use the Hobie name. In fact, Hobie was trying to buy it back from Midwest. He knew what Midwest paid for it and so he offered to buy it back, but there was another bidder, one willing to pay Midwest much more than Hobie but Midwest was sworn to secrecy and would not tell Hobie who it was. We purchased the tooling and the oven from Midwest, contracted a huge flatbed semi to truck it from Hobart, Indiana to our new facility in California. When the tooling for the Hobie Hawk arrived, I was amazed at the quality of the tooling and fixtures. The Hobby Industry was making kits, primarily from balsa and a few with fiberglass fuselages, but essentially made the same way for the past 50 plus years. A box of balsa, printed or die cut parts, plans and instruction book, maybe basic hardware.

In the coming days I will offer several chapter, each dealing with how the Fuselage , wings, elevators and rudder are made, step by step. I am trying to get permission to use some pictures that will greatly enhance this presentation.

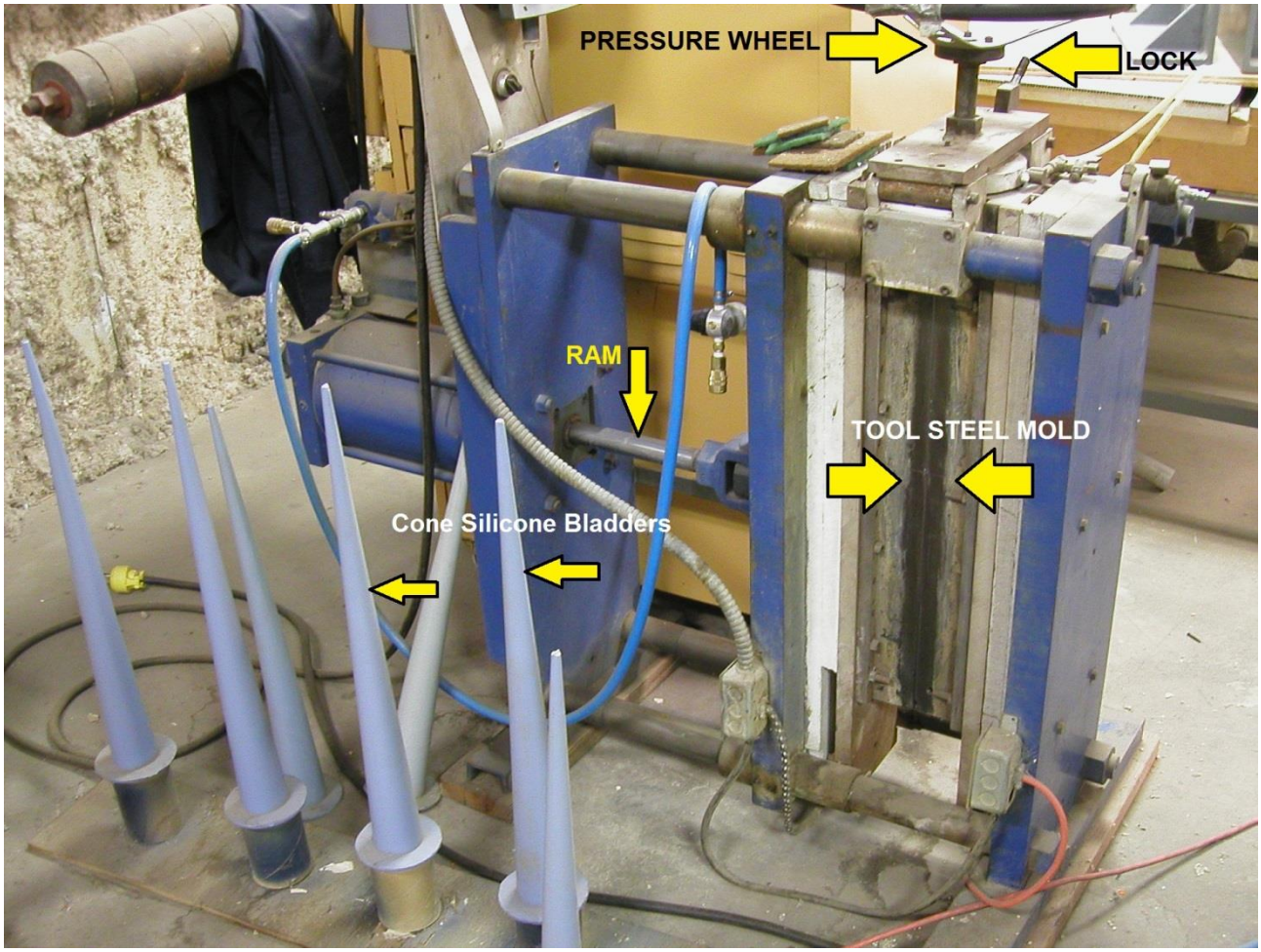
Chapter Two - Fuselage

We will start with the fuselage. To my knowledge, to this day, no RC Sailplane has gone to this extent to make a fuselage that offered such design advantages.

The nose piece: This was designed to be ultra strong and resilient, therefore rotational molded from natural polyethylene. The molds were made in a process called “vapor deposition”. This means that a plug (the male shape of the final part) was put into a chamber and literally coated with nickel, molecule by molecule until it was about .060” or 1/16” (1.6mm). This is far more accurate and precise process than electroplating as I did with my *Dura-lene* molds and more expensive too. The molds had two holes in them that a rod was slid through holding an aluminum insert for the main wing rod and a brass tube for the alignment wing rod. A pre-measured amount of polyethylene powder was poured into the mold, the mold was closed and bolted together and mounted on a arm that would go into a large 10 ft. X 10 ft. oven. This arm had gears on it so each of the several nose molds would rotate in every axis. The oven door would close and the interior would heat up to 400 degrees. The arm would continue to rotate for approximately 45 minutes. During this time, the interior of each mold would get hotter and hotter until the powdered polyethylene would begin to melt and stick to the sides of the mold. After 45 minutes, all of the plastic would have coated the sides of the mold and the two inserts bonding everything together into one piece. The doors would open, the arm removed and the molds cooled. Depending upon how fast the mold and the polyethylene part cooled, it would shrink different amount which can cause problems later in assembly, so it was critical to cool them correctly. Once cooled, the nose pieces were inspected, the flash trimmed off and put into a jig that would open up the front and back for the push-rods. Once open, further inspection of the coating of the wing rod inserts to make sure they were coated properly and completely with the polyethylene.

The tail cone: The tail cone was made from pre-preg epoxy and fiberglass. Pre-preg fiberglass is fiberglass that has the resin and catalyst already mixed and impregnated into the fiberglass. In order for this to not go off prematurely, it is kept frozen in a chest freezer until ready for use. Each tail cone was made doing the following:

First you must make a mandrel. From RTV silicone you make tail cone mandrel with a thick top, somewhat like a safety cone you see the electric company use. You spray a release similar to PVA onto the silicone.



Next on a special table, you lay the pre-preg fiberglass on the table and cut four sections per the pattern. You carefully roll the mandrel onto the fiberglass and it will wrap around the silicon mandrel five times. You have to be careful not to have any wrinkles.

The tail cone machine is a large tool steel mold in two halves, mounted vertically on linear bearings. It is electrically heated to the proper temperature and has a couple of relief grooves for excess resin to escape. You close the mold and place the bladder into it and close the top piece that clamps the bladder in place, lock it into place and turn the pressure wheel to completely seal the bladder. This top piece has an air valve and you open it to put 125 psi into the bladder, forcing the five layers to become one and forces the excess resin out. Because the mold is heated to the proper temperature, it only takes 3 minutes to fully cure the epoxy tail-cone.

The tail cone is removed from the silicone bladder and put onto a mandrel and trimmed to length both the front and the back. There is some sanding to remove the parting line from the mold and it is ready for assembly. The process is repeated over and over and when you get a large amount of cones, you are ready to begin assembly.

The tail piece: The tail piece or dorsal is an injected molded piece that has 3 parts. The two sides and a bell crank. Early Hobie Hawks were ABS (white) but Hobie later went to Lexan (clear). A special glue was used to carefully assembly these parts.

Fuselage assembly: The fuselage has four components. The nose is polyethylene for strength and durability, the fiberglass is for strength and is temperature stable, it will not grow or shrink with temperature which would change the trims and the dorsal was injected molded for strength in a critically small area that had to hold the horizontal surfaces rigid.

The first thing is to slide the dorsal into the tail cone. Because the tail cone is tapered and you are sliding something into it from the small end, the tail piece is slotted to allow it to be compressed and slid into the tail cone. Special glue that will glue fiberglass and Lexan together is applied and the dorsal piece is inserted into the tail cone. One other piece I have not mentioned yet is a small ABS lock ring that is pushed inside the dorsal fingers to keep them tight against the fiberglass cone.

I mentioned earlier about cooling the polyethylene nose pieces. Every fiberglass tail cone was the same size, therefore for it to mate with the nose cone, the nose cone must be the right size too.

The tail cone/tail piece assembly is put into a jig using the horizontal stab wires to hold them level. The nose pieces is also put into this jig using the front wing alignment rod to keep everything parallel. Again special glues are used to glue the polyethylene nose piece to the fiberglass tail assembly. The jig has linear bearings and the two pieces are slid together. The fit is so tight that they can be removed from the jig and allowed to cure. Once cured the fuselage was again put into another jig and the main and alignment wing rod holes drilled through the fiberglass. Remember that the fuselage has the inserts molded in but are then covered by the fiberglass tail cone.

Although I never produced the RTF versions, it is interesting how they were done. The nose piece, tail cone and tail piece joints were filled with putty. Once cured they were sanded as was the nose piece and tail

cone mold parting lines until smooth and the tail piece was hand sanded with fine sandpaper. The nose piece was then flame treated and the entire fuselage was painted with a primer and then a two part urethane paint in a large paint booth, just like a car. Our original Katie Hobie Hawk still has the original paint and it looks great.

Hobie told me he spent most of the time concentrating on the wing plan form, dihedral and airfoil. Ultimately it is the wing that makes the airplane, the rest is dressing on the cake. Boy did Hobie dress up the cake.

Chapter Three - Wing

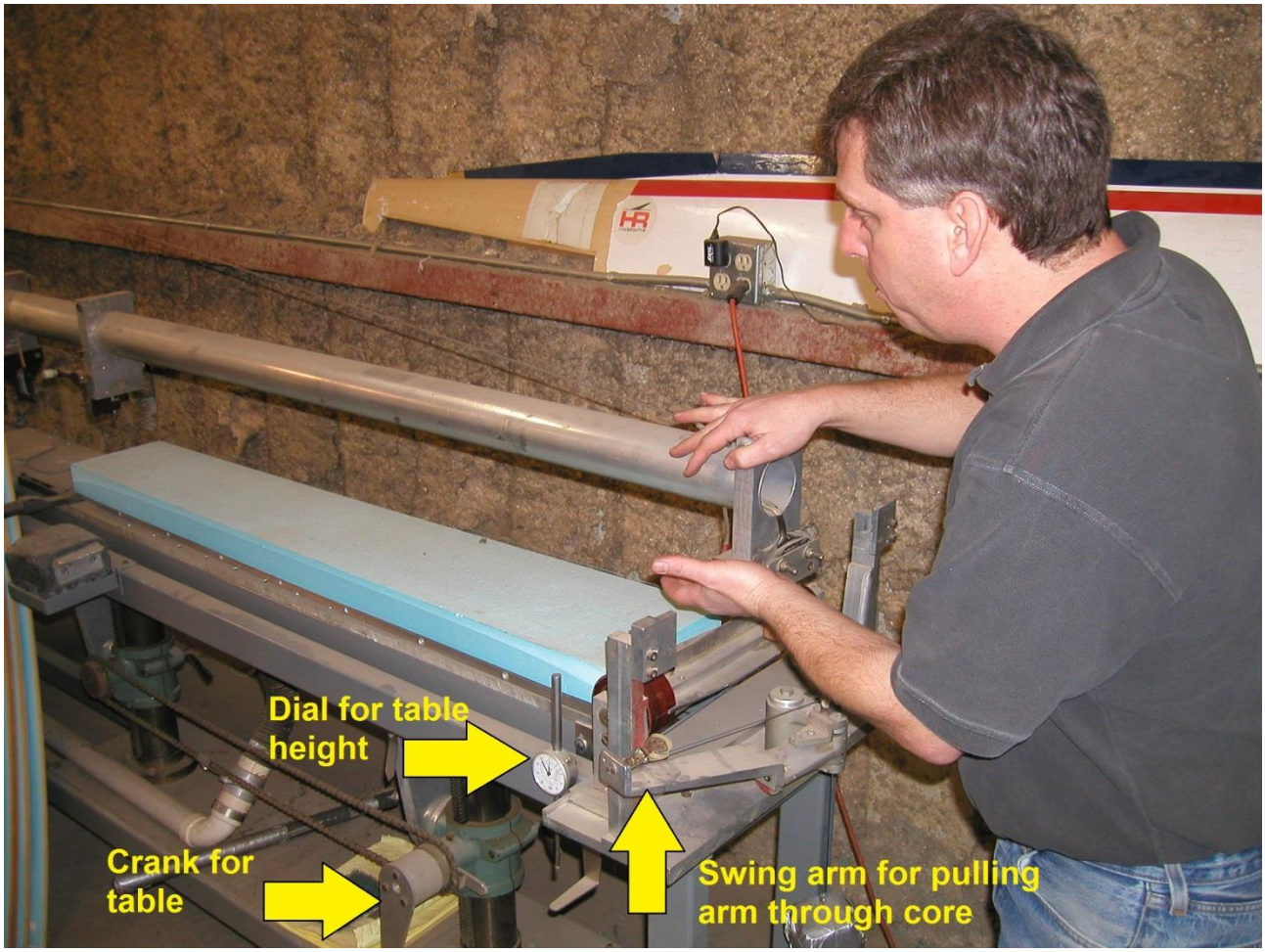
Rather than guessing, as I do not remember with any certainty about the airfoils origin I will only state that it is relatively thin under camber section and it works incredibly well. Brian Joder published information he got from Hobie I believe, so if you need to know more information, go here: http://hobiehawk.com/hist.html and scroll down to the bottom.

The Hobie Hawk is not a floater, that is to say, you cannot fly it just above a stall but it is very efficient and will thermal in light lift as long as you keep it going but still has the ability to penetrate pretty strong breezes on the slope. The elliptical dihedral was chosen for control and low drag. As with all wings and especially long slender wings that are common on sailplanes, wash out is extremely important.

Special Note: One very obvious trait the Hobie Hawk had was what many called the Hobie Rock. Because of the low drag clean aerodynamic wing design, when you would turn by inputting rudder command, the airplane would yaw, this means the tail of the airplane would go left if you wanted to turn right. This means that the right wing would speed up gaining lift, the left wing would slow down losing lift and the plane would bank into the turn you wanted. The opposite control would reverse this input. The Hobie Rock resulted in over control and rapid reversing of the input. All airplanes do this but because of the weight of the wings, the moment of the fuselage back to the rudder and the low drag of the wing the wings would gain and lose lift thus causing the appearance of a rock. I proved on many occasions that if you would reduce the input during normal flying the unwanted tendency would nearly disappear. I would set my Hobie Hawk up the way I liked it, ie a lot of throw because I like to do aerobatics and on dual rate, I would set it up very gentle. I would then offer interested parties or people complaining about the way Hobie Hawks flew a chance to fly my Hobie Hawk. I would hand them the transmitter with the HH in the air on low rates. They were always amazed how smooth my HH flew and asked me what I did to fix the problem. I told them I did nothing and I would reach over and flip it onto the high rates and immediately they were all over the sky. Moral of this story is most problems related to flying a Hobie Hawk was not the plane but the set up. I race also when I was younger and no racer lost the race due to their performance, it was always the race car or motorcycle was to blame, right? (I publish an article in RCM magazine, suppose to be anonymous but they published under my name called " End the Hobie Rock". We proposed buying a rudder kit from us that included a new rudder, a long pivot pin, and a control horn piece and pictorial instructions. The object was to make a fin extension that glued to the top of the dorsal leaving a straight hinge line that went from the top of the rudder down to the bottom. Now you had less rudder, eliminating the counter balance part of the rudder and reduced the effectiveness of the rudder. Now it was more difficult to over control the Hobie and thus make if fly more smoothly. It was a crutch, I agree but like training wheels on a bicycle.....once you got confidence and learned how to fly a Hobie you could go back to a standard rudder. Now you could fly smooth or kick it up to high rates and do lots of fun things.

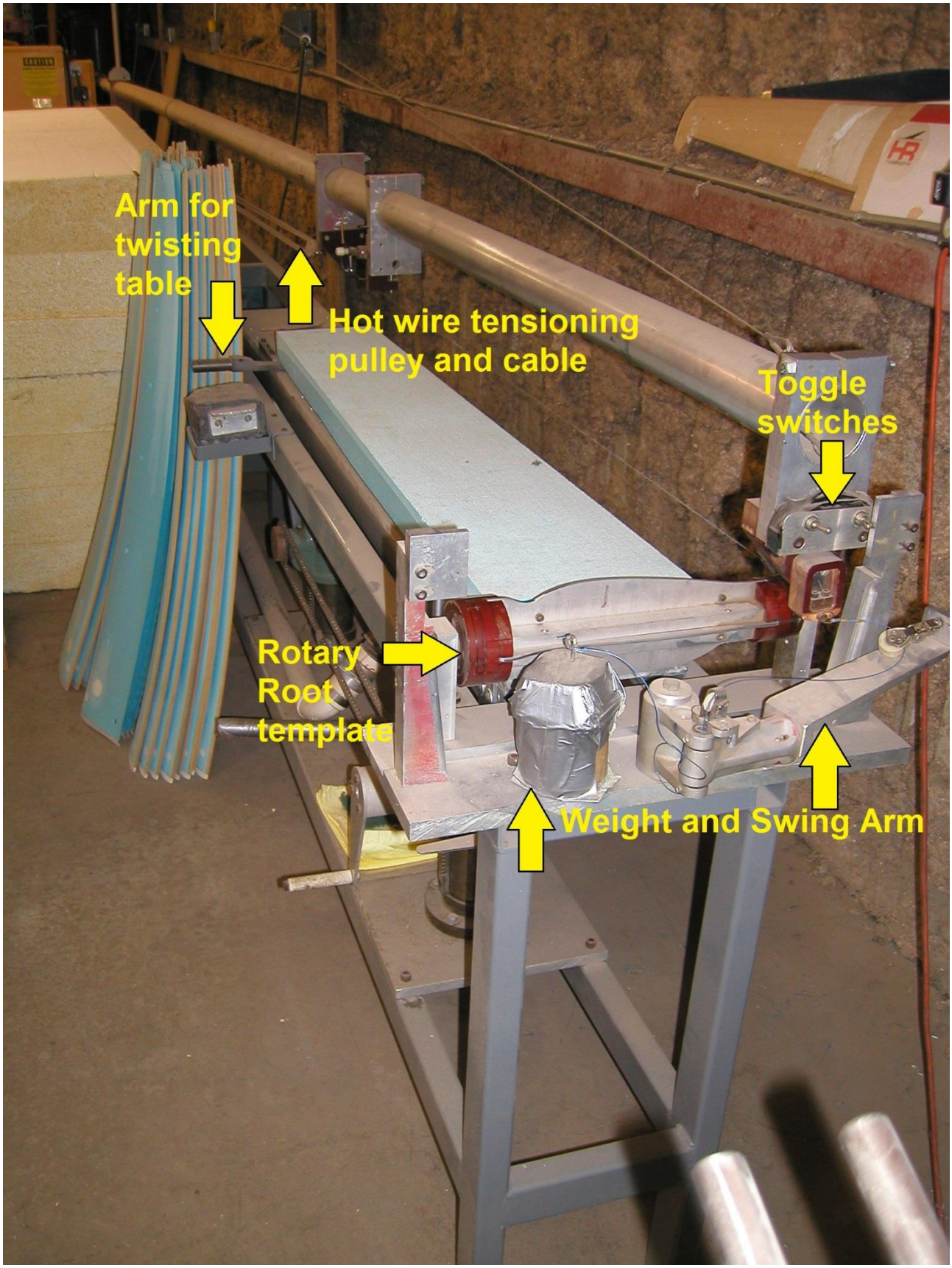
Recently there was a discussion about how the Hobie Wing was made and there were some interesting theories expressed. Here is an in-depth explanation of how it was actually done.

The Foam: We used the same foam Hobie used originally, a 2 lb extruded polystyrene blue foam. For you experimenters out there, be very careful about cutting other types of foam....some can be deadly...so read the warning sheets on them before cutting them with a hot wire.



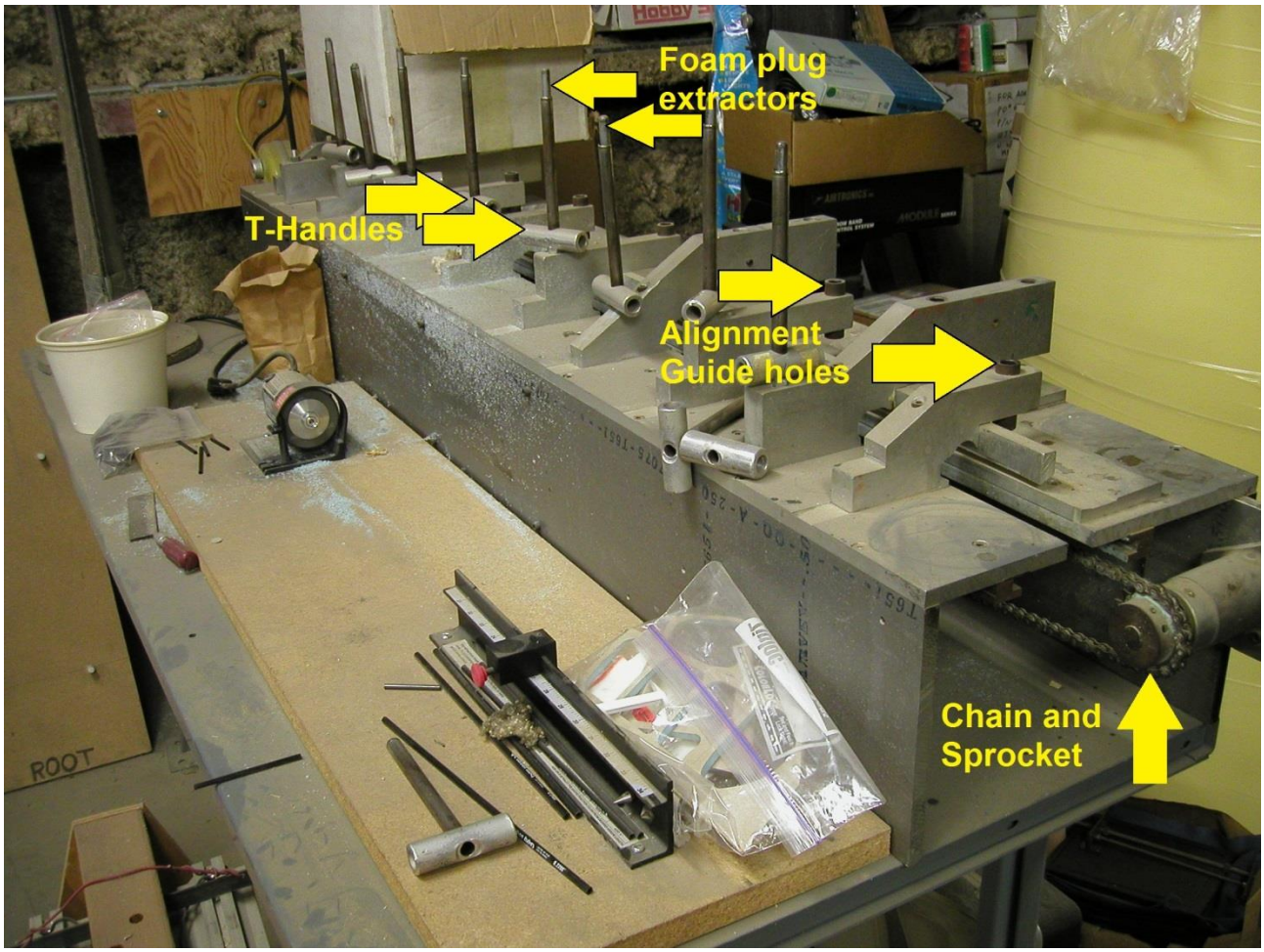
The hot wire machine was made out of a Hobie Cat sail mast! I do not remember how long it was but the idea was to have the pivot point make an arc the was the same as the taper of the Hobie Hawk wing. It was something like 20 or 22 feet long and the hot wire was tensioned by an 80 lb weight. The wire was about 5 or 6 feet long, attached at the end of the boom and attached to a pulley. A braided cable was attached at the pivot area, run towards the hot wire, around the pulley and back to another pulley and down to the 80 lb weight. Originally I was told to use stainless wire but after three or four cuts, the wire would expand when heated but could not lift the weight back up so it slowly became thinner and would eventually break. Big noise when that weight hit the ground....scared the crap out of us, was dangerous and usually ruined the foam block we were cutting. To solve the problem I looked up a company in El Monte, CA that was suppose to be really experienced in special wires, besides it had a great name...Bob Martin Wire Co. I went there to visit and spoke to Mr. Bob Martin and explained my problem. He suggested using Inconel wire because it does not loose its physical characteristics with heat. I asked to buy 10 feet of .020 and he explained that the smallest roll was 100 feet. Oh! I said....and bought a roll, kind of expensive. I tried it and the problem was solved, so it was worth it.

The table that the foam sat on was actually a vacuum table that held the foam down. This table had to be carefully adjusted up or down to begin cutting. If the table was too high you could not get all the panels out of the block, if the table was too low the wire would exit the top of the block. Notice in the picture, there is a dial indicator showing the height of the table. Down below you can see the crank and chain that moves the table up and down. At the tip side of the table there was a lever that could be lifted up or down, twisting the foam core to create wash out for either a right or left wing. (Not shown is the 2 foot long torque tube that slides over the arm shown. A lot of pressure was needed to twist the table.) At the root side of the table there were templates that were mounted on a rotary fixture where you rotated with top, bottom, right or left airfoils. I think the foam was 2½ or 3 inches thick and we could get 2 sets of wings out of each block.

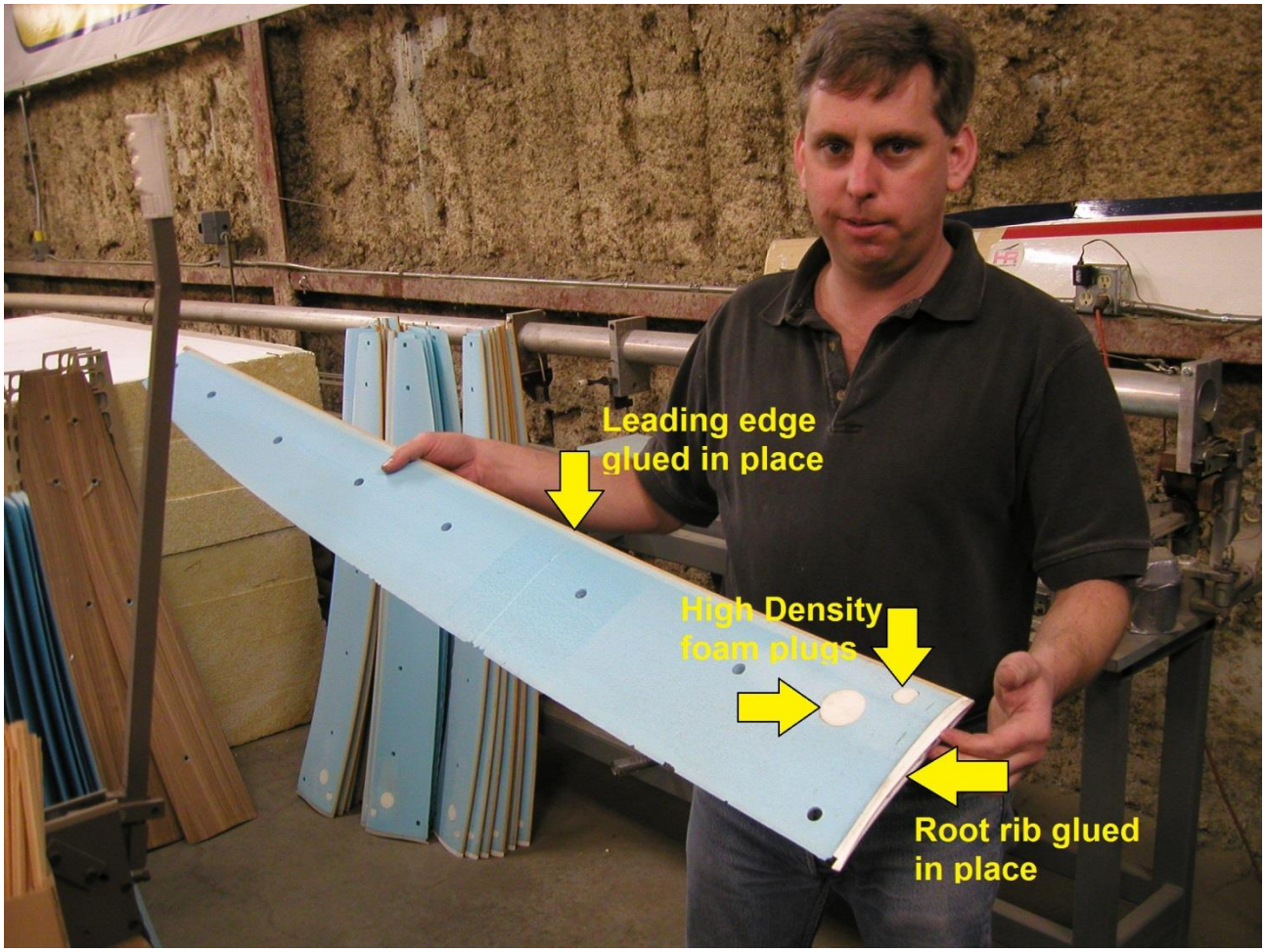

Arm for twisting table
Hot wire tensioning pulley and cable
Toggle switches
Rotary Root template
Weight and Swing Arm

Once the foam was cut into proper lengths and planform we were ready to cut some cores. When cutting, with the twist engaged the hot wire, which also was driven horizontally by a weight on pulleys on a swing arm, would enter at the leading edge and exit the trailing edge with toggle switches to turn off the wire when it exited the foam. During the tours we use to offer, everyone was amazed that a straight wire could cut and exit in an arc, the same arc you see in the trailing edge of the Hobie Hawk wing. The secret was the twist in the foam for the washout.

Now we have a basic flat foam core....the core were then placed into a fixture and a series of alignment holes were punched into the cores using T-Handle tools. These holes will be used for several operations later. This fixture has a router mounted on a slice and is driven back and forth with a crank , sprocket and chain. While in this fixture a router with a special bit will trim the leading edge to the proper shape and grove it for the hardwood leading edge to be glued on.

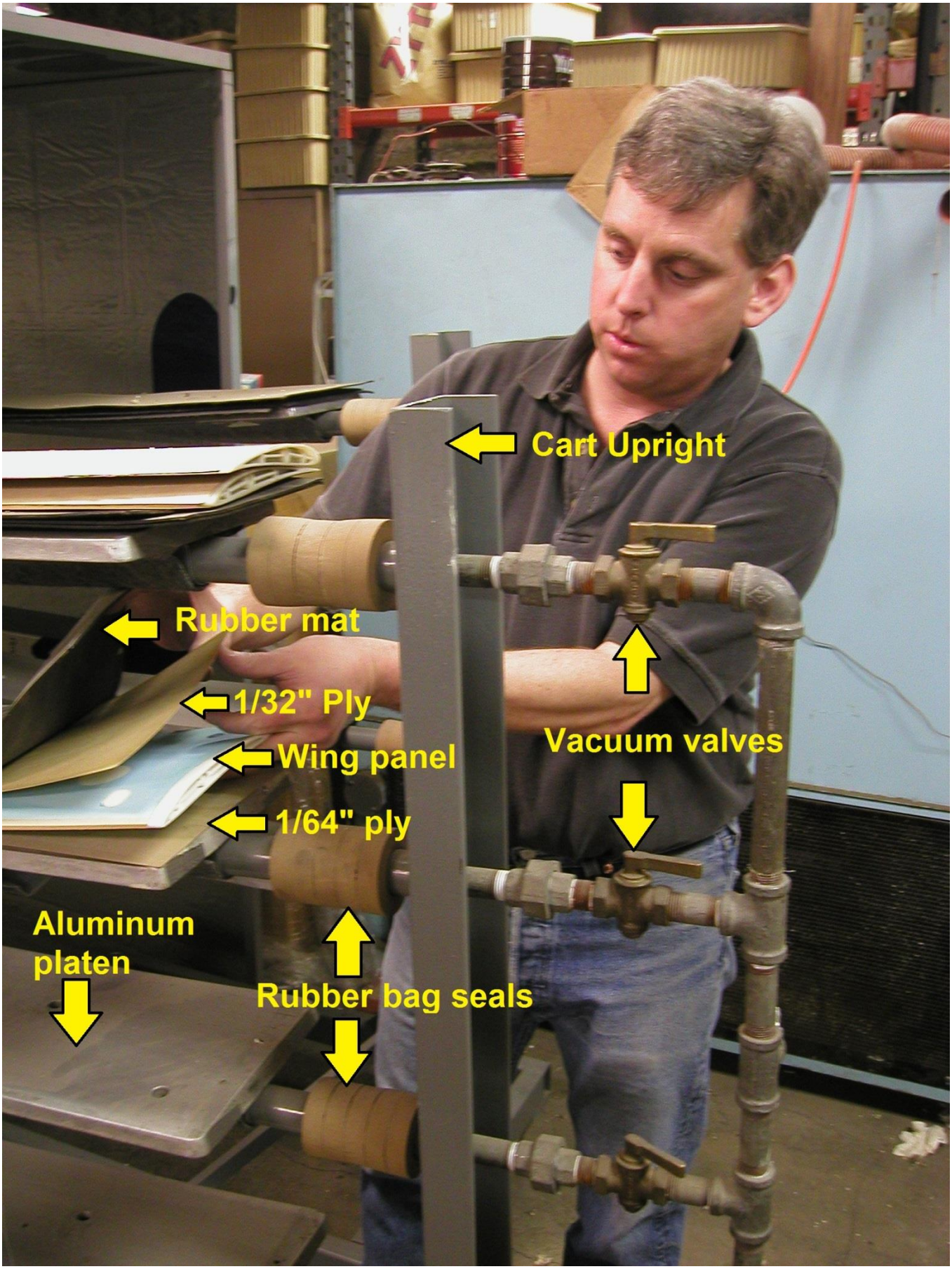


We had special leading edges made from spruce. We glued them in place. There are two hi density foam plugs inserted. We drilled these holes with a jig. These will be the extra strength needed at the termination points of the wing rods. This is 20 lb. white foam. We then sanded the leading edges and the foam flush with the cores. Next we glued the injected molded glass-filled root pieces in place.



There were several carts for making the wings. These carts were made of steel, had four steel casters on a rectangle base and a upright. On the upright there were four aluminum platens in the shape of the bottom elliptical dihedral and the airfoil. These could be arranged to make four left or right wings or could be set up to make two right and two left. The washout was cast into the platens also. There was a large pipe that went through the upright and these platens were bolted to them. On the other side of the upright there was a manifold that had valves for each wing. Between the upright and the wing platen there was a thick foam O-ring with a hose clamp to clamp and seal the bag.

We would take one 1/64th in.(.4 mm) and one 1/32nd in. (.8 mm) birch ply wing skin (they were die cut to shape with alignment holes) and run them through a special roller machine that applied the proper amount of a special two part glue to one side of each wing skin. This glue we bought in 55 gallon drums and the second part was a powder. Once mixed you had a limited time to use is before it began to gel and cure. Working rapidly you would assemble the bottom skin, core and top skin, carefully aligning all pieces and also the holes in the aluminum platen with Delron pins. Once all pieces were placed properly, a 1/8 in.(3.4 mm) rubber mat was placed over the wing, a bag was slid over all, sealed with the hose clamp and vacuum was applied by opening a valve. Once the cart, 4 wing panels, was loaded, the cart was pushed into a hot box, around 120 degrees and left to cure for about 30 minutes. NOTE: It was imperative that you had the wings under vacuum while the glue was still liquid so that it could penetrate the foam. If not, the wings could delaminate.

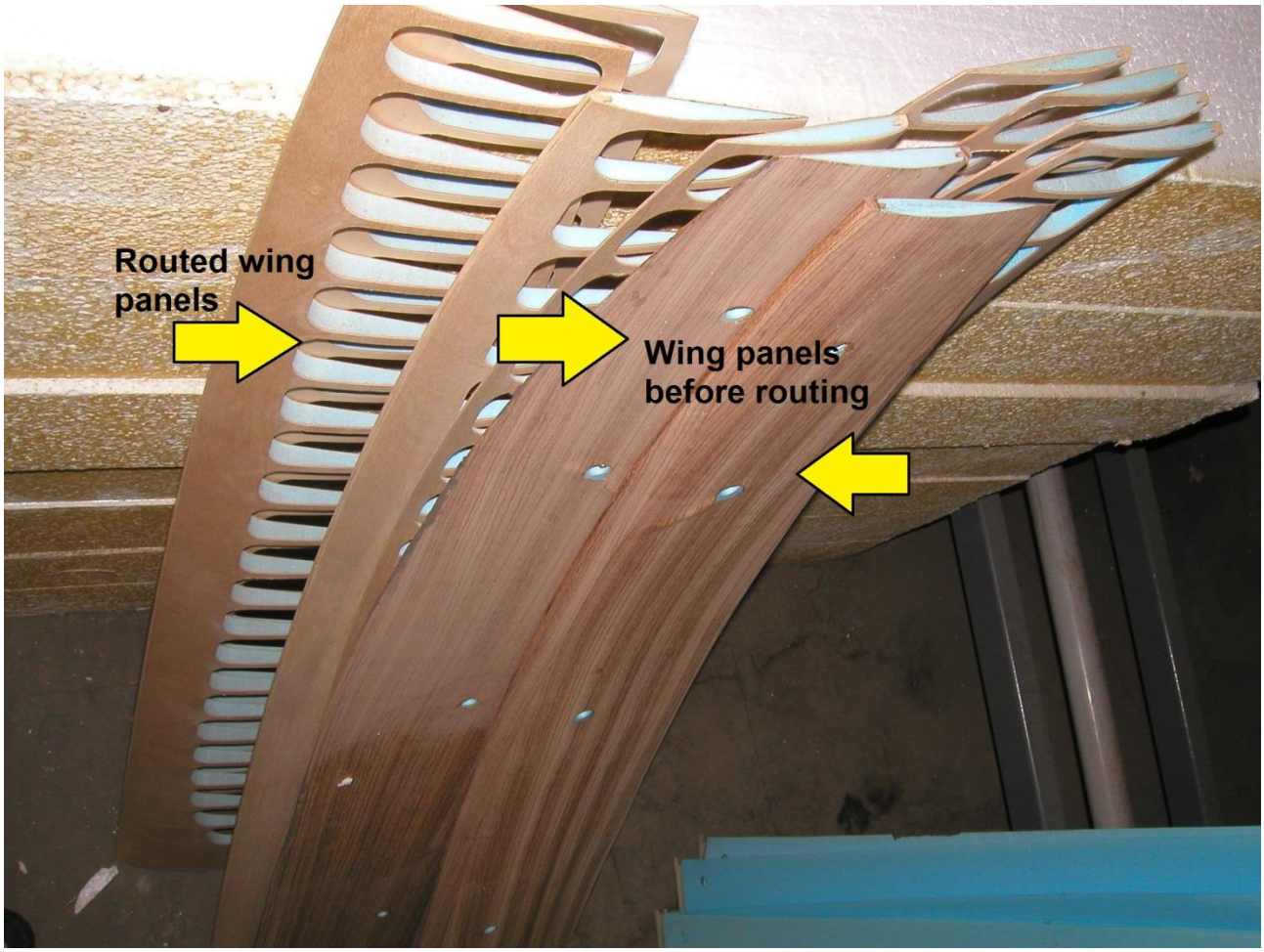

Cart Upright
Rubber mat
1/32" Ply
Wing panel
1/64" ply
Vacuum valves
Aluminum platen
Rubber bag seals

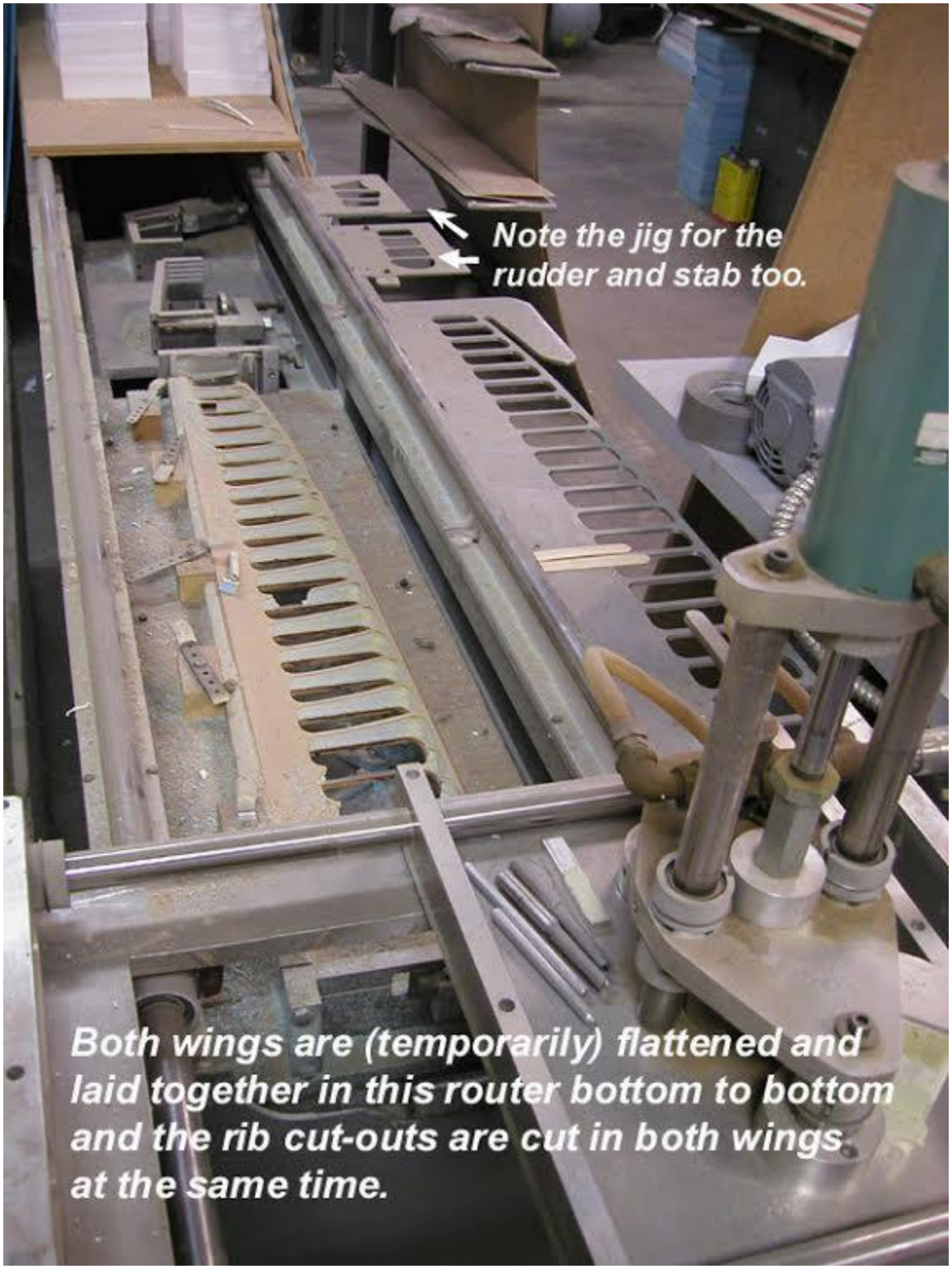
When cured, the carts were removed from the oven and the wings were allowed to cool. Next we removed the the wing panels and set them aside for further processing. You had to be very careful handling these panels as the glue that seeped out was hard as glass and razor sharp.

The next process ruined more wings than any other process. Each wing had to be drilled for the main wing and alignment rod brass tubing. Special bits that had huge flute valley to remove the plastic. If the bit got a little hot, the plastic would soften and not exit properly, cool and when the bit got beyond the root plastic and enter the foam area, it would blow a hole through the foam and plywood skin rendering the panel unsaleable.

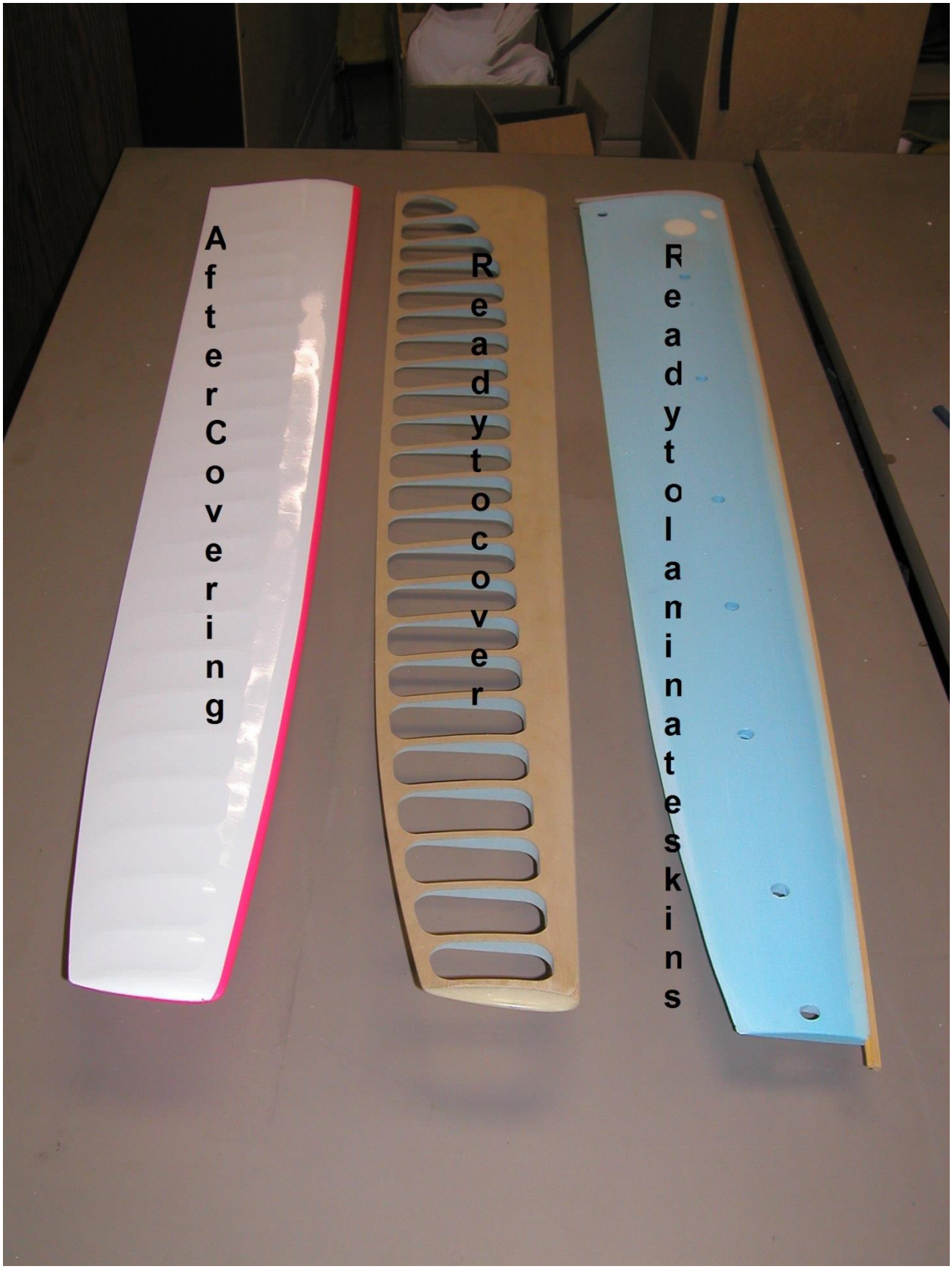
NOTE: This did not happen too often but when it did, I would shorten the wing to 3 foot (.9 M)by cutting off the damaged area. When I got a damaged left and right wing, I would hollow out the root to install a injected new root piece. Again I would carefully drill for wing rod tubes and then adjust the clamps in the routing jig and I would have SLOPE wings.

Back to stock wings. The next process was to route the wings. Amazing as it seems, the two panels, one left and one right, were put into the routing jig, back to back. They were then flattened out, tips clamped and a plunge router would route out the wings. The jig was a large machine that had an air router mounted on a pana-graph arm with a ¼ in aluminum template to follow. The pair of wings were routed, unclamped and then final dressing, sanding any fuzz that was in the bays, planing the leading edge and final inspection before shipment.





One final note: This applies to all of the machines and fixtures needed to produce the Hobie Hawk. Ingenious design but if you followed the basic procedure, each and every machine would produce an exact copy of the part before. Whether you bought the 10th or the 10 thousandth, you could buy a Hobie Hawk replacement wing, rudder, elevator, fuselage, canopy or any other part and be confident they will fit your plane. Besides the unique and beautiful design, this consistency that the tooling provided is the true legacy Hobie left behind.


After Covering
Ready to cover
Ready to laminate skins

Chapter Four – Stabs and Rudder

I do not remember the hot wire machine for the rudder and stabs. I do remember that they were cut with multiple wires. I have a vague image of the foam blocks, from the same foam as the wings, sitting vertically with a clamp that held the block in place. The arm with the wires was brought down around templates and cut the stabs and a different jig cut the rudder foam blanks. As I remember it, we got four or more elevators and four or more rudders from each block.

The horizontal stabs had hardwood leading edges glued in place and the root injected molded pieces were glued on. They were then sanded and prepared for the 1/64th (.4mm) ply skins to be applied. Special aluminum platens were also used to vacuum bag the horizontal pieces. Like the wings, there were holes in the foam, die-cut ply skins with holes for alignment and glued, vacuumed bagged and cured.

On the rudder, after the foam cores were cut and prepared, the injected molded rudder piece with control horn was glued into place and a wood wedge was glued to the bottom and a wood piece glued to the leading edge. As with the stabs, the die-cut 1/64th in. (.4mm) ply skins had glue applied, aligned and vacuum bagged in their special platens.

If you go to, and I highly recommend you do, www.hobiehawk.com, click on History on the left, scroll down to the Shop Tour of Ross models and check out the photos. On the left, second one down shows the air router that cut all those bays in the Hobie Hawk wings. Also notice the fixtures that routed the stabs and rudders. We told you the wings were done in pairs, back to back and notice that the rudders were done two at a time and the stabs were done stacked 4 deep.

NOTE: *Most all of the photos in this article came from* www.hobiehawk.com. *Our sincere thanks to Brian Joder for their use.*

Once the rudders and stabs were routed, like the wings, light sanding around all of the bays and final inspection. They are ready for shipment unless they were finished so the injected molded stab tips and the rudder top were glued into place and sanded smooth. The rudder bottom had to be sanded round too.

SPECIAL TIP BEFORE COVERING

Because when shrinking, the covering will also heat the air in each bay and cause ballooning. For this reason I will drill a small hole or take a large paper clip and poke a hole in the foam rib between each bay. These holes allow air to move between bays and reduces the ballooning considerably. Try to keep the holes in a line for appearance purposes.

FINISHING THE WINGS & TAIL FEATHERS

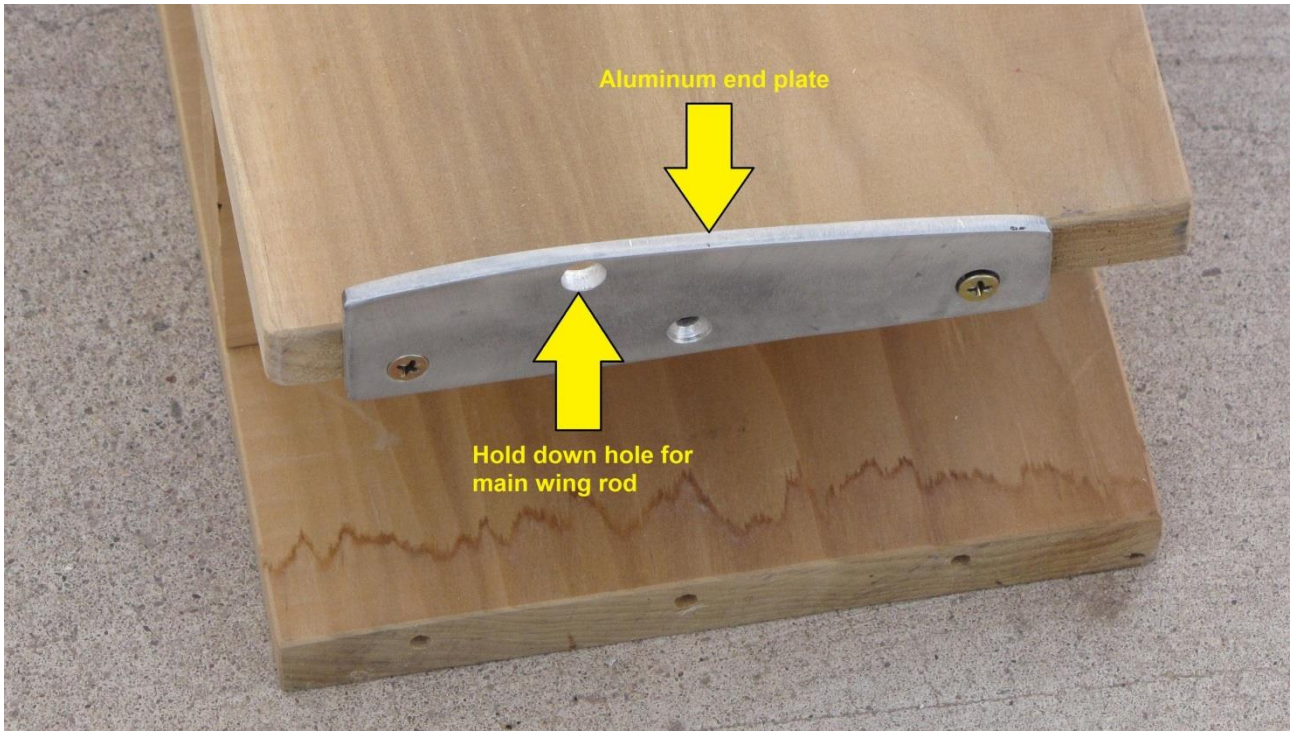
As with everything else, the Hobie Hawk required a different approach in finishing. The elevators and rudder were pretty much the same as with other planes, but care had to be taken not to get the foam too hot or it could melt.

The wings however were a different story. Many people have covered the wings very carefully and slowly. Having manufactured the Hobie Hawk and insight into how Hobie covered them wings, I have always covered them by flattening out the wing on a special board designed for covering the wing. At the end of this chapter is a picture of the board Brent Daily built for me to cover his stock Hobie Hawk wings.

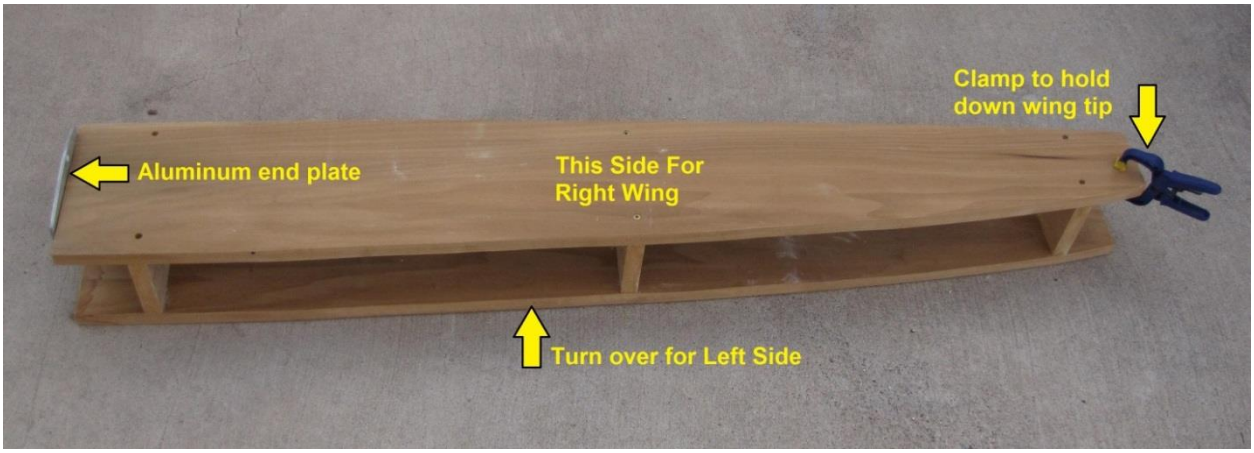
The idea is that with the elliptical dihedral and curve of the airfoil, covering material does not like to bend two directions at the same time, so if you flatten the wing, you only have the curve of the airfoil to contend with. This is accomplished by the building board.

HOBIE HAWK COVERING BOARD

If you want to build a board for covering your Hobie Hawks wings the way the original was done, here is how to build a covering board. The planform is the shape of the wing only 1/4” smaller and you have the left and right. You have to make a metal end plate, it can be 1/16” up to 1/4” and aluminum is easiest to work with. First thing I would do is drill the 5/16” hole in the end plate. Using your wing, slide the main wing rod through the end plate into your wing. Clamp the wing to the covering board so the bottom is flush with the end of the board. Using a small drill, drill a hole near the leading edge and one near the trailing edge through the end plate and into the covering board. You will need to open up the holes through the end plate to accommodate the screws and mount the end plate onto the board. Next draw a line over the airfoil and one at the bottom of the board. Remove your end plate and wing. Saw, grind, file the end plate so that when mounted it will hold your wing in place and be aligned with the bottom of the board and the top of the wing. Mark and drill the holes and mount the end plate on the other board.



Originally they used a U-shaped piece of plastic to hold the tip down flat, but as you can see in the photo below, I used a clamp.



Now that you have the covering board, covering is much easier. Place the covering on the wing, tack around the parameter, then seal leading edge and trailing edge, iron down to the ribs. Just be sure to leave a few extra inches at the tip so you can heat and pull the covering over the round wing tip.

Once you are done covering the wing top, release the clamp and finish shrinking the covering with a heat iron or heat gun. Be careful not to put too much heat anywhere as damage to the foam core can occur.

Covering the bottoms is pretty simple. I always tack the parameter and then I seal the covering to the center of the under camber ribs before I finish sealing to the leading and trailing edges. Once again, be careful not to over heat the foam core.

The horizontal stabs and the rudder were covered in a normal fashion. Again the Monokote was die cut to shape.

NOTE: *I have read various reports from individuals that talk about doing piece work on covering wings, rudders and elevators. They also talk about when Hobie sold the business that he told these individuals to keep the wings, rudders and elevators and the* ***rolls of covering.*** *I am not disputing these claims in any way, but in my conversations with Hobie he stated that he had ladies in house that did the covering. He also stated that he had the Monokote die-cut for wings, rudders and elevators. To support his statement when I had the wing, rudder and elevator ply skins die-cut for my production runs, they told me they use to die-cut Monokote too. At the rate that Hobie was producing Hobie Hawks, it is quite possible that the ladies could not keep up and Hobie had outside sources sand and cover the parts on a piece basis. In any case, here I only make reference to the facts that I am sure of.*

PUSHRODS

The push rods were fiberglass and the 2-56 threaded metal rods were bent into a tight U shape on the non-threaded end and with hot melt glue, were glued into the fiberglass rods. You could adjust the rods by heating the hot melt glue with your covering iron and then small final adjustments could be done with the clevises.

NOTE: *If you get out your old Hawk or acquire one, test the firmness of the rod in the push-rod. If these come loose in flight, chances are that you will severely damage your Hawk. If the rod is solid after giving it a good pull, fine, but if it moves just a little I would recommend rebuilding the push-rod. Originally they were glued with hot melt glue, but epoxy with mico-balloons can be used.*

The hardest part for most people was getting the elevator clevis attached to the bell crank in the tail piece. Nylon clevises were stock but some would replace them with metal clevises but both were difficult to attach.

THE READY-TO-FLY (RTF) VERSION

Hobie told my that he wanted a sailplane that he could fly at or near his house on the beach. The went into various Hobby stores and there simply was nothing available ready to fly. If you ever met Hobie, he may seem very laid back with his causal clothing but his mind was always in high gear, so he did not want to spend a lot of time building....he wanted to fly. This is when he began to conceive the Hobie Hawk. He really did not want to create a sailplane because it represented a lot of time and work away from his REAL JOB! Eventually he decided if he was to design a sailplane, he wanted it to be the best he could make, typical Hobie. He decided to create two, actually three versions of his plane.

For those use to and willing to put a little time into the plane he created the kit version. Finishing this version entailed shaping the leading edge on the wings, elevators and rudder, covering them. *Unlike future manufacturers of the Hobie Hawk, Hobie's kit version had a painted fuselage.*

Next came the covered version where the fuselage was painted with an automotive urethane paint, the wings and tail feathers were covered in a variety of colors, yellow, red, orange and blue. I believe you could have opaque or transparent in those colors. I do not remember any other colors available.

Finally there was the ultimate RTF.... A real Ready-To-Fly sailplane, I believe the first in the world. This version was not only covered, but it had a radio installed and was balanced. Just charge the batteries and FLY!

I cannot in a million years explain to you the balancing apparatus Hobie had, but you would set the finished Hobie Hawk with radio gear installed on this contraption, add the weight through the hole cut in the cockpit until it was balanced. I know that it also was able to balance the Hobie Hawk, nose to tail, wing tip to wing tip at the same time.

Covering was another item we did not offer in the Hobie Hawks we sold. To my knowledge, Hobie was the only one that offered a pre-covered, pre-painted and in some cases available with a radio installed and balanced. Hobie wanted to ship complete airplanes, some even with radios as well as the unfinished kit versions we sold.

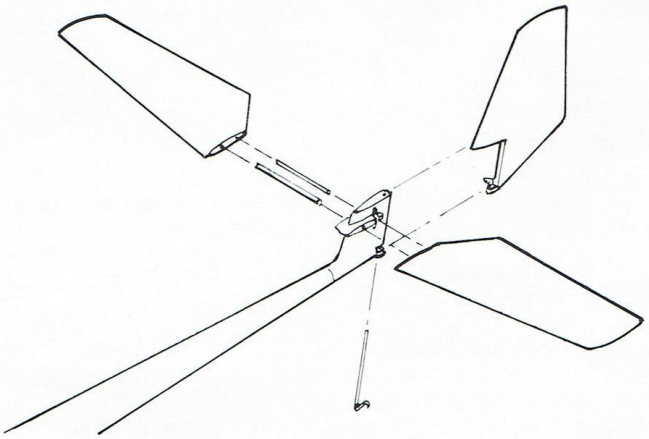
Hobie told me that he had ladies that sat at a special table with a jig that allowed the wing to be flattened, clamped and covered. At one end of this jig was an aluminum plate with the shape of the top of the airfoil and flush with the top when held in place. Using a main aluminum wing rod through the plate and into the wing would hold the root down while she would flatten the wing and use a U-shaped plastic clip to hold down the tip. She would then take the color of Monokote for that wing, lay it on the flattened out wing panel and seal it around the edges and onto the ribs. She then released the tip, finished sealing the Monokote and using a heat gun, finish shrinking the covering. Next she or someone else would apply the bottom covering in normal fashion, without flattening and finish the wing. I am not sure if each lady did the same thing over and over or if she did a whole wing. I do know that the Monokote was die cut to the shape so there was very little if any trimming. I have also heard from other sources that the prep of each wing (installing the wing tips, sanding the fuzz from the ply in the bays and rounding the leading edges) and also covering was outsourced and paid as piece work.

BALANCING

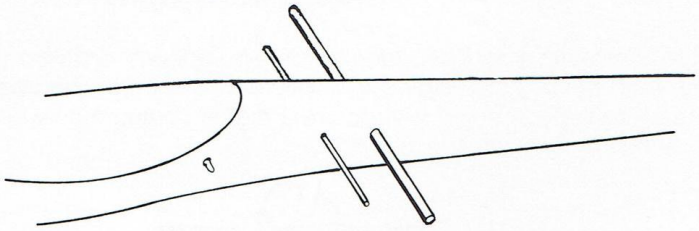
Hobie came up with a unique way for customers to balance their Hobie Hawk, a way I have not seen before or since but obviously works. Pictures cover most questions so at end of this chapter is a copy of the balancing page from the manual.

Because the Hobie Hawk can be temperamental if slowed too much, I would error on the nose heavy side, at least until you become proficient flying this great sailplane. That means more like 20” to 20½” from the table up to the base of the tail skid.

Install tail surfaces **complete** with wires.

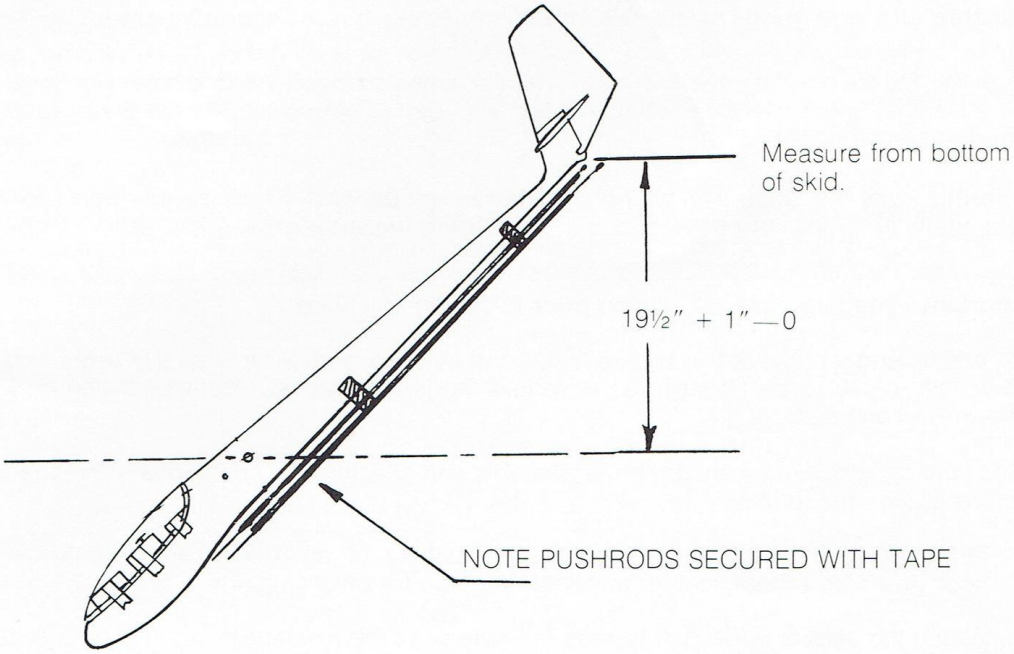


Install main wing rod and front wing wire.



The model is now prepared for balancing.

Support the complete fuselage by resting the main wing rod on a table edge and balance by moving radio gear fore or aft to the suggested balance point shown. (See illustration.) Add lead or other suitable material as required.



Chapter 5 will be the final chapter and I am still trying to locate, scan and present promotions and ads for the Hobie Hawk over the years. Some very creative and beautiful ads were run by the various companies that produced the Hobie Hawk. One such ad prompted a phone call from a Madison Avenue Ad agency, looking to get a piece of the action. When asked what they would charge for such an ad, they calmly said they could do an ad like this one for around $20,000.00. That is just the production cost folks, and has nothing to do with the placement in a magazine.....They obviously do not understand the hobby industry but shows the quality and creative effort the Hobie Hawk inspired. I will keep looking and will present as many as I can.

If any of you have access to any Hobie Hawk ads or reviews, please let me know. Until then.....I hope you have enjoyed the look inside the manufacture of the magnificent Hobie Hawk.

Bob

Chapter Five – Hobie Ads

Chapter 5 will be the final chapter and I am still trying to locate, scan and present promotions and ads for the Hobie Hawk over the years. Some very creative and beautiful ads were run by the various companies that produced the Hobie Hawk. One such ad prompted a phone call from a Madison Avenue Ad agency, looking to get a piece of the action. When asked what they would charge for such an ad, they calmly said they could do an ad like this one for around $20,000.00. That is just the production cost folks, and has nothing to do with the placement in a magazine... They obviously do not understand the hobby industry but shows the quality and creative effort the Hobie Hawk inspired. I will keep looking and will present as many as I can.

If any of you have access to any Hobie Hawk ads or reviews, please let me know. Until then...

This appeared at the end of Chapter Four and my sincere thanks to Tony Johnson, Greg Garrett, Curtis White, Mitch Brian and Gerry Yarish at Model Airplane News for sending me ads and copy to help complete this final chapter. Sorry if I missed someone.....but thanks to everyone who helped out. I spoke to Dennis Ross and he does not remember running any paid ads, so I will present what I have collected and those sent to me because of the Hobie Tales thread on RC Groups. I tried other threads but received no response.

I am going to include price lists, order forms, promotional flyers, Magazine Covers as well as purchased placed advertisements and anything else I can find.

I welcome any comments and any additional info that I could include in this article. I encourage everyone that reads this to also go to RCGroups, and read the posts in the thread called Hobie Tales. I am sure you will have a story or two you would like to add that will be of interest to the many thousands of Hobie lovers worldwide.

I have published reviews before but if there is a desire to have all information together I can re-publish the review here. Let me know.

Bob

Available Mid-March

Complete Kit $89.00.
Easy to finish glue-on tips—sand—paint—cover

Finished Plane $129.00.
Entirely ready to fly.
Monokoted and painted (your choice of colors, orange, white, or yellow)
Just install R/C gear.

Weight—30 oz. less R/C gear
Wing Length—99 inches plus
Wing Area—590 square inches/4.1 square feet
Wing loading—(with 8 oz. R/C gear) 9.2 oz.
Airfoil (undercamber)—our own design

Above, you see my shot at R/C sailplanes. I have put a tremendous amount of time, thought and tooling into the Hobie Hawk, trying to use the right materials in the right places to give the highest strength-to-weight ratio possible. It's not indestructible, though surprisingly strong. I think you'll find the design and construction unique. Even more interesting are the Hobie Hawk's flight characteristics. Elliptical dihedral gives you the best of both worlds of dihedral and polyhedral. The thin undercamber air foil gives high lift and penetration, making for excellent thermal and ridge soaring.

Hobie Alter

Construction:
Wing
Top Skin—1/32" plywood
Inner Core—High-density foam
Bottom Skin—1/64" plywood
Root Rib—Injection-molded A.B.S.
Leading Edge and Wing Tips—Pine
Stabilizer and Rudder
Same as wings except both top and bottom skins 1/64" plywood
Fuselage
Nose Cone—Rotationally molded of cross-linked polyethylene (a tough resilient material)

Tail Cone
6 layers pre-impregnated epoxy fiberglass formed under 150 P.S.I. at 300 degrees
Tail Piece
Injection-molded A.B.S.

Hobie Model Company
Department 100
33081 Calle Perfecto
San Juan Capistrano, California 92675
A Division of Coast Catamaran Corp.

See your dealer first. If not available, write us direct. Dealer inquiries invited

HOBIE HAWK

Reprinted from April 1974 R/C Modeler Magazine

In the world of surfboards and catamarans the name Hobie is synonymous with "the best," "the fastest," and many more superlatives too numerous to mention among devotees of both sports. And, mention a competitive product to Hobie owners, and you will evoke a degree of loyalty and pride of ownership so aggressive the debate is over before it began.

And the man behind that name is Hobie Alter, who has been associated with surfing since 1954 when he quit making surfboards for friends and started making them for a profit. By 1966 Alter had fifty dealers in the United States selling two hundred and fifty boards a week at an average price of $130.00. It was during that era that Hobie Alter, himself, became a blazing light in tandem surfboard competition as well as setting a worlds record for the longest ride on a surfboard, riding one of his own boards in the wake of a large boat from Long Beach to Catalina, a distance of 26 miles. It was also during this period of time that he decided to start production on a fast, small catamaran with a lot of strength and no center board. Thus, Coast Catamaran, Inc., was launched and, today, this company employs 350 persons and has distributors throughout the United States, Japan, France, South Africa, Brazil, and Mexico City. The company has sold more than 20,000 14' and 16' catamarans and about 1500 12' monocats.

Today, the forty year old chairman of the board of Coast Catamaran Corporation in Irvine, California, still works sixty to seventy hours a week researching and developing new products which he will personally "imagineer" - - - a combination of imagination and engineering - - - into production items which will have the high quality and value associated with the Hobie name.

And one of these products is the Hobie Hawk, an 8' radio controlled sailplane which has been under development for the past few years and is only now in production.

There is nothing unusual about most sailplane kits currently on the market. Exactly the opposite is true of the Hobie Hawk - - - there is nothing ordinary or usual about this graceful sailplane. It is the end result of imagineering, dedication, and thousands of hours of research, testing, and finding new methods of production techniques that would result in what Hobie Alter hoped would be the finest sailplane available to the RC enthusiast today.

And, in our opinion, Hobie Alter has done just that. As you purchase the Hobie Hawk, it is completely ready to fly, minus radio. Looking for all the world like a full scale sailplane, our prototype was so sleek that it was impossible to tell all of the revolutionary engineering ideas that went into its make-up. As an example, the front section of the fuselage is cross-linked polyolifin which can literally be beat with a hammer without breaking or cracking. From the trailing edge of the wing to the leading edge of the stabilizer, the fuselage is fiberglass, six layers of it blown into a steel mold. The tail section is a unique injection molded ABS plastic unit – each of the pieces telescoping into the other. The joints are so smooth that it is virtually impossible to tell where the sections have been joined and, as you receive it, the Hobie Hawk is completely painted in one of several colors in a finish that is virtually abrasive resistant.

The wings and stabilizer are just as revolutionary as the fuselage since they were molded of rigid foam and covered with a layer of 1/32" thick plywood on top and 1/64" plywood on the bottom. In order to reduce weight, the material between "rib" sections have been completely routed out and the wing formed in an elliptical dihedral mold. Finally, the wings and stabilizer are completely covered with MonoKote to match the fuselage. Finally, a thick tinted canopy blends into the fuselage and is mounted with two sheet metal screws. The result is a ready-to-fly sailplane unlike anything you have seen to date.

How does it fly? The prototype we tested had a set of 8' and a set of 6' wings, both with elliptical dihedral. And, if the appearance is impressive, the flight performance is even more so. This machine, the Hobie Hawk, is one of the highest performance sailplane kits available today. In our test flights, including several fun-fly contests, it equalled or exceeded even the great thermal chasers such as the Grand Esprit, the ASW-17, the Windfree, and other well known contest designs. And this our test pilot did with the smaller set of wings which were primarily intended for slope soaring! The Hobie Hawk can be flown extremely rapid and has far more control response than that to which you may have become accustomed. But, it also has excellent low speed characteristics - - - in other words, the speed envelope is extremely wide - - - far more so than the average sailplane. As an example, the Hobie Hawk with smaller wings has been clocked at near record speed with absolutely no adverse effect. And, the machine is so rugged it can take more abuse than any model aircraft we have tested to date. The novice sailplane flier may have a little difficulty at first unless he tones down the amount of control available, but once he has mastered the Hobie Hawk, he will be capable of flying almost any other type of aircraft – if he should have the desire to do so, which is doubtful!

The name of the game in competition sailplane flying is efficiency - - - a combination of efficiency both on the part of the man and his aircraft. With the Hobie Hawk we have come closer to 100% efficiency than ever before. Now it is simply up to you as the competition pilot. And if you're interested in just sport flying, you can't do better than this fantastic new sailplane from Hobie Alter and Coast Catamaran. It will be available at your dealers shortly, if not by the time you receive this magazine, and will be priced at approximately $129.00. If you're not a "buy-it-in-the-box" type soaring enthusiast, Hobie has a kit form of the sailplane which will be unpainted and "un-MonoKoted" and sells for approximately $89.00. See your dealer or write to Hobie Model Co., Dept 100, 33081 Calle Perfecto, San Juan Capistrano, California 92675.

Either way, you'll end up with a sailplane that you just won't believe until you fly it. Take it from us - - - we've been there, a hundred flights or more - - - and we still find the performance of the Hobie Hawk almost unbelievable.

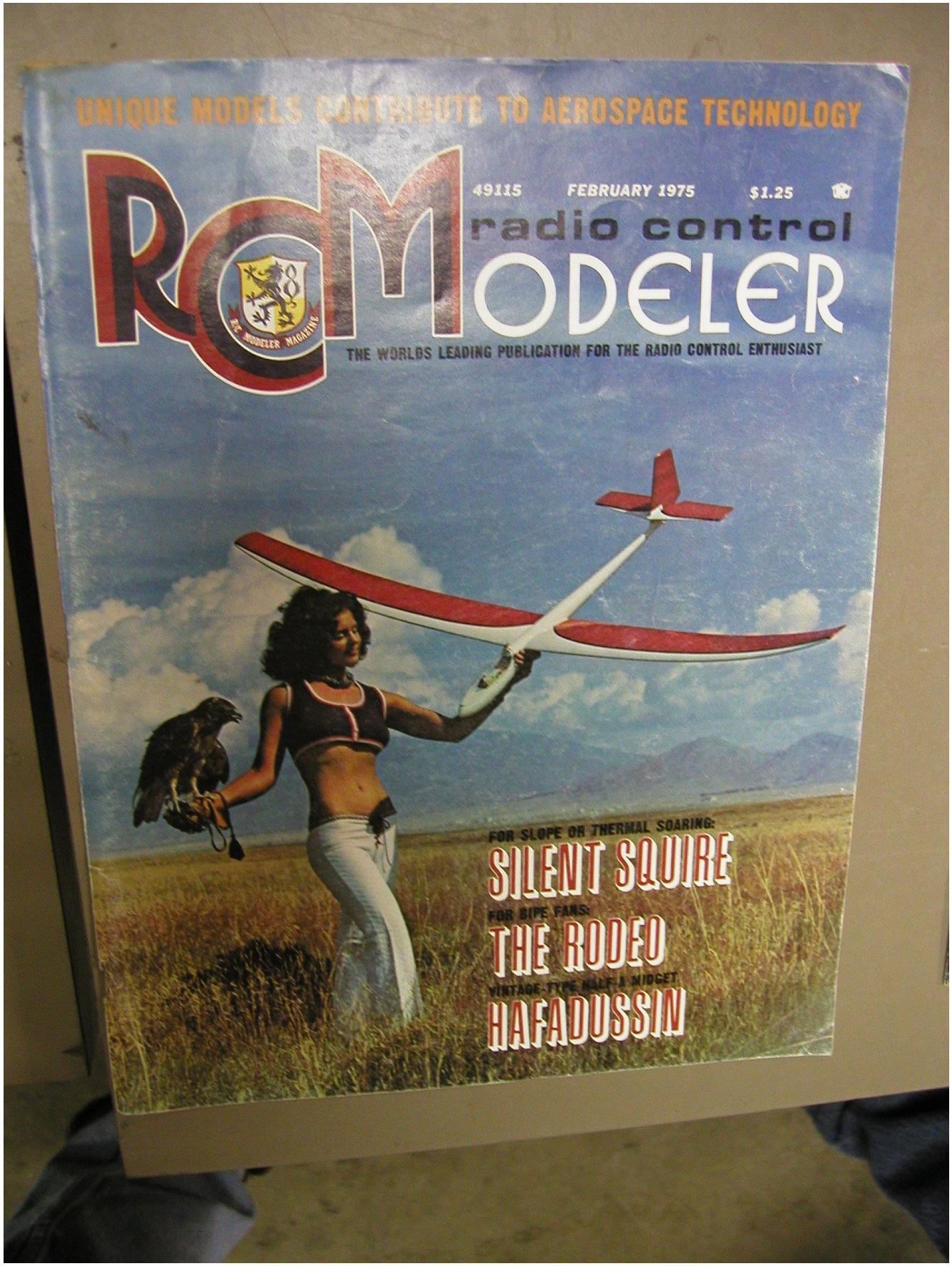
Tested, Approved, and Recommended by RCM.

HOBIE MODEL COMPANY

Dept. 100, 33081 Calle Perfecto, San Juan Capistrano, California 92675 / (714) 493-0991

A Division of Coast Catamaran

Prices Subject to Change


UNIQUE MODELS CONTRIBUTE TO AEROSPACE TECHNOLOGY
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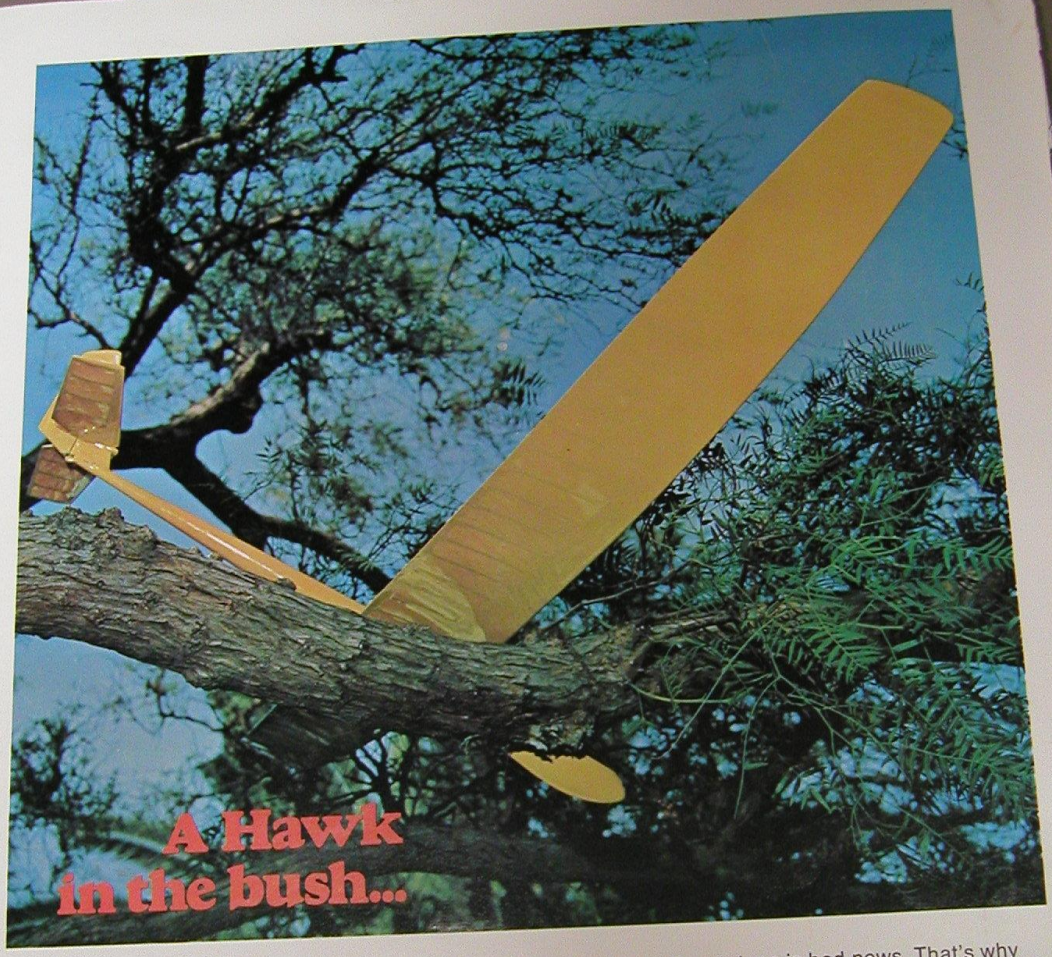
radio control
MODELER
THE WORLDS LEADING PUBLICATION FOR THE RADIO CONTROL ENTHUSIAST
FOR SLOPE OR THERMAL SOARING:
SILENT SQUIRE
FOR BIPE FANS:
THE RODEO
VINTAGE-TYPE HALF A MIDGET
HAFADUSSIN



is worth three of any other sailplane

An accident with your R/C sailplane is bad news. That's why we designed the Hawk to take the bumps it's bound to get, with construction so rugged it's practically indestructible. Because of the highest strength-to-weight ratio in the industry (that's no accident), the Hawk is bound to be tougher and more durable than all the rest.
Owning a Hawk won't make those trees stop hitting you—but the pain is a lot less!

HOBIE HAWK®
Bird of Play

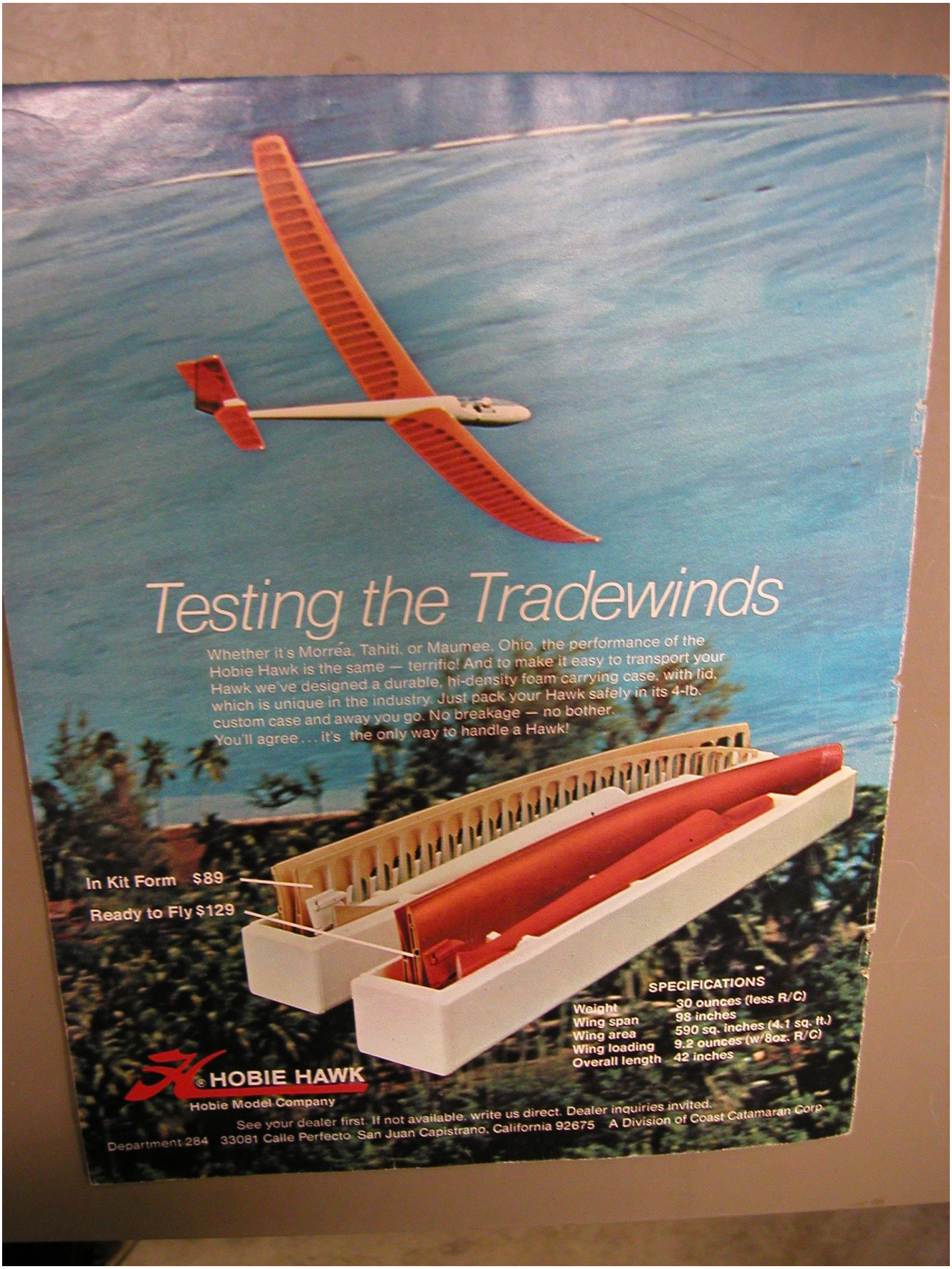
Specifications

Weight	30 ounces (less R/C gear)
Wing span	98 inches
Wing area	590 sq. inches (4.1 sq. ft.)
Wing loading	9.2 ounces (W/8 Oz. R/C)
Overall length	42 inches
Color choices	White, Yellow, Orange

Price
$ 99 (Finish-it-yourself Kit)
$129 (Completed. Just add R/C gear)

Hobie Model Company A Division of Coast Catamaran Corp. • 2026 McGaw Ave. • Irvine, Ca. 92705

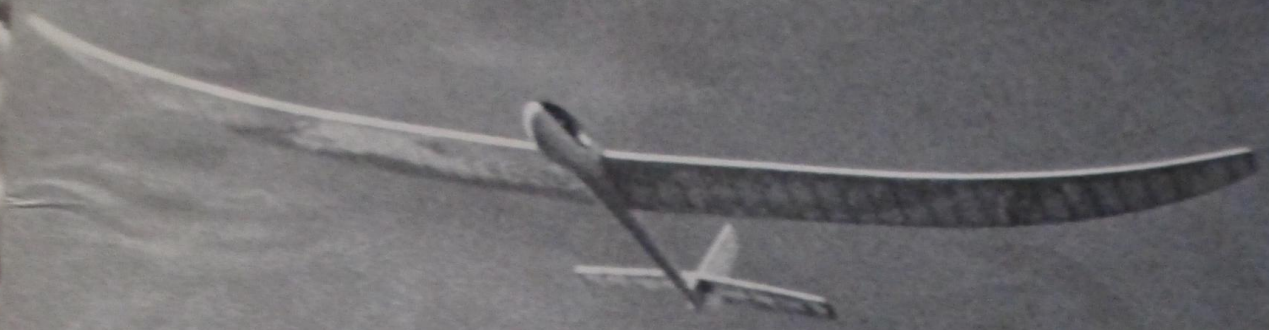

Hobie Hawks
San Felipe, Mexico was the scene of the 1st Hobie Hawk soaring contest. (Kodachrome transparency by Sandy Banks)


Testing the Tradewinds
Whether it's Morrea, Tahiti, or Maumee, Ohio, the performance of the Hobie Hawk is the same — terrific! And to make it easy to transport your Hawk we've designed a durable, hi-density foam carrying case, with lid, which is unique in the industry. Just pack your Hawk safely in its 4-lb. custom case and away you go. No breakage — no bother. You'll agree . . . it's the only way to handle a Hawk!
In Kit Form $89
Ready to Fly $129
SPECIFICATIONS
Weight 30 ounces (less R/C)
Wing span 98 inches
Wing area 590 sq. inches (4.1 sq. ft.)
Wing loading 9.2 ounces (w/8oz. R/C)
Overall length 42 inches
HOBIE HAWK
Hobie Model Company
See your dealer first. If not available, write us direct. Dealer inquiries invited.
Department 284 33081 Calle Perfecto, San Juan Capistrano, California 92675 A Division of Coast Catamaran Corp.


We know what you'll be doing December 25th
Hobie Hawk
...and 26th
...and 27th
...and 28th...
When you get a Hobie Hawk for Christmas, the rest of the year is bound to be great! And what's more, you aren't stuck oohing and aahing over socks and ties you didn't want.
The Hawk is the kind of present you dream of getting, but seldom do. It's beautifully designed and surprisingly strong — easily one of the most rugged sailplanes in the industry. You can choose a Hawk kit to finish yourself, or completed, ready for the RC gear. Either way, you get a fully detailed instruction and operation manual, plus a lightweight, hi-density foam carrying case.
Let's face it, there are a lot of dull things you could get for Christmas — but the Hawk isn't one of them.
HAPPY HOLIDAYS
from Hobie Model Company.
HOBIE HAWK
Bird of Play
Specifications
Weight 30 ounces (less RC)
Wing span 98 inches
Wing area 590 sq. inches (4.1 sq. ft.)
Wing loading 9.2 ounces (5/8 oz. RC)
Overall length 42 inches
Distributors & Dealers: Ask about our new pricing structure.
Hobie Model Company
2026 McGaw Ave., Irvine, California 92705 • (714) 979-2880 • A Division of Coast Catamaran

RADIO-CONTROLLED SOARING

A Beautifully Simple and Simply Beautiful Experience

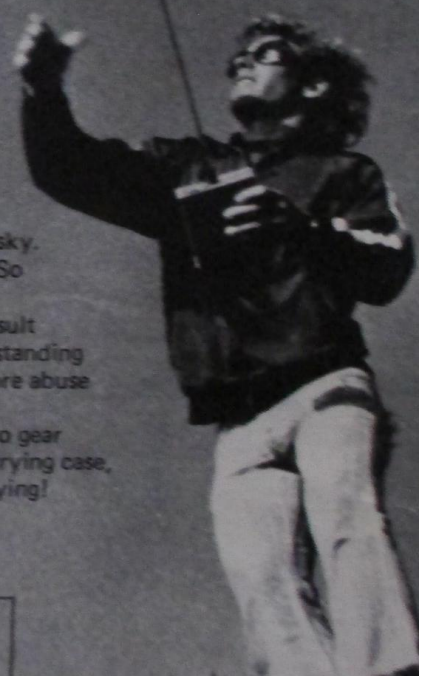


Becoming a pilot is easier than you'd think. Radio-controlled soaring lets you experience the joy of flight. . .without the risk. You can do it alone or with friends. . .almost anywhere and any time. A gentle toss off a sloping hill or a "sling-shot" launch with a hi-start is all it takes to become airborne.

Provided with lift, a sailplane will do amazing things. The power is external. It comes from the air, whether in the form of a strong breeze or a thermal updraft, a column of heated air that rises as it warms up and will carry a sailplane along with it. The skill is to find that lift and ride it into the sky.

But radio-controlled soaring is more than just a sport. . .it's an experience. So if the idea intrigues you, you owe it to yourself to fly the finest R/C sailplane available today. . .the HOBIE HAWK. This sleek, graceful "bird" is the end result of thousands of hours of design and technical research; its performance is outstanding in both thermal and ridge soaring. And, the HAWK is so rugged it can take more abuse than any model aircraft tested to date.

As you purchase the HOBIE HAWK, it is completely ready to fly, with radio gear already installed. And because every HAWK comes with its own protective carrying case, it is easily stored in the trunk of your car — ready for spur-of-the-moment flying!



HOBIE HAWK (completely ready to fly with radio installed) . . . . **$399.**
(California residents add 6% sales tax)

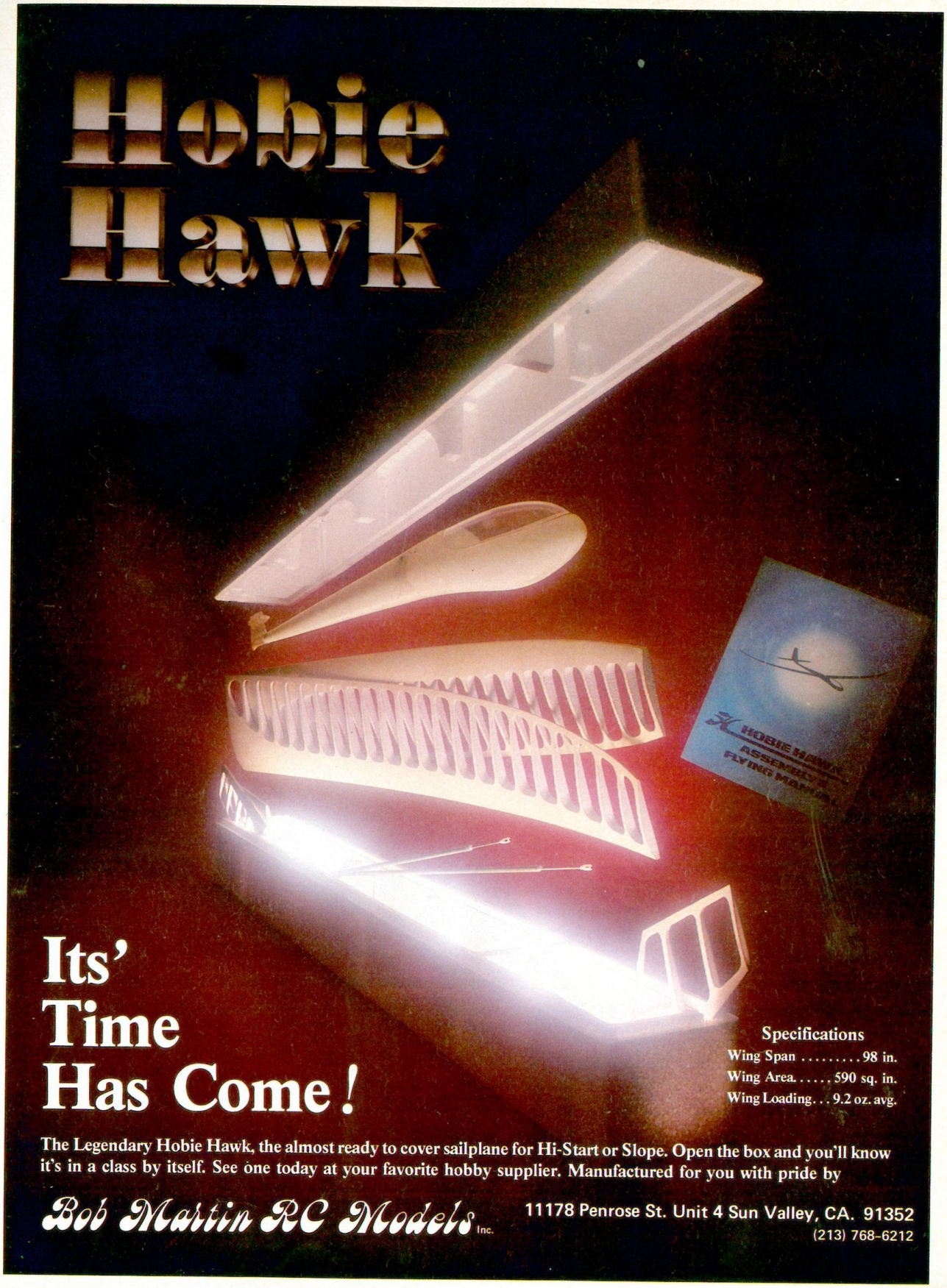
☐ Please send me (freight prepaid) _____ Hobie Hawk(s). (Specify color: Blue/Orange/Yellow/Red.)
I have enclosed my check or money order.
☐ Please send me more information on the Hobie Hawk and radio-controlled soaring.

Name _____ Address _____
City _____ State _____ Zip _____
Mail Coupon To: **HOBIE MODEL COMPANY**, Dept. RCS, 2026 McGaw Ave., Irvine, Ca 92705

HOBIE HAWK *Best of Play*
A Division of Coast Catamaran Corporation


MODEL AIRPLANE NEWS
August, 1974 • $1.00
ON THE COVER
Hobie Alter of Hobie Hawk fame doing his thing with his new famous glider which features elliptical dihedral, extraordinary engineering and superb flying qualities. Photo by David Gooley, David Gooley & Associates.


MODEL
AIRPLANE
NEWS
November, 1978 • $1.50


Hobie Hawk
Its' Time Has Come!
Specifications
Wing Span ..... 98 in.
Wing Area..... 590 sq. in.
Wing Loading... 9.2 oz. avg.
The Legendary Hobie Hawk, the almost ready to cover sailplane for Hi-Start or Slope. Open the box and you'll know it's in a class by itself. See one today at your favorite hobby supplier. Manufactured for you with pride by
Bob Martin RC Models Inc.
11178 Penrose St. Unit 4 Sun Valley, CA. 91352
(213) 768-6212

From Brian Joder of HobieHawk.com:

I went to the 20th anniversary Hawkus Caucus at Torrey Pines CA that Dennis Ross sponsored. I have several Hobie Hawks that were given to me by one of Hobie's test pilots, Chuck Moore. Chuck was a founding member of the Orange County Soaring Society and used his AT-6 to give aero tows back during the club's early days. Hobie met Chuck due to his interest in gliders. One bird was all orange, just like the one in the advertisements. It had a smoke tinted canopy just like the one in the pictures in advertisements and was unbuilt. Chuck told me it was a demo model and it was the one used for those ads. Chuck gave me the hawks back in 1979 and there were several dorsal assemblies, each made with a different type of plastic. There was a dorsal with a fin and a hinged rudder experimenting with curing the Hobie "rock" as it was then known. There were also modified nose sections of the fuselage, one was shortened, and the other lengthened. Obviously they were playing with the nose moment arm. Chuck did a lot of testing ideas, design mods, and materials for Hobie. One of the unique flight characteristics is due to the wing having the center of pressure aft of its maximum airfoil thickness. Hence the sudden and sometimes violent stall when it got slowed down. Chuck said that was a problem that Hobie never cured, in part because the tooling was already made and too expensive to change to a new airfoil, and also it was not a problem if you kept the speed up. In 1982 I ran into a guy that used to finish off the wings, rudders, and stabs for Hobie on a piece work basis. He picked up the rough, routered panels, glued on the tips, installed the brass tubes, sanded the LE root and tips, and sanded the routed rib bays smooth then returned them to Hobie in Capo Beach and picked up another batch. The fuselages were sent to an auto body shop where they were filled, sanded, and primed. They were then painted. He (Hobie?) asked me to repair an old navy Oscilloscope so he could tune his receivers up and troubleshoot them. For that he gave me a box of un-sanded wings (4 sets in all) and a box with about 20 sets of stabs along with a couple of rudders, tips, and tubes for everything.

Chuck told me that when Hobie got divorced that the glider company got sold to Midwest Products and Hobie told his "sanders" just to keep what they had as the company had been sold. I remember the original Hobie surf shop in Dana Point CA where Hobie's home was just above it, his wife could call him to lunch! They used to have a box full of wings and stabs in the shop so you could grab a spare set if you crashed and continue flying. This was really convenient because back in those days we flew off Dana Point and if you racked it up real good we were only 15 minutes from the shop and you were back in the air! A lot of guys had different colored wings because of that! Hobie also had a magazine that covered soaring events for the Hobie Hawk, there were huge turnouts back than as it was a new fad. The Hobie Hawk was and still is very difficult to land as it just does not want to slow down! This was due to the low drag and the aforementioned airfoil. If you tried to slow it down a nasty tip stall and snap roll occurred in less time than it took to say "Hobie". This undoubtedly destroyed the bulk of Hawk wings and we took to catching the Hawk due to that. Some guys hinged the rear of the canopy and rigged a latch and limit line to the front of the canopy that released it when full down was applied. It was an interesting form of an airbrake/spoiler that helped the Hawk sink on final approach. A lot of us would launch, stay up for over an hour, and land only once. That was the other way of dealing with the Hawk's landing difficulties. We used to watch Hobie fly his Hawk off the sand at his beachfront home on Beach Road in Capo Beach. He had an RS Systems single stick 2 channel Orange Box (made by Bob Novak) in one hand, and a cocktail in the other. There was enough lift generated by the gentle slope of the sand at the shore's edge to create lift for the Hawk and, of course, Hobie was a masterful pilot. My only question was what was Hobie drinking? Scotch and water? Or perhaps a Tequila Sunrise (very 70's) or a Harvey Wall Banger??!!

Sometime in the 1980's a fellow flyer from Salt Creek gave me a pair of Midwest Hawks that had been ordered by San Clemente Hobby Shop. I still have them and have not built them. I had just purchased a Bob Martin Hobie Hawk and did not need to build them but the price was right! I still have the original orange Hobie Hawk that has been through at least 2 sets of wings, one set was destroyed when a Dominator flew through my port wing panel. It still has the original rudder that has somehow survived all these years. This weekend I took the Hobie Hawk out to Dana Point and flew it, there is no air as smooth as there. It's come over 5000 miles over the Pacific Ocean with no obstructions, you just can't beat it! This was the first time I have flown the Hawk since the 1994 Torrey Pines 20th anniversary meet and it gave me chills.

All the guys were flying EPP foamy combat wings they were in awe about the Hawk. So much so the landed to watch and asked me to do runs up and down the slope so they could get a better look at it in flight. There were a lot of “ooohs” and “wows” as I did a couple of slow rolls and snap rolls along the cliff face below foot level. It’s breathtaking to see the crashing waves and scenery behind the Hobie as she effortlessly performs her soaring tasks. I thought of Hobie Alter and Mark Smith two people who all RC sailplane pilots are immeasurably indebted to. Today the places where Hobie Hawks used to reign supreme have all been closed off and homes or hotels have been built. The lift is still there but there is no place to land. I went home and realized how lucky we were to have enjoyed the Golden Era of slope soaring with Hobie Alter. I should have flown more if I could have but I can still sneak past the barbed wire and fly the headlands for now. At least I took the Hobie Hawk to its flying home site for a good session and it knew it was home! So, the Demo Hawk still lives. It has flown 100’s of hours off Salt Creek and the Dana Point Headlands as well as “Hospital Hill”, one of Hobie’s favorite thermaling sites behind San Clemente Hospital. It also made the 20th Anniversary at Torrey Pines as well as a true veteran.

From Bob Martin on RC Groups:

In the early days, launches like this were not uncommon with the Hobie Hawk. The placement of the tow hook and the angle of launch was key to successful launch.

Hobie Hawks could not be launched with the nose pointed straight up like most of the thermal sailplanes of the day. If you did, before the wing could begin flying, the plane would violently snap right or left and usually did not end well. If, as instructed, you pointed the nose nearly level upon release, the wing would start flying and the Hobie would quickly arc upward and you could get a good strong launch. Again, this was one of those " DO IT MY WAY OR ELSE" traits of the Hobie. Although I preferred the slope, in promoting and selling the Hobie Hawk we had to visit flat land sites and demo the Hobie and how to launch it. Katie use to launch her Hobie and say to the guys, "If a girl can do it, you can!"

It is sad that you were witness and influenced by those bad launches and you never had the opportunity to fly this wonderful sailplane.

Bob

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Most snap rolls on launch were caused by improper wing washout. The wing planform lends itself to stalling on the outboard part of the wing first. The wing is double tapered and elliptical in shape which stalls on the outboard portions first. Has nothing to do with the airfoil. If washout is not done properly (either not enough or asymmetrically) the wing will stall outboard first and it will curve off to one side immediately, especially at slow speed right after launch. The factory recommended 1/4" washout was too little. Should be more like 3/8". Flies very well in tight turns and at slow speed if the washout is enough and symmetrical on both wings.

Another problem with sudden snap roll stalling was caused by warped wing panels (either poor covering technique, bad storage practice, or more commonly- improperly repaired wing panels).

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And besides having a little extra washout, I found it helpful to have a large leading edge radius.

Several of the used Hobie’s I acquired from disgruntled owners back in the day had LE's that were too pointy. I often had to cut them off and replace with new wood as there wasn't enough left to work with.

From Bob Martin on RC Groups:

Quote:

> *Bob was there any difference in the actual manufacturing process or build with the hawk when it changed owners, or are they all pretty much the same?*

There were a number of changes over the years and with different owners but essentially the end product from Hobie, Bob Martin RC and Ross Models the wings, fuselages, elevators and rudder are all interchangeable. To my knowledge the only differences were what some of the parts were made of, mostly the molded parts.

For example, Hobie started with ABS plastic for the dorsal, but changed to Lexan. His first kits had wood wing, rudder and elevator tips, all later versions from all of us were injected molded. From the pictures I have seen, Ross Models used white polyethylene instead of natural as Hobie and I did. None of these made any difference in the appearance or performance of the Hobie Hawk.

Bob

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Hobie Model Company used to include an addendum sheet with their Hawks that warned consumers not to use softer hardware store alloy wing rods in their planes (read this as saying DO NOT use 6061 alloy). The verbiage directly said it would seize in the fuselage and they would not be held responsible. 2024 0r 7075 aircraft structural grade alloys are hard enough to use without seizing. DO NOT use steel. You will risk destroying your wing roots on a hard landing. Letting the rod bend is a safety feature built in to save your wings. Now that Carbon Fiber is available it can be used as well. It will snap like a piece of glass on a hard impact, saving your wings.

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Quote:

> Originally Posted by **cmwhite**
> *Since we are kind of on this subject*
>
> *When you took delivery of the Hobie tooling, how long did it take to get comfortable with it where you felt you could make a quality product.*
>
> *Curt*

Curt,

From the time the goose neck trailer arrive at our facility until we release our first production, it was about a year.

When the tooling arrived, we assumed, never do this, that the tooling just needed a little cleaning and we could start production. We began with the elevators and rudders and quickly found they did not work right..... I called Hobie and told him I was having problems. (By the way, this was when Hobie found out it was me that bid against him for the tooling.) Hobie sent the engineer that built the tooling to begin with to my shop. He introduced himself (I think it was Bob, but I cannot remember for sure) looked at one of the fixtures, picked it up, took it to his truck and drove off! Seriously, he did not say anything other than showing disgust. Hobie had sent him so I just waited. A few days later he showed up with the repaired fixture and took another. This went on for a month or so and finally he brought back the last one and said "Now you can make good planes!" I asked how much I owed him and he reluctantly gave me a very modest number and Katie cut him a check. I asked if he could help us get the Hawk into production and he

agreed to bring his son up who I think was Hobie's production manager. We paid them to walk us through each step and made parts they inspected and told us what to look for and how to have good quality parts. Sorry for the long story but it helps explain the duration between purchase and production. I wasn't until after we began production and numerous inspections of Bob Martin RC products in hobby shops and a couple of visits by Hobie inspecting the parts we produced that we were finally licensed to market the HOBIE Hawk.

Bob

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Quote:

> Originally Posted by **Ward Hagaman**
> *I apologize if this is been covered for but were the pods rotomolded in house? Bob, would you mind describing the process?*
>
> *Ward*

Hey Ward,

When we bought the tooling for the Hobie Hawk from Midwest, there was a Rotational Molding oven included. This oven was about 10 ft. by 10 ft. by 14 ft. The front was two 5 ft. X 10 ft. doors that slid open to allow the oven to roll forward around the arm with all the molds. The arm had a spider gear set that would rotate all of the molds in every axis. As the nickel molds heated up, the powder plastic inside would slide around and begin to coat the interior of the mold and inserts. Eventually all the plastic would be melted and coating the mold and process called cross-linking would occur and the part would be done except for the cooling that would make the part rigid.

Because of the cost of running an oven of this size and the space needed for it, we chose to lease the oven to the roto-molding company we were using for our Dura-lene fuselages. They met our production orders and when the oven was not making our parts, they could use it for other customer’s orders.

Hope this clears up your questions....if not let me know.

Bob

FIELD & BENCH REVIEW

HOBIE HAWK

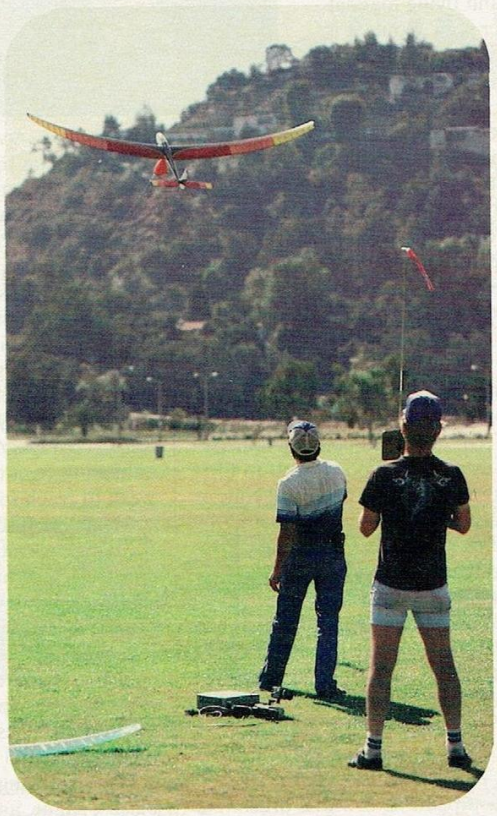
FROM BOB MARTIN RC MODELS

article and photos by ALAN GORNICK JR.

CLASS IS THE WORD, IN LOOKS AND PERFORMANCE

CLASS. In a word that's what the Hobie Hawk is all about. From its design concept, choice of materials, manufacture, packaging, and ease of construction to its unique appearance and outstanding flight characteristics, the Hobie Hawk is pure class. This model from Bob Martin RC Models* is a flashy performer that flies equally well from the high-start or on the slope. Its undercambered airfoil provides lift in the lightest of thermals or slope breezes, while its clean design and elliptical dihedral wings provide exceptional speed, penetration, and maneuverability. The Hobie Hawk flier has a tremendous advantage when seeking thermal activity. In the same time it takes a more conventional sailplane to mush around for a few hundred yards or so, the Hobie Hawk has covered three-quarters of the sky, with a proportionally greater probability of finding the thermals. And it's so much more fun too!

Initially marketed in the mid-'70s in either a ready-to-fly version or as a kit, the Hobie Hawk was highly touted by many dealers as being an ideal beginner's sailplane. It is not. It is a high-performance aircraft that demands considerable care and attention to detail in construction, as well as pre-flight alignment, balance, and trim. When the Hobie Hawk is set up properly it's an absolute joy to fly. When it's set up poorly, it will bite. The same speed, responsiveness, and maneuverability that make it such an exhilarating experience for the experienced flier can be a real handful for the novice. The control surfaces, especially the rudder, are extremely effective and demand smooth, sure inputs. The Hobie Hawk is not tricky to fly, however; anyone who can successfully fly and land a basic trainer will have no trouble doing the same, and much more, with the Hobie Hawk. The experienced flier will find performance capabilities unparalleled among rudder/elevator sailplanes.

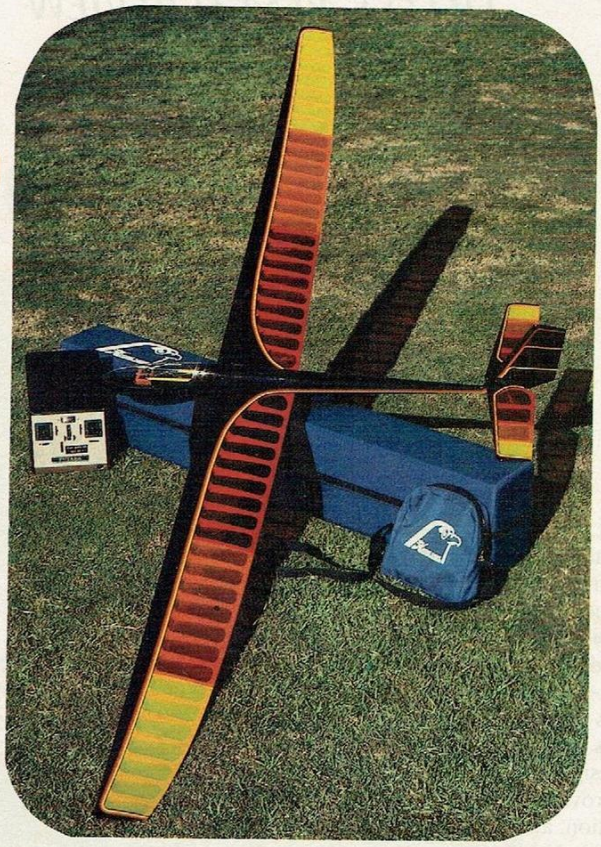


The grace of the Hobie Hawk is even apparent on launch.

THE KIT. The class and quality of the Hobie Hawk are apparent before even opening the box. Just check out the label! Opening the sturdy box reveals a handy bonus: a custom-fitted, hard-surfaced, styrofoam shipping case. Later this case can be used for carrying the completed model, thereby considerably diminishing hangar rash and ensuring that all the parts will be intact when you reach the field. For the ultimate in class and convenience, the manufacturer offers a sturdy Cordura carrying bag, fitted with an ingenious zipper and Velcro fastener system. This enables a snug fit and easy access to the model. There's also a matching transmitter bag.

Inside the shipping case is a poster-board copy of the label suitable for framing, a beautiful 30-page manual, a Bob Martin RC Models brochure, an informative 16-page Pactra manual detailing model finishing techniques, and a postcard that will provide its owner with a Hobie Hawk logo decal by return mail.

Delving further into the case reveals the almost-ready-to-finish-and-fly fuselage, wings, elevators, and rudder, all neatly nestled in



A masterpiece of engineering, the Hobie Hawk employs advanced design.

their custom-fitted slots. You'll also find control rods, a canopy, all the necessary hardware, plastic flying surface tips, a tow hook, and even a control switch actuator. The kit is very complete, requiring only finishing materials and a radio. Comparing the quality of workmanship and materials with a couple of original Hobie Hawks, I found the kit produced by Bob Martin RC Models to be at least equal, if not superior, to the originals.

The assembly and flying manual is the best I've ever seen. While it is written for those who have little or no experience in R/C modeling, it contains a wealth of information for the advanced modeler. Starting out with a complete parts list, the manual details the materials needed to complete the kit, materials compatibility and environmental characteristics, construction and covering methods, radio installation, set-up and final adjustments, flying techniques, and repair methods. There is even a glossary at the end for those unfamiliar with the terminology. The clear illustrations support the text well. Anyone following the manual faithfully should not have any trouble successfully finishing and flying the Hobie Hawk.

CONSTRUCTION. I started construction with the fuselage, using Hobbypoxy Stuff to fill the slight gaps between the nose cone, tail cone, and dorsal assembly. This is an exceptionally light, durable, and easy-sanding, putty-like material that I highly recommend for building and repairs. When it is thinned, it can also be used as a brushed filler. After lightly sanding everything smooth, paying particular attention to sanding the gloss from the dorsal, flame-treat the nose cone in preparation for priming. This step is necessary to ensure proper primer and paint adhesion. Using a spreader tip on a fully turned-up propane torch, pass the flame over the surface of the nose cone as if painting it with a brush. Do this at a rate of approximately 1 foot per second. Take care not to overheat any one area, since the idea is to singe the surface, not heat it.

When this was done, I primed the entire fuselage using Pactra Prep primer/surfacer. This is a fast-drying primer that won't clog sandpaper. After I applied several coats of primer I sanded with 220-grit sandpaper until the fine weave of the fiberglass tail cone was completely filled and the entire fuselage was perfectly smooth. Then I sprayed the fuselage with two coats of Pactra Formula-U Polyurethane finish and set it aside for seven days. Although Formula-U is dry enough to handle after four hours, it requires a week to reach full cure.

While the fuselage was drying I moved on to the wings, elevators, and rudder. These are constructed of high-density styrofoam, sandwiched between thin plywood, and equipped with pine leading edges and plastic root ribs. After gluing on the plastic tips with 5-minute epoxy (be sure to sand and rough-up the inner surface of the tips for good adhesion), I sanded the leading edges to shape using 220-grit, then finish-sanded all surfaces with 400-grit. Then I covered the wings, elevator, and rudder using black opague, and red, orange, and yellow

(Continued on page 106)

HOBIE HAWK

(Continued from page 56)

transparent Super MonoKote. If you want to cover your Hobie Hawk with only one color, the manual provides a pattern that will enable you to use only one roll of material. The manual recommends that you cover the top of the wings before the bottom so that the bottom covering can be removed faster if it is damaged. When you're covering, be careful not to leave the iron or heat gun in one place for too long or the foam will be damaged.

The next step is to install the large, brass wing root and elevator hinge sleeves using 5-minute epoxy and the wing rods as installation tools. At this point you *must* check the wing alignment and adjust it if necessary. The easiest way is to temporarily install the small wing root sleeves halfway into the wing, place the wing rods through the fuselage, mount the wings on the wing rods, and then place the fuselage between two parallel wood blocks of sufficient height to keep the fuselage clear of the work surface. The leading and trailing edges of both wings should contact the blocks. If they don't, the hole of *one* sleeve must be enlarged so that they do. Once they are adjusted, the wings should be held in alignment while the small root sleeves are epoxied in place. I found this method to be easier and more precise than that shown in the manual.

The supplied tow hook can now be installed, as well as the pre-cut canopy. These will require fine trimming to make them fit properly. If you want, you can dye the clear canopy with Rit (warm, not hot). Blue or amber canopies are available from the manufacturer as replacements.

The final finishing step is the application of striping tape. At my local auto parts store I discovered a real boon in the form of multi-colored striping tape. This stuff is available in single-, two-, and three-stripe widths, as well as a wide variety of compatible colors. It is applied by peeling off the transparent plastic top layer that holds the stripes together. When turning sharp corners, the clear top layer should be removed first and the stripes applied separately. A light touch of the iron will ensure that it lies flat. You'll like the price too!

To successfully install the Hobie Hawk radio, the aircraft must be properly balanced before cutting any holes. This process is quite different from that used with other models. First, the model should be assembled with the exception of the wings, the pushrods taped against the fuselage relative to their final position, the radio gear taped temporarily in place atop the cockpit, and the canopy on top of that. Next, rest the fuselage by the ends of the large wing rods between two parallel blocks, which must be at least 14 inches high. Then, with the fuselage free to rotate on the wing rod, adjust the radio position until the distance from the bottom of the tail-skid to the top of a block identical to the others is 19½ inches, plus 1 inch and minus 0. I recommend 20 inches for the first few flights.

There is plenty of room and leeway for any radio system you wish to install. I used a Futaba* FP4N with Novak Bantam Midget servos which fit very nicely in the nose and alleviated the need for additional weights. Once the radio position has been determined, mounting is facilitated by using the piece of 1/64-inch plywood supplied for making a template for the servo cutout. It works great and the plywood keeps the knife tracking straight when you're cutting the nose cone material.

I used servo tape for securing the battery and receiver, then fastened the servos down with the screws provided. The manufacturer even provides an external switch actuator. Although it's supposed to be used as a mini-switch, a slight filing of the switch button allows it to function with a Futaba switch. Once the supplied control rods are installed, the radio installation is complete. To adjust the control rods, soften the glue holding the wire rods in place by applying heat at the ends of the tubes. I've found a heat gun works best. As usual, fine adjustments are made by turning the clevises on the threaded wire rods.

FLYING. The Hobie Hawk must be set up and adjusted properly to fly well. The effort expended in doing this correctly will be well rewarded by the enhanced performance of the aircraft. First, and most important, is the wing adjustment. The bottom of the root and the mid-span sections of the wing must be parallel. To adjust them, prop the wing root on a 2-inch-high block, then apply heat to the covering while twisting the wing into alignment. Once this is done, use the same technique to adjust the tip wash-out so that it is between 3/16 and ¼ inch. It's extremely critical that both wings be identical. Last, carefully adjust the rudder, elevator position, and throws according to the detailed instructions in the manual. Take care not to increase the rudder throw beyond that recommended and recheck the balance along both pitch and roll axes.

For a long time I flew my two original

Hobie Hawks only on the slope and had never launched one from a high-start. My first such flight with the Hobie Hawk was at the Rose Bowl in Pasadena, California. After a thorough pre-flight checkout of all the adjustments, I hooked the aircraft onto the high start, re-checked the controls and, making sure the wings were held level, gave it a toss. The Hobie Hawk went up straight as an arrow. I didn't even touch the controls or trim.

I should mention here that the rudder is *extremely* efficient and over-control of the rudder is the cause of most difficulties in launching and flying the Hobie Hawk. This includes the fabled "Hobie wing rock," which is only pilot-induced oscillations caused by over-controlling. If the pilot is smooth and subtle with the controls, the Hobie Hawk will reward him with a smooth and precise performance.

Back to the flight. While thermal activity was only light and sporadic, the Hobie Hawk made the most of each thermal and I soon realized that if I wanted it back for another launch I was going to have to force it down. (I also remembered that I hadn't put my name and phone number on it.) Subsequent launches and flights were a virtual carbon copy of the first, with a number of aerobatic maneuvers thrown in for good measure. The Hobie Hawk is at least as easy to launch as any sailplane I've ever flown. It will find thermals when everything else is falling out of the sky, it's easy and fun to fly and land, and it looks as classy as its performance. On most days the determining factor for landing the sailplane will be the duration of the batteries—or the endurance of the pilot!

On the slope the Hobie Hawk is a real performer. In light winds I can almost guarantee it will be the last plane to land and if a thermal wafts across the slope the Hobie Hawk will find it first and make the most of it. In stronger winds up to and including a gale, the Hobie Hawk will not only out-climb everything else, but will provide the most exhilarating flights possible with a rudder/elevator sailplane. It rolls easily, and will perform almost any aerobatic routine not requiring outside maneuvers or inverted flight. While it penetrates well and flies fast, it is not tricky to fly in the least, and is easily slowed for a smooth and precise full-stall landing.

On top of it all, the Hobie Hawk looks great! There are few sights as beautiful as a Hobie Hawk banking through the sunset with its wings aglow from the backlight through those elegantly routed wing bays. It's a classic and a class act all the way. Everybody should have at least two!

**The following are the addresses of the companies mentioned in this article:*

Bob Martin RC Models, 11178 Penrose St., Unit 4, Sun Valley, CA 91352.

Futaba, 555 West Victoria St., Compton, CA 90220. ■

MAGNUM 182-V

(Continued from page 30)

forces in the model engine manufacturing business, Peter had been in the toolroom of the SKF bearing company, while Brian had been with the experimental engine division of Vauxhall Motors, General Motors' automotive subsidiary in the U.K.

Readers familiar with the appearance of the Magnum 91-S will observe that the Vee-Twin bears a strong family resemblance to the single-cylinder model. Broadly speaking, the 182-V is, in fact, two 91-S cylinders on a common crankcase but with their axes at 90-degrees to each other.

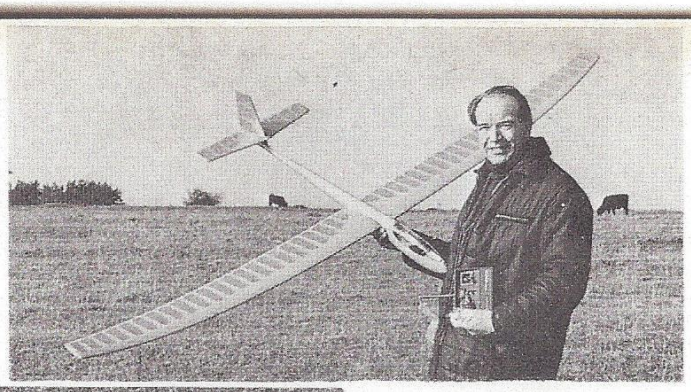
A "Vee" layout is not too common in model engine design. There are, of course, several forms of twin-cylinder motors. Two of the most familiar are the horizontally-opposed (flat) twin and the inline twin. When used for two-stroke motors, these offer conspicuous advantages as regards smoothness of running. For example, the simultaneous-firing flat twin two-stroke has almost perfect balance since the reciprocating masses (piston, conrod, etc.) are always moving in opposite directions; while the alternate-firing inline twin, in addition to providing improved balance, contributes more even torque delivery by reason of having two equally spaced firing intervals per crankshaft revolution.

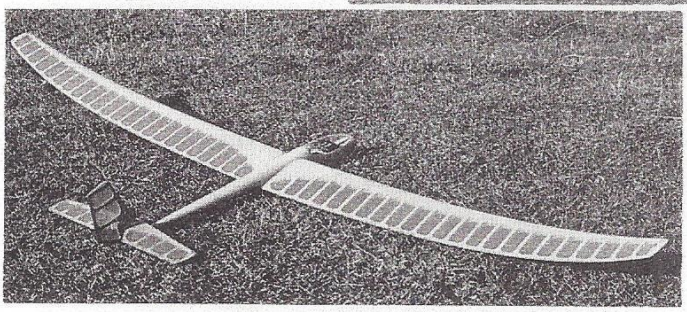
Both these configurations call for a crankshaft having two crank throws located at 180 degrees to each other and (except in the case of a very small flat twin model engine, e.g., the G-Mark .12 and .30 Twins) will require at least one additional main bearing. This will be placed in the rear of the crankcase in a flat-twin and between the sealed front and rear crank chambers of an inline twin.

Things are a little different with twin-cylinder four-cycle engines. So far as inline twins are concerned, there are two possible arrangements. If the cranks are at 180 degrees, as in a two-stroke inline twin, the reciprocating masses will be partly balanced, but torque fluctuations will be emphasized as one power stroke will be

RM TEST REPORT

by DAVE HUGHES





THE HOBIE HAWK

Span 99in. Wing area: 590 sq. ins.
Wing loading: 9·2 oz./sq. ft. (av.)
Tailplane: 9·25% of wing.

AS WE SAID in last month's preview in Trade News, the Hobie *Hawk* is probably the most *ready* almost-ready-to-fly model ever to hit the market. Originating in America (San Juan Capistrano, to be precise) it is produced by the Hobie Model Company, seemingly as an offshoot from a thriving Catamaran and general aquasport business. The techniques used in its construction have evidently been developed from those used in building cats—and they are nothing if not impressive.

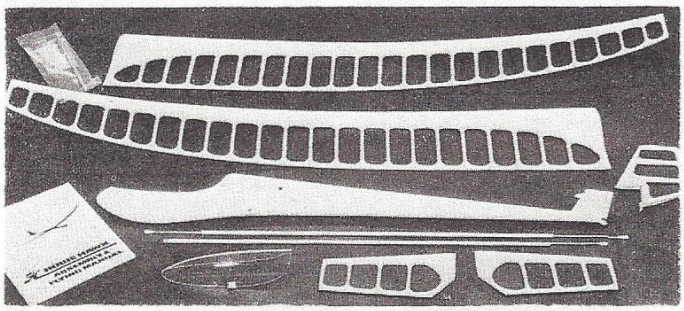
The *Hawk* is available either as a "just install your radio, hook it up, balance and fly" version or, if you don't like to see the workbench *too* idle, a "kit". This latter means that you have to fit the moulded ABS wing and tail tips, the wing and tail dowel tubes, sand the wing leading edges, do some finishing and painting work on the fuselage—and film cover the flying surfaces—in order to catch up with the ARTF version —which is what we received for review, though we've also been able to photograph some of the uncovered parts.

Definitely different . . .

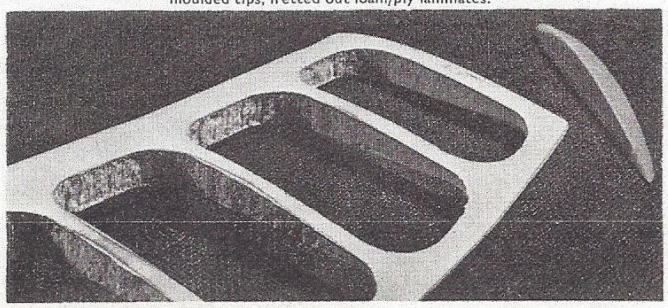
The fuselage of the finished version, which comes completely spray (dip?) coloured to a beautifully high finish, comprises, underneath, three sections of quite different materials. The nose and radio area, back to about the leading edge, is made of a slightly greasy plastic known as cross-linked polyethylene — enormously tough, yet slightly resilient. The cockpit area, where a cut-out has to be made for the two servos, reveals this to be about $\frac{1}{8}$in. thick. The tapering tubular rear fuselage is from fibreglass and the tail-end, including fin and tailplane-roots, is moulded from ABS. One simply cannot detect any join anywhere, and hardly likes to handle the gleaming, fish-like thing, lest one should sully it with fingerprints!

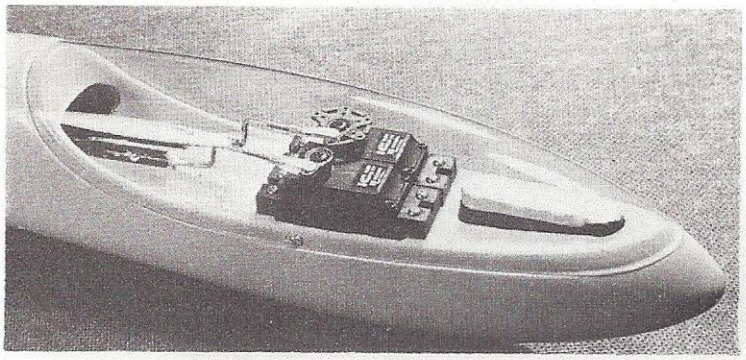
The wings? Ah—now, those distinctive wings with their unusual elliptical dihedral and semi-elliptical planform. They are made basically from a high density foam, covered top and bottom with ply, and the holes fretted out to give that "rib" effect. Don't ask me how the compound curve of the leading- edge cum-elliptical dihedral is accomplished. I imagine anyone who builds catamarans and surf boards would find that child's play. The roots of the quite highly under-cambered wing are injection moulded ABS, like the tail-end. Leading edges are pine, and tips again ABS.

The wings are supported basically by a single dural rod of about $\frac{5}{16}$in. dia. with an additional locating peg of 3/32in. piano wire—and the all-flying tailplane is held on with two wire rods, plus friction and faith, in the manner we have become used to from the Continent. The

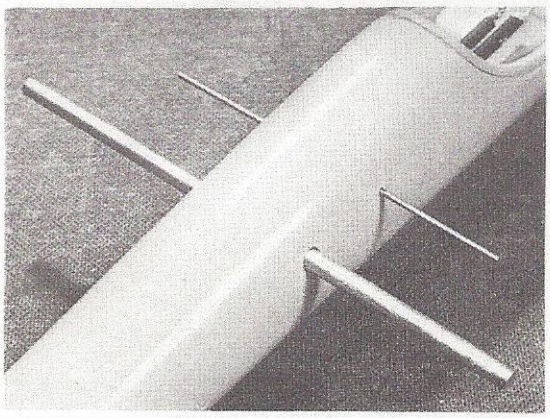


This is the "kit" we were able to examine, though we actually opted to take the finished 'drop-your-gear-in' version. Finished models carry in own moulded foam box, 51x9x6in. *Below:* note moulded tips, fretted out foam/ply laminates.

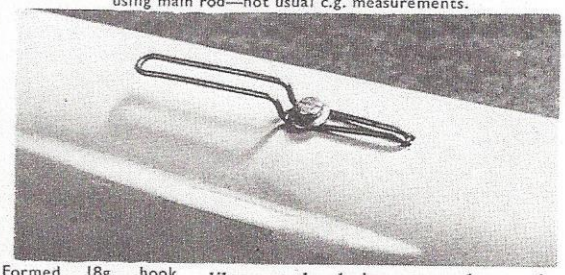




Tail-end is nicely moulded ABS plastic.



Installation neat—just cut-out for servos (not normally needed for nicads, but ours pencell type). *Left:* one 5/16in. dural rod takes all launching and flying loads, with small locating dowel. Model is balanced using main rod—not usual c.g. measurements.



Formed 18g. hook looks flimsy but seems secure enough. We put epoxy on inside of screw, to be sure. (*Shown inverted*).

covering material is, of course, Super-MonoKote, and this remains really drum tight throughout a variety of climatic conditions. The rudder—virtually all-flying—has a transparent moulded front hinge facing, (of w/polycarbonate) which incorporates the control horn, and is simply secured in place by sliding in the hinge-pin. (I found the "detent", or clip, for this, moulded into the tailskid, didn't work, so resorted to the time honoured bit of tape to keep pin—and rudder!—in place.)

Doing the necessary

Though tough, the polyethylene was easy enough to cut with a stout modelling knife, and receiver and servos were soon in place. The push-rods supplied are of fibreglass tube and already have pre-formed wires and nylon clevises fitted! The wire ends are buried in "hot glue" within the tubes, so that all one has to do in the event of their not quite reaching your servos by the time you've moved 'em around for balance, is to heat the ends of the tubes with an iron, when the glue softens and you can pull or push the wire ends to suit. (Must have been invented by the proverbial lazy office boy!)

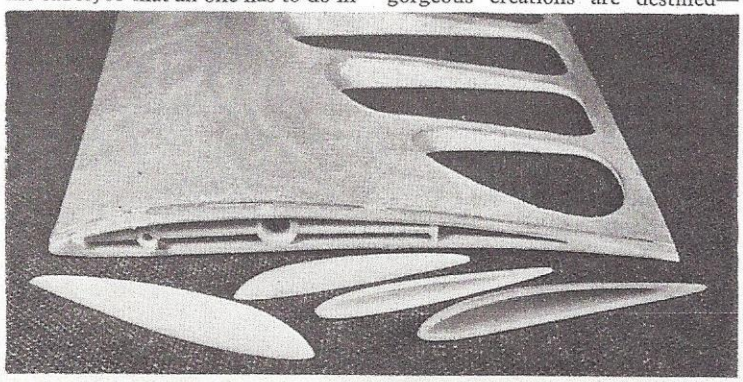
The tow hook is a simple formed wire arrangement, securely screwed to the fuselage bottom by a large self-tapper. (These—only smaller—are again used to secure the canopy—the one point in the whole magnificent model that I felt could have been done better. Some form of canopy frame, plus a spring catch or similar quick release device, would have been the final touch, *par excellence*.)

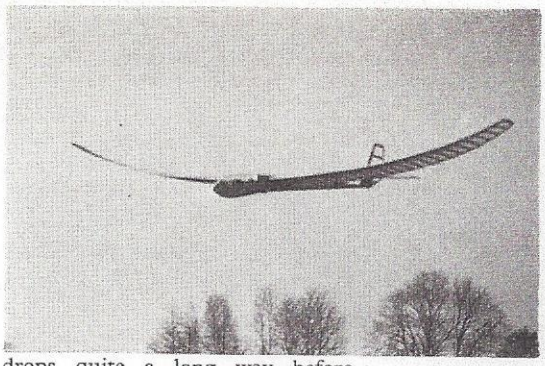
The balancing and rigging techniques are, I think, unique to the Hobie *Hawk*, and appear to cater for non-modellers—for whom no doubt a large proportion of these gorgeous creations are destined—like youth, being wasted on the young! You balance the fuselage on the wing rod—and measure just 19½in. from bench to tailskid. And stuff like that. (I never did believe that c.g.'s were really necessary, anyhow).

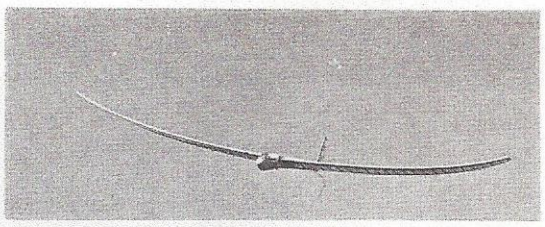
All that was quite painless, and accomplished one wet Saturday afternoon. (I imagine the "kit" could take a week's evenings, especially if you wanted a really good finish on that fuselage).

Airborne—on the slope

First flights always seem safer from the slope, to me—partly because I'm a sloper at heart anyway, and partly because there's more "insurance" underneath when I let go. Let go I did, and the *Hawk* steamed outwards and upwards in no uncertain manner—almost as though some secret electric motor had been fitted, as well as all the other luxuries. This was in 8-10 m.p.h. slope lift. The model was *very* responsive—perhaps even a little over-sensitive, which was possibly to be expected since Irvine Engines had also supplied one of their Sanwa outfits to go with it, and I've never handled a more positive, sensitive and precise set of gear. The centring on the control surfaces is quite incredible. But I'm digressing . . . I would have to get used to both equipment and model before making any comprehensive comments, though the first thing one finds out is that it has quite a sharp tip stall when slowed up too much, and







These in-flight shots show the model's quite hawk-like appearance. Can cause disorientation—got ours in one of those trees! Just like the advert—not a scratch! *Right:* going up on thebungee. *Below:* serenely from the slopes.

drops quite a long way before recovery. But it makes height like a dream. Even in "scraping" conditions it is usually on top of the pack, name what you will.

Aerobatics are hardly the *Hawk's* forte, but loops and stall turns are quite positive though, in its present trim (more anon), it will not spin. I found this out on one occasion when I was beginning to get worried about bringing it down—the wing tips seeming to have disappeared in the cloudbase a couple of times. A very big, wide flattish spiral did the trick without seeming to have put too much strain on anything—even the slide-in tail stayed secure.

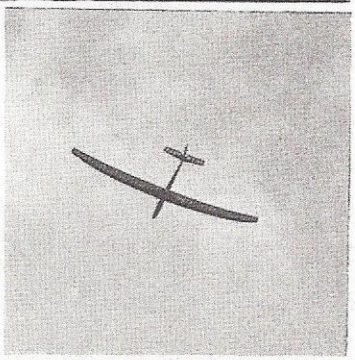
On the bungee

A standard Graupner bungee was used, with about 11lb. pull, and the model's rigging exactly as per the 48-page manual. She went up very straight, but came off rather early, at which point I found I had to pull in full up trim and hold a little back stick to get her flying right. Checking the tail neutral again showed it correct as per diagram but, after some trial and error, we found the satisfactory "neutral" to be at some 3/32in. less positive at the l.e. than specified.

Another bungee launch and I experienced what seems to have become known in the States as the "Hobie Roll"—a complete rotation on the line! Once really started, full opposite rudder won't arrest this, but once you've had a few frights you begin to anticipate it and can catch it the instant it starts (preferably a little before!), so translating the roll into just a rather violent weaving, but still getting good high releases. Mind you, the roll doesn't always occur as soon as launched—you're occasionally fooled into thinking you've got a smoothie, slow her up for release, wing drops and—zowie. But at least there's plenty of room for recovery up there.

Apart from having earned a nickname, the "complete rotation" on the line is noted in the instruction manual as a characteristic to be on one's guard for, incidentally. I have found that fitting the tow hook an inch further forward than specified does seem to help in getting a higher proportion of roll-free launches. But you can still get the odd one, just to keep you on your toes . . .

That the *Hawk* is very sensitive can be seen easily, as the wings rock at every little sign of lift or turbulence, and in more lively weather, it's just got to be a great performer, judging by its from-slope thermal performance. Indeed, I expect to see some fitted with spoilers before too long. It seems to have two different approach characteristics. In calm weather, don't try stretching the last leg, or it just stops flying and drops the last 2 ft. vertically. In a 10mph wind, however, you can take it a long way down wind, then work it up back to you, in an undulating flight pattern, as though riding invisible ridge lift!



Summary

A really superbly produced model, on which a tremendous amount of thought and preparation have been lovingly bestowed. It's certainly a thing of beauty and, while unlikely to last quite forever, is undoubtedly a joy to behold and will collect admiring groups wherever displayed. But I hope you'll be able to take in good part all those cracks about its being time you got yourself a new building board, and so on!

Importer/Distributor: Irvine Engines, Unit 8, Alston Works, Alston Road, High Barnet, Herts.

END THE HOBIE ROCK

The object of this exercise is to add low speed stability and to eliminate the Hobie Rock that many modelers have had problems with because of over control.

Materials needed:

3/8" x 4" x 15" medium balsa

3½" long brass tube 3/32" O.D.

*Hobie Hawk control horn (**e** — see drawing)

*Special .045 music wire with bend

Glue and covering material

*Available as package from your hobby dealer for $3.50

To begin, purchase the materials noted above. Take your stock rudder and trace the outline onto a piece of paper. Remember, when this modification is complete, there will not be any difference in the profile of your Hawk. Draw a straight line from the bottom to the top on your tracing in line with the stock hinge line. You now have templates for the two balsa pieces that make up the dorsal and rudder.

Take the plastic control horn and cut it as shown (parts **e & d**). Build the rudder first, being sure you countersink the control horn so that the hinge line will be buried. Do not glue the control horn on yet, just trial fit, then groove the leading edge and glue the brass hinge bearing into place.

Next, glue the scrap balsa filler into place (see Figure **Y**). Now trial fit the **e** into place using the hinge pin for alignment. When properly fit, glue into place.

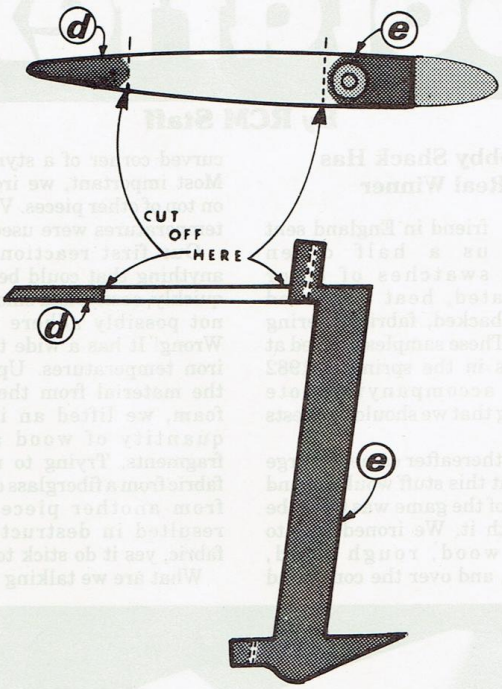
Carefully round the leading edge of the rudder as shown in Y. **Note:** the cut-outs shown in the drawing are optional and not required.

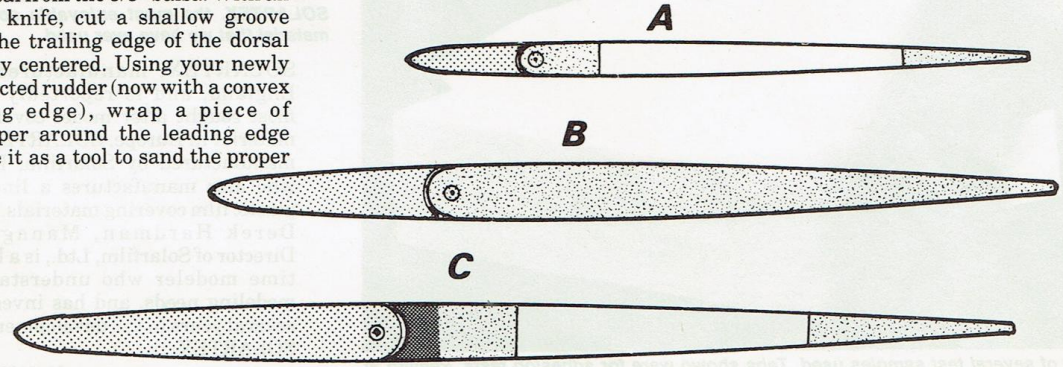
Using your paper template, cut out the dorsal from the 3/8" balsa. With an X-Acto knife, cut a shallow groove along the trailing edge of the dorsal perfectly centered. Using your newly constructed rudder (now with a convex leading edge), wrap a piece of sandpaper around the leading edge and use it as a tool to sand the proper concave surface in the trailing edge of the dorsal.

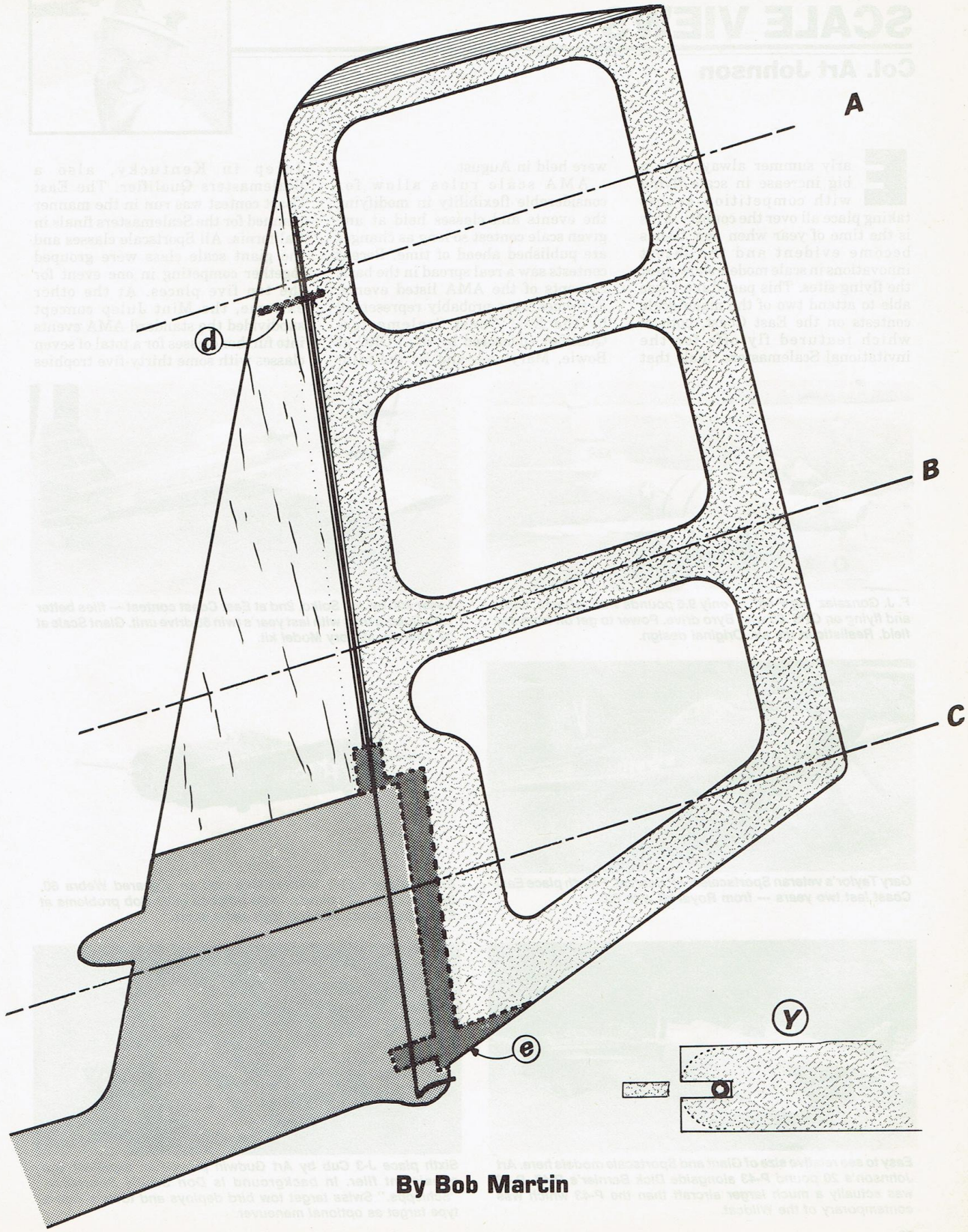
Once this is done, shape the leading edge and sides to match the top of the fuselage. Sand the top of the fuselage and with the rudder in place, glue the dorsal onto the fuselage.

The final construction is to take part **d**, drill a .045 hole as shown and trim to shape. Cut a slot just above the brass tube in the rudder and slide part **d** into this slot until you can thread the hinge wire through part **d**. Now cut a slot into the dorsal, trial fit and when the fit is just right with the hinge attached to the rudder, glue **d** to the dorsal.

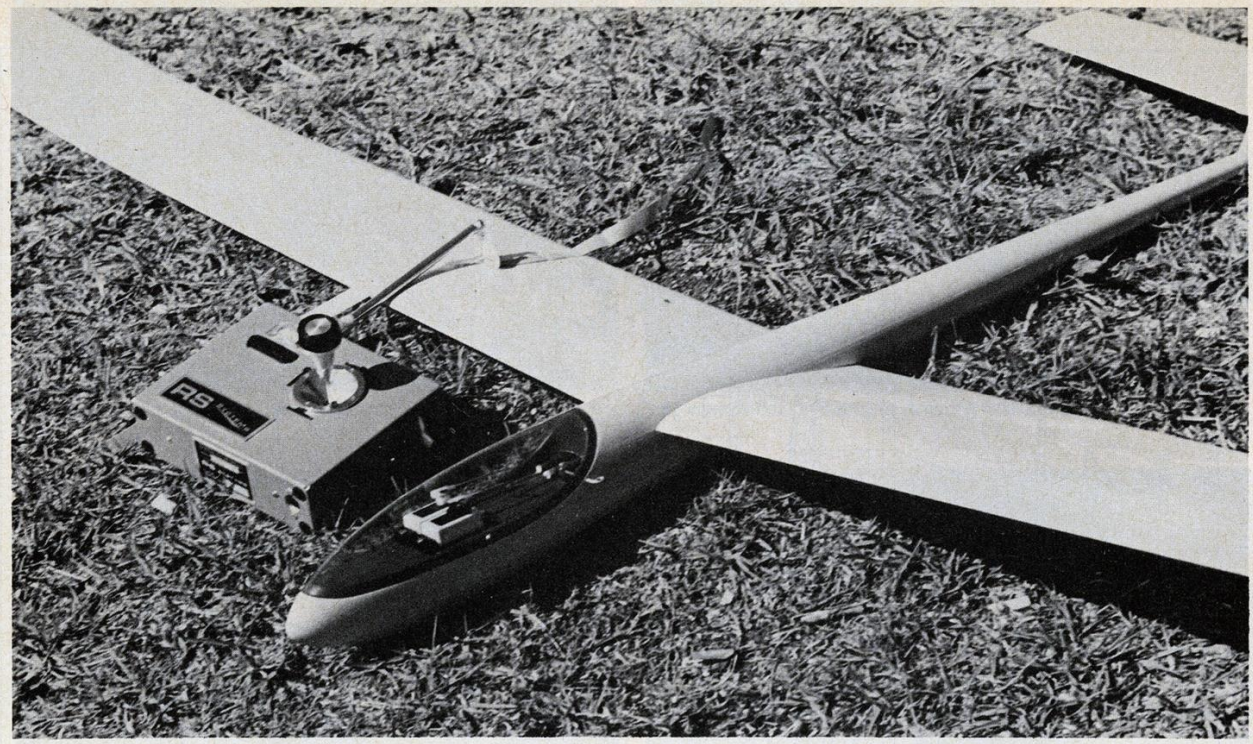
When glue has dried, remove the rudder pin and rudder, finish both new parts and paint or cover to suit. □







By Bob Martin



RCM TESTS THE HOBIE HAWK

BY BILL O'BRIEN

In the world of surfboards and catamarans, the name Hobie is synonymous with "the best," "the fastest," and many more superlatives too numerous to mention among devotees of both sports. And, mention a competitive product to Hobie owners, and you will evoke a degree of loyalty and pride of ownership so aggressive the debate is over before it began.

And the man behind that name is Hobie Alter, who has been associated with surfing since 1954 when he quit making surfboards for friends and started making them for a profit. By 1966 Alter had fifty dealers in the United States selling two hundred and fifty boards a week at an average price of $130.00. It was during that era that Hobie Alter, himself, became a blazing light in tandem surfboard competition as well as setting a worlds record for the longest ride on a surfboard, riding one of his own boards in the wake of a large boat from Long Beach to Catalina, a distance of 26 miles. It was also during this period of time that he decided to start production on a fast, small catamaran with a lot of strength and no center board. Thus, Coast Catamaran, Inc., was launched and, today, this company employs 350 persons and has distributors throughout the United States, Japan, France, South Africa, Brazil, and Mexico City. The company has sold more than 20,000 14' and 16' catamarans and about 1500 12' monocats.

Today, the forty year old chairman of the board of Coast Catamaran Corporation in Irvine, California, still works sixty to seventy hours a week researching and developing new products which he will personally "imagineer" - - - a combination of imagination and engineering - - - into production items which will have the high quality and value associated with the Hobie name.

And one of these products is the Hobie Hawk, an 8' radio controlled sailplane which has been under development for the past few years and is only now in production.

There is nothing unusual about most sailplane kits currently on the market. Exactly the opposite is true of the Hobie Hawk - - - there is nothing ordinary or usual about this graceful sailplane. It is the end result of imagineering, dedication, and thousands of hours of research, testing, and finding new methods of production techniques that would result in what Hobie Alter hoped would be the finest sailplane available to the RC enthusiast today.

And in our opinion, Hobie Alter has done just that. As you purchase the Hobie Hawk, it is completely ready to fly, minus radio. Looking for all the world like a full scale sailplane, our prototype was so sleek that it was impossible to tell all of the revolutionary engineering ideas that went into its make-up. As an example, the front section of the fuselage is cross-linked polyolifin which can literally be beat with a hammer without breaking or cracking. From the trailing edge of the wing to the leading edge of the stabilizer, the fuselage is fiberglass, six layers of it blown into a steel mold. The tail section is a unique injection

molded ABS plasic unit – each of the pieces telescoping into the other. The joints are so smooth that it is virtually impossible to tell where the sections have been joined and, as you receive it, the Hobie Hawk is completely painted in one of several colors in a finish that is virtually abrasive resistant.

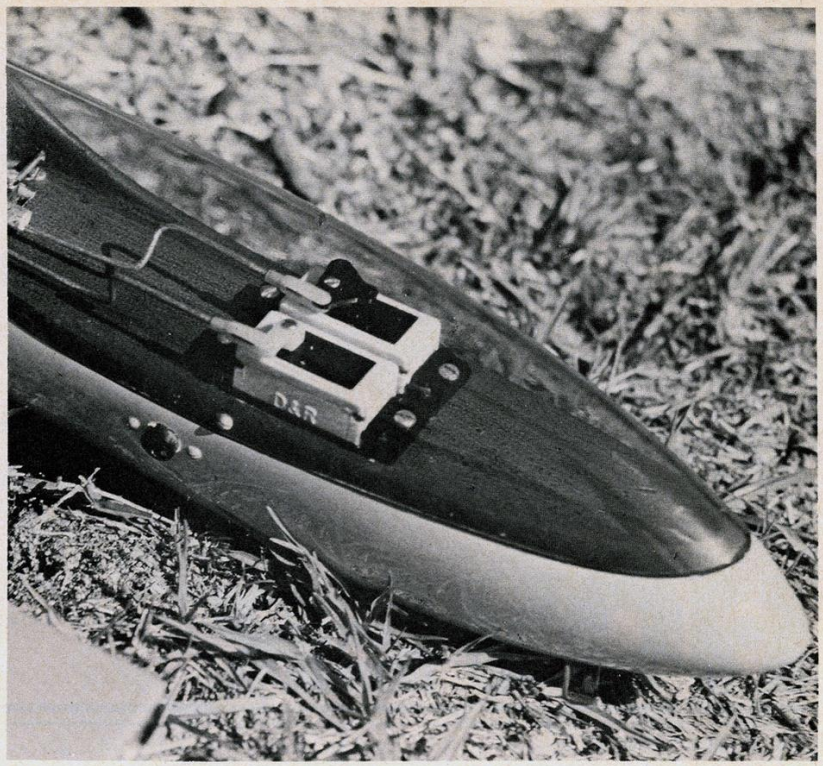
The wings and stabilizer are just as revolutionary as the fuselage since they were molded of rigid foam and covered with a layer of 1/32" thick plywood on top and 1/64" plywood on the bottom. In order to reduce weight, the material between "rib" sections have been completely routed out and the wing formed in an elliptical dihedral mold. Finally, the wings and stabilizer are completely covered with MonoKote to match the fuselage. Finally, a thick tinted canopy blends into the fuselage and is mounted with two sheet metal screws. The result is a ready-to-fly sailplane unlike anything you have seen to date.

How does it fly? The prototype we tested had a set of 8' and a set of 6' wings, both with elliptical dihedral. And, if the appearance is impressive, the flight performance is even more so. This machine, the Hobie Hawk, is one of the highest performance sailplane kits available today. In our test flights, including several fun-fly contests, it equalled or exceeded even the great thermal chasers such as the Grand Esprit, the ASW-17, the Windfree, and other well known contest designs. And this our test pilot did with the smaller set of wings which were primarily intended for slope soaring! The Hobie Hawk can be flown extremely rapid and has far more control response than that to which you may have become accustomed. But, it also has excellent low speed characteristics - - - in other words, the speed envelope is extremely wide - - - far more so than the average sailplane. As an example, the Hobie Hawk with smaller wings has been clocked at near record speed with absolutely no adverse effect. And, the machine is so rugged it can take more abuse than any model aircraft we have tested to date. The novice sailplane flier may have a little difficulty at first unless he tones down the amount of control available, but once he has mastered the Hobie Hawk, he will be capable of flying almost any other type of aircraft – if he should have the desire to do so, which is doubtful!

The name of the game in competition sailplane flying is efficiency - - - - a combination of efficiency both on the part of the man and his aircraft. With the Hobie Hawk we have come closer to 100% efficiency than ever before. Now it is simply up to you as the competition pilot. And if you're interested in just sport flying, you can't do better than this fantastic new sailplane from Hobie Alter and Coast Catamaran. It will be available at your dealer shortly, if not by the time you receive this magazine, and will be priced at approximately $129.00. If you're not a "buy-it-in-the-box" type soaring enthusiast, Hobie has a kit form of the sailplane which will be unpainted and "un-MonoKoted" and sells for approximately $89.00. See your dealer or write to Hobie Model Co., Dept. 100, 33081 Calle Perfecto, San Juan Capistrano, Calif. 92675.

Either way, you'll end up with a sailplane that you just won't believe until you fly it. Take it from us - - - we've been there, a hundred flights or more - - - and we still find the performance of the Hobie Hawk almost unbelievable.

Tested, Approved, and Recommended by RCM. □



BY JOHN LUPPERGER

Return of a Legend: The Hawk From Ross Models

A truly ageless design, the Hawk is now in its 20th year and, as reported by a dyed-in the-wool Hawk fanatic, the Ross Models version is better than ever.

The Hawk (originally the Hobie Hawk), like the Grateful Dead, is an American legend. Like the Grateful Dead, you are either totally in love with the Hawk or you don't like it at all. Many Hawk lovers have owned more than one, and are completely lost when their "baby" is broken or otherwise not airworthy. Those who have flown a Hawk and didn't like it, find it hard or impossible to fathom the total devotion of a true Hawk lover.

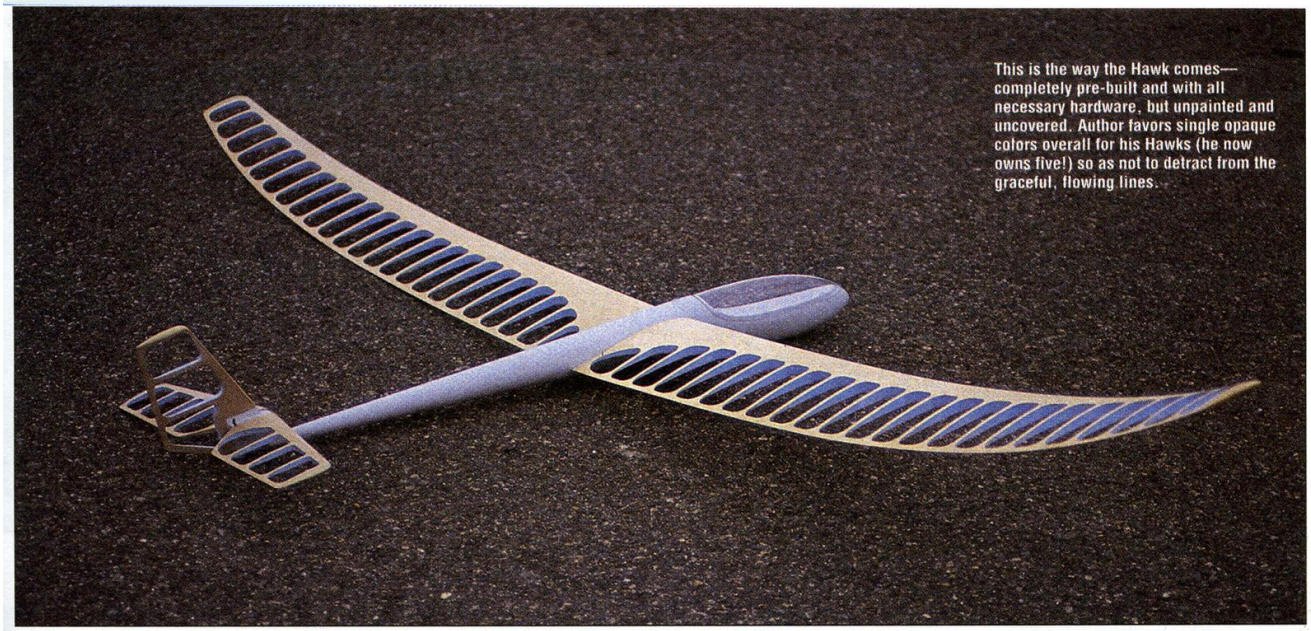
Not only am I a Deadhead, I'm also a Hawk fanatic. I presently own five—four original Hobies (including one 10-footer) and the subject of this article, the new Ross Hawk.

Hobie Alter, of surfboard and catamaran fame, would be proud of the job Ross Models has done with their rendition of his legendary, curved-wing bird. I pulled my original Hobies out of the rafters to compare them to the new Ross Hawk. Being a true Hawk fanatic, I was ready and willing to tear the new Ross Hawk apart. What a surprise! Not only is the Ross kit as good as the original, in many ways it is even better!

BUILDING THE HAWK

The entire model consists of only six main pre-built components. Wing, rudder and horizontal stab cores are cut from blue foam and sheeted with plywood—1/32 on top and 1/64 underneath on the wing and 1/64 ply on both sides of each of the tail surfaces. All leading edges are made of pine. Root ribs and tips are ABS plastic.

The fuselage is supplied assembled but unpainted and is composed of a polyethylene nose cone, fiberglass tail cone, and polycarbonate dorsal assembly. A bit of prep work is required prior to painting. The joint between the nose cone and the tail cone is pretty pronounced, but if you take a little extra time and sand the raised portion of the tail cone, you won't need much filler.



This is the way the Hawk comes—completely pre-built and with all necessary hardware, but unpainted and uncovered. Author favors single opaque colors overall for his Hawks (he now owns five!) so as not to detract from the graceful, flowing lines.

After sanding the entire fuselage with 220 and then 400 grit sandpaper, the polyethylene nose cone must be flame treated. You literally use a torch and pass the flame over the nose cone as though you were spraying paint. This treatment removes any oils or "fuzz" from the surface, allowing good adhesion of the primer. After priming, it is essential that you don't sand through the primer to the polyethylene surface, otherwise flame treating will again be necessary to assure that the final coats of paint will stick.

The wings and tail surfaces also require a bit of work. The five ABS tips are all glued in place with 5-minute epoxy, then the pine leading edges of all surfaces are shaped and everything is finish sanded. As the instructions state, the plywood is thin, and care must be taken not to oversand any one area. I was really impressed with how well the flying surfaces are constructed. There were no small chips in the plywood from routing out the open areas, and the resulting "ribs" were very straight and equal in size.

FINISHING

I love the smooth, flowing lines of the Hawk and tend to do mine in one-color finishes, as I hate to be distracted from the beautiful form by multi-colored panels. With this in mind, I painted the fuselage with white Pactra Formula-U and covered the flying surfaces with white Oracover from Hobby Lobby. The instructions recommend MonoKote, but I think this is mainly due to the fact that up until the fairly recent release of other coverings like Oracover and Ultracote, MonoKote was one of the few materials that could hold the required washout in a Hawk wing (it takes a bit of effort to twist those plywood sheeted surfaces). I've covered Hawks with almost every covering available over the years, and for me, Oracover goes on the easiest, plus it is capable of holding the necessary washout. Also, the recommended procedure of weighting down the wingtip to flatten the panel for covering isn't necessary with Oracover.

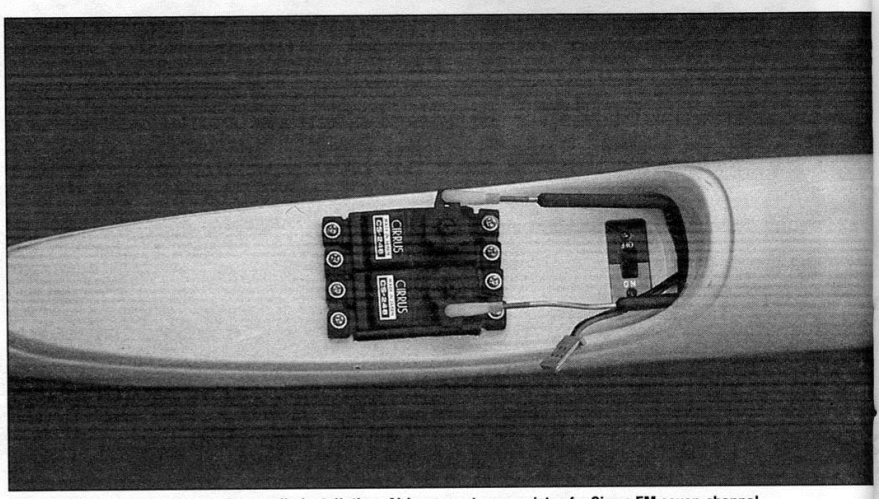
I always found it difficult to get a good finish on the wings with MonoKote. Once the weight was removed and the panel sprang back, the wrinkles that often showed up in the MonoKote were very difficult to remove. But maybe this is just a problem for me, as I've seen many beautifully MonoKoted Hawks over the years.

Even after 20 years, the Hawk is still in a class by itself. Looks just as modern today as it did when it was first introduced.

THE ROSS MODELS HAWK

WINGSPAN	98 in.
WING AREA	590 sq. in.
FLYING WEIGHT	38 oz. (42 oz. as tested).
WING LOADING	9.2 oz./sq. ft. (10.2 oz./sq. ft. as tested).
AIRFOIL	6 percent undercambered.
RADIO	Two channels required (rudder/elevator).
SUGGESTED RETAIL	$350.

Distributed By Ross Models Inc., 708 Dermody Way, Sparks, NV 89431; (702) 358-7677.



You couldn't ask for a more sanitary radio installation. Airborne system consists of a Cirrus FM seven-channel receiver, two CS-248 standard servos, and a 600-mAH NiCd pack.

RADIO INSTALLATION

The procedure for determining component location prior to actually installing the radio is to tape all of the components temporarily in place, mount the tail surfaces, canopy, wing rods, and tape the pushrods to the outside of the fuselage in their approximate location. With the main wing rod resting on a smooth surface on both sides, the distance from the bottom of the skid directly below the rudder hinge line to the surface the wing rod is resting on should measure 19-1/2 inches. Shift components around or add lead to the nose until it does. Either way, *don't fly until you have your Hawk balanced.* A nose-heavy Hawk is difficult to land (you tend to run out of elevator), but a tail-heavy Hawk is murder!

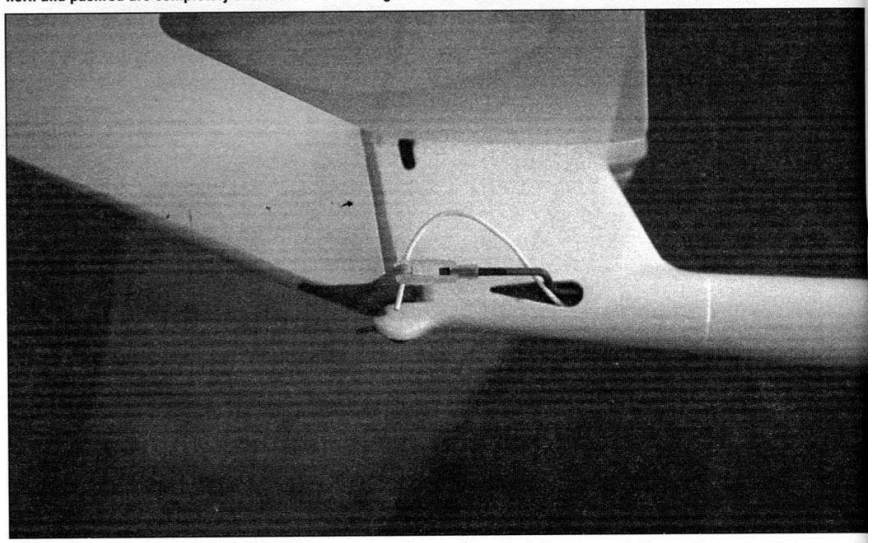
The last step is to make the cutout for the servos in the nose cone. The receiver and battery are installed through this hole, and all that shows in the canopy is the servos.

FLIGHT PERFORMANCE

Oh boy! The fun part . . . time to fly! Hand tosses at a local park produced a long, flat glide, and all that was left was to wait for the right weather and hit the slopes. As luck would have it, I had to wait over a week for some decent wind, and even then it was only a 6-9 mph breeze. That doesn't sound like much, but the Hawk is an exceptional soaring bird, and I was ready to go for it. What a beautiful sight! The Hawk flew majestically and after just a couple of passes, was well over 100 feet above the lip of the hill. That first flight lasted about a hour and ended in a picture perfect landing.

The next day looked more promising—winds of 20-25 mph with occasional gusts to 30. Today was going to be fun! With several clicks of down trim, I launched the Hawk straight out. She went up like a rocket and before I could complete one pass across the face of the slope, she was up at least 200

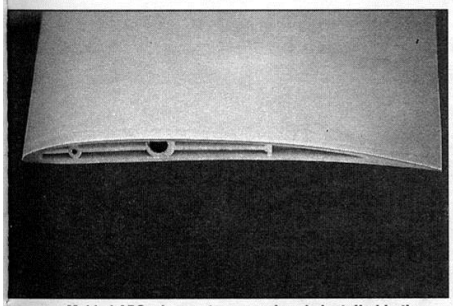
The rudder hinge and control horn are a single molded unit. Rudder pushrod exit is clean and unobtrusive. Hinge pin for the full-flying rudder snaps securely into the tail skid bump and allows for easy rudder removal if needed. Elevator horn and pushrod are completely enclosed in the fuselage.



feet. This is where the real fun begins. After a prolonged dive, pull up, hard rudder, and over she goes. No other glider rolls quite like a Hawk; it's kind of a half roll, half loop—sort of like doing a loop sideways. You have to see it to appreciate it, and it's even more fun to do!

How about thermal flying? Many people think of the Hawk as strictly a slope ship, but nothing could be further from the truth. Thermalling a Hawk simply requires finesse. It's not difficult to thermal, it just takes a certain flying style to get the most out of it. Unlike a polyhedral model that can be forced through maneuvers, a Hawk takes a light, deft touch on the sticks. When coring a thermal, it's best to fly a wide, smooth circle. The Hawk doesn't like to be wracked up on a wingtip, nose high; it will just fall off on the inside tip and you'll find yourself losing a lot of altitude.

Something you often hear about the Hawk



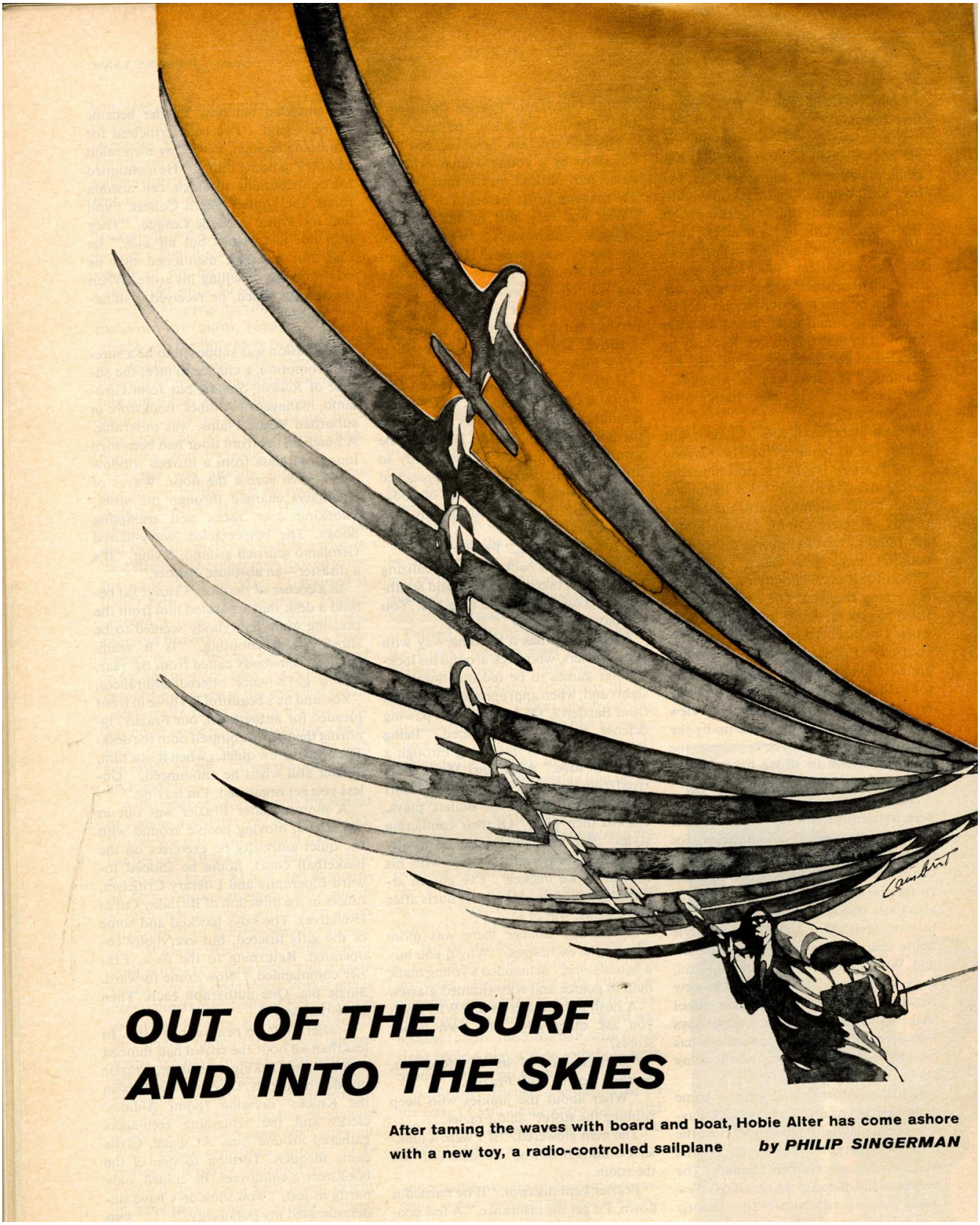
Molded ABS wing roots come already installed in the wing panels and have the brass tubes for both wing rods already in place.

is that it's all over the sky during a hi-start or winch launch. Again, it's a matter of flying style. Most people tend to put more than the recommended throws in the rudder and elevator, and this is where the "wobble" comes from. When launching a Hawk on a hi-start or winch, it's important to throw straight so that you don't have to make a lot of corrections during the first (and fastest) part of the launch. If you need to make corrections, keep them small. If you have more than the recommended amount of rudder throw, you'll probably overcontrol, then find yourself wobbling all over the sky trying to catch up with your own control inputs.

CONCLUSION

The Hawk is more than "just another glider." The Hawk is an experience—one that will either leave you breathless, or wondering what all the fuss is about. If you're lucky enough to fly a Hawk that's properly set up, you'll surely experience the thrill that so many have known over the past 20 years. And, lucky for you, the legend lives on in the Ross Hawk. It's not inexpensive, but then, you get what you pay for. . . and you definitely won't feel like you overpaid for the privilege to be a Hawk fanatic. Heck, some people have traveled halfway across the country just to hear the Grateful Dead play! ***MB***

From Sports Illustrated February 1975:



OUT OF THE SURF AND INTO THE SKIES

After taming the waves with board and boat, Hobie Alter has come ashore with a new toy, a radio-controlled sailplane ***by PHILIP SINGERMAN***

It is the day before Thanksgiving in Southern California. A late afternoon sun hangs just above the ocean, glinting through translucent orange wings as the sailplane banks for a slow turn, loops once, then dives straight for the water off Salt Creek Beach. Two surfers, hunkering on their boards as they wait for the day's last ride, duck instinctively, but in the instant before it plummets into the waves the glider pulls sharply out of the dive, loops again and climbs swiftly on a turbulent updraft. The plane, nearly four feet long with a wingspan just over eight feet, resumes its lazy figure-eight flight, drifting 75 to 100 feet offshore in a pattern parallel to the ridgeline like an orange-skinned osprey looking for something to eat.

On the edge of the ridge above the beach stands Hobie Alter, a grin on his weathered face, cigarette dangling from the corner of his mouth, a two-channel radio transmitter in his hands. He is dressed in his business clothes: a flowered Hawaiian sport shirt, baggy denim pants, old sneakers and wraparound sunglasses. With the exception of his right thumb, deftly working the control stick of the transmitter, he is motionless. He is in rigid communion with his glider, the Hobie Hawk.

The Hawk, weighing only 30 ounces without its radio-control equipment, which consists of two tiny servo units mounted in the cockpit and joined to the rudder and elevator by thin control rods, is the latest creation by Alter, now 41, the maverick designer who personally revolutionized the sport of surfing in the 1950s and who builds more catamarans today than anyone else in the world. Along the way Hobie has become a millionaire, but that has changed neither his hell-raising life-style nor his compulsive dusk-to-dawn work habits. Although he is chairman of the board of the Coast Catamaran Corp., he has no office at its 15-acre headquarters and plant in Irvine, preferring—in the style of the Wright brothers' bicycle shop—to work in a large cluttered room over his garage. For relaxation, give him some old friends, a case of beer and either a dirt bike, a catamaran or a model glider. He bought his one and only business suit in 1958, and to call him either "Mr. Alter" or "Hobart," his given name, is as appropriate as calling Henry Kissinger "Hank."

"To really fly one of these sailplanes right," says Hobie, "you have to get your mind inside the plane. You have to feel yourself up there with it and anticipate what it'll do as the air currents change. Here, give it a try." He hands over the transmitter, and for a moment I feel as if I have been turned into a block of Jell-O. With hardly any effort on my part I can send $300 worth of high-density Styrofoam, cross-linked polyethylene, ABS plastic and some rather sophisticated electronic sensory gear into the Pacific. "Remember," Hobie says, "move the stick right to turn the plane right, left to turn left, push it forward for down and pull back for up. That's all there is to it. Just don't overcontrol it. If you turn too tight, the plane will go into a spin."

Gingerly I push the stick to the right. As the plane begins to turn, Hobie tells me to let off on the stick. "Just blip it a little bit. Make your turns nice and slow at first," he says. "There's plenty of lift out there so the plane will free-fly without your doing much of anything." I tap the spring-loaded stick two or three times with my index finger as though flicking the ashes from a cigarette, and the glider swings in a wide right-hand arc over the ocean. I try the same thing again, only this time to the left, then back again to the right and, despite my earlier skepticism about the enjoyment quotient of a model airplane for an adult, I'm hooked: a glider junkie in less than two minutes.

As the plane's wings bob in the unstable air my stomach jumps and my knees tremble. With my finger I seem to control this noiseless creature, yet, like a launched falcon, the plane retains a control of its own—it is an eerie man-made reproduction of a bird of prey.

My last dealings with a model airplane were at the age of 13 when the two thin pieces of wire linking me to my authentic scale version of a P-51 Mustang snapped and, with a noise like a chain saw being swallowed whole by some great beast, the plane was reduced to a set of Pick Up Sticks in a nearby elm tree. The Hobie Hawk is different. Like everything Hobie Alter has designed, it uses no fuel, has no smell and is so functionally sleek that it seems to be in motion even when it is still. Its only sound is the shriek of the wind rushing by the upswept wings during a high-speed dive.

My aeronautic reverie is interrupted when the glider, without warning, noses up into a stall. Instead of allowing it to level off with just a gentle push on the control stick, I panic and jam the stick forward. For a moment the sailplane hangs motionless, then hurtles toward the water like a bag of cement. Frantically I pull back on the stick. The plane performs one marvelous loop, a second even more impressive than the first and continues its *Kamikaze* journey toward the sea. For the first time I hear Hobie's childish giggle, a strange sound coming from a man with Lee Marvin-James Coburn tough-guy looks. Calmly he takes the transmitter from my busy hands and the glider flattens out 20 feet above the ocean, where it circles, waiting to rise on another updraft. I had allowed the plane to get too low, and while high-altitude corrections are simple, flying a Hobie Hawk below 50 feet is about as easy as moving a large old dog out of the sun.

"You have to watch the glider every minute," says Hobie as he brings it into the wind for a soft landing in some grass.

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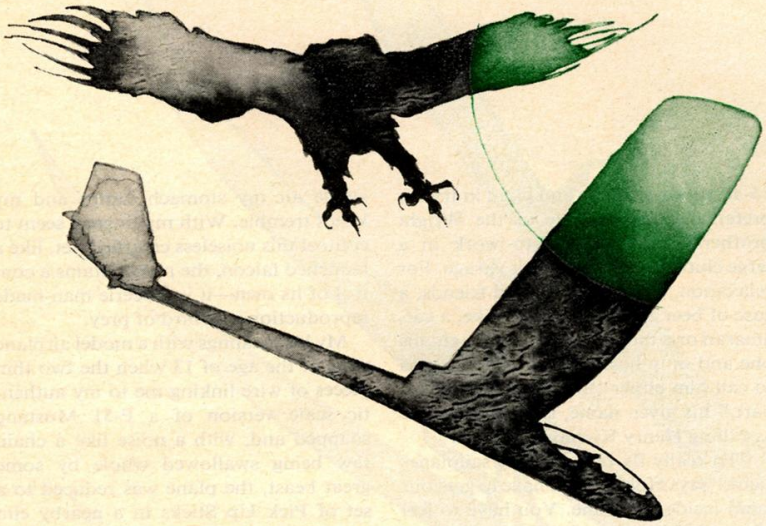

"The range of these transmitters is two miles, and when the plane gets out of sight there's no way in the world you can control it. A guy up in Aspen who bought one from me spent three days hunting in the mountains for his." The orange Hobie Hawk rests on the ground between us. Beneath the tinted plastic canopy are the radio-control servo units, lending the glider the sinister aspect of a miniature U-2 spy plane. The surfaces of wing, fuselage and rudder flow together to create a symmetry that reflects the thousands of hours Hobie spent building models until he perfected this sailplane.

"In a way," he says, "the glider is like the surfboard or the catamaran. But instead of the water's flow, it makes you aware of the movement of air. You watch birds and the way they pick up thermals and soar. Tomorrow we'll go out with my friend the Colonel and try to get the glider up in a thermal with some hawks. Now that's real fun." Hobie's eyes widen as they do whenever he is excited or wants to stress an important point. The Colonel, I am told, is a fanatical model builder who considers ridge soaring to be child's play. He concentrates on thermal soaring—maneuvering the sailplane into warm rising air where, with skillful handling, it can glide for hours.

Hobie Alter's romance with the wind began when he was five. His grammar school in Ontario, Calif. conducted a kite-building contest for all students, kindergarten through sixth grade, with prizes awarded for design and performance. Hobie won first place in both categories. By the time he was seven he was building stick-and-tissue-paper model airplanes of a complexity to make grown men throw away their X-Acto knives and start collecting beer mugs. In Ontario and at his parents' summer house in Laguna Beach, where he stayed as often and as long as he could near the sea and windswept cliffs, he worked on one project after another, related more often than not to his passion for the currents of the water and the sky.

Most of all Hobie loved to have fun, and since he lived then as he does today in the land where enjoyment is the leitmotiv, he arrived at a simple but brilliant solution to a problem that has plagued men for centuries. Imbued with the spirit of hard labor, endowed with the soul of a creative dreamer and blessed with a child's capacity to enjoy himself, Hobie Alter would design and produce playthings that brought him closer to the natural elements he loved, and he would do it better than anyone else because he would work harder and longer. From up and down the coast kindred spirits flocked to wherever he happened to be creating—a cellar, an old boathouse or his front yard—somehow knowing that this wild man who worked day and night for weeks on end, living alone on the beach in a room under his folks' house at an age when other kids still played Monopoly with the baby-sitter, was up to his ears in pleasure.

More than 25 years later the situation remains the same. Wayne Schafer, a real-estate broker and championship-caliber sailor who lives near Hobie along the same strip of Capistrano Beach, sums it up: "There's a group of guys, all around 40 years old, living in this part of Southern California, who are primarily interested in having fun. For years we've surfed together, sailed together, ridden dirt bikes and skied. We look to Hobie as our leader. We figure if he's doing it, then it must be fun."

In 1954, against the advice of almost everyone, Hobie Alter opened what is believed to be the world's first surfboard shop. All his surfing buddies told him he'd sell a couple of hundred boards up and down the coast and then go broke. Martha McManus, a jolly, robust old woman who lives several houses down the beach from Hobie, recalls the time quite well: "Nobody gave Hobie a thousand-to-one chance, but when my husband, who would sooner swim to Hawaii than part with a dollar, bought one of Hobie's boards, I said to myself, 'Well, by God, the kid's gonna make it.'"

For three years Hobie built boards from balsa wood with a fiber-glass covering, but then one day he heard about a light, strong substance called polyurethane foam. Convinced it would make a better surfboard, Hobie closed down his shop and with a friend named Grubby Clark worked nonstop to develop the proper foam mixture. "For weeks and weeks we worked and we slept, and once in a while we ate a greasy hamburger and drank some beer," Hobie recollects. "It was the only time in my life I was really scared, because I'd closed my business to do it. A couple of times we blew out the side of the mold. The night we finally got the right mix for the foam blank I got an ulcer. But really, I think I got it from the hamburgers rather than the fear."

By 1966 Hobie's dealers around the world were selling 250 boards a week at $130 each, and Hobie was a rich man, but by then he was off on a new project. He had gotten involved in sailing, and

decided that he could build a catamaran better than any available at the time. He used his surfing know-how to design a boat without a centerboard that used an asymmetrical hull with one flat surface to prevent sideslipping in the water. Once again Hobie's critics told him he was crazy. He took two of the first boats he built to Hawaii, where they sat, friendless, for six months at the Outrigger Canoe Club. "Who'd want to race a catamaran nobody ever heard of?" the local salts wanted to know. Today the Hawaiian sailors form one of Coast Catamaran's most enthusiastic fleets. Around the world, Hobie sold 8,000 of his catamarans last year.

Twice now, Hobie's successful designs had enhanced his own, his friends' and thousands of others' enjoyment of the water. Still, during the surfboard and catamaran years he would return now and again to the high bluffs over the ocean and the mountains near the coast to fly model gliders and study the birds soaring in the shifting eddies of air. Hobie had been away from gliders for a while when, four years ago, he and some friends put a case of beer in the car and traveled to a nearby model shop. Model sailplanes, they found, had become more controllable with light, precise radio apparatus, but the fragile balsa-wood construction remained.

With his knowledge of resilient plastics Hobie studied the available planes, trying hard to resist the creative impulse to design and build a better one. "At first I said to myself, 'I don't need this. I mean, it's nothing but a lot of work.' But once the bug bit me I was cooked. I knew I could build a better glider."

Overnight the workshop above his garage was filled with dozens of wings, chunks of polyethylene, sheets of diaphanous Mylar and plywood and hundreds of his own drawings. Alter designed by trial and error, not theory, reading no books but choosing instead to test one creation after the other in the wind near Capistrano Beach.

The result—taking three years and $100,000—blended sensuous, natural form with space-age construction: a unique injection-molded ABS plastic tailpiece (tooling for this part alone cost $12,000), a six-layer fiber-glass fuselage blown into a steel mold, wings of routed Styrofoam to save weight and a nose section of a substance so tough it can be beaten with a sledgehammer without breaking. Today, at the shop in San Juan Capistrano where the models are manufactured, rock music blasts over FM radios and long-haired kids run Hobie-built machines that make the parts for orange, white and yellow Hawks. They are sold assembled for $129 or as a kit for $99; the radio gear is extra. Across the street work tooling engineers and corporate wizards who would rather put in a creative 12-hour day in T-shirts and jeans than shuffle papers in a coat and tie for eight.

Two Hobie Hawks, riding a thermal, circle in the clear morning air 1,000 feet above an old helicopter pad at the Camp Pendleton Marine Corps Base in San Clemente. On the ground, Colonel Bob Thacker (U.S. Air Force, retired), a model-airplane aficionado, expounds on his compulsion to reposition the wings of the plane he bought from Hobie. "No serious self-respecting modeler would buy a plane and fly it as is," he says. "Besides, if I can't change the design a little bit, there's no sex in it, if you know what I mean." The Colonel, a short, spare man with twinkling green eyes, dressed in his model-competition uniform of white sneakers, a white shirt with a one-inch collar, a black tie with a knot the size of a quarter and a straw boater, looks more like an escapee from a vaudeville road show than an ex-military man. He and Hobie have launched their gliders into the thermal using a "hi-start"—100 feet of surgical tubing joined to 300 feet of 40-pound-test monofilament fishing line. The line is stretched taut between a stake in the ground and the glider's tow hook; the pilot lets go of the plane and, like a paper clip coming off a rubber band in geometry class, the sailplane wings away to become airborne.

For about an hour Hobie and the Col-

continued

onel have been holding an impromptu glider competition, first endurance tests and then precision-landing contests in which a glider must be brought from high altitude to a given spot on the ground in exactly two minutes. Suddenly Hobie spots two hawks, wings outstretched, soaring effortlessly in a thermal just above the ridgeline of a hill a mile away. In less than a minute he maneuvers his glider into the same thermal and the plane quietly joins the two birds. At first the hawks ignore the strange intruder that mimics the pattern of their gyre, but then Hobie lofts his sailplane above them, and the hawks react. Instantly they gain altitude and, with a cry that echoes through the valley, one bares his talons and dives for the glider. But Hobie sends his plane streaking toward the ground, and the furious bird is thwarted. "You can play with those hawks all day," Hobie says as he lands the sailplane, "but they won't let you get above them."

After dropping the Colonel at his house, Hobie aims the van for Ontario and a Thanksgiving dinner at his sister's. "We'll take the long way around through the mountains," he says. "Maybe see some people hang-gliding off the cliffs."

For a man who treats heavy surf and a wild broad ocean with the kind of disdain most people reserve for the bathtub, Alter drives the narrow winding roads of the Santa Ana Mountains with extreme caution. In part this is caused by his constant searching of the sky for soaring birds, sailplanes and hang-gliders while at the same time scouring the roadside for places to fly the Hawk.

As he drives, Hobie also gives a running, encyclopedic account of rock formations, crop yields, animal life and other ways to get to where we're going with a Kerouac-like exuberance. In the middle of a long discourse on the region's dry, hot winds, called Santa Anas, he suddenly wrenches the van's steering wheel 90 degrees to the left and pulls to within three inches of the edge of a cliff hundreds of feet above Lake Elsinore. Before the dust raised by the van's wheels has settled to the ground Hobie has the back doors open and is jamming the glider's wings onto the fuselage. "We got some lift out there," he says, and dashes for the edge of the cliff, the glider in one hand, the transmitter in the other. He flicks the transmitter and receiver on, and hurls the plane off into space.

continued

Within five minutes the small overlook is crammed with bubbling onlookers—two heavy-duty bikers, three female hang-gliders, some campers, four sets of smoochers and an assortment of Thanksgiving Day sightseers—all of them risking a slip into oblivion for a better look at the Hobie Hawk. Not one to pass up an opportunity to petrify the crowd, Hobie, deadpan, brings the glider streaking toward the goggle-eyed spectators, several of whom hit the dirt. The plane does a roll, loops no more than 10 feet from the edge of the cliff and, before anyone has time to blink, catches some lift and hovers hundreds of feet out over the lake. If Hobie had brought a dozen sailplanes with him he would have sold them all.

It is very late Thursday night. We have been talking for hours in the van on the trip back from Ontario and now in the beach house at Capistrano. Hobie pulls the sliding glass door shut against the late-night fog rolling in across the harbor, and suddenly the noise of the surf breaking 50 feet away is muffled. We pull our chairs a little closer to the freestanding fireplace and stare at the snapping coals behind the screen. After what seems like a very long time Hobie speaks, as much to himself as to me. "With the surfboards," he says, "I wasn't sure. With the catamarans I thought 'probably,' but I *know* the glider'll be a success." "Why?" I ask him. "Is there something about the timing—are people more ready for a glider now than, say, 10 years ago?"

"Nope," Hobie replies, "it's just that plane. I can feel that it's right." Twice before Hobie's instincts have been correct, but who knows? I think about the crowd on the cliff overlooking Lake Elsinore, literally jumping up and down with enthusiasm, but then people in Southern California like excitement. Will thousands of folks in Kansas and Florida and New Jersey rush out to buy a Hobie Hawk for $129 plus radio-control equipment? Whether they do or not, this much is certain: from time to time, somewhere along the Coast Highway between Newport Beach and San Diego, not far from a blue Dodge van, a straight-backed figure wearing sunglasses will stand motionless as a bronze statue and gaze out over the Pacific where an orange bird drifts silently like a dream. **END**