Falco Builders Letter

Jim Slaton taking off on the first flight of his Falco.

First Flight: Jim Slaton

The phone rang the other day. "I just wanted to let you know that sucker flies." It was Jim Slaton, who flew his Falco for the first time on January 26. The first flight was 'by the book', a conservative gear-down flight to feel the airplane out. Jim flew fighters in the Air Force back when they still had propellers, he has an A36 Bonanza which he flies regularly, and he had flown with John Harns in his Falco last summer, so he was well-qualified and prepared for the first flight.

On the first flight, the left wing was heavy, but overall Jim was delighted. "I'm so happy with the way it flies. The way it handles is really great." He reported that there is "absolutely zero vibration"—less than his A36. He said he was "absolutely amazed" that he did not have anything to adjust except the trim tab on the wing. "I made the nicest, softest landing you ever saw."

He said he did have to use a lot of nose-down trim with the gear down and wanted to know if that was normal. I

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First Flight: Steve Bachak

Steve Bachnak is the latest Falco builder to break ground. He flew his Falco on March 14th, becoming the 19th home-built Falco to fly. The Falco, N64SB, weighed 1,174 lbs empty with its 160 hp O-320-B3B engine and steel-hub prop from a Piper Apache.

On the first flight, everything went well except that he has a very heavy right wing. It wasn't a particularly good day for a first flight and there was a short runway with a crosswind and lots of haze, but

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In This Issue:

Goings On at Sequoia Aircraft

For those of you in the U.S., we have an unusual enclosure with this issue, a copy of the September 1988 *Pilot* magazine from England. *Pilot's* editor and publisher is James Gilbert, a name you all know from his flight report on the Falco. In 1964, James was runner-up in the national aerobatics championship in England, and then he was an editor at *Flying* as part of Bob Parke's irreverant and talented 'brat pack' that included Dick Weeghman, Steve Wilkinson, Peter Garrison, George Larson, Richard Bach and others. James was hired at a breakfast meeting in London by *Flying's* publisher after a search for a writer/photographer in the U.S. had proved fruitless. James quickly accepted, since he had just been fired by an ad agency.

James has always been a notorious snob about airplanes and his sharp criticism of U.S. planes won him few friends among *Flying's* advertisers, but Bob Parke protected him. Born in a London suburb at the outbreak of WWII (he remembers seeing, at age 3, the Crystal Palace burn) James knew most of the European airplanes and was particularly fond of some beautiful airplanes built in Italy designed by an obscure designer, Stelio Frati—"about whom I can tell you little since he doesn't answer my letters." For the longest period of time, James was the only one who wrote about Frati's airplanes, and although their names are closely associated, Gilbert and Frati have never met.

Eventually let go by Bob Parke ("I guess I proved too stroppy for even the most tolerant of men"), he roamed for a while, wrote books (*The Great Planes*, *The Flier's World*, *The World's Worst Aircraft*, *Skywriting*) and eventually settled in London. He bought a 1940 Bücker Jungmeister, painted it in a 1930s scheme of silver and grey with a swastika on the tail. His old flight instructor, Miss Joan Hughes, told him in an amused, only-half-disapproving tone, "You simply *can't* fly around with those swastikas." But

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Jim Slaton

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really couldn't say, since I always trim my Falco for cruise and never touch it for landings and takeoff.

Jim said his wife Judy was "on cloud nine" and that she and some relatives videotaped the whole thing. After he landed, someone asked Jim if the flight made it all worthwhile. "Nah. Not all that for one flight. What made is worth it was the building."

Jim and Judy Slaton live in Hemet, California, where they owned and ran Hemet Redi-Mix. Jim bought the Falco plans in April 1985 and started construction soon thereafter. Jim flew P-40s and P-51s in the service, had a Bonanza which he flew regularly and was busy with the concrete business. I once asked Jim why he built a Falco, and he said it was just something he had always wanted to do. The concrete business had become rather daily, and Jim admits he was bored with it.

Like so many Falco builders, Jim has been an inveterate tinkerer. Years ago he worked as a sheet metal fabricator and inspector at Douglas, taught sheet metal work in a school and had many years of experience in woodworking and cabinetry. Jim began work in his garage and planned to put up a pre-fab metal building at Hemet Redi-Mix to finish the Falco, but there were numerous interuptions.

First there were zoning and building permit problems, and just as those were being resolved, he was approached about selling the business. This was a little ahead of his schedule, but Jim named his price and they bought, so he lost some time while that went on, and then he went round-and-round on the pre-fab building, finally building it as planned at the concrete business.

Jim worked irregularly on the Falco until the building was completed, and he spent some time building spec houses. But finally the building was done, and Jim went to work steadily on the Falco. With all the talk of Karl Hansen, Pawel Kwiecinski and Tim Baker finishing their Falco in record time, it's fair to record that Jim did not find it so easy. He figures he's probably got 7,000 hours in building his Falco, and once at a moment of frustration when he threatened to "torch that thing" and grumbled about the time it was taking, I asked him if he was sorry he was building a Falco. "Oh no. It's been the highlight of my life."

Jim's Falco, N118J, weighed in at 1,270 lbs empty, while still in primer and with the empty weight C.G. at 67.0". He has full gear doors all the way around and the initial speeds look very good. It indicates 165 knots at 24/24 at 4000 feet. The Falco has a full IFR package and the Nustrini canopy. The engine is an IO-320-B1A overhauled by High Performance Engines, so this is easily the most powerful '160 hp' Falco flying.

So far Jim had developed two problems. The circuit breaker pops when the gear is about 3 to 4 turns from full gear up. I think this is because of the main gear wheel well doors. Apparently there is a rapid build-up of air loads on the doors on the last few turns. Pawel Kwiecinski had the same problem, and I can't remember if he solved the problem or just took the doors off.

The other problem is one that I have not heard of before. With the gear up, Jim is unable to trim the airplane to level flight. Full nose-down trim is not quite enough. I asked Jim to check the angular movement of his trim tab, and I haven't heard back yet. He was off to Mexico for a few weeks in the Bonanza with Judy and some friends.

Jim plans to fly off the first twenty-five hours and then take the Falco to a paint shop. The airplane will be painted in mother-of-pearl with gold and bronze stripes.—*Alfred Scott*

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Articles, news items and tips are welcome and should be submitted at least 10 days prior to publication date.

Steve Bachnak

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Steve was tired of waiting so he took it up for 20-25 minutes with the gear down.

"It is touchy—or should I say, tender—on the controls." Yeah, well what about it Steve? Do you like it? "Yeah, I want to keep it." It's hard to get Steve excited.

Steve Bachnak lives in Munster, Indiana, where he has been a general contractor until he retired recently. He took on the Falco because he wanted a project. He has always had a shop going and while he had never built an airplane before, he has built eight sailboats, from 20 to 45 feet.

The project took Steve seven years of work on a very irregular schedule. There were large blocks of time in which he would not even touch the project. Steve made all of his wood parts and since he had a bandsaw and a small lathe, he made all of the simpler metal parts but purchased the engine mount, cowling, canopy, landing gear, retraction system, etc.

Steve Bachnak:
"Yeah, I want to keep it."

The Falco is painted white with blue stripes and blue trim around the canopy. The Apache propeller can only use one spinner, and that spinner does not quite blend with the lines of the cowling, but it looks better than you might imagine. The carburetor is on the bottom, and Steve has done a good job of making an unobstrusive carburetor air intake. (The gear doors are too long and will go bye-bye on the first hard landing with a low strut.) There is an attractive blue interior and a full panel of radios, including a loran, and a left hand throttle.

Many Falco builders approach the contruction of a Falco like the making of a great art form. Everything must be perfect, and I can't tell you how many have assured me that *their* Falco is the best one ever built. Steve Bachnak has always remained aloof from this this sort of perfectionism. He's spent a lifetime making things and doesn't strive for trophy standards. He succeeded in his goal and has built an attractive, well-built airplane that should keep Steve flying while he works on his next project—who knows, another boat?—*Alfred Scott*

Goings on at Sequoia Aircraft

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James did and once admitted to taking "a wicked delight in (and have been in trouble for) creeping up on unsuspecting Cherokees and sailing past them upside down with my swastikas blazing."

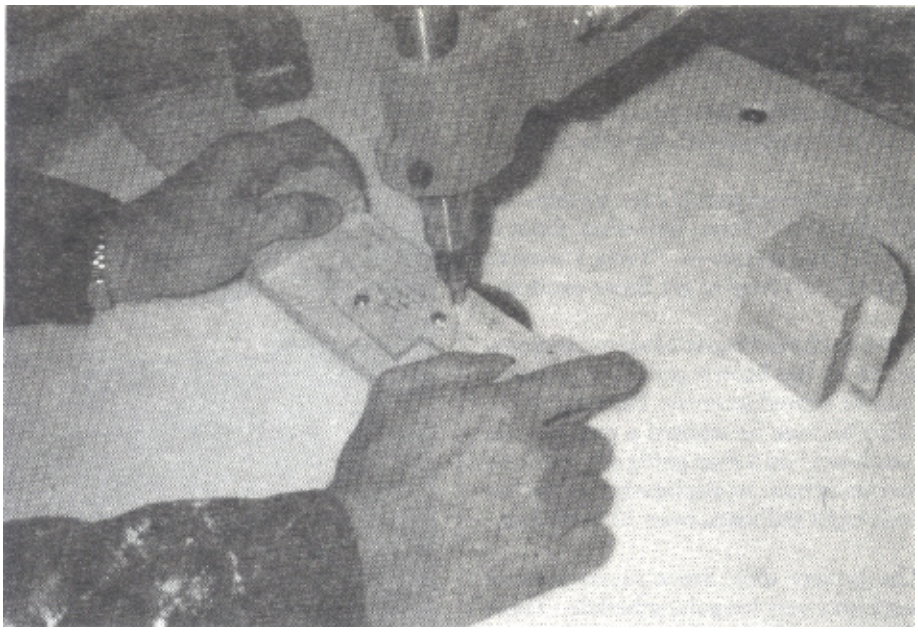
"So perfect are the airplane's controls that often I do not bother with aerobatics, but simply float about over the beech woods, staring down at the patches of purple rhododendron or the banks of bluebells, admiring the many mansions that earlier aristocrats caused to be built. I am an aristocrat of today: An *aerial* aristocrat." He did a few airshows ("very carefully") in the Jungmeister and "for my finale, I screwed up the throttle friction butterfly nut and made an inverted fly-by giving the Hitler salute. Wrong hand, but who cares?"

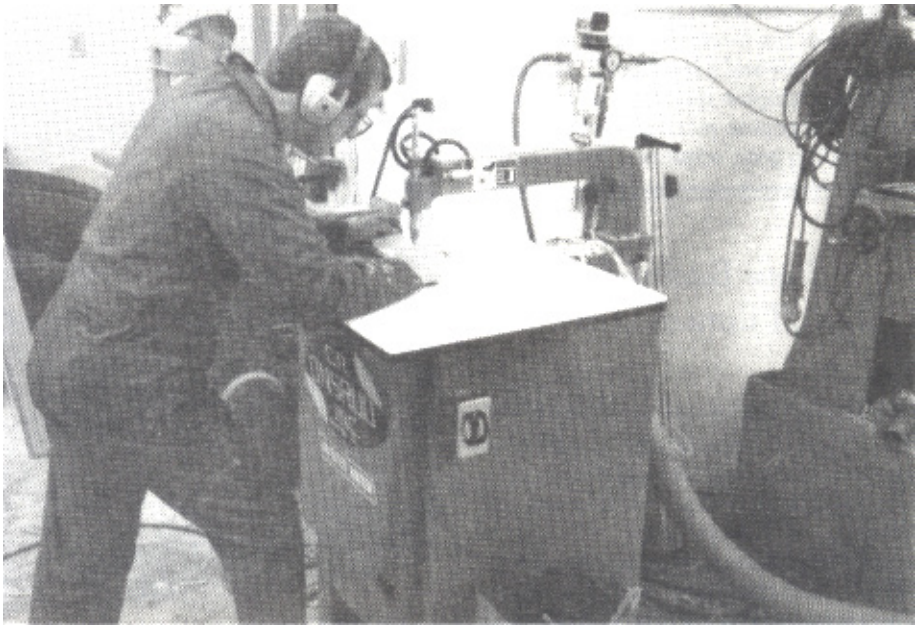
James became editor of the tiny *Pilot* magazine (where earlier the ever-cynical, Harvard-educated, California-born Peter Garrison had been working when he first contacted *Flying* through James) and a few years later he exercised an option to purchase and thus became publisher as well.

It was at this time that I began work on the Falco, and I needed photography and an objective flight report to lend credence to the project. I wrote James. He wrote back that there was a good-looking Falco at Doncaster, and he could do it all for $1,000.00. It was a very reasonable price, and I immediately agreed. Congenitally incapable of delegating, James was up to his ears with work at *Pilot*, didn't want to do the work and had quoted what he *thought* was a 'go-away' price. He was astonished to get my approval and had no choice but to go fly the Falco. The rest you know about.

Recently James wrote asking what I thought about sending a complimentary copy of *Pilot* out with the Falco Builder Letter in case any of you might want to subscribe. I'm delighted to do so, because not only does the magazine continue with a lot of coverage of Frati and his airplanes, it's also a wonderful magazine.

What I particularly like is the glimpse into European aviation with all its diversity and the saucy irreverance of the magazine. It was in *Pilot* magazine that you could have read—two years ago—that the SX-300 project was being offered for sale and would probably not





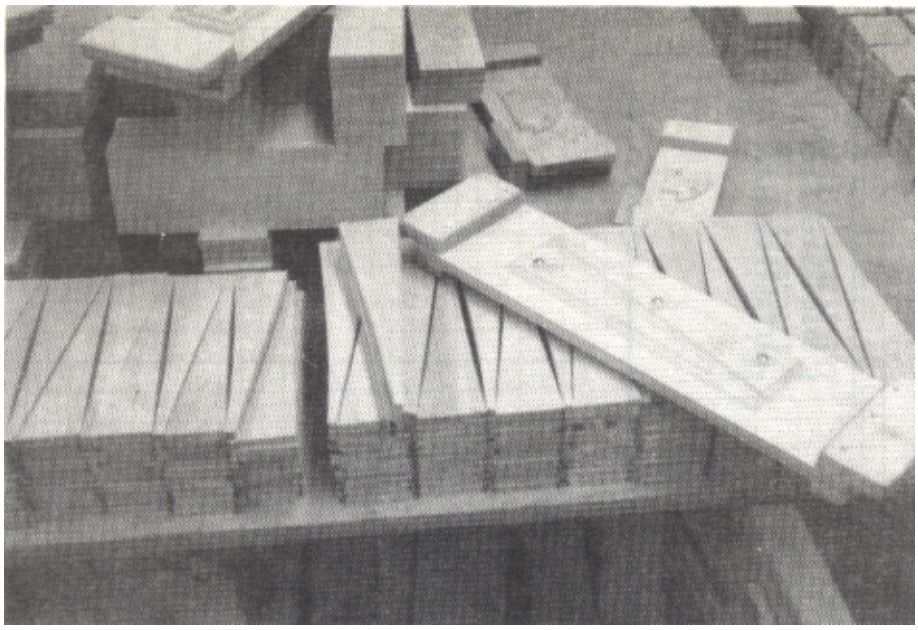
be a permanent part of the kit market. No one else reported that. The enclosed issue carries an article on the Argentine Air Force during the Falklands war. You and I cannot understand the controversy this article has stirred; it was written by an Argentine pilot—the enemy.

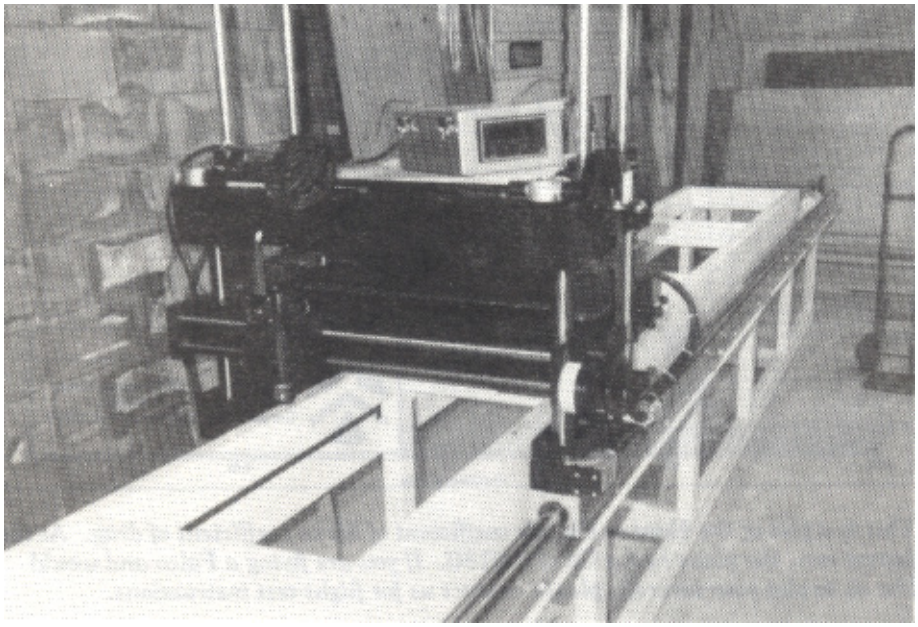
Our own Steve Wilkinson is a regular contributor of material, witness the "Letter from Italy" on Frati and the Avanti. (Can you believe it? Beech has blown $300 million on the Starship and Piaggio is feeling smug because they only spent $150 million to develop an airplane for J. R. Ewing.) There is an occasional article by Brian Lecomber. That's a name you won't know, but he is easily one of the best writers in aviation today.

My only complaint about *Pilot* is that there is not enough by James Gilbert, but it's a great magazine. We subscribe and if you are getting bored with your aviation rags, take a look at this one.

I've been spending a lot of time working on the wood kits. We've really begun work in earnest now and will continue at a heavy pace which will probably last through most of the year. I have a helper, Daryl Corle, a machine designer who wanted to do some extra work at night. I make the jigs, Daryl makes the parts.

Progress has been very good and the thing that I find most interesting is the thought process of designing the jigs and the production process. My goal is to make the wood parts to the same high standards that the rest of our parts are made. I want jigs and fixtures that will





turn out parts with a very high degree of consistency. The words "cut to fit" are anathema to me.

I have found that there is a lot of Zen in a good jig. You think and think and think until you can arrive at no simpler, faster or more accurate method. If you have properly exercised your grey matter, then you'll get the results you are after. I've spent a lot of time over the years imagining how I would make these parts and in the last two years the thought process became rather intense.

When you think about making the wood kits, some of the most frightening parts are the solid spruce ribs. None of them are particularly difficult to make if you just want *one*, but when you consider how many of the parts there are in the airplane and how many of these parts there are in 50 airplanes—our typical production run of other parts—it gets very frightening. Francis Dahlman made these parts by tracing a pattern onto the wood, bandsawed the parts to a rough outline and then sanded them to the line. There is no way that I am going to do that, or even pay someone to do that.

We use a C. R. Onsrud inverted pin router, one of the cleverest woodworking machines I've seen. It's an expensive machine (about $3000) but it's an incredibly productive piece of equipment. A heavy-duty commercial router motor is mounted under the table centered on a guide pin that is mounted on a cast iron overarm. Both the guide pin and router retract and are adjustable; press on the foot pedal and the guide pin descends actuated pneumatically, and then the cutter comes up. The cutter is surrounded by a grate and a dust collector pulls the chips down and out. The template is located on the top of the fixture and the part is on the bottom—away from your fingers.

I make the tooling from acrylic. I sand the plexiglass so that I can draw on it like drafting mylar, then I cut it out with a bandsaw, and sand on the belt sander right to the line. The templates take relatively little time to make and they are very accurate.

The jig boards are Baltic birch plywood and a raised handle on each end hits the guide pin if you slip, protecting your fingers. The template is mounted on the top with a couple TRA screws, and we drive some small finishing nails through the plywood. These make little 1/8" long spurs which drive into the spruce and hold it in place. We cut the blanks on the table saw and then press them on the spurs and cut the part out.

Just because they are mean little parts that I don't want to fuss with, we are making enough of these parts for 100 aircraft. We have made most of the parts for the tail group, and we are now about halfway through the process of making the aileron and flap ribs. The only real trick to operating the machine is understanding the grain of the wood and when to cut slowly. So far the easiest parts are the aileron/flap leading edge ribs. The hardest are the aileron/flap trailing edge ribs. These are made two at a time from a rectangular blank.

I am very happy with the way the parts turn out, and they are very accurate parts. The parts have little holes from the spurs but these do no harm. The parts also have a fair amount of fuzz at the corners, and you will will have to spend a few minutes sanding this off.

I am presently working on the tooling and pieces for 50 sets of tail group ribs. These are well under way and in the next issue I'll talk about how we make those parts in a method which will surprise you in the way it depends on the table saw and some unique capabilities of the inverted pin router.

Work progresses on 'Gonzales', our one-of-a-kind horizontal mill for wood. The basic framework is a welded steel frame of 2"x4" rectangular tubing. This is bolted to the concrete floor and then

non-shrinking grout is troweled under the frame. It is very rigid.

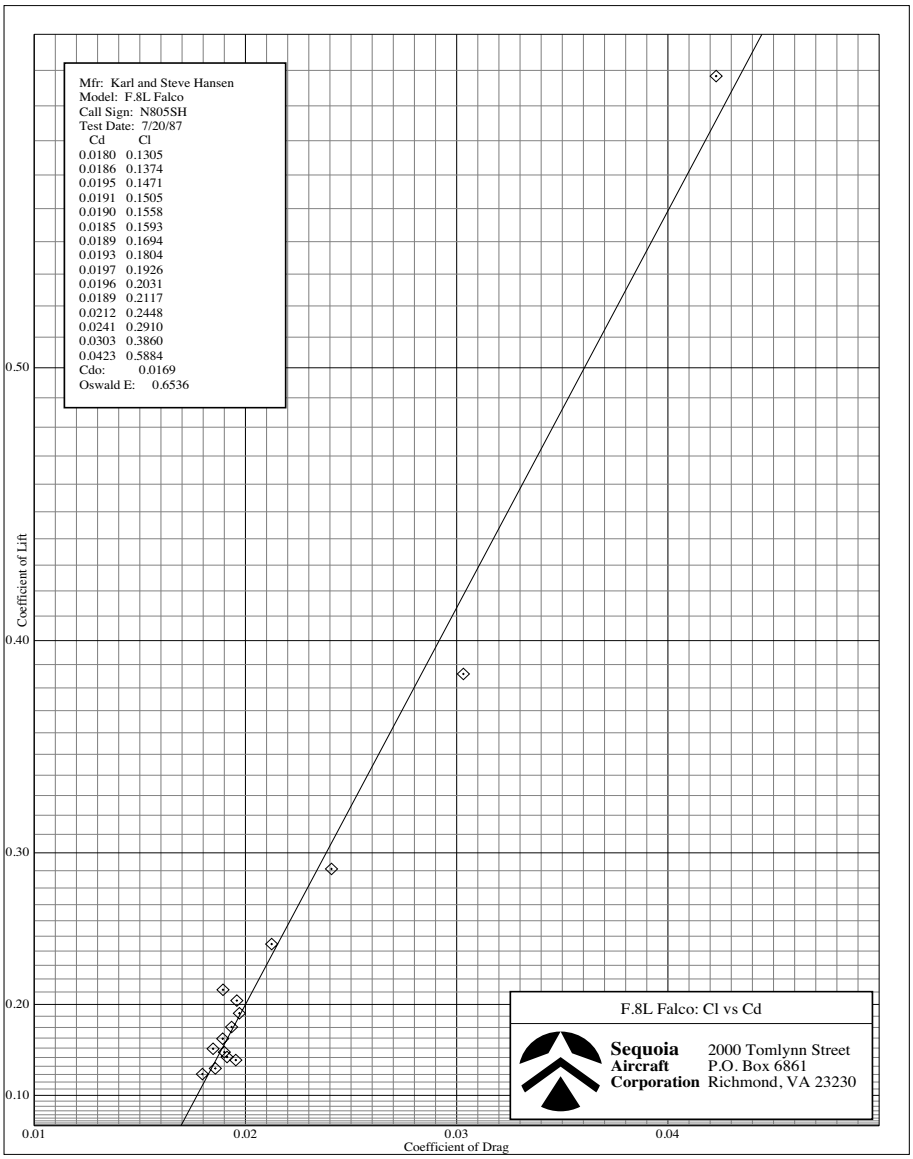
The traveling cutter head moves on linear ball bushings, a specialized type of ball bearing that runs on a case-hardened steel shaft. The cutter assembly is raised and lowered with four screwjacks which are interconnected to a single handle. A digital readout shows the height of the cutter in thousandths of an inch. There is a heavy-duty router mounted in the front of the machine for leveling the table and just-in-case. The machine is now wired and running, but we still have to shim the tracks to absolute levelness, install the table top and doors, and install the chain that pulls it back and forth.

With the table top and doors installed (the insides will have shelves to store jigs and fixtures) the machine will look more like a long kitchen counter than a woodworking machine. It's a dead-simple device which will be a key piece of equipment for the production of the wing and tail spars. It's frightfully expensive, but it will allow us to make the spars quickly and with unheard-of accuracy.

One of the things that we have always striven for is same-day shipment of kits from our office. For the most part, we do this but occasionally we get caught. We got hit with a flood of orders on the tail group this fall and our apologies to the few of you who got hit with some back-ordered parts. We are presently out of main landing gear legs but the next fifty are being made now and should be in stock shortly. We are out of fuel tanks because we are awaiting a new shipment of tank ends from a supplier who works on his own schedule and who recently delivered a shipment of aft tank ends when we declared an emergency on the *forward* tank ends! Such is life on kit row.

I hope to get all of the wood kits to same-day shipment soon. We are presently out of tail group ribs, and I expect to have those in stock in a few weeks. This leaves only the main spar to build in quantity. At this time, I would have to guess that it will be June, but that's just a guess. The only time I can tell you when we can ship a kit is when we have the parts on the shelf.

One long-term project that I have been working on is an unusual computer program for flight test performance analysis. It's been an on-and-off project for odd moments and recently I have put some time on it because the Loprestis are now



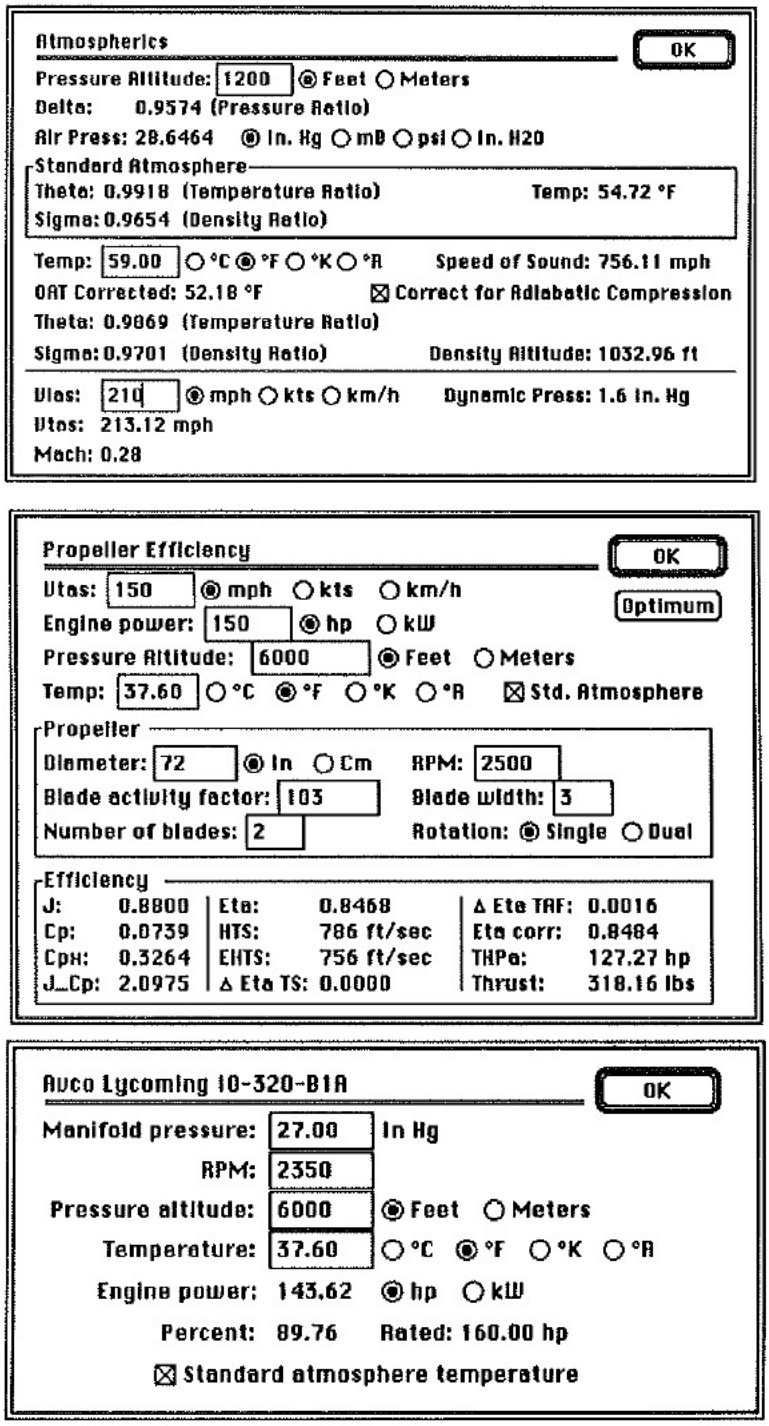
This is a plot of the Hansen Falco's coefficient of lift vs coefficient of drag. At the fastest run, the plane had a Cd of 0.0180. If you are flying a Falco and would like us to plot your aircraft, please contact us for flight test instructions.

flying the Swift and will be running performance flight tests on the aircraft. This was precisely the kind of kick-in-the-rear I needed to finish up some parts of the program.

Unlikely as it may be, this program is the first in the world to automate the process of flight test performance analysis to calculate the Cdo and Oswald E from drag polar flight test data. At this time, only a portion of the overall program is running, but it dramatically reduces the time required to make these calculations. Curt and Roy Lopresti are very familiar with the methodology and have used it for years. Previously the method has depended on lookup charts of empirical data for propeller efficiency and engine power. This program, called Benchmark, reproduces the charts with a variety of methods. This whole thing is something of a joint effort with Jim Petty and myself. Without Jim solving some of the knottiest problems, none of this would be possible.

Curt Lopresti spent one summer looking up values on the Boeing General Propeller Chart, and this program calculates those values as quickly as you can type the numbers into the computer. It takes Curt about half a day to analyze the numbers from a drag polar flight test. Benchmark does the same thing in about 15 seconds. I was in Florida last week, and it was fun to watch the expression on Curt's face as he watched this happening on the screen.

All this may sound like computer-nerd talk that has no practical value for any of you, but I can assure you it does have real



Benchmark has three calculators. Top: The atmospherics calculator calculates all of the standard atmospheric conditions and speed relationships with temperature and pressure changes. Center: The propeller efficiency calculator duplicates the Boeing General Propeller Chart. Bottom: The engine power calculator.

value. When I finish this thing, you will be able to run a fairly simple series of flight tests, write down some numbers and then print out a number of flight manual performance charts for your specific airplane. The same kind of charts you get with a production aircraft that show miles per gallon at various altitudes, temperatures, weights and power settings. The method is well-known, but the math is horribly complex and the program will simply handle all the math and charting.

Joel Shankle agreed to check out my wheel well doors, which are made for greater stiffness. Unfortunately, he discovered a problem which will send me back to working with fiberglass. Apparently, I neglected to fully inflate the tire that I took the dimensions from, so the door is simply too tight on the tire.

To gauge the stiffness of the doors, I did run a simple test on the doors that Richard Clements made. I supported the doors with a board along the forward edge and along the hinge, then I place a 20-pound weight (actually a little-used dumbbell) on the outer edge at the raised reinforcement. We measured the deflection of the door with the weight on the door. Richard's doors deflected .33" on the left and .38" on the right. This is a simple test of door stiffness that anyone can run, and I would be interested in hearing the results of anyone else's tests.

I have also not yet done anything about the wing fillets. I've been too busy with other things, but Steve Wilkinson and Tim Baker have both checked out parts that I pulled from the molds and the parts fit perfectly and look beautiful.

As previously reported, Sky Dynamics is getting out of the business of making one exhaust system at a time, so we are in the process of ordering exhaust systems in quantity. We are only going to stock the exhaust systems for the engines with the aft-mounted injectors (IO-320-B1A and IO-360-B1E). Regretably, the price of the exhaust system is going up to $685.00, which includes the heater muff ends installed. We get a better price for ordering in quantity, but we have to add a markup. One thing that makes this look particularly bad is that the price of the Falco exhaust system had not been increased since it was first introduced and most cross-over exhaust systems are around $600.00 these days. The 4-cylinder Glasair exhaust system, also made by Sky Dynamics, sells for $700-800. We are adding the exhaust system to the Engine Controls kit and have changed some kit numbers to accommodate this.

If you want a system for an engine which has the carburetor or injector in the bottom of the sump, speak now! Specifically, let me have your order by March 31. We can get these exhaust systems made at the same time as the others. Although it will cost us a little more than the other systems, we will handle these at the same price as the other systems. Whenever we order exhaust systems, I'll make a point to let you know so we can get the other systems made at the same time. I can't predict when we'll reorder the systems, so you should order now.

Other changes in the kits: The Tail Group Equipment kit now includes the rudder and elevator stops which increases the price slightly. The last time we ordered these parts we did them in a lot of 100 airplanes and thus the price increase is much greater than it normally would be. But just to show you what good people we are, we are going to increase the price in two jumps, so there will be an additional price increase next time. We have also added the wing tip lenses and tie-down kit to the wing equipment kit, since everyone orders the parts anyway.

—Alfred Scott

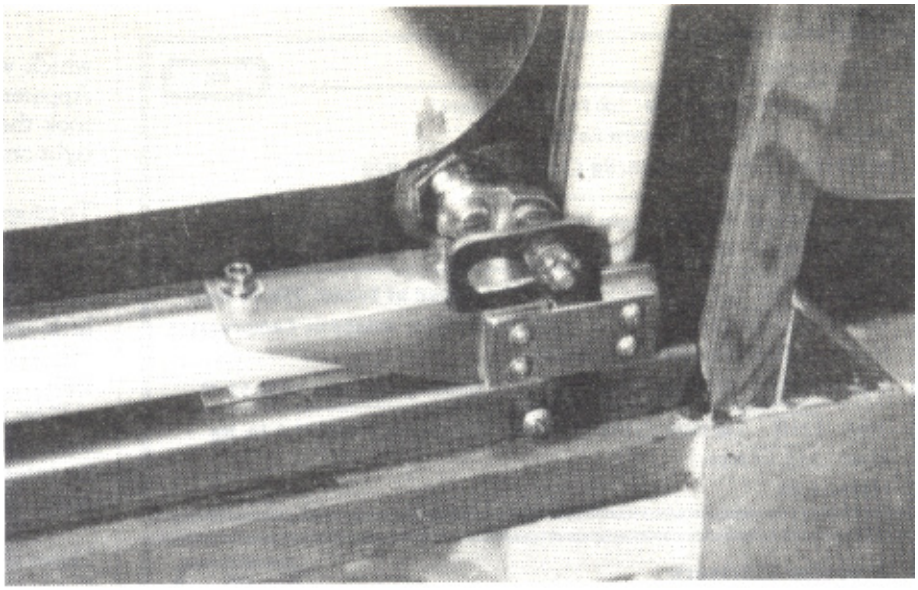
Construction Notes

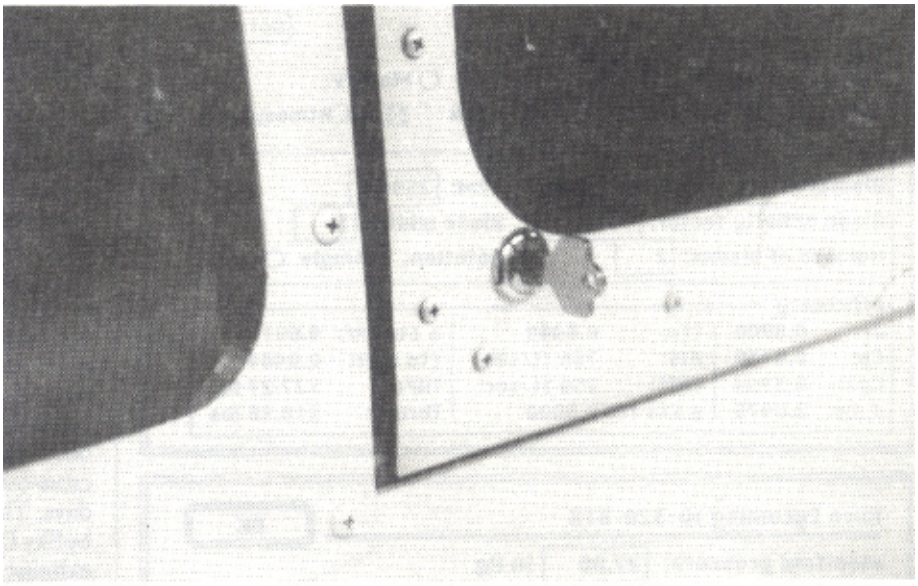
It may already appear in *The Wit and Wisdom of Chairman DeAngelo*, since he was the one who put me onto it, but I've been using a "found-wax" method of forming all the small fiberglass fairings for the top and bottom of the wing and such things as the rudder-cable outlets. It requires only a few pounds of supermarket canning wax, several aluminum-foil "loaf tins" and a small implement called a melon baller, which is *not* something you do to the Orange Bowl queen but a small scooper with a different-size cup-like hemisphere at each end, used for making cute little balls of canteloupe for fruit salads.

Melt the wax, pour it into the loaf tin and let it harden. (It inevitably hardens with a declivity in the center, but no matter; you're going to be scooping out most of the wax anyway.) Sharpen your—preferably stainless steel—melon baller with a file and just go to work hollowing out, freehand, what you reckon the shape of the needed fairing will be, by sliding—not "scooping"—the sharpened mellon baller across the wax. As a finishing touch, put the scooped-out wax mold under the hot-water faucet and rub smooth the tooling marks with the heel of your hand or perhaps a sponge or balled-up wet paper towel. (Careful, since the wax remelts surprisingly quickly.) Then just cast your fairings in the hollowed-out mold, with the normal three plies of nine-ounce cloth and epoxy mix, and pop them out when done. (Obviously, they won't stick to the wax, no need for any mold-release agent.)

One advantage this has over the turned-spinner-shapes-cut-in-half technique suggested in the plans is that you can carve and try as you go: plop the hollowed-out mold down onto the wing where the fairing will go, and you can immediately see if you've hollowed out enough or if it's the correct shape. Also, since it's already a female mold, you get a finished exterior of your casting without having to convert a male shape to a female mold, as you would with the half-a-spinner method. And finally, for those who, like the neurosurgeon tallying his BMW's mpg, calculate the cost of glue and staples as they build their $70,000 airplane, the wax can be melted, recast and reused forever.

It's surprisingly easy to do the carving freehand with a sharpened melon baller, as long as you concentrate on shaving the wax rather than cutting it out, and you can make the mold more than adequately symmetrical with a little practice. Also, I worry less about the exact plan-specified dimensions of these fairings than I do about having identical twins on each wing. I have two loaf-tin molds at a time going—carving on one set of fairings while another is drying—and I'm just cranking these things out one after the other. Maybe I'll go into business, since writing is getting boring.

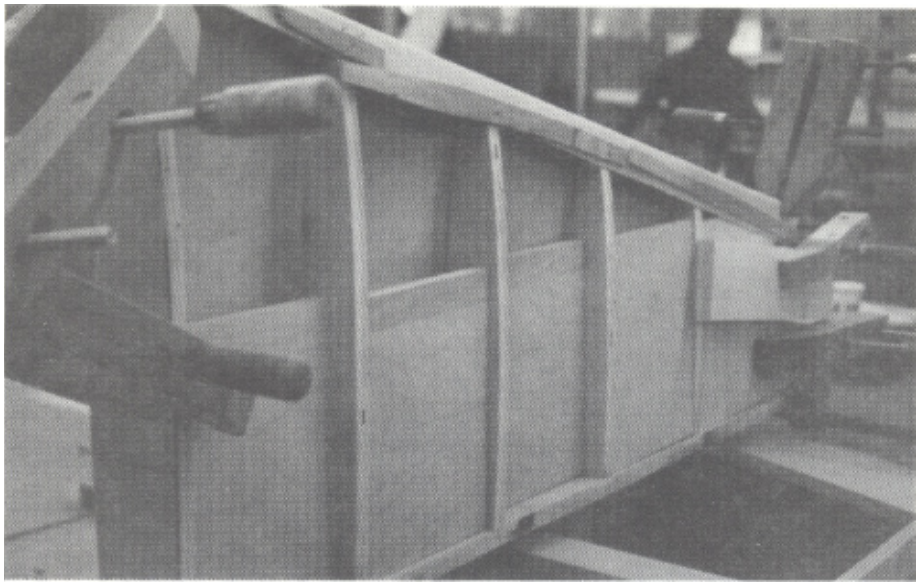


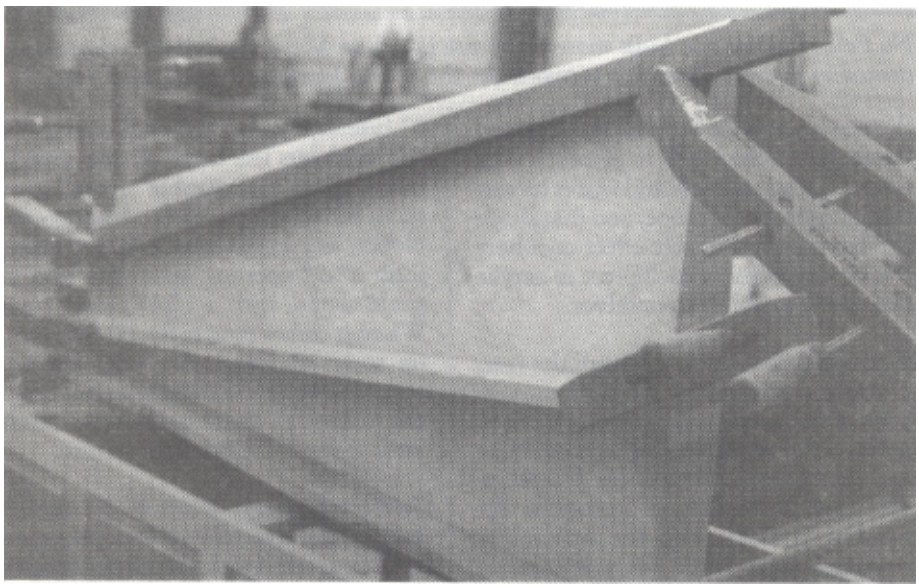


Rex Hume designed the canopy lock shown above. The photographs are of mock-up parts to test the idea. They have since been remade, and Rex reports the lock works well.

Alfred already described my happy-go-lucky procedure for fitting the acrylic bubble to the canopy frame, and it seems to have worked out just fine, other than a couple of misdrilled holes. However, it should be pointed out that fitting the canopy frame plus bubble to its tracks and rollers takes some shifting and adjusting even though you might have gotten the naked canopy framework to seemingly slide back and forth freely. I had to slightly rout out two small areas of fuselage skin at each rear lower edge of the canopy, for example—where the rear diagonal fuselage frame meets the cockpit side rails—to allow the acrylic to "nest" rather than being bowed slightly outward by the full width of the fuselage. I also had to play with the dorsal-fin "slider tube"—sand slightly deeper the groove within which it fits—in order to have the whole assembly slide neatly, and had to file a tiny bit off the bottom edge of the acrylic on each side so it wouldn't rub against the cockpit side rails. It's surprising what tiny, almost imperceptible hangups will affect the freedom of canopy movement.

Also, it should be pointed out that mount-





To bend the stabilizer skin, Gary Smith made a dummy stabilizer from 3/4" Baltic birch plywood. Gary reports, "It took about 30 minutes. The jigs (we can use this term in the South) worked great to bend the plywood for the stabilizer."

ing the uppermost of the two black plastic rollers on each side of the canopy does *not* require drilling a hole through the acrylic in order to afford access for the capscrew and then for a hex wrench to to hold it steady; you simply slide the canopy aft about halfway, to its widest point, which allows space for the capscrew to slip into its roller, bushing and hole, and then use a hex wrench that you have shortened appropriately with a hacksaw.

Another thing: I'd suggest not going to a vast amount of trouble to laboriously cut and fit the spruce spacer that goes between the canopy framework and the acrylic on each side. Put blocks of wood in there—or whatever—to space the canopy the proper distance from the framework as you drill the necessary mounting holes. Then, when you get the entire canopy assembly mounted on its tracks, you can run it full forward and make the precise measurements that will allow you to cut and custom-fit the precise spacers for your airplane, so the curve of the acrylic conforms *exactly* to the flow of your airframe. Maybe every other airplane fits the plans precisely at that point, but I had to make new spruce strips on each side to account for variations on the order of one or two millimeters.

The windshield: Obviously, the canopy has to be completely fitted, rolling freely, and the leading edge of the acrylic sanded so that it conforms exactly to the windshield bow before you start work on the windshield. Then latch the complete canopy in place. Draw the outline of the canopy bubble on the aft face of the windshield bow. And draw another line 3/8-inch *inside* that line, to account for the thickness of the windshield. That latter line will be the one down to which you sand the bow.

I used a yard-long float-sander to do the finish sanding of the windshield bow at the correct angle all the way around. First you put the windshield in place temporarily, draw a pencil line at the arc where it hits the fuselage skin, and then you can float-sand freehand keeping the forward end of the float-sander "pointing at" that line all the way around. It comes out close enough for gummint work if you keep checking your angle with a straightedge. (Tony Bingelis also details a slightly more complex procedure using a stick and blue marking chalk in his excellent newest book.)

One problem that might come to light as soon as you try to fasten the canopy to the windshield bow using the hook-and-handle arrangement supplied with the canopy kit is that overcentering the U-shaped "hook" with the handle to snap it fully shut severely stresses the bow. You either need to file oval the holes in that hook (which I did, and I might even have to end up welding a little more metal to them) or redrill the hole in the handle around which the hook pivots. Either way, you need to make the hook in effect longer, so it isn't trying to torque the windshield bow so severely—which I imagine could crack the windshield eventually.

The seemingly obvious way to mount the windshield is to fasten it first to the windshield bow starting at the top center and working out to the left and the right, and then mount it where it abuts the fuselage skin at its forward bottom edge. If you do this, however, you'll find that the slight weight of the windshield, and perhaps the pressure of repetitive drilling and screwing, may have almost unnoticeably bent the windshield bow slightly aft. You'll end up with the windshield bow and the canopy-framework hoop no longer parallel, and when the canopy is tightly fastened at the top, there will be quarter-inch gaps at each side, at the bottom, between the wooden bow and metal hoop.

So mount the windshield at the top of the canopy with, say, six or seven screws. Then hook the canopy to the bow and use it to shove the windshield forward as far as it needs to go in order to keep canopy hoop and windshield bow parallel all the way around. Draw a pencil line

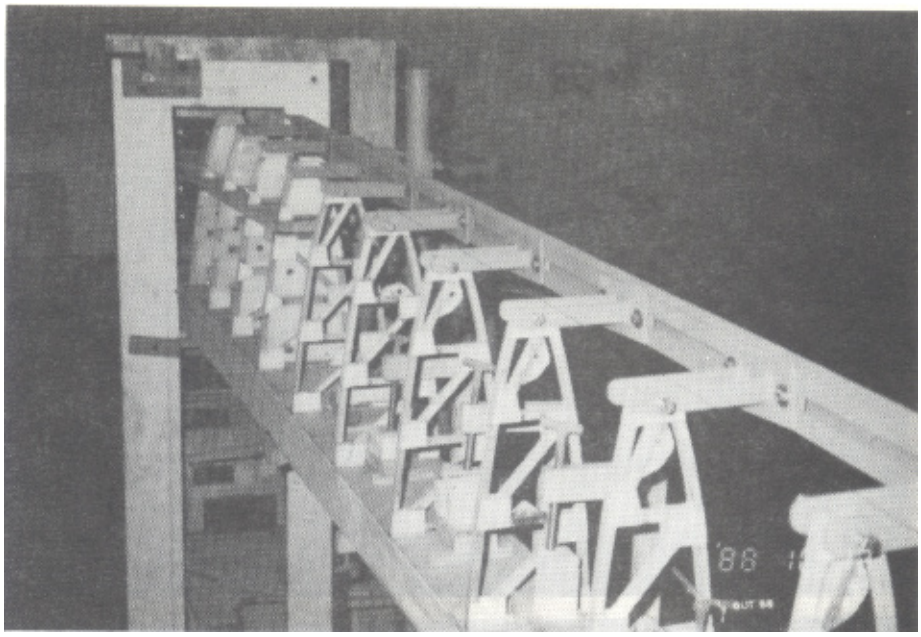
at the lower leading edge of the windshield, about six inches out from the center on each side, where it then meets the fuselage skin. This is where you will establish your windshield-to-fuselage mounting wedge.

The plans show that "wedge" to be a continuous strip between windshield and fuselage skin, all the way around the lower edge of the windshield, assumedly of varying thickness and angle all the way around. I found it much easier to use 30mm-wide, wedge-shaped blocks, one at each screw location. This way, each wedge-shaped block could easily be tapered and shaped to fit exactly in its proper location. I made a total of 13 of them, 80mm apart—one on the centerline and six progressing down and aft on each side. (There's room for two more on each side, but the angle between windshield and fuselage skin at those points is so slight that it doesn't seem worth bothering with. Maybe I'll add them later simply as spacers, since at those points the windshield-mounting screws go straight into the fuselage frames and make no use of the external wood for mounting strength.)

The entire canopy and windshield procedure is a matter of mounting and fitting, removing and adjusting, remounting and fitting. So it goes with the windshield. You glue in place the single wedge on the centerline, then drill the windshield and the block to fit it. With the windshield properly fastened to the top of the windshield bow, pull it forward—if you have to—so you can snug it down to that one centerline wedge. Then check your windshield-to-fuselage line and redraw it if necessary. Then dismount the windshield and glue in place the next two or three wedges, say, on each side, in exact alignment with the pencil line you've drawn. Drill and remount the windshield and continue in this fashion both along the windshield bow and the windshield forward edge.

The series of wedges doesn't look nearly as elegant as a continuous strip would, but they'll ultimately be out of sight anyway, hidden from the outside by the metal "framing strip" around the windshield and from the inside by... jeez, I dunno: Glareshield carpeting? Vinyl? Flox? Numerous old Jepps and yellowed E6Bs?

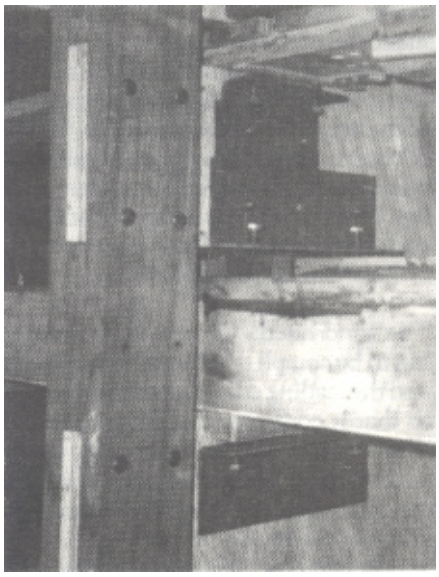
The secret, I think, it not to work too fast—not to drill too many holes at any one time. As you work from the aircraft centerline out—and this is true both for the canopy and for the windshield—and fasten the acrylic snugly in place screw by screw, it seats and sets and works its way into its permanent shape, and that shape can have a considerable effect on where the bottom edges of each piece of acrylic ultimately establish themselves.



No Falco builder has built more elaborate jigs than Marcello Bellodi, whose wing assembly jig has adjustable supports for the spars, fuselage frames, and ribs.

And when you finally establish the true, ultimate perimeter of the bottom-most edge of the windshield, you can mark it, remove the windshield one more time and rout out a ramp-like area of fuselage skin (and under-skin blocking) so the windshield melds with the airframe at that edge. But I haven't done that yet, so what do I know.—*Steve Wilkinson*

If anyone is looking for small "tee"-type blind nuts, your local hobby shop will have them in sizes ranging from 2-56 to 8-32 (usually by Du-Bro), cadmium plated. We modelers use these all the time for permanent inaccessible installations such as motor mounts, landing gear blocks, tec. I used some 4-40's to make a flush 2"x2" opening under the trim tab cable clamp, with a 1/16" Lexan cover. When it comes time to fly, I'll try to scare up some stainless steel 4-40 flat-head screws to keep the molecules happy and the rust away. These tee-nuts would also work well on the tail light fixture.



Free-hand rough scarfing of installed skins seems real easy using a pneumatic right-angle drill with a sanding disc, using 80-grit paper. The disc that I got is made by 3M, and your local hardware store is sure to have it. This drill turns much more slowly than my die-grinder, and also because of the relatively light weight (compared to an electric drill) and the working angle seems much more controllable and less tiring. Again, the pneumatics never get hot, but you should watch out for moisture and oil coming out of the exhaust and getting on your work. The drill uses so much air volume that I doubt that a small filter/moisture trap such as is used for paint spraying would be useful—too much pressure drop.

I found that the easiest way to almost-finish such a scarf was with my 22" long tee-bar with carbide abrader flats stuck on the bottom. I got the best results holding the bar at right angles to the length of the joint. With the long bar out there in the breeze, I was able to remove material quickly (high pressure, small footprint) almost to my marked scarf line, with a

consistent angle. Final finishing was with the bar laid along the scarf for a few passes.—*Craig Bransfield*

Craig Bransfield and Robert Brantley, each a modeler-turned-Falco-builder, have touted the instant glues made by Pacer Technology. Zap-CA is for any hard non-porous surface, Poly-Zap is for acrylic, polycarbonate and fiberglass, and Zap-A-Gap is the formulation for wood. I have bought them all and tried them in our shop, and while I like the glues, I have had mixed results.

I use a lot of acrylic to make router templates for ribs, and frequently I have to build up several layers of the stuff for cross-brace and gusset guides, which have to be precisely located. An instant glue is a boon for this sort of thing. I have had better luck with Zap CA, then 'hottest' of the glues, than I have with Poly-Zap which is intended for flexible materials. I'm sure it's something that I am doing wrong, but I find the glue a little unpredictable. In some cases, the glue hardens in 30 seconds, and in other cases it takes 5 minutes—I suppose the surface is contaminated with oil or something.

There is also a noticeable characteristic that the glue does not form a homogeneous film bonding the two pieces, but rather takes on a lacey pattern of interconnected islands. In many cases, I will go back later and work in more glue by capillary action to get more coverage.

I use a lot of Zap-A-Gap to glue pieces of wood in my cutting fixtures. In these situations, I want to place a stop block, glue that sucker down and start using the tooling right *now*. Zap-A-Gap is nice because it is so thin that you don't normally have to contend with a hardening blob of glue squeeze-out. Glues such as Elmer's white glue or the yellow aliphatic resin glues harden from the outside, while cyanoacrylates like Zap-A-Gap harden only when deprived of air. Any extra glue is easily wiped off with a paper towel.

I squirt a little of the glue, position the block and then grab my Senco stapler and shoot a staple to hold it in place until the glue dries. The label on the bottle says that the glue will harden almost instantly, but I haven't found this to be true. The only thing this glue bonds instantly to is your fingers. For wood, I think at least 10 minutes is necessary. That's too long for me since I want to use the fixture right away, so I just depend on the staple and go right ahead and use the tooling to cut the pieces. The whole process only takes 15 minutes, so I suppose the glue will help on the next fifty Falcos.

I also think the strength of these glues is exaggerated. We use a lot of Baltic birch plywood for our tooling, and we glue the pieces together with a variety of glues. On our router jigs for the aileron/flap leading edge ribs, we needed a block of wood stuck on one side as a safety feature to preclude the possibility of slipping and routing off your right thumb. We installed half of the safety blocks with Aerolite and half with Zap-A-Gap. All of the Zap-A-Gap blocks broke off in service, while none of the Aerolite blocks did.

When you look at the failures, it is apparent that the same lacey pattern of hardened glue is one of the culprits. And in chipping away hardened pieces, I have come to the conclusion that these glues are medium-strength glues, roughly in the same category as Duco Cement or Elmer's white glue.

We have gradually gone to Aerolite for all of our gluing of the jigs and fixtures, except for the staple-glued guide and stop blocks of our cutting fixtures. One thing that I like about Aerolite is the way you can clean up the squeeze-out at various times. The white and yellow glues skim over and are difficult to clean up, and I prefer to scrape and then wipe with a wet paper towel. When the glue is freshly applied, you can wipe Aerolite with a wet paper towel, or you can wait until the glue is hardened to a gummy, cheese-like state and then scrape it off.

I have also given up on using the 'instant' glues on my acrylic pieces. I find that the old standby of methylene chloride, which has been used for years for bonding acrylic, works better. I like it because you position your piece of acrylic and then run a bead of the thin liquid around the edge. It flows in by capillary action. You get good coverage and in 30 seconds it is hardened enough so that you can let go of things.

Stephen Friend writes from Australia that acid-catalyzed phenolics (ACP) and/or urea formaldehyde glues are banned there for joints in the primary structure of wooden aircraft. The prohibition is based on some problems with ACP, a glue type about which I know nothing. The theory on that glue is that the acid slowly attacks and weakens the wood. ACP glues have been implicated in accidents.

The Australian report goes on to say that the case against UF glues is not so clear-cut. They cite no glue failures or accidents and base their prohibition on UF glues because "they are known to react chemically to changes in humidity and there is ample research to cast doubt on their long-term durability in outdoor conditions." While they recognize that some formulations are more durable than others "the Department has not yet seen data to prove that any particular formulation does not suffer long term deterioration, particulary under outdoor conditions."

The Australian position of Aerolite and other UF glues is truly absurd. I don't know a thing about the phenolic glues, but I suspect that the acid is much stronger than the very weak acid used with Aerolite. Several years ago, there was some concern about mixing epoxy and Aerolite since epoxies such as T-88 are slightly alkaline and their cure is completely prevented by any acid condition. If you put epoxy over a fresh Aerolite joint, the glue would not harden, but Falco builder and chemical engineer John Oliver ran a series of extensive tests and found that this effect stopped after 48 hours. In short, there is a little acid left in the wood after the glue is hardened, but it quickly disappears. I am not aware of any evidence that the acid-weakening of wood from Aerolite's catalyst is a problem for anyone but nervous bureaucrats.

The statement that UF glues will not stand up under 'outdoor' conditions is absolutely correct. No room-temperature glue, except resorcinol, will stand up to long-term repeated water soakings on unprotected wood. Aerolite is a water-resistant glue, not a water-proof glue, but this makes no appreciable difference since the wood is so well protected from moisture that it would be a very rare event that a glue joint in a Falco would ever see any liquid moisture.

One thing that Steve Friend can do is to use epoxies, paint his airplane white and take tranquilizers when the temperature is high. I will observe that the addition of some brown food coloring would make the glue indistinguishable from resorcinol. Perhaps they're like my daughter who explained why she so readily dove into a Christmas plum pudding that turned out to be inedible.

Said Sara, "I never question anything that's brown."

—*Alfred Scott*

Tool Talk

We don't get many questions about saw blades, but I've been doing a lot of work at the table saw lately and have done some experimenting with various saw blades and bits for our pin router.

Pick up any catalog and all you can read about is carbide, carbide, carbide. Everyone is in love with the stuff, and you'd get the impression that everything else is obsolete. But when you start talking to the real experts in the router business they all talk about high-speed steel (HSS) for softwoods and many hardwoods. So who is right?

The primary reason carbide is used is that it is a very long-lasting tool. The material is tough as all-get-out, and it lasts much longer than steel. Whenever you are dealing with an abrasive material, such as plywood, you have to use carbide. On the other hand, HSS can be sharpened to a keener edge than carbide and the cutters are a third the cost of carbide-tipped cutters and a tiny fraction of the cost of solid carbide cutters. A HSS router bit will give a better cut in softwoods than a carbide bit.

Yet most people will tell you that a carbide saw blade gives a better cut. For the most part, this is true, and the reason is that a carbide-tipped saw blade is sharpened by grinding each tooth. Most steel blades have the teeth set—bent alternately to one side and the other. This is an imprecise business and just the tip of every other tooth carves grooves through the wood. This is not the case with a carbide blade, where each tooth is ground on the side so that it takes a nice square cut through the wood. Thus, it is the precise grinding on the side of the tooth that produces the finish, not the material.

But not all steel blades have the teeth set. Some are "hollow ground" and you will find that they will cut spruce nearly as well as the best carbide blade. And don't forget that spruce is relatively easy to cut with a saw. Most of the standard rules don't really apply to spruce, since it's so light, soft, resin-free and dry that you can rip with a crosscut blade all day long.

I have a Freud LU85M Telflon-coated 80-tooth crosscut blade, and there is no question that this blade makes the smoothest cuts in spruce of any blade I have tried. I use it for crosscutting spruce pieces and have been very happy with it. It is a very noisy blade, and it drums and vibrates to warn you that this saw can give you shortfingeritis. If you've just gotta have the best, this is it.

I also have a Freud LU84M 50-tooth combination blade, which is slightly less noisy and which is the best all-around blade to leave in your saw for everything.

You may be interested to know that Western Aircraft's Jean Peters and Trimcraft Aero's Francis Dahlman have never used, nor do they even own, a carbide blade. These two men have spent a lifetime cutting spruce, and they use steel blades. The simple truth is that if you use the right steel blade you don't need anything else, and they are painfully cheap.

The first blade that you should buy is a hollow ground planer blade. You can get one from Sears, Delta or your local hardware store. This is what Jean Peters uses the most.

Francis Dahlman was also very fond of the Sears thin rim satin cut veneer blade, and I heartily agree. This blade is hollow ground and has 200 teeth. With that many teeth, it's great for cutting thin spruce and birch plywood. The blade is hollow ground and thus produces a finish that is close to that of the best Freud carbide. The blade is limited to a 1-1/4" cutting depth, and I especially like it because it is easily the quietest blade I've seen. Compared to that howling banshee Freud, this blade barely whispers.

The big reason Dahlman and Peters use these blades is that they are thin and thus waste less spruce. When you are ripping spruce into capstrips, it is quite easy to have more than 50% waste. (Jean Peters has a secret weapon, a Hitachi resaw whose 80mm-wide stellite-tipped band saw takes a hair-thin cut through a seven-inch thick board of spruce.)

There are some thin carbide saws. Most are small diameter blades, and you want the maximum speed at the cutter for the best finish. I have a Piranha, and it is a rough cutting blade. Freud has recently introduced a series of thin kerf blades. I haven't tried one, but I doubt that they have anything to offer to us spruce-cutters. They are only slightly thinner—.090" vs .104"—and with 60 teeth the cross-cut LU88M can't cut as smoothly as the 80-tooth LU-85M.

The enemy of any steel blade is heat. Wood is such a good insulator that it is important to keep pushing the wood through the blade or the blade will quickly heat up—the heat goes out with the chip. This is easy to do with a saw, but more difficult with a router. The experts all say to use a HSS spiral bit for softwoods, and we found it was a disaster. Spruce splits so easily that you have to go very slowly when you are cutting 'up grain' and a HSS bit will be dull in 15 minutes of production work.

We have experimented with all of the most popular types of router bits and have found that a straight 5/16" carbide-tipped bit works best, but after an hour of cutting, the bit is worn out. This drove us crazy until we understood the problem. Spruce requires a very keen edge to cut cleanly. Our 'dull' carbide bits are still so sharp that you can drag the edge across your thumbnail and scrape a shaving off. This is the classic test for a very sharp blade, and yet the spruce wouldn't cut cleanly.

However when you look at the edge with an 8-power magnifying glass with

Stelio Frati's latest design, the F.22 Penguino

the light in just the right direction, you can get a slight reflection off the edge. There is just the tinest radius on the edge, probably measured in millionths of an inch, but it's there. We bought a 600-grit pocket diamond file from Trendlines, and that does the job. A few minutes of stroking on the face of the cutter will restore the bit to the original sharpness.

My thanks to the many of you who sent in suggestions for the carbide sanding disk for a table saw. There are a number of rubber sanding disks offered in catalogs, but they lack the rigidity to the the sanding-to-a-pattern that I had in mind. George Barrett called to say that he had one of the things. He had bought it at Sears in the '60s and had only used it a few times, so he just gave it to me. It was still in the original box—a Craftsman Karbo-Grit sanding disk. It's a great tool for sanding spruce and it will never wear out, which is perhaps why they no longer sell the tool.

But as luck would have it, I dropped into Sears the other day and they have a new product in the saw blade department. It's a ten-inch sanding wheel for use on a table saw, functionally identical to the old Karbo-Grit but with a very high quality sandpaper bonded to each side. I tried it out and found it did a slightly better job of sanding spruce than the Karbo-Grit wheel. Obviously, the sandpaper will wear out in time, but I doubt that it would be soon. The sandpaper is what is sometimes called 'resin-bonded' which apparently makes it last many times longer than standard paper.

Terry Smith bought a Radio Shack coaxial cable stripper and reports that it is one great tool. It is very cheap ($3-4), looks like a piece of junk but works great.

In our construction manual, we give the model number of the Senco pneumatic stapler as J-1/2 stapler. Senco has a new series of staplers which supersede the older ones, and I recently bought one. The salesman talked in circles so much that I never could figure out what the new part number is, but there is only one stapler that shoots the fine wire half-inch-wide staples. This stapler is apparently a rather rare item. More popular is the stapler that shoots the 3/8"-wide fine wire stapler. This staple is exactly the same as the other, except for the crown width, and it is the stapler-of-choice for the upholstery industry. I bought one of these and can't see any big difference, so get the one that easiest to find.

—Alfred Scott

The Perfect Day

It was a mid-February morning in the Arizona desert, and I knew this was going to be one of those rare perfect days—a day that I would remember the rest of my life. The temperature was already in the mid-fifties as we had breakfast with our very good friends, Larry and Edna Wohlers. The clouds formed a thin lacy curtain hanging about 25,000 feet AGL and below that the air was 'severe clear', giving the impression that you could see forever.

As Larry and I arrived at the airport, I knew I was accompanying the Grand Partriarch of the local aviation community. The greeting he received was testimony to the respect and admiration they all felt for him. It made me feel good to know that my own view of him was shared by so many.

We rolled back the hangar door and the sight was almost breath-taking. The beautiful silver-and-maroon Falco sat nestled under the wing of a huge gull-wing Stinson, like a majestic balled eagle that had adopted a prairie hawk chick and was protecting the fully feathered youngster until it decided to fly. The very look of the little Falco seemed to say, "Why aren't we gone yet?"

After the pre-flight we settled into the wide, comfortable seats and were soon listening to the gyros winding up. With the third turn of the prop, the little bird shook itself as if to test its feathers and came to life. What a thrill!! The Falco seemed to sing as we moved to the 'active' and waited for three aircraft to land before we could make that running leap into the air.

I did not feel the trailing-link gear leave the runway. I simply realized that the ground was moving away, and this made the second thrill contributing to my perfect day. I briefly thought, "Here I sit, placing my life in a wooden airplane that was built in a home workshop, and I feel very secure with the situation".

At this point, Larry gave me the controls, and the next hour and a half were fantastic. It took some experimenting for this Cherokee driver to know how much control force to use for the desired result, but the bird was very cooperative and my gracious host sat calmly and let me do it without outwardly biting his nails. Very little of that flight was spent straight and level, because I wanted to learn and experience the ecstasy that so few people have ever had the opportunity to appreciate. I did however enjoy the mountains as we flew by the tall peaks and through the canyons.

It was with great difficulty that I turned toward the airport and only then because I did not wish to impose upon the generosity of my friend. It was a perfect day, and I will always remember and be indebted to both Larry and the circumstances that made it happen.—*Don Stark*

Here in Virginia, where they're considered an endangered species, smelly, and frankly not that much fun, we don't do that to eagles.—Alfred Scott

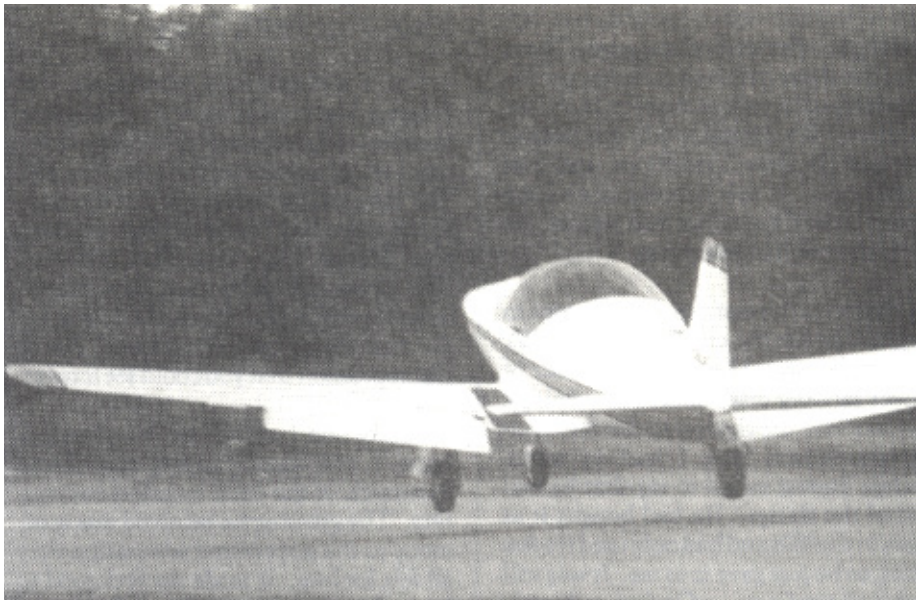
Devoe, DeAngelo and D'Bengilis

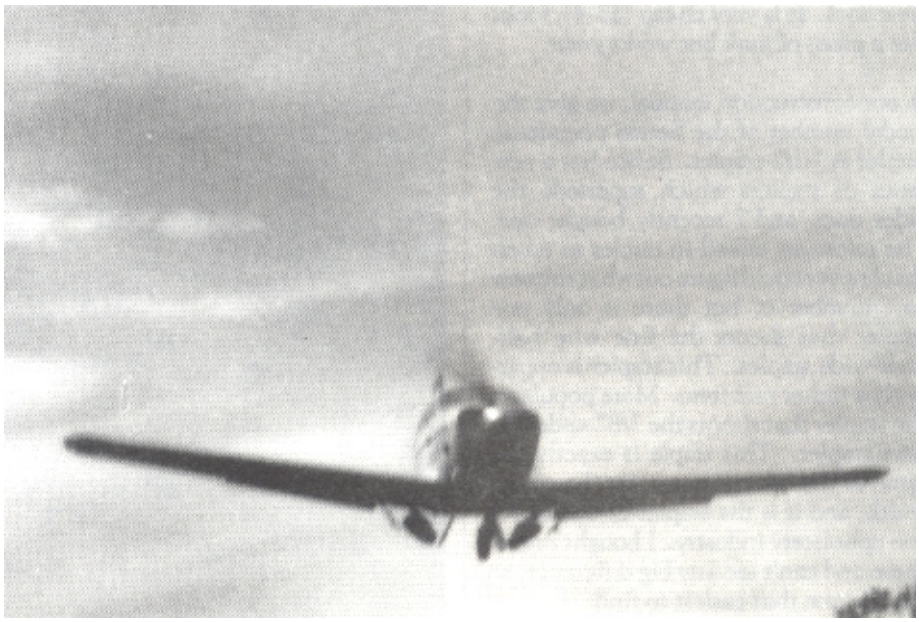
I told Gwen to look for an aircraft slower than the Pease AFB FB-111s and faster than anything else likely to be in the area. We were standing on the tarmac at Littlebrook Airpart in Elliot, Maine—"the busiest little New Hampshire airport in Maine"—scanning the skies for Jim DeAngelo's white and blue Falco.

It was early fall of last year, and Jim had been threatening to fly up this way since late summer. Today was the day. The demand for bakery products in central Connecticut had repeatedly delayed his trip and when that did not interfere, IFR weather did. Jim somewhat overshot his loran, made a wide circle to the left and established a long final, lots of time for me to try out 360mm worth of lens on my Leica, and I caught several on the final and one six inches before touchdown.

Jim had called around eight o'clock to say he would depart in a couple of hours. The phone rang again about nine and given the previous efforts I fully expected it to be another delay. Not Jim on the 'phone, but Tony Bingelis! He was in Boston, enroute to his brother's home in Maine, via auto. Could he and Morine expect to find us home?

As we drove the twenty minutes to Stratham from the airport, I refrained from telling Jim, but broke down at lunch. He was delighted. We had a good visit, made more interesting than expected with the addition of Tony. In the photograph of the three of us, it is not difficult to discern who is doing the talking. Both Tony and Tony and Jim allowed as how doubling the number of supports for the wing walk would be beneficial. I followed their suggestion a few days later. We all went to the airport in the late afternoon to see Jim off; slightly better results with the long lens!—*John Brooks Devoe*





That's Jim DeAngelo on the left, John Devoe in the middle and Antoni d'Bingelis still wearing the free hat they were giving out at Oshkosh '88.

Sawdust

• You can't blame it all on lawyers. In the waning days of Lear Siegler ownership of Piper Aircraft, one of their lawyers advised the Piper president that they could reduce their liability exposure on the Aerostar if they scrapped the tooling, and the MBA from Dogpatch U. did precisely that. Millions of dollars of jigs, fixtures and tooling were systematically cut up and sold for scrap.

Our hero also knew how to manage money—under pressure to reduce inventory, he would order wings and spare parts destroyed, only to have to make them again in a few months.

• One of the great delights of calling Steve Wilkinson is finding him not at home. Instead you are treated to an imaginative telephone answering machine message. They change every month or so. Last month it was "The best message you can leave for Stephan Wilkinson or Susan Crandell is that you want to adopt the two tomcats that have adopted them. These are not Grumman F-14 Tomcats, but rather two ball-bearing mousetraps. Take them!" The latest is "A scientist decided to clone himself, and after he had finished it, he took the clone out for a test at a local bar. It was a disaster. The clone insulted the waiters, cursed the bartender and used horrible language with the guests. So he took the clone up to the roof and pushed him off. The police arrested him—for making an obscene clone fall. So if you have an obscene clone fall for Stephan Wilkinson or Susan...."

• Announcing the first annual Buttercup rally. Since the Great Oyster Fly-In was such a bust, we're going to have a Falco Day in May on Saturday, May 13. By then we should have a reasonable group of east coast Falcos with Jim DeAngelo, Joel Shankle, John Oliver, Terry Smith, Tim Baker. Add in Pawel Kwiecinski and Steve Backnak, and we could have 8 Falcos, if you still count the Corporate Disgrace as a Falco. Please let us know if you are coming, so we can get enough beans, particularly if you'll be around for Saturday night supper and guitar-picking. Campers welcome.

• Karl Hansen is organizing a formation flight of west coast Falcos to Oshkosh. So far Ray Purkiser and John Harns have signed on and he's hoping to recruit Jim Slaton, Larry Wohlers, Jim Martin, and any new Falcos that fly by then. Jim DeAngelo would like to team up with any east coast Falcos to keep the continent in balance.

• Karl Hansen plans to run in the Cafe 400 this year. Ray Purkiser and John Harns will probably come down and lend moral support, guidance and protection from fiberglass perverts.

• The strangest things happen. Some years ago we had a Falco builder in California by the name of Hal Engel. He was an experienced woodworker and musical instrument maker who was living in a sparsely furnished house (one mattress & one sofa) with a barn out back where he was building a Falco. He made his own wood parts and bought our kits for the rest. I stopped by there in 1982 on my way to the Cafe 400 and spent the night, and then Hal and I did the race together. Hal was a very nice guy, but a quiet man who kept mostly to himself and hung out with some very strange-looking people. Several years ago, Hal left town, leaving the property in the hands of a rental agent, but that is the last anyone saw of him and they never had an address. Although he moved from San Luis Obispo, no one knows where he was from or anything about him. With the taxes unpaid on the property, the county seized the property and auctioned it. The property is now in the hands of Robert Middleton, 1400 4th Street, Susanville, CA 96130 who would like to sell the Falco project, which has the woodwork largely complete. Interested parties should write or call him at home at (916) 257-3084 or at his office: (916) 257-6181 ext 121.

Brenda's Corner

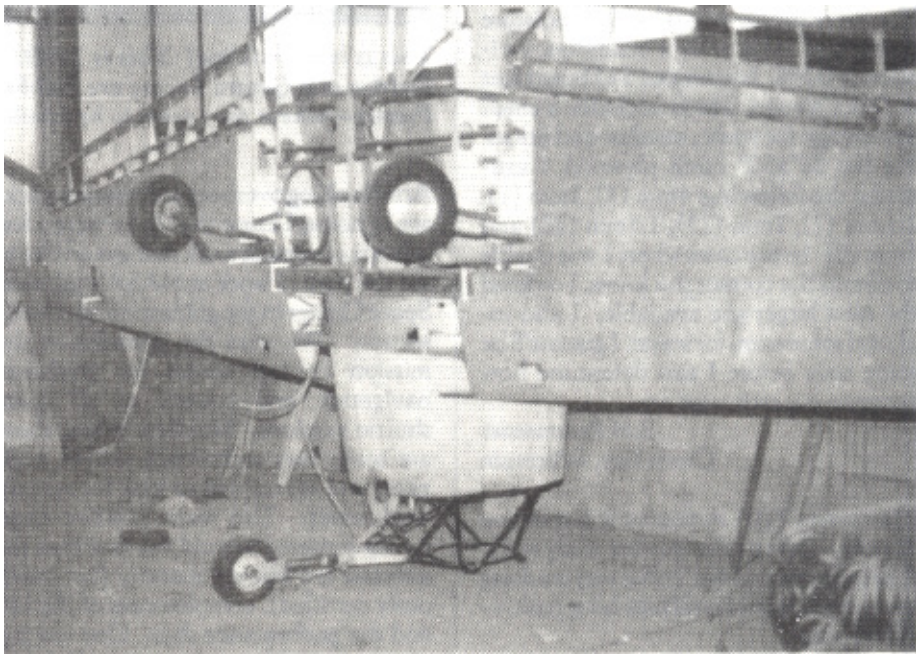
It was a dark and stormy day and there was to be no Brenda's Corner in this issue. Alfred had written that Brenda Avery had nothing to say, but we all know that's just not true.

The block of rooms we have reserved at the Paper Valley Hotel for Oshkosh have all been spoken for, and we have asked to be put on the waiting list for another ten rooms. I hope this will all work out. If you want a room, please speak up now. The hotel does not need to know the exact dates of arrivals and departures until about a week before so if you think you might want to stay there, it would be a good idea to go ahead and be put on the list now. You can always make a change or cancel the reservation later. The rooms are all guaranteed in Sequoia's name, so you don't have to make a deposit with your reservation, but we would like to know your final plans as soon as possible.

Falco builders outside the United States who are going to buy the wood kits might want to consider purchasing the plywood locally if possible. The sheets are 50"x50" and have to be shipped in a separate crate. Once the freight charges and custom charges are added the plywood becomes very expensive. If you decide to do this, we will, of course, deduct the cost of the plywood from the price of the kit.

Please let me know if I can assist you in any way.—*Brenda Avery*

Hal Engel's Falco has the woodwork largely complete. The landing gear, retraction system, flap controls, control system & engine mount kits are installed.



Mailbox

Here's my check to renew my subscription. I'd subscribe to your rag even if I wasn't building—it's priceless. But go easy on old Rutan, the guy's on an unbelievable losing streak—15 or 20 unsightly airplanes in a row! You'd think he'd hit at least one pretty one out of sheer dumb luck or something. Technoqueebs the world over are pulling for the guy.

Paul Ryan
Brea, California

On a month's visit to Texas, I stopped and visited with Tony Bingelis and learned a bunch—and enjoyed every minute. My compliments once again on your newsletters—excellent. Your bit on Aerolite was super. My experiments with the stuff substantiate all claims I've read.

Bill Roerig
Kaukauna, Wisconsin

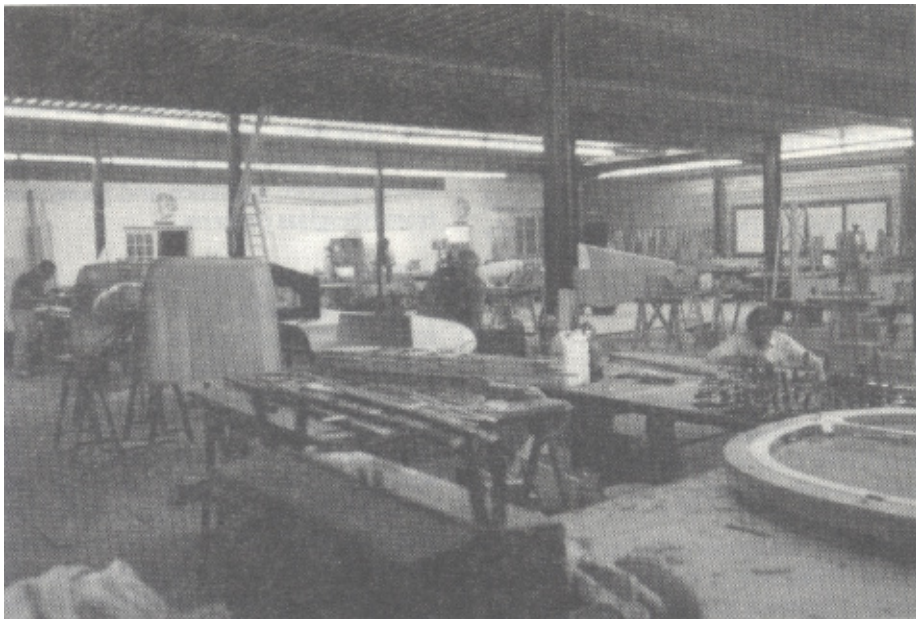
I have read the mailbox section of several past Falco builder Letters, where some builders have mentioned various pre-cover inspections by the FAA. When I contacted the FAA, they said they make no inspections and that their Chicago engineering office is in charge of all aircraft certification. Upon checking with them, I found they make one and only one inspection after the plane has one hour of taxi time or is completely finished. Does this information sound even remotely correct?

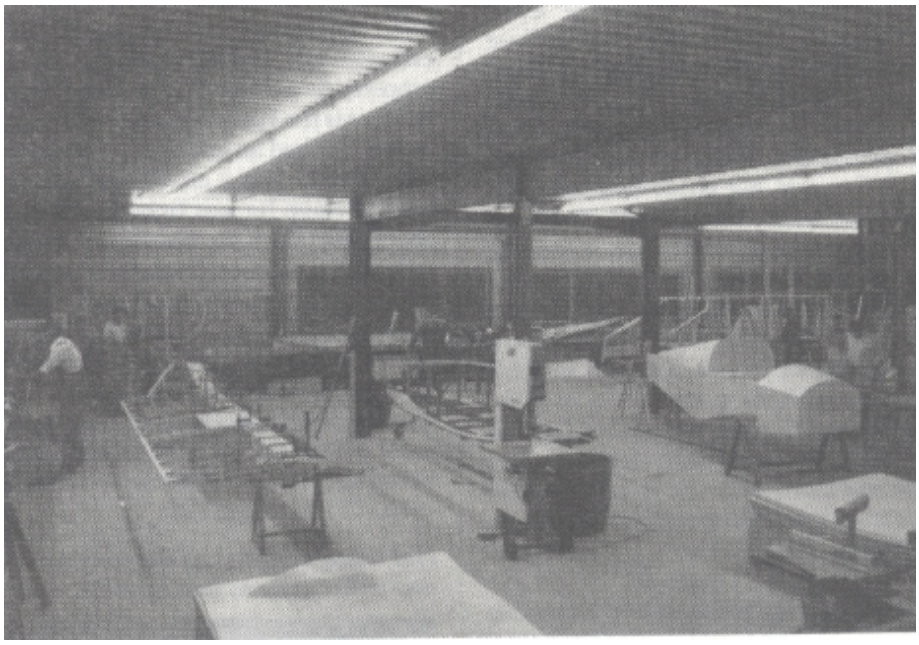
I have a complete woodworking shop so I am building all the wood parts from scratch. I began estimating my supplies right after the EAA show and have just received all the wood, glue and plywood. The Sitka spruce arrived with a moisture content of 5.5% with a maximum variation of 0.5%. I estimated 225 board feet of Sitka spruce, which includes a small percentage for waste, sawdust and errors. For the 50"x50" birch plywood, I estimated the following: 4mm (3), 3mm (1), 2.5mm (7), 2mm (23), 1.5mm (20) and 1mm (6). In the cases where I was unable to obtain the correct thickness, I ordered the next larger size available. I also included some extra for waste. I guess it'll be some time before I can determine how accurate my estimates are.

Earl Rentmeester
Green Bay, Wisconsin

The current FAA inspection is just as you describe—call us when you are ready to fly. It suits me fine and that's what they are doing now with so many homebuilts being built.

—Alfred Scott





This is homebuilding? This is 1989? Jean Luc Mallet, Serge Gaubert, Gilbert Fedrigo and Gerard Lecerc are building 4 Falcos in this shop in the south of France—where they seem to be familiar with wooden aircraft.

After looking over your infomation package at home, I knew that there were a few cohorts of mine at work that would like to see the data. I work at NASA's Johnson Space Center in the guidance and control section. We man the consoles in the mission control center for guidance, navigation and control of all space shuttle missions. Needless to say, these are some very technically skilled engineers and are trained to look for systems weaknesses. The main positive comments centered around the fact that the airframe is a known quantity (i.e. previously certified), completeness of the kit, and the performance data. One old guy would not even consider an amateur-built aircraft, "Does it come with a coffin?" The most enthusiastic group was the 25-to-35 crowd. It took almost two weeks for the data package to make it to everyone who wanted to see it.

Kevin Dunn
Webster, Texas

I would like to build myself a Falco, if you are willing to give me an offer. I would like to order the kits, and I will pay in 8 days after receiving the first shipment and if you wish I will be glad to send references from the bank. I did send money before in advance and never received the

order ($2,290.00 to Eipper Aircraft, and $387.60 to Top Wind Star Aviation). When I order the last kit, I am willing to pay for the rest. I would not be able to finish the Falco with parts missing.

Matthias Steiner
Hauptstrasse 200
A5541 AltenMarkt 200
Austria

Matthias Steiner has certainly had very poor luck with airplane kits! For obvious reasons, we have a policy of shipping kits only after we have received payment, and after his experience, I can understand Mr. Steiner's reluctance. Mr. Steiner has a set of Falco plans and is quite serious about beginning a Falco. I would like to encourage those of you who have bought kits from us to pen a note to Mr. Steiner and give him your impressions, good or bad.—Alfred Scott

I ran into Larry Wohlers and his Falco at the airport the other day. I immediately relapsed into another bout of Falco Fever. The damn airplane's a narcotic. Have you registered 'Falco' as a drug with the FDA?

I hope to get going on my Bellanca restoration this spring, then the Falco. My son was born with Down's Syndrome a couple of years ago and all aircraft related activities became quite low on the priority list. Maybe Falco building will be good therapy for him. I have found that reading my Falco plans is good therapy for me!

John Lambert
Tucson, Arizona

Work on the Falco is going good. I finished the elevator. I started to build the horizontal stabilizer at 8:00 AM Sunday and finished all but the skinning by 11:00 that night. The prints and information are very exact.

Gary Smith
Monroe, Georgia

At long last I am finished with the woodwork in the new house and 1989 will be a Falco year again, after two years. I am planning to start on the main wing spar at the moment.

S. C. Hendriks
Standerton, South Africa

What happened to the tip tank interest? Presently constructing wing. Should we consider building in small wing tanks—if only for reserve—particularly as two Falcos were lost for lack of fuel? Five gallons (2 x 2.5) would suffice. Inboard of course.

Sydney George Clifford
Wiltshire, England

I haven't gotten to the extra tanks yet, but for local flights around England and the continent you don't need to increase the 40-gallon capacity. The inverted tank adds 3 gallons. Beyond that, I think you would be adding an unreasonable amount of complexity for no appreciable gain in capacity.—Alfred Scott

I believe the time has come for me to pass some personal observations on building the Falco. I have been building primarily without kits—I have also been building my Falco over eight years. Don't get me wrong, I really enjoy building, but having had an opportunity to fly with John Harns, I think I'd rather be flying.

I am just putting the finishing touches on my cowling. I have built my own. I decided to write giving the pros and cons of kits versus scratch according to my experience. When I started on the cowling, I realized that making my own would require molds so that any damaged parts could easily be replaced. Kit parts would not possibly fit my parts so a damaged part would have to be built new. Without molds, new parts would be extremely time-consuming so I started by building a plug which molds could be pulled off. The plug building time worked out to about 60 hours. (I should tell you that my livelihood has been molding and shaping, so this is not foreign to me. Without this background it would have taken much longer or be altogether impossible.)

Each segment—lower, upper and cowl door molds—each took approximately 4 hours equalling 20, now 80 hours involved. Pulling parts from the molds

took another 6 hours each including mold prep so there's another 30 hours, now 110 hours. Next came the stiffener angles on each side of the lower cowl. More molds, more time. Add another 10 hours, plus an hour installing the upper cowl air inlet airfoils and the combination of the prop spinner shape to the baffling is 14 hours, so we're now at 135 hours. Finishing pin holes and other imperfections, installing intakes for the injector added 20 hours—now 155 hours. Sanding and priming for paint prep was 10 hours, now 165 hours. Now at this point if I had bought the kits my time is not worth a heck of a lot but if I considered a menial wage of $10.00 per hour (poverty level), I have $1650.00 worth of time in my cowling, plus $400.00 worth of materials brings it to $2,000.00 for my cowling and a lot of other assembly that never got done.

Am I ever glad I bought the electrical system. After receiving it I was astounded at how complete and beautiful it was. I think it's one of the best bargains in the whole airplane and, as the cowl times and costs are considered, I speak from certain authority.

I now have my Falco primed, except for the tail section. It is primed including the UV black primer. I have my main gear doors built and fitted. I have cranked them through complete cycles, and they perform as advertised. I have all my hinge fairings built. I built molds for them also. I have been thinking of using 3M's tape for auto side moldings to install my hinge fairings. I don't like the idea of drilling holes in my wings for screws. I will be experimenting with this tape and keep you informed.

I hope to have my Falco flying sometime in the summer of 1989. I plan to have John Harns test fly it if he is available. Please forgive my rambling letter but I never did claim to be an author.

Larry Black
Los Gatos, California

Our kit cowling molds took about 500 hours, but they are made to extremely tight tolerances and are production molds where you go to much more trouble than you would for a one-off. The cowling installation from our kits is really neat. The cowling jig is such a good idea that the federal government should start issuing fines on kit manufacturers who do it any other way. Most builders average 12 to 14 hours, working alone, but Charles Gutzman did it in 7 hours.

Until you get one and put it together, there is no way for you to understand what is in the electrical kit and how good it is. Of all the kits we offer, the electrical kit is the only one that we get thank-you letters from builders.—Alfred Scott

I have not begun my project yet but I plan to start in August after I move to Myrtle Beach, South Carolina. I am in the Air Force and did not want to have to move a partly built aircraft, but I should be able to complete the project while I'm in South Carolina.

Glenn Roberts
Beverly Hills, California

I thought your latest article on glue was terrific—should be reprinted in *Sport Aviation*. The full-time plus work on the Sequoia has kept the Falco on the back burner. This Sequoia is really going to be a super airplane!

Gar Williams
Naperville, Illinois

In addition to restoring a production Falco, Gar Williams is finishing a Sequoia 300 for Butch Harbold. Many of you may not be aware that we have produced a limited number of kits for the Sequoia 300, a 300 hp turbocharged two-seater with aluminum wing and tail, steel tubing fuselage and non-structural fiberglass fuselage shell. Since I want to devote all my time to the Falco, we no longer accept orders for the Sequoia but that may change after the first one flies. My guess is that Gar will have it finished in late spring, and we'll have the plane at Oshkosh.—Alfred Scott

I will take my Falco to the airport in April with the first flight in early summer. The metal cowling and nose strut door are ready for painting. I'm working on the nose wheel well doors now and installing an Apollo 618 loran with an external antenna. Ray Purkiser could not get internal antennas to work satisfactorily. He has an Apollo 604 installed. I'm also installing Electronics International CHT/EGT and OAT/CAT systems. I've ordered the B&C lightweight starter. Two friends have them and they work great.

Rex Hume
Williams, Oregon

Enclosed are some photographs of our construction workshop in which you can see various achievements of ours being built. As far as our Falco is concerned, we are presently working on the fuselage framework and promise to send you the first photos in the near future. The news concerning our Falco construction project has gone round French amateur construction circles, to such an extent that some people who did not know the plane, have shown and are showing great interest in building one. Others have phoned us for further details. These constructors are not aware of the right procedure to follow nor of the drawback a foreign language can represent. Consequently, to help our own understanding, we are having the construction manual translated and, if you agree, offer to become your correspondents, so as to help all French amateur constructions and to represent the Falco during any meetings in France. All this coordination would be done free of charge.

Jean Luc Mallet
18 Avenue Bernard IV
31600 Muret, France
Tel: 61.51.01.80

Of course, we are delighted to have all the help we can get. If any of you are translating the manuals and have access to an Macintosh computer, please let me know and I can send you the manual on disk.—Alfred Scott

I finished the installation of the rear center section of the elevator. Boy, what a job that was. So far that curved piece of 2mm plywood has been the toughest part to install on the whole project. I have decided to make the Falco my only hobby at this time. It makes it easier to explain to people why it takes so long to build. The fitting of the elevator skins are next on the list and should be finished by mid to late April. I plan to start work on the stab next.

Bob Brantley
Santa Barbara, CA

I'm using Aerodux as my glue. It is strongly recommended here as far superior to Aerolite. Ciba-Geigy state in the technical data sheet that it is gap-filling, and I have confirmed this with their technical support people. They even say it can be modified with an additive to gap-fill to 1mm, but I'll take their word for it and pass on the practical. It's also available in a fast version, curable down to 10°C. Any comments?

Gary Montgomery
West Lothian, Scotland

Aerodux is a resorcinol which as a family of glues is superior to all others in strength, is very waterproof but does not gap-fill well and requires 70°F to cure. I had always understood that Aerodux is similar, so the news that it gap-fills well and will cure at low temperatures is news to me.—Alfred Scott