Falco Builders Letter

John Oliver and his Falco at the Great Oyster Fly-In.

Building a Falco, Part IV

by Stephan Wilkinson

This article appeared in the September 1991 issue of Pilot *magazine in England.*

I finished the Falco without knowing it.

You'd think it would be a major moment—a ceremonial last levering of the torque wrench, a final dab of touch-up paint, an ultimate electrical connection made good—but it doesn't work that way. Completion sneaks up, then sits quietly in a corner of the workshop waiting for you to notice.

Of course the Falco wasn't *finished* finished. It probably never will be, for there's always more to do on a project airplane: speed to seek, mistakes to correct, glitches to fix, the difficult lessons of daily operation converted to hardware. But one unusually balmy October afternoon, hurrying to get some jobs done before a writing assignment took me away from my barn and its rude shop for a week, I hooked paint pot to compressor and casually sprayed onto the airframe two coats of fast-drying primer the color of a baby's diaper deposit. I knew this might be the last convenient day warm enough to paint before the onset of winter.

The airplane was already covered with numerous coats of Featherfill—a talc-rich automotive sanding primer that can be smoothed to a glassy surface as easily as sanding soft balsa. But Featherfill is hygroscopic: it attracts and absorbs humidity. Woe betide the wooden airplane left in a damp, snowy barn with an unpainted coating of Featherfill, for it rotteth therefrom.

In This Issue:

The Featherfill—and the attendant "microfiller" that is troweled on to correct grosser mistakes before the sanding primer is applied—had another unfortunate quality: It encouraged endless fiddling and sanding, smoothing and perfecting. Enough was never enough. Never could I get the wing perfectly smooth, the fuselage silky. There was always another minute dip or hollow in the airplane's skin.

The khaki paint put an end to that. I was finished. I could no longer touch the airplane with sandpaper or file. What I saw was what I got. Oh, someday I'd finish-paint the damn thing, but only after I'd flown the Falco enough to know it was debugged, reliable, complete. Some argue that a homebuilt must be painted before it is ever flown, else the fluids and exhalations of normal operation will have sullied the airplane's skin. But since well-used airplanes are routinely repainted after years of operation, that seems a silly argument. Besides, most manufacturers production flight-test their airplanes before painting them.

Oddly, I was in no hurry to get the airplane to an airport, to get the Falco flying. It became winter in due course, so I manufactured myself some more jobs. Making gear doors, for one. Nobody has successfully gotten a Sequoia Falco to operate routinely with its full complement of optional gear doors, but I built them all just in case I'd be the first.

The fully optioned Falco has seven gear doors: a pair of typical main-gear doors that close inward with the landing-gear legs to cover them; a pair of big wheel-well doors hinged near the aircraft's centerline to cover the rest of the main gear—wheels and tires; two narrow doors that clamshell to cover the nosewheel leg and tire; and a final forward-facing door attached to the upper part of the nosegear and closing in concert with it.

Levering all seven doors to seal the Falco's belly seems to overwhelm the airplane's electric landing-gear motor. In fact, the landing gear is one of the Falco's touchiest systems. Early homebuilt Falcos had

gear-retraction problems apparently due to voltage drop over the distance from relays to motor, but even after modifications to the wiring, Falco owners continue to gripe about the demands on the motor's gearing, particularly when all the doors plus the landing gear need to be dragged through the air during the retraction cycle. Some Falco owners make it standard operating procedure to assist gear retraction with a final turn on the manual emergency crank between the seats, for the motor sometimes can't snug all the wheels and doors into place unaided. Or if it can, the effort pops its circuit breaker.

No matter. Every homebuilt airplane has foibles, and anybody who thinks they're getting a dead-reliable beater needs to go buy a 172 or a Cherokee 140 and suffer the consequences of butt-ugly flying.

The Falco's front fuel tank has turned out to be another problem spot, for several Falcos—one of them Neville Langrick's, in England—have sprung hairline-crack leaks in the front tank. It is a saddle-tank affair directly in front of the instrument panel—an archaic design from the days of Spitfires and Cubs, a piece of crash-*un*worthiness that no certificating body would today allow.

I told Alfred Scott of Sequoia, who markets the Falco plans and kits, that only the weekend before, an acquaintance of mine had been incinerated on takeoff in his Ercoupe when a long-standing leak in his airplane's similar saddle tank erupted in a fireball. They had yet to identify what remained of my friend's unfortunate passenger. "Did you have to tell me that?" Scott moaned after a long pause.

He set forth with monomaniacal concentration to find a fix for the cracking tanks—typical of his obsession with having the Sequoia version of the Falco as fully engineered and proven as any certificated airplane. It turns out there is an old CAR Part 3 FAA certification hurdle called the slosh-and-vibration test. It requires a motor-driven test stand that harshly vibrates a partially filled fuel tank at a frequency equivalent to cruise rpm while concurrently flopping the tank through the equivalent of 15-degree wing-rocking to each side. Scott builds a complete slosh-and-vibration rig. The Falco front tank cracks after four of the specified 25 hours. (When the test was performed by Mooney on one of their wing tanks some years ago, the first tank blew apart three minutes into the test!)

After three months of modifying, stiffening, rewelding and strengthening, Scott creates a fuel tank that passes the slosh-and-vibration test. The owner of the tank refuses to take it back, afraid that perhaps it has been torture-tested beyond reason, so I swap him my unused, unmodified front tank and happily put the weld-dotted, brace-laced Godzilla tank into 747SW.

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Jonas Dovydenas, a New England Falco builder and friend, has bested me. An engraved card arrives in the mail, inviting us to the debut of his airplane on the lawn of the spectacular Dovydenas manse in the Berkshire Mountains of Massachusetts. My wife steals some of Jonas's thunder by casually riding her racing bicycle—a vehicle she loves as much as I do the Falco—the 100 miles from our house to the party, but I go by car. ("You know the one thing nobody forgot?" Jonas later admits. "Not the airplane but 'that woman who rode her bicycle.'")

Perhaps 200 people mill about the temporarily assembled, primered Dovydenas airplane as valets park cars amid the grove of enormous pines in front of the house. Caterers hoist trays and waiters dispense champagne and cocktails. Three of us are Falco builders, several more are local pilots, but the vast majority are neighbors and friends. Jonas is a photographer of considerable repute, so the crowd is eclectic.

I listen as one man tells his wife that the airplane will go 300 mph and another explained that the machine must be totally disassembled each year for an annual inspection. Dovydenas later admitted to being stunned by the number of otherwise intelligent guests who assumed he would do the first flight from the lawn, an area of perhaps 200 by 75 feet.

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There are worse things than watching the airplane you've spent six years and $80,000 to build being moved on a bouncing trailer from a remote barn, across a rocky lawn bisected by a brook, down a steep driveway, along a one-lane country road, to the nearest highway and 20 miles to the airport amid Saturday-afternoon traffic. The only ones I can think of, though, bring to mind old photographs of a country church being hauled down a road on a 64-wheel tractor-trailer while the advance crew dismantles traffic lights and powerlines. Or of the

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little guy with the sledgehammer in his hands who's about to knock out the last wedge that will allow the entire frigate to either roll over on him or slide sideways into Penobscot Bay.

The moving crew began to gather at nine o'clock on a Saturday morning in April—friends, friends of friends, friends' girlfriends, people I'd never even seen before. Among the first to arrive was George, a sinewy, ruddy-faced local pilot in a USN cap who quickly took charge. Turned out he was a rigger, who made his living manipulating and moving huge objects. "George sees steel, his nipples get hard," explained his friend Tony.

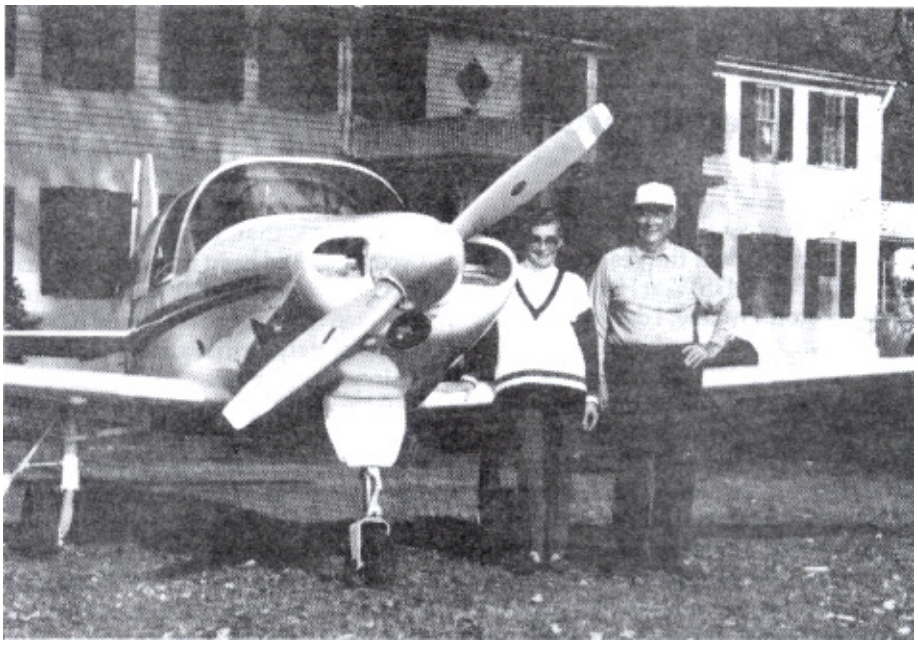
In minutes, George had the Falco out of the barn despite six years of theorization by visitors and onlookers that the airplane would never fit through the door. Hey, this is going to be easy, I thought. The crowd had grown, about evenly divided now between experts and drones. The experts gave orders. The drones drank coffee. But no matter what they did, the airplane on its borrowed trailer wouldn't fit past the tree outside our kitchen windows.

"Be my guest," said George with exasperation as Jim, a mountain man who handles a chainsaw with aplomb, countermanded the rigger's plan on how to chop the handsomest—and biggest—limb off the tree without having it fall on the Falco.

Six-foot six-inch Gary, the photographer, did no lifting or toting. "I'm a prince," he said only half-kiddingly. "I usually work with an assistant, and I'm all alone on this job." Gary dashed hither and thither taking pictures, occasionally backing off a porch, plunging up to his ankle into the brook or stepping on his camera bag like a plumber putting his foot in a bucket. "Steve! Stand here and talk to Jim! Make believe you're talking about taking that other tree down." Aw, no, not another one.

The Falco's tail and fuselage afterbody was proving to be the most irksome component to move. Though light enough for two people to carry—and equally delicate—it was shaped like a child's huge jack missing an arm or two.

Jim had become a flurry of activity, a househusband released for the day from tending to his two little boys. "Lesley said I could even take the Aeronca and go away for the weekend if I wanted,"



More shots of John Oliver's Falco at the Oyster Fly-In. Bottom right: Midge and John Oliver.

he admitted. "Got any tires? Old tires? How about some more of that foam rubber that's in the barn? Blankets? We need blankets." Four drones trotted past, bearing the delicate tail, and it was tossed—oy, I can't bear it—up into a borrowed truck, where Jim bedded it down and strapped it like a gorilla being delivered to Clyde Beatty.

Listen, I'll go rake up some grass clippings. I'd rather not watch. Lunch... yeah, that's the ticket, I'll make lunch. With my wife, a take-no-prisoners shopper, away for the week on a business trip, I'd already indulged in all the supermarket excesses she loathes: The best ground sirloin for the hamburgers, and nine pounds rather than the three I'll need. Six-packs of imported beers I'd never even heard of. And finally, boxes of yuppie-priced ice-cream bars for dessert. By the time the hamburgers were on the grill, the crew had everything on the trailer and ready for the towtruck, due to arrive in two hours. By the time the ice-cream bars appeared, they were offering to move the entire barn next weekend if I'd promise to make lunch again.

The towtruck—a homebuilder friend's huge van—finally showed up, and the parade began. The local police stopped traffic long enough for our caravan to pull onto Route 9W—the highway that will forever represent for me the answer

to the musician's question, "Do you spell your name with a V, Mr. Wagner?"—and we were on our way to Dutchess County Airport: two trucks, a trailer, six cars with flashing lights, one photographer and a pickup truck I'd never even seen before.

Unfortunately, reaching the airport required crossing the Hudson River on an Interstate-highway toll bridge. By several illegal inches, the Falco was a wide load. Would we be caught? We could hardly hope to slip through unnoticed, but George's friend Tony turned out to be a recently retired New York State Trooper. "Leave it to me," he said. "They won't bother ya." Tony negotiated briefly at the tollgate, and we magically became a narrow load.

Drivers in other cars pointed, jabbered and swiveled their heads as they passed, the Falco's bubble canopy and military-brown primer paint perhaps making it look like some new stealth fighter. But even more interesting were the few who drove by without a glance, as though they saw airplanes being towed along highways daily. Worst of all, however, was the rusty, listing Pontiac that veered into the convoy right behind the trailer, intent on getting as close a look as possible.

Was it possible to transport such a delicate mass 20-odd miles without a disaster, without even a ding? Slowly I realized that the half-ton of wood and metal I'd sheltered so carefully for six years had better not be all that delicate. For it was not only going to the airport but was beginning real life. A life in which it would be rained upon, in which it might spend some days half-buried in airport snow, in which the harsh summer sun would cook a structure that had never before felt its glow. It would even fly—*there's* a thought—while the pounding of its big four-cylinder Lycoming racked carefully bonded glue joints and vibrated every compulsively torqued fitting, while the Gs of aerobatics and bad landings flexed and bent an airframe that never was meant to sit in a silent barn in

The Uncertificated Petard

I learned a potentially expensive lesson in the aftermath of the gear-up landing of my Falco, N747SW, at Hanscom Field, near Boston, last July. I don't know if it's a standard form or perhaps even part of the general FARs, but the two-page, single-spaced sheet given me by the Teterboro Manufacturing and Inspection District Office (MIDO) has a description of my test-period operating limitation contained deep in its text the proviso that any accident or incident during the test period automatically and totally voids the airplane's airworthiness certificate. It also must be reported "to the cognizant FAA office."

I ended up getting into an ineffectual argument with the Teterboro MIDO as to what constituted a "cognizant FAA office": the one at the scene of the incident—to which, as it happens, we'd indeed fully reported the gear-up landing, or the one 150 miles away from the incident, at Teterboro. No matter. My Harvard English degree notwithstanding, my 30 years as a writer of no import, Teterboro told me the word meant they were "the cognizant office," and that since we hadn't reported the incident to them, I would now have to recertify and do a 10-hour retest of the airplane. And—worse yet—adhere to the provisions of any AD that might have been issued in the nearly six months between the incident and the time (mid-November) when Teterboro learned about it.

It happens that one AD affecting Lycomings had been issued during that time. It specified that any Lycoming involved in a prop strike would have to be completely torn down and examined for internal damage.

This we didn't want to do, since our prop strike had been quite gradual, at an idle-power setting and with numerous revolutions of the prop while it was chewing concrete and before the pilot (not me but my friend Mark Reichen) pulled the mixture and probably actually shut down the engine that way rather than through any "sudden stoppage" caused by the prop. A dial-indicator check of the crank showed it to be within new-engine limits (0.002" total, for an actual net untrueness of 0.001"). Spectrometric oil analysis shows no anomalies. And—most encouraging—Mattituck Airbase, builders of my zero-timed engine, advised us to go fly it, that no teardown was necessary.

Teterboro said no way. Tear it down.

Now for the good news. When the Teterboro bureaucrats originally certified N747SW for flight, they said it had "an uncertified engine." Why? Because it had a 45-degree injector elbow, as specified by the Falco Construction Manual, rather than the straight elbow with which IO-360-B1Es are normally equipped. What chicken-droppings, I thought! They're making me fly a 40-hour test period, rather than the normal 25, even though I have a brand-new Lycoming. That reg's meant for VWs, two-strokes and belt-drive Pinto engines! (They had even initially demanded that I remove the engine data plate, since "it's no longer a Lycoming.")

Thanks, Teterboro. You saved me $3,000. When the MIDO said I'd have to comply with the teardown AD, on the sage advice of Mahlon Russell of Mattituck, I told them it didn't apply to me—that my engine was not a Lycoming but a Wilkinson. Let's call it an IO-360-F8L [*Hey, what about "Ferrati Tipo 360 Testaroni"?—Scoti*]. Huh? they said. Yup. That's what you told me—it's not a certificated engine. Teterboro glumly caved in, hoisted by their own uncertificated petard.

I furthermore now realize that at the price of an extra 15 hours of flight-test time—which, as we all know, can be accomplished in a variety of ways—I have an engine with all of the advantages of a certificated Lycoming plus the added advantage that in the future, I'll be able to choose which Lycoming ADs I will comply with. Certainly I'll do those that affect safety of flight, but there may be others—we also know the kind the FAA sometimes comes up with—that I'll legally be able to ignore.—*Steve Wilkinson*

the first place. Mud would splash its carefully painted landing gear and oil would streak its smooth belly.

It took about ten minutes to undo what had consumed an entire morning of madness to create. The Falco came off the trailer and rolled onto the ramp like a boxer bouncing into the ring. Experimental Seven-Four-Seven Sierra Whiskey was finally home.

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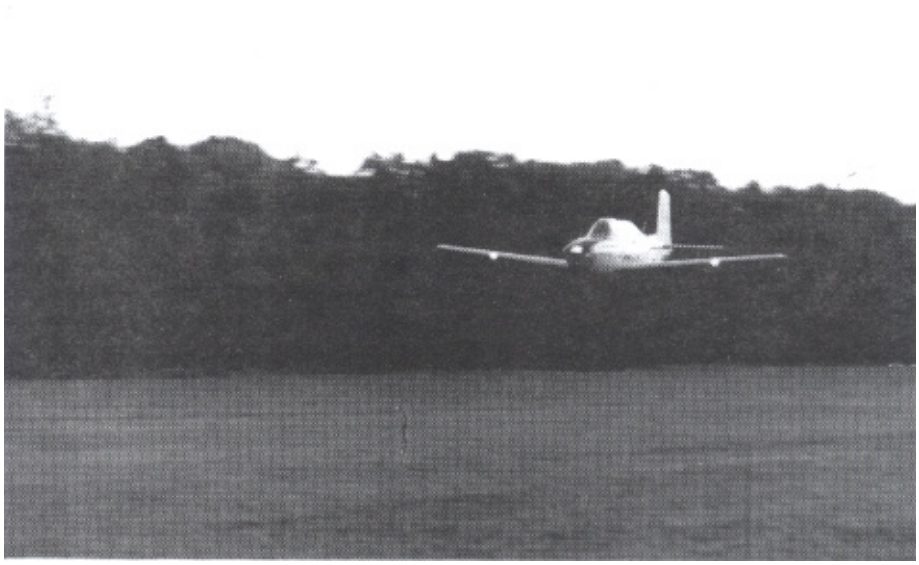
Home is a hangar—a piece of real estate as rare, around New York City, as a cheap Manhattan penthouse, a bad pizza or an empty highway. Yet it is my good fortune to find not one but three hangars.

The local EAA chapter has its own hangar at a nearby small airport, but their bylaws prevent my using it until I've been a member for at least a year. Fair enough, though I later learn that several chapter activists are miffed that they've therefore lost the opportunity to have such an exciting homebuilt as a tenant.

Dutchess County Airport is far friendlier. A mechanic I've never even met provides free hangar space for the two weeks it takes to reassemble the airplane. Then Daniel Helegoin and his wife Montaine Mallet, U.S. CAP distributors and teammates in the horrifying low-altitude aerobatics act The French Connection, volunteer their six-plane hangar and shop for the Falco while they're away for the summer air-show season. Their hangar probably holds more wood-and-glue aircraft knowledge than any structure in the country, and while I work on the Falco, an elderly Frenchman posted from the CAP factory chisels bits and smears resorcinol on the bellies of half a dozen disassembled CAP-10s subject to some arcane factory bulletin.

But best of all, the airport's young avionics technician, who helps me fix the inevitable wiring mistakes in the Falco's panel, chooses to permanently sublease me his private tee hangar, since he now has a newly built shop in which to park his Mooney 231.

Furnishing my little cinderblock space takes on all the secret pleasures of a college student's first apartment. Let's see: I'll set up a workbench here, some shelves over there, put down some carpeting scraps to keep the wingwalks clean, gotta get a portable radio to play some tunes, maybe a little refrigerator...



Top: Don and Bonnie Peterson in their Starduster.
Bottom: Travis Edwards in his T-34.

I could buy an air compressor, a small electric winch to pull the airplane in, an engine preheater for the winter months... where will it end?

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Depending on one's domicile, an FAA inspection of a homebuilt is to either be anticipated or feared. Not long ago, the FAA had to inspect a homebuilt before every permanent closure of a major component. Today, only one inspection is required: upon completion of the airplane, when it is in every way ready to be flown. Many inspectors have no knowledge of—or interest in—craftsmanship or lightplane construction techniques, and particularly in the shadow of the New York TCA one is assured of dealing with inspectors who spend most of their time negotiating toilet modifications with airlines or approving Donald Trump's helicopters for in-flight blackjack.

I prepared to climb Mount Bureaucracy by getting all the advice I could from local EAAers, who confirmed that the Teterboro FAA office was placard-crazed—that an airplane could be glued together with library paste and would be passed so long as every switch, knob, handle, gauge and container was accompanied by text. Montaine Mallet further advised that the careful candidate should leave just one "fault" for the inspector to find, else the FAA representative will implode from frustration.

My minnow was the canopy handle, and

the FAA happily took the bait. "You'll need to placard that," the young inspector said—the Falco happened to be one of his first assignments—and demanded that an explanation be placed in full view of the occupants explaining how to extricate themselves from the airplane in case of terminal befuddlement. Since the Falco's hook-and-handle canopy closure is somewhat less complicated than a doorknob, we agreed on the legend, "Handle forward to open, aft to close."

Done and done. The Falco is legal. Let's fly the sucker.

Something like 10 percent of all the fatalities suffered in homebuilt aircraft occur on the first flight, thanks to the combination of uncurrent pilot (he or she has almost certainly been building rather than flying), unknown handling qualities (it's difficult for a homebuilder to get a checkout in a similar airplane, though several Falco owners had offered me theirs), and the potential for small anomalies to create a big emergency. A not-untypical scenario might be a malfunctioning airspeed indicator, a leaky oil line, a miswired comm radio that quits working plus landing gear that jams the first time you retract it under air loads. More than one harried homebuilder has spun in under such a burden.

Not me. My friend Mark Reichin, the best lightplane pilot I know, will first-flight the Falco. Mark flies almost daily and has owned everything from a Skylane to a 310. A local EAAer who has come to videotape the first flight for the next chapter meeting tells me that as far as he's concerned, what I'm doing is akin to "chasin' some broad for six years and then lettin' somebody else fuck her," but I'm fond enough of Mark that perhaps I'd give him that privilege as well.

My confidence is well-placed. Reichin makes a handful of high-speed taxi runs down Dutchess County's 5,000-foot main runway, gets good air on his penultimate run and floats back out of ground effect to a soft touchdown. Then, after a nervous pause for one more runup, Reichin goes for broke. The Falco climbs away, gear down as planned. The wings twitch and rock several times as Mark meets Frati handling for the first time, and my airplane fades to a speck.

Was it incomprehensibly thrilling to see it finally fly? Or was I terrified that its wings would clap hands on climbout, the unspeakable arrogance of my ineptitude finally revealed? Neither one, really, for

my own several high-speed taxi runs had already made it obvious that 747SW would fly just fine: at 50 knots (which comes up at about half-throttle in a 180-hp Falco), the wings were light, the wheels weightless, the controls all sleekly effective. And to worry about structural failure in the framework of a Falco is akin to treading lightly on the Brooklyn Bridge for fear the cables might snap.

So I watched unemotionally as the little airplane buzzed around high above the airport, too far away to see that Mark was cycling the gear, running the flaps and making other checks, and soon it was over. One low pass down the runway, the Falco making a distinctive, dopplered, Spitfire-like whistle as it streamed past, and then I was back in my hangar with the sweaty little racehorse, Reichin and the EAA videotaper and several other friends gone their separate ways.

I wasted as much time as I could uncowling and recowling the airplane, checking every engine connection, cleaning and tightening tiny leaks here and there, inspecting yet again every control-surface nut and cotter pin. But the truth was that I had to fly it too, and oddly, I was putting off the moment—perhaps for fear that I'd be disappointed, that the Falco would indeed turn out to be just another airplane.

Silly boy. There is no thrill like flying for the first time an airplane you've built, especially if it's a Falco, and it took a single lap of the pattern to prove it to me. No American-trained lightplane pilot can possibly be prepared for the sensation of sitting in a fishbowl that extends unbroken virtually from one's beltline up, holding controls overpowered by anything more than the pressure of a finger, in an airplane that could find plenty of shade under either wing of a Skylane. It's like riding atop a large radio-controlled model.

Yet at that lightly loaded moment, 747SW's power-to-weight ratio was eight pounds per horsepower—identical to that of a P-51H Mustang at gross. It was almost impossible to apply full power fast enough to get the throttle advanced before liftoff, else the torque overwhelmed the nosewheel's ability to track straight. I found myself climbing out at 2,000 fpm at what seemed a 45-degree angle, and then squaring off the pattern with near-aerobatic banks. Only maturity kept me from the ridiculous singing and whooping I remember performing 25 years ago during my first solo.

Six years and $74,000 ago, when I began building the Falco, my wife presented me with a formally worded "certificate" authorizing the project, which would inevitably cost us an amount of money and effort perhaps somewhat beyond our means. "First-ride privileges are reserved by the undersigned," the document closed.

Several days ago, in happy disregard of all FAA regulations prohibiting the carriage of passengers in a provisionally certified homebuilt still under test, Susan claimed those first-ride privileges. She too is a pilot, both single- and multi-engine rated, though an unenthusiastic one who flew out of a sense of duty and hasn't touched a set of controls in over 10 years. "You know," she said after we landed, "I think I'll take some dual in this and start to fly again. That was *fun*." Thank you, Stelio Frati. Thank you, Alfred Scott. □

Construction Notes

George Barrett asked the other day about installing engine pre-heaters. As it turned out, Steve Wilkinson had mentioned the same thing several days before, and I suggested he contact Charles Gutzman who has one on his Falco to find out if there's anything special to know about these things. Thinking I might write something about this, I mentioned it to Steve Wilkinson, who sent me the following notes:

I don't know much beyond what I've read and seen second-hand, such as the contortions of a friend of mine who carries a Red Dragon propane heater in a metal box in his Skylane wherever he goes, summer and winter. The most impressive thing I've ever seen it do was knock out the Skylane's rear window—the top one—when his 18-year-old son took the 'lane up and tried to demonstrate zero gravity to a girlfriend with the heater chest sitting in the baggage compartment.

I just ordered a Safe-Heet external oilpan heater probably about identical to the E-Z Heat unit on Charles Gutzman's airplane. (The reason I didn't take Charles's advice is that the E-Z Heat unit requires you to somewhere procure Permatex P-77 gasket goo/adhesive whereas the Safe-Heet unit comes as a complete kit.) The E-Z Heats are sold by Chief Aircraft and can also be bought—same price, about $140—from Chief via the Wicks catalogue. The Safe-Heet comes from an 800-number ad in *Trade-a-Plane* and as I remember was $147 including the adhesive. I think it's also 4x5 inches versus the E-Z Heat's 4x4 (for four-cylinder Lycomings, at least).

The classic engine heater is the Herman Nelson—that big unit that looks like a GPU, which big FBOs wheel out and use to blast the paint off the cowl of your Cherokee. When I was flying up in the Canadian Arctic with Weldy Phipps, we always used Herman Nelsons to get the Beavers and Otters warm in –40° weather.

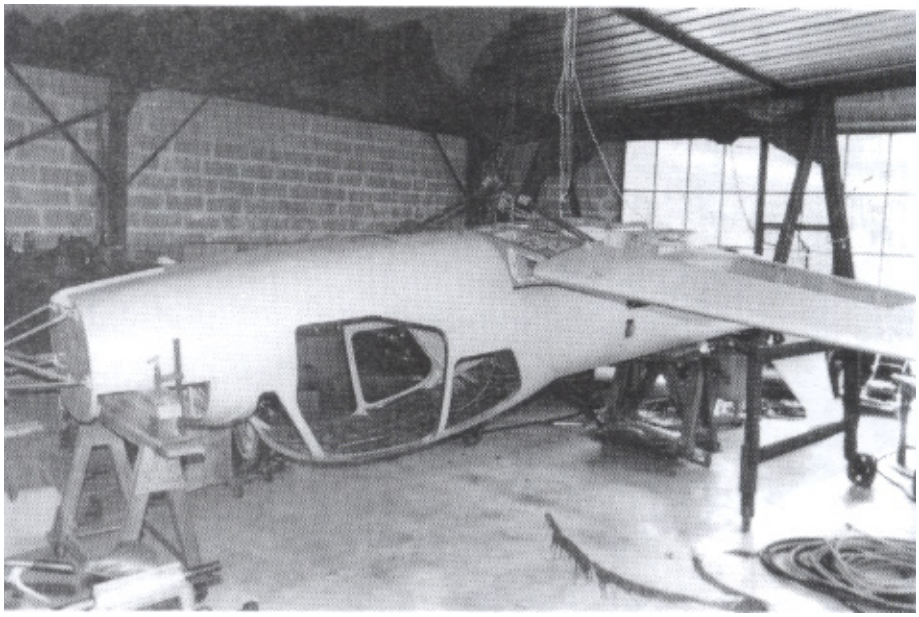
The basic dispute between heater manufacturers, as I understand it, is that the makers of the hot-air heaters—from Herman Nelson down to Tanis and Red Dragon—say, "Heating only the oil does absolutely no good. The minute it hits the cold oil passages and cylinders, it's as cold as when you started the process." The tech rep I talked to at the company that makes the Safe-Heet said that's bull—that oil is an extremely good heat sink; that it takes a long time to get it hot and that it holds its heat for the same reason and conducts it to cold metal quite effectively.

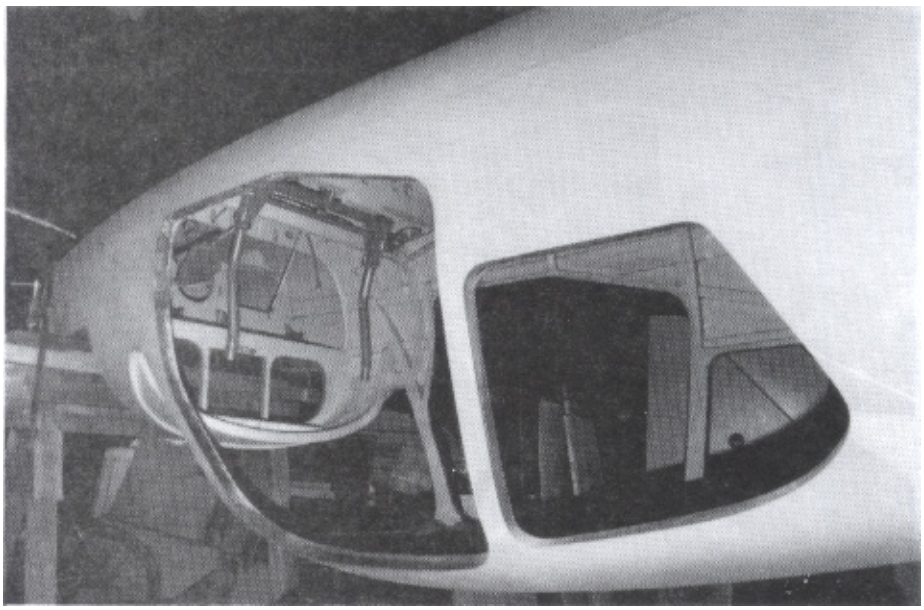
I'm sure that heating the entire engine with hot air—oil, case, cylinders and accessories, plus you can then blast the thing into the cockpit and heat the instruments—is the single most effective way to go, but I don't think there's much argument in terms of convenience. Either you go through the somewhat complex, active process of setting up your hot-air heater and then stand around for an hour monitoring it while flames glow here and there and you stuff spare rags into cowl openings... or your plug your safe, external oilpan heater into a self-timer, go home, then the heater comes on automatically, passively the next morning at 0300 and the oil's at full operating temperature by the time you arrive at the airport at 9. Of course, the latter requires a hangar (or some other electrical outlet) whereas the propane heater can supposedly be used anywhere... if the igniter works, which it often doesn't, and if you can then light a match in the howling wind on the ramp.

There are also dipstick heaters—at least there are for cars—but if you're going to heat the oil electrically, why not heat the oil pan, too?

The oilpan heaters have integral thermostats, so they go off and recycle whenever

Here's a couple of photos of Charles Bezard's project. As best as I can figure it, he is completing the unfinished prototype of Frati's F.480, the four-seat version of the Procaer F.400 Cobra.





the temperature of the pan (and assumedly of the oil) reaches 165 degrees. So they can be hooked to timers and safely left alone. The one thing you don't want to do, however—the Safe-Heet people tell me—is plug it in for several days at a time. If you do that, it begins to cook the moisture out of the oil, and that moisture will rise and precipitate out as soon as it hits cold upper-engine parts such as the camshaft, creating instant rust.

—Steve Wilkinson

The latest issue of Highland Hardware's excellent catalogue talks about the new Titebond II waterproof glue. Titebond was the first of the yellow glues, known as aliphatic resin glues, and sold as 'Carpenter's glues' by some brands. They're superb for general woodworking around the shop because they're one-part glues that you just spread and clamp. They are stronger than the white polyvinyl glues like the original Elmer's and also sand nicely, while the white glues gum up your sandpaper.

The problem with all of these general-purpose glues is that they have minimal resistance to water and heat. Although they are calling it 'waterproof', apparently Titebond II is a water-resistant glue that passes Type II (above waterline) waterproof testing. That puts it in the same category with Aerolite and plastic resin glue (only resorcinol and high-temperature phenolics are waterproof). Also I don't know a thing about claims for temperature performance of Titebond II.

At this point, no one should use Titebond II on their Falco, but I do think it's a good idea to get some, use it for general projects and run some tests on the glue for water-resistance and temperature performance. Lord knows, there's no easier glues to use that Elmer's or Titebond, and if there's the slightest chance they're suitable for use on airplanes, we should all take a look-see.

Highland Hardware also has a number of other potions and goops that are worth taking a peek at. Dri-Cote is a spray lubricant that you put on saw blades to slow the accumulation of resins and carbons that builds up on blades. I've tried it, and I like the stuff on a saw blade. It dries to a slightly greasy-feeling surface—not the hard-dry surface that you imagine from its name. I use it on saw blades but not on my router bits because I use a diamond hone to sharpen the router bits.

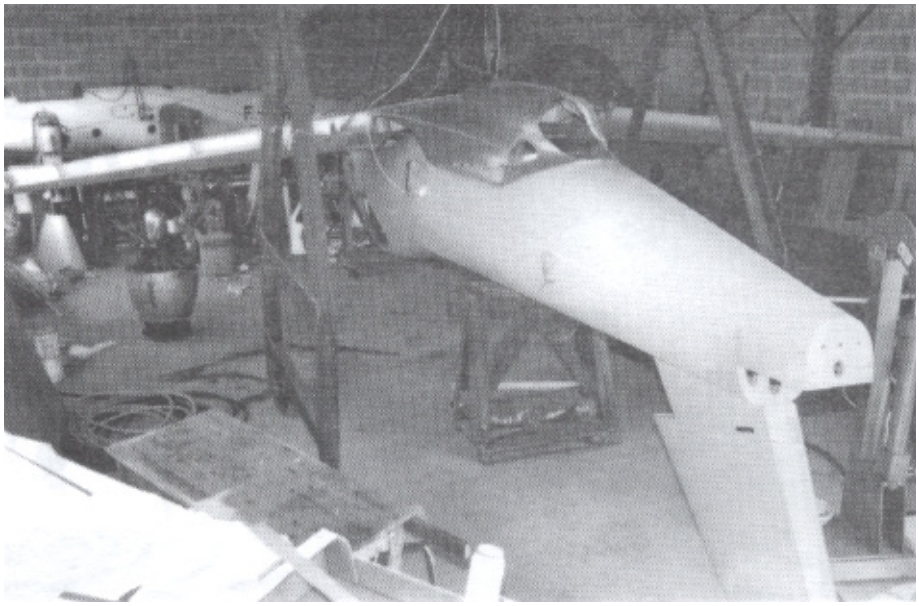
There are three other interesting products that I haven't tried yet. Top-Cote is a hard, dry teflon-like coating for cast-iron tablesaw tops and tools. It reportedly lowers friction dramatically. There's also something called Renaissance Wax with is a synthetic wax which can be used on tools and tablesaw tops, and which was originally developed for the British Museum for cleaning and restoring fine art works.

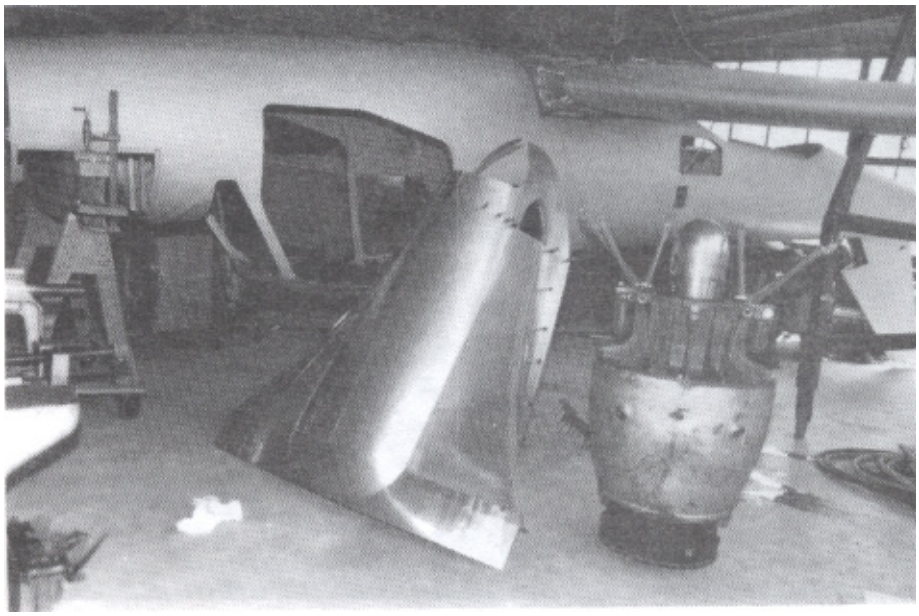
Finally, there's Boesheild T-9, a corrosion-protection product developed by Boeing for long-term protection of metal components. It dries to a waxy, waterproof film, and this is something you might want to spray on metal parts in the Falco, over top the zinc chromate primer. But you will want to be careful, because any wax you spray will prevent glue adhesion if you don't have all the woodwork finished.

Boesheild T-9 is hardly an experimental product. It was developed by Boeing after exhaustive testing of all the popular penetrating lubrications. Boeing's engineers were unsatisfied with the performance of all of the brands they tried, particularly in the area of long-term corrosion protection. Some protected well but were messy and thick, while others penetrated well but didn't last long. What they needed was a penetrating oil that dried to a clean protective film, and everything they used came up short in one area or the other.

Boesheild T-9 is a combination of thirteen solvents, oils and most importantly, a wax that remains as a barrier film after the other components have penetrated, lubricated, displaced moisture and evap-

And here are two more shots of Charles Bezard's jet project. This is his third all-wood jet restoration.



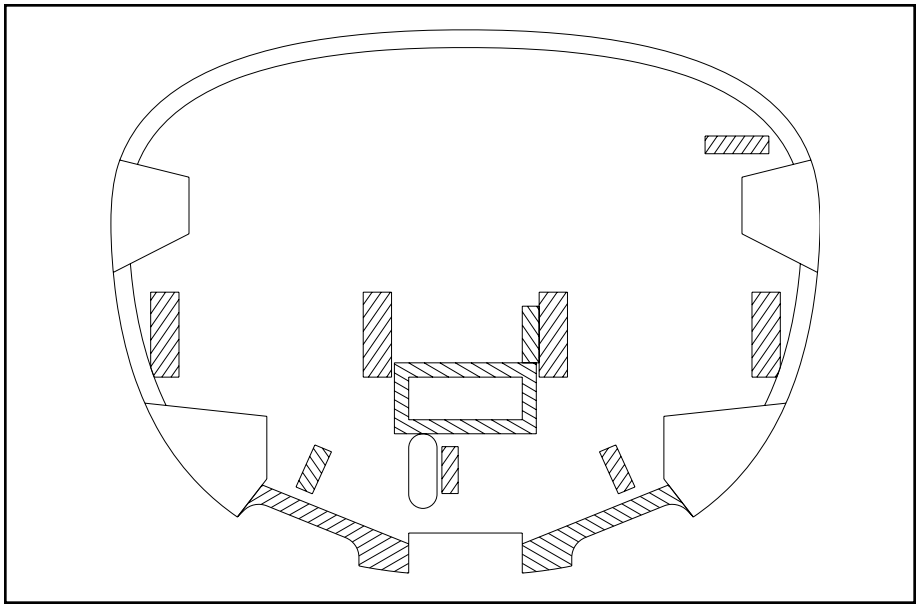


orated. Boesheild T-9 has received rave reviews for its ability to protect engines, electrical systems, tools, machinery, firearms, trailers, bicycles, etc. It's used all over the world, particularly in marine applications where a saltwater environment is exceptionally tough on metal.

Eagle-eyed Craig Bransfield noticed that we had shipped some two-amp fuses with the electrical kit, instead of the three-amp fuses shown on the electrical drawings. Brenda was worried about what sort of problems this might cause, and she was getting ready to order replacements when she mentioned this snafu to me. Actually, it doesn't make any difference. We use some fuses for wire protection at a couple of places in the electrical system. To protect the wires, they should be five amps or less. The meter movements and indicator lights that these wires go to draw something less than a quarter of an amp, so any fuse from one to five amps is fine—I just picked three-amp fuses as a happy middle ground.

I get questions about insulating the interior of fuselage frame 1 and the cockpit side walls. Some builders have filled the cavities of fuselage frame 1 with foam to cut down on cockpit noise. Others have done nothing. As far as I know, it doesn't hurt anything and may help slightly on the noise level. Some people do it and others don't—and I couldn't tell you if it makes any measurable difference.

And on the side walls, I think most builders have put some foam or fiberglass insulation in there, largely to insulate for heat and to cut down on wind noise. The production Falcos did not have any foam or insulation in the side walls and I've never noticed a problem. Again, it's okay if you want to do it, but I really don't know if it's necessary. It's one of those things like spanking tiny infants or microwaving cats—if it makes you feel better, do it.



Above: This is how Steve Wilkinson added plywood to his frame No. 1.

I also get a lot of questions about the firewall, the Fiberfrax insulation and the plywood padding underneath. First, take a look at Section G-G on the cowling installation drawing (Drawing No. 134, Sheet A13e). We use a 25mm-wide strip of 2mm plywood around the outside of fuselage frame 1 for several reasons. The engine mounting requires some 2mm pads, and by running a strip around the outside, you create a level surface for the cowling supports and the firewall to sit on. The gap that remains is filled with insulation.

Now there are numerous places where bolts go through the frame—for the exhaust hangars and rudder pedals. What everyone does there is to make little 2mm plywood washers and glue them in place. This gives the bolt a solid foundation to clamp upon, the firewall doesn't get squeezed down Godforbid, and you just use insulation in the low areas.

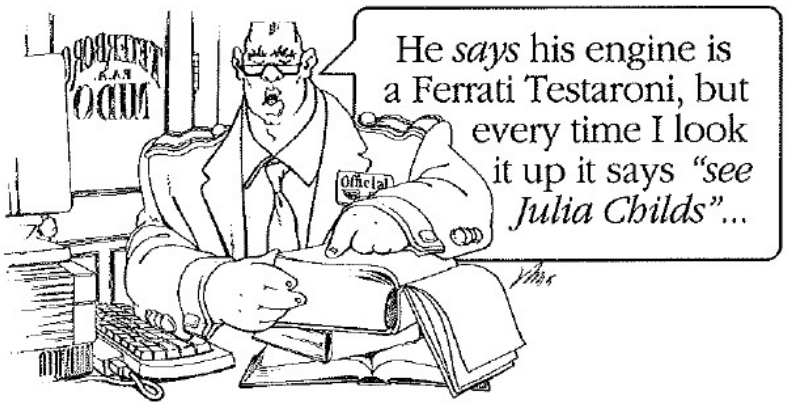
This whole scheme gets a little messy down at the bottom. Steve Wilkinson, for one, just carried this scheme around all 'borders' of the frame.

Builders also ask about the opening for the rudder pedal cables, where they come through the firewall. I've thought about various schemes like a rubber bellows-shaped boot over it, but there's not enough room, and I doubt it's worth the trouble. This is one of those areas in the airplane where things aren't as neat and tidy as you might like, but it's also not worth a lot of mental effort.

Begin by drilling a hole through the firewall and the fuselage frame that's just big enough for the cable to get through. On the firewall side, make a little rubber or leather seal to pinch up on the cable to seal against the cable. I'd just cut two or three round patches of leather, say 30mm in diameter, punch a 1/8" hole in the center, and then make a single cut from the hole to the outside so you can slip the disks over the cable. By using several pieces of leather you can rotate them so the cuts don't align with each other. Then cover that whole mess with a little ring (or split ring) of aluminum—heck just make them out of hardware-store washers—and install them with a couple of sheet metal screws.

That way it will seal nicely against the cable and won't let any appreciable amount of engine-compartment air into the cockpit. On the aft side, you can put insulating foam right up to the cable and just let it rub.

Don't worry about friction, you have so much power in your feet, you'll never notice a slight drag from the seal.—*Scoti*



The Brave New GPS World is A-Coming

Whiners and complainers about the lack of progress in aviation simply have not been watching what's been going on with electronics and avionics. Oh sure, there are other areas where there has been progress, and like all technological advances, they come one small step at a time: The new generation of lightweight starters. Satellite weather maps. Teflon engine hoses. Teflon-lined engine controls. A better design for a fuel selector valve. Composites for various components.

But the most exciting changes have been in the world of electronics, and what we've seen to date is only a tiny taste of what's to come—and sooner than you might think. Today's crazy dream has a habit of becoming tomorrow's reality. And no sooner than you have enunciated a bizarre scheme do you find out it's already been done.

Homebuilders are rightly proud of pointing at the Wright brothers and the Voyager as major milestones in aviation which belong in their camp. Give credit also to the free spirits of aviation for bringing loran to aviation. Free to put *anything* in their panels, certificated or not, homebuilder buying habits have become the bellweather indicator of the market—indeed most industry observers pay more attention to what's selling at Sun 'n Fun than at the NBAA.

The pieces of the puzzle are coming together rapidly. First there were the simplest of devices, encoding altimeters that brought the modern miracle of silicon chips sensing light shining through holes in a revolving disk and then another chip that could count the blips and turn that into useful information. The microprocessor and other forms of chips started making their way into our panels.

Remember the excitement associated with RNAV when it first came out? Have you ever thought about how primitive RNAV really is? The calculations can be easily done on any hand calculator, and I could program an entire RNAV in a single page of Pascal. Yet these things sold for $6,000.00, and we marveled at the ability to 'move a vor' and fly to any point we choose.

Then came loran, which brought reasonably accurate, go-anywhere navigation. You could taxi along a grass strip and the dang thing would tell you how fast you were going, and how far it was to your destination. The earliest units had only a few user-waypoints, and I remember when a friend who flew Spitfires for the RAF regaled me with stories of this amazing modern invention. He described what it was like to scud-run down the Long Island shore under a 200-foot overcast in his CAP-10 and know precisely where he was and how to get to the airport. That was six years ago.

Today lorans come in every shape and size, and the variety is astonishing. Once you have the ability to know where you are, then you have to deal with the realities of translating airports, vors, intersections, TCAs, TRSAs, MOAs, etc. into lat-long data and back. It didn't take long before these things had databases with all that info in the loran so that you could punch a button to get directions to the nearest airport, the frequencies at the airport, and the telephone numbers of the local motels and restaurants. Now it's a question of the quality of the database, what's included and ease of use.

I've happily bombed right through the Philadelphia TCA on several occasions, only to discover it after I casually glanced at my map. But if Jonas Dovydenas were to do that, the Warn button on his Northstar would flash, and all you have to do is punch the blinking button to be told that you're in the TCA, and it gives you the frequency to call the controller.

These things are so cheap that I have several friends who are already on their second lorans. They simply trashed the first one and replaced it. And these avionics devices are free of the product liability claims that push the prices of other products through the roof—I've sat in the hot tub at the Oshkosh hotel and listened to the overweight and prosperous salesmen from II Morrow extol the virtues of *volatile* memory. Unless you go to your death—thus converting yourself to something the kids around here call 'street pizza'—screaming the lat-long readout of your loran on the radio, how's anyone to know if your navigation system was at fault?

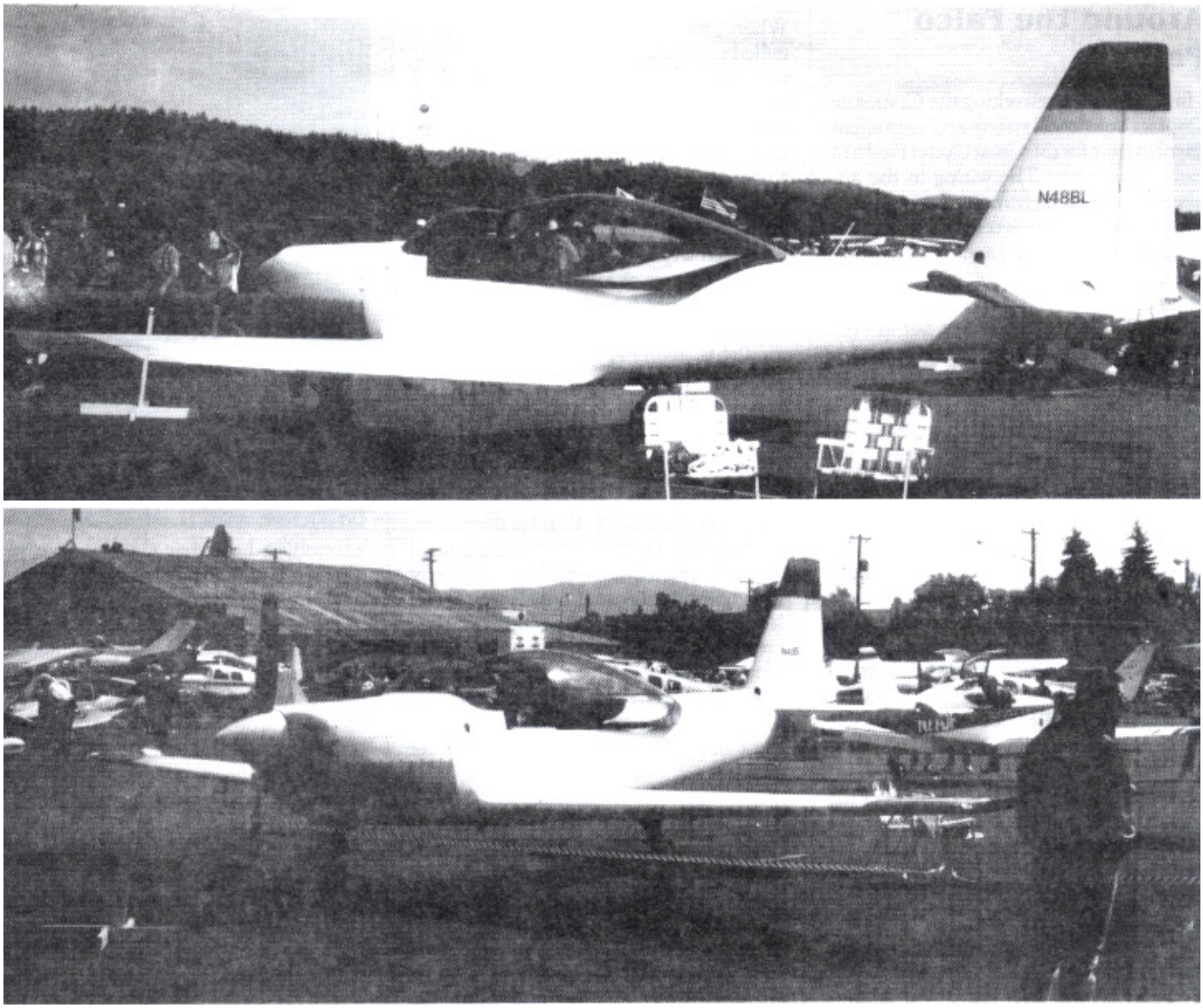
Now comes GPS, a satellite-based global positioning system that's going to displace loran, ADF, VOR's and probably even ILS in time. I have on my desk the spec sheets for the Sony GPS (list price of $1,395.00—street price will obviously be much lower) a palm-size portable that weighs a little more than a pound and which will tell you your location to about 100 feet and your speed to an accuracy of 0.35 mph. I find it astonishing that you can stick one of these babies in your airplane and in the event of total electrical failure, you can have a precision navigation system that runs for eight hours on four AA batteries.

You don't have to be very smart to figure out what's coming. You've got a very accurate method of determining your location. You've got all the information from maps and approach plates in a database, and this information can be displayed in a variety of ways. You've got accurate fuel flow data from a fuel totalizer. Throw in an autopilot and the power of an inexpensive personal computer and you have all the makings of an astonishing navigation system.

You have today all of the pieces you need to have your own custom instrument approach to your grass strip out in the boondocks. Hook up a portable PC to the plane, and you could even let the PC fly the plane down to your minimums—hell, let it land the thing in an emergency, it would certainly do better than *you* would in that situation.

My latest issue of *Flying* has an advertisement for a little handheld 'calculator' that has a full aviation database for only $140.00 plus $40.00 for each card for the three other sections of the country that you might want. Later in the same issue, there's a review of the Garmin GPS, which at $3,600 list has a full Jeppesen database. Also in the same issue is a notice that the FAA says that GPS receivers may not be used as a sole means for IFR navigation nor can they be linked to any other avionics—are FAA employees the same *species* as the rest of us?

II Morrow has just come out with a GPS version of their Fly-Buddy loran (street price $2,100), and Dick Wagner is working with the orientals to bring out a low-cost GPS with a full database. Like the Wag-Aero nav-com, it will have a battery backup in case of power failure. I can well imagine that a standard feature of future airplanes will be a neat little row of AA batteries that back up all of your equipment in the case of power failures. In the event of a power failure, part of your survival would be switching batteries to keep things running—lemme see here, our GPS is running low, so let's steal the batteries from the clock-timer, and let's switch the flashlight batteries with the nav-com batteries.



Here's the world's first look at the Sequoia S.300 being built by Milford D. "Jim" Baugh of Spokane, Washington. Due to fly shortly, the airplane has a 300 hp TIO-540-S1AD Lycoming, all-metal wings and tail, steel-tube fuselage and a non-structural fuselage shell. The design dates from 1975, thus the airplane may set a record for the longest design-to-first-flight time, though Charles Bezard will quickly eclipse that record.

When my Falco was flown over from Ireland in the early eighties, the pilot used a monster loran that he carted with him. From Iceland to Canada was an eleven-hour leg, and over Greenland the thing didn't work at all. Today he would just need a Sony GPS which he could slip in his pocket. It would be lighter, cheaper, more accurate and would consume less power. And if that's not progress, I don't know what is.

Although the FAA will probably have to be dragged kicking and screaming into embracing GPS, there's no turning back. Fortunately, loran has served as a precursor to GPS and has put everyone in the right mindset. We now have an improved safety record in aviation, and it's impossible to prove, but I'll bet an important part of that is due to loran's ability to guide a pilot in bad weather and low on fuel to some little field out in the middle of nowhere.

I think the future belongs to GPS. The FAA could scrap the entire VOR and ADF system, give every pilot a Sony GPS, tell them to go fly, and I'll bet they'd get their money back in less than six months. It's a silly thing to suggest that the U.S. government give Japanese avionics to pilots for nothing, but the cost savings are probably there. The whole idea of terminal area radar starts to make no sense, rather than bouncing signals off airplanes, why not just let the airplane tell the controller's computer where it is? The function of the transponder would be replaced by a radio which would simply 'talk data' back and forth with ground, whether in radar contact or not.

Instructions to fly various headings could be done electronically and could be displayed on your moving map display as a flashing arrow. Same kind of thing is easily do-able for the location of other airplanes. Faxed weather maps. Feelthy pictures. The FAA is proposing that we now have to install Mode-S transponders on new planes, and these have the ability to transmit slightly more data to the ground, including (gasp!) your N-number. What we really need, though, is some radical thinking and a device which will serve as a radio-based RS-232 serial port for the airplane—one that can accommodate the inevitable changes in software on each end.—*Alfred Scott*

Around the Falco Patch

I finally finished reworking the Corporate Disgrace's electrical system and instrument panel in time for the Great Oyster Fly-In in early November. The wiring in the airplane was a real nightmare. I spent many evenings and entire weekends out at the airport tearing wires out and trying to figure out what the devil was going on. I had the original electrical system drawings, which meant almost nothing at first but as I got into things, they all started to come together.

The production Falcos had an unusual electrical system design. The circuitry is conventional, but the assembly was... well, *different*. Because of the front tank, the panel pieces all have to be removeable so you can get the tank out. The Italians made an electrical 'box' that sits in the middle of the panel. Every switch, circuit breaker, indicator light and fuse was located in this box, jammed in there with unbelieveable density. To accomplish this, the circuit breakers were odd little open-frame devices which were installed at every conceivable angle to get them all in.

You had to marvel at the ingenuity of the designer that crammed all this in there, but once it was assembled, woe betide the mechanic who had to work on it. Behind the switches and breakers are two rows of terminal blocks, like an old train station receiving a stream of wires that arrived from the back of the plane—*all aboard for stations 3, 4, 5, 6, aft fuel tank and points south*—looping up from the right and another feeding a bundle that looped up to the left and on to the engine compartment.

Once years ago I was working on it and dropped a tiny screw down into that jungle. I could hear it tinkle and rattle down into a hidden recess, and I was never able to find it again. I've cursed this design many times, but it slowly dawned on me that it was, after all, a remarkable piece of design and very logical. The only problem is that no one ever thought about the system growing.

The airplane was wired for two nav-coms and an ADF—remember, this is a 1959 airplane and the original directional gyro was a monstrous box easily twice the size of a modern unit. What happened was that as people added equipment, they would reach down in the electrical box, solder in another wire and run it somewhere. In the process, the box grew electrical weeds and fungi, and the neatly bundled wiring became an insane cobweb.

When I first got the airplane years ago, I pulled nine pounds of unused, abandoned wires out of the plane, and I got rid of another couple of pounds in September and October. There was never any such thing as a main power bus, instead there was a post on the back where the main battery wire makes a pit stop on its way to the starter. A wire lead from that, split off into two, then was soldered and split off again, and the process of splitting and soldering continued until it became a giant copper neuron synapsed to circuit breakers, indicator lights, switches and fuses—logically perfect and a perfect nightmare to maintain. (By the way, except for the main battery wires, every single wire in the airplane is 16 gauge—this on a 24-volt system!)

I slowly worked my way through the system, snipping out weeds and discarding unused devices. The more I ripped out, the easier the whole thing became, until I had stripped it down to the basics: just a couple of circuit breakers, lots of color-coded wires and plenty of room to work. The master switch and generator switch came out, and they're now on the left side of the panel. The flap switch came out and is now down on the center pedestal.

The further I went, the bolder I became. I now have a complete sub-panel of electrical stuff on the left side. There're a million new connectors, and I can actually take the thing apart and put it back together now. Wires are like worshipers at a church, they gather strength from each other, and mine are now neatly bundled and follow big loops through the plane rather than each going its separate way.

There's still some room for improvement. The right side panel connects to the airplane with five connectors when one giant one would be better. I've just got an altitude encoder to stick in the plane, and I am going to move all the circuit breakers now scattered hither and yon with a neat row of Potter and Brumfields in the electrical box, and with only the gear switch in there.

That's months of additional work, so I buttoned it all back together and fired the thing up. The bugs in the system turned out to be minor, and they're all fixed now. And one day in late October I took the old bird up for a test flight. As it happened, it was a beautiful clear day with smooth air, and the sun had nearly set.

The instrument panel is exactly the same as before, except that now everything *works*, and it's painted a nice gray color. It's astonishing how that changes your perspective, and as I turned toward the setting sun, the panel became the old familiar indistinct dark pit. I reached for the light switch and turned on the panel lights—there are two dimmer circuits connected to post lights, the internal lights of the avionics as well as two flood lights—and the sight of the panel lighting up on my old Falco was a nearly orgasmic experience. The modern miracle of panel has come late to the Corporate Disgrace!

But *hey*, it looks great and everything works. I'm even making plans to fix up other parts of the plane once warm weather comes.

It was all running in time for the Great Oyster Fly-In. The Urbanna Oyster Festival has grown to an enormous size; this year 85,000 people attended. We had about twenty planes there, including a Jungmann, CAP-10, T-34, Starduster, a Cessna 140 on floats, an old T-6 as well as the Corporate Disgrace and a bunch of Wichita tin.

Bad weather up north caused some no-shows. Steve Wilkinson was temporarily grounded by his ear doctor and couldn't come. Terry Smith called to say that he had to turn back because of bad weather in southern Pennsylvania, and Jonas Dovydenas was not about to launch with 100-foot ceilings and no instrument ticket.

John and Midge Oliver arrived in their Falco, and we parked the thing in the front yard. It made a spectacular sight in there among the trees. It's the first time I had seen the finished plane, and it's a beautifully built airplane with very attractive leather-and-fabric interior. All in all, a beautiful day and for those of you who missed it, there's always next year!—*Alfred Scott*

Goings On at Sequoia Aircraft

I'd rather have a venereal disease than work on the wing ribs, Lord help me they are so slow and boring, boring, boring. The only reason I'm doing it myself rather than hire a flunky to push sticks through the saw is that I want the jigs and fixtures to be right. Next time we do this, some poor college student will do it all in three weeks.

But the good news is that I'm nearly done with the job of cutting up the pieces for the ribs. I'm now finishing up the rib for station 1, and that leaves only station 2.5. I'm making the parts for 50 airplanes, and aside from the huge number of parts—there are about 60,000 cuts that are required—the bulk is also surprising. I have three stacks of large boxes that go nearly to the ceiling that contain all these pieces. Another stack of exactly half the number of boxes contains the cutting fixtures.

I wish I could tell you that I have learned some great lesson about making ribs that would help all of you who make your own, but I really haven't anything to offer. When you are making the numbers of pieces that I'm working with, every step requires a jig or fixture. I'm just working with birch plywood cutting jig boards on my Beisemeyer miter table on my Unisaw table saw. I make the jigs by using a combination square, little extra pieces of spruce capstrips and instant isocyanate glue. Magic markers. Gallon-size freezer bags of pieces. Boxes. Tape. Lots of time.

We now have the 13-second model-B gearbox in stock. We've already exchanged them with a lot of builders who are going with the full gear doors. And there's also plenty of others who aren't (or don't plan to) using the full doors and thus are sticking with the faster model-A gearbox.

Because we are handling this on a free-exchange basis, we are asking that builders send their gearboxes back here for us to change the parts. We were a little worried about getting some badly junked up parts back here, or having to beg someone to please send the pieces back. As it has worked out, all of the gearboxes that we have gotten back are clean, unscratched, and indistinguishable from brand-new gearboxes. The only parts which would ever wear are the gears on top and the motor, but these are things that the builder gets back with the new gear boxes. If you have a gearbox and want to change over, please let us know.

Top: Cecil Rives and Alfred Scott at McCall, Idaho, in September. Bottom: The Corporate Disgrace takes off at the Oyster Fly-In in November.

When you install the cowling, you need some Dzus tools to set the grommets on the studs that go in the cowling doors. These have always been common tools that builders have been able to borrow from their local FBO, or they just buy a set. For some reason, the tools are no long sold by Wicks or Aircraft Spruce, and they are also getting fairly expensive.

When Alan Hall said he'd paid over $100 for the tools, I realized it was time for us to make a change in how we do this. From now on, we'll be including those tools in the cowling jig kit (which you only need for a short time and return to us when you're through). Rather than buy new tools, we'd just as soon get them from Falco builders who don't need theirs anymore. We have a set from Steve Wilkinson, and if you'd like to sell/donate your Dzus tools, please let us know.

There's a minor change in the brake system. In the past, we've used brake reservoirs from some kind of Volkswagen pick-up. They were light and very convenient, but the last time we went to buy 50 the parts-department clerk just stared at his terminal and said the parts were obsolete and not replaced with a new part—now why the devil didn't Volkswagen check with me first! To hell with them, I just sat down and designed our own using a piece of aluminum tubing and two weld flanges. That's the way it's done on the Pitts and Christen Eagle.—*Alfred Scott*

Sawdust

• Christmas Shopping? The 1992 Home Built Kitplanes Calendar features Karl Hansen's Falco in November. As usual, a spectacular color photo of that sleek red eye-talian machine. They're available from DSB Publications, P.O. Box 9265, Peoria, IL 61612 for $7.95 postpaid. Send check, cash or money order. Sorry, no credit cards.

• Media Watch. See the December 1991 issue of *The Aviation Consumer* for an article by Steve Wilkinson on owning, flying, and repairing the Falco. Nice coverage of Bjoern Eriksen's Falco in the January 1991 issue of *Kitplanes*.

• Lithuanian Q-Tips. "What's the stupidest thing a pilot could do?" asked Jonas Dovydenas. Land with your gear up? Yup. Seems Jonas was on a trip to Laconia, New Hampshire, and had his mind on other things as he was shooting an approach to a grass strip. Just as he was about to touch down he heard a thumping sound, jerked it up and went around. On landing, he found the tips curled slightly, so he flew it home, and it was as smooth as ever. The prop shop was able to straighten the blades and get him back in the air in short order.

• The Missionary Formation. My friends Chuck and Polly were driving along at 10,000' in their Baron the other day, chatting on the intercom and reading a trash magazine from the supermarket checkout counter. There was an article by a guy who was a customer of the Florida housewife hooker, who mentioned that he was surprised that the lady preferred the 'missionary position'. "What's that?" asked Chuck, and Polly said "Well, I think that's when the man's on the top and the woman's on the bottom." "What's that you said, Charlie X-Ray?" asked Boston Center, and someone else chimed in with "That woke me up, too!" A couple of minutes later, they got a call from Boston Center, "Baron Ten Charlie X-Ray, you have opposite direction traffic at 12 o'clock and 11,500—another chance for you to be on the bottom."

• Not everything that's Italian is fast. Got a call the other day from a guy out in Minneapolis who was buying a copy of Benchmark. He mentioned he had a Waco Vela, which is the name used for the SIAI Marchetti S.205/22R when it was imported some years ago. This is one of the most forgettable airplanes imaginable, designed by SIAI Marchetti's chief engineer, and it was the spectacular *un*-performance of this most ordinary airplane that caused SIAI Marchetti to turn to Stelio Frati. How bad was it? Well, the guy mentioned that it's the only retractable-gear airplane he's flown that flies the same speed with the gear up as with the gear down.

• Congratulations to John and Midge Oliver for winning the Grand Champion-Custom Built award at the EAA East Coast Fly-In at New Castle, Delaware, at the end of September. Midge reports, "There was a red Marchetti parked across the aisle from the Falco. Looked big and powerful, but it didn't win anything."

• Aviation's loss is software's gain. Kas Thomas, one of aviation's ablest writers recently left *Light Plane Maintenance* to pursue writing Macintosh software. Kas is one of the most original writers around and generates more one-liners than Peggy Noonan. He's one of the feistiest individuals to hit aviation in a long time—there's hardly an aviation mucky-muck that he hasn't lampooned—and he was responsible for getting *The Aviation Consumer* to pursue the EAA story. Kas is also a superb programmer, and one day while sitting in a bathtub, he concocted a new and very innovative method of data compression. I was his first beta tester a couple of years ago, and his PakWorks data compression software just released is about ten times faster than all the competitive offerings and is 80% the speed of a 50 MHz dedicated add-in board. PakWorks is available for $79.95 postpaid from Small Miracles, P.O. Box 625, Old Greenwich, CT 06870 or call (203) 967-8260 with your Visa/Mastercard order—most probably the voice that answers will be Kas Thomas himself.

• Ship-shape. Be glad you're not Hans Sonntag, Falco builder in Germany. We shipped his spar kit by sea, in the usual glued-screwed-and-stapled plywood crate. It went by sea, and when it arrived in Hamburg, Dr. Sonntag reported that the crate was essentially gone and that the spar had made the Atlantic crossing on the open deck of the ship and was well-washed with sea water. Amazingly, there was no damage to the spar nor any missing pieces, but he nearly had a cardiac arrest when he saw the spar for the first time. From now on, all shipments to Dr. Sonntag go by *air* freight.

• Steve's ear-up landing. Back in October, Susan Crandell called to report that Steve Wilkinson had a six-hour operation on an abcess in his ear, that he was in some hospital in NYC and would be there for a week. Since he wasn't going to be phone-able for a couple of days, I chased down the fax number for the nurse's station on the floor and then sent a fax to a bunch of his writer friends—all of whom have faxes and who quickly passed the word around. Within minutes the fax machine at the hospital began erupting with messages from all over the world, the most memorable being from *Flying* photographer Russell Munson:

"Dear Steve, Can you 'ear me? I say, CAN YOU 'EAR ME? They tell me you had an abacus in your ear, and it made you feel bad. Well, what did you expect? Even a banana isn't comfortable, but an abacus? Are you nuts? Did you think you would be able to do calculus in your head? NEVER STICK ANYTHING FOREIGN IN YOUR BODY. Now you know why, asshole. Don't expect any sympathy from me. Your old pal,—*Russ*"

This is what aviation is all about.

Brenda's Corner

When we reordered the oil pressure transducer that is part of the electrical kit, we discovered that the one we had been using is no longer being made. That has created a problem for the people who have purchased the engine instrument cluster, but not the electrical kit.

The new oil transducers will not work with the old oil pressure gauges. We are having the clusters reworked, but we have a couple of builders who have already installed the cluster in their panel and really would like not to have to take theirs out of the panel.

If you have purchased the electrical kit and not the instrumentation kit, we would be very grateful (and so would these two builders) if you would return your oil pressure transducer to us, and we will send you one of the new ones that will work with the engine instruments clusters that we will be sending out in the future.

In the June 1991 builder letter Alfred mentioned the trim tab cable snafu. If you have one of the black cables that has a three-inch stroke, please return it to us so that we can replace it with a cable that has a two-inch stroke.

If you are one of those people who believe one man's junk is another man's treasure, boy do I have something for you! Alfred recently had to replace his state license plates on his car. The letters on the plates are FALCO. Not knowing the value of something like this, Alfred just threw them in the trash, but I rescued them. I know there's someone out there who would just love to have one of these plates hanging in their workshop. I have two and will happily send them to the first two requests.

Best wishes for a joyous holiday season and a prosperous New Year!—*Brenda Avery*

Mailbox

Interested in your Construction Notes piece about panel placarding in September's newsletter, specifically your remarks about protective coating. I've been fooling with model aeroplanes since I was a kid, and when time permits I'm heavily into small-scale static model building, matching FS numbers and all that stuff. As you say, you have to be careful what kind of clear coatings you use over enamels—the more so with the ultra-thin waterslide decals used on small models.

The best (if unlikely) product I've ever come across is Johnson's 'Clear' floor polish (I think it is marketed under the 'Future' brand name in the USA). It seems to be compatible with just about any kind of base coat, even metallics which are easily softened by most clear coat oversprays. It brushes on even over a high gloss airbrushed finish with nary a trace of a brush mark (though you can spray it, but be careful if the base paint is a high gloss or highly impervious or it'll pool or run) and provides a very effective barrier against whatever you susequently apply. In fact, for gloss finishes there's no need to do anything further, though you'd obviously want a non-glare finish on a panel. I've seen little evidence that it yellows perceptibly, either. I have a couple of Clear/Future-coated all-white models (the worst!) that are still virginal after about eight years of daylight exposure in a glass-fronted case.

Incidently, regarding color changes with lacquer coats, I've found that flat coats invariable lighten the appearance of a colour to the eye, gloss coats darken it, particularly when applied over a finish that started off flat.

Luv that Passenger Warning placard on the Corporate Disgrace!

Mike Jerram
Spalding
Lincolnshire
England

Just a note to let you know I received the plans and manuals shortly after talking to you last month, and I am very impressed and excited about the intrinsic value represented by them and the backing of your organization. Congratulations and well done to you all—keep up the good work. I thank you particularly for the back copies of the newsletters which I have worked thru backwards and now plan to work up thru to bring everything into focus to date. Alfred S. and Steve W. sure make for good reading.

Jack Lange
Ft Collins, Colorado

You've probably already included this in your instruction to installers of the new B-model landing-gear gearbox, but I think it is crucial to point out that the landing gear up- and down-limit switches will have to be reset after installation of the new gears.

I was amazed to see the extent of the influence of momentum and battery power on landing-gear position the other day when I had the Falco up on jacks and was working to check whether or not the jackscrews were bottoming out. I had run the gear up and down two or three times, using the fresh and fully charged airplane battery, and by that point, the gear would coast to an up-and-retracted position that didn't allow closure of the wheel-well doors. (I didn't have them installed, but if I held them in position, they hit the tire well before coming flush with the bottom of the wing.)

Hitching the Saab, idling, to the airplane battery with jumper cables and repeating the retraction cycle, the gear went fully up easily, the only difference being 14 volts rather than 12 on line and the resultant momentum of the entire assembly. So I'm assuming that the momentum of an assembly running at substantially fewer rpms, with the new gearbox, will require resetting of the limit switches.

Steve Wilkinson
Cornwall-on-Hudson
New York

The speed and power output of a DC motor is directly proportional to the voltage, so you get about 16% more speed when running on an alternator rather than the battery.

—Alfred Scott

Fuselage assembled and covered from frame 6 to main fin beam. Fin, stabilizer, and all control sufaces assembled. Landing gear, gas tanks, engine, main spar and wing ribs on hand. Canopy installed and working on the windshield.

Frank Leahy
Peterborough
Ontario,Canada

Finally saw a real Falco—even got to touch—John Oliver's. He and his wife are really nice. The plane is... wow!

Dean Williams
Fruitland, Maryland

Have been slowly progressing. Fuselage frames are now approximately 50% complete. Thanks for the tail group equipment kit—quality is excellent. I have pencilled in the 50th anniversary of the first flight (when was it, 1954?) for my first flight, but hope to go quicker.

Martin Bennett
Lynsted, Kent
England

After two years, all fuselage frames are completed. So are all the wing and tail group ribs.

Gérard Leclerc
Thiais, France

After lots of rebuilding, my Falco is now all covered except the top of the wing. It's still upside down, ready for the cloth covering, but due to the tight money situation, my progress is very slow right now. My Falco is the one that I acquired through your newsletter (the one in Susanville, California) two years ago.

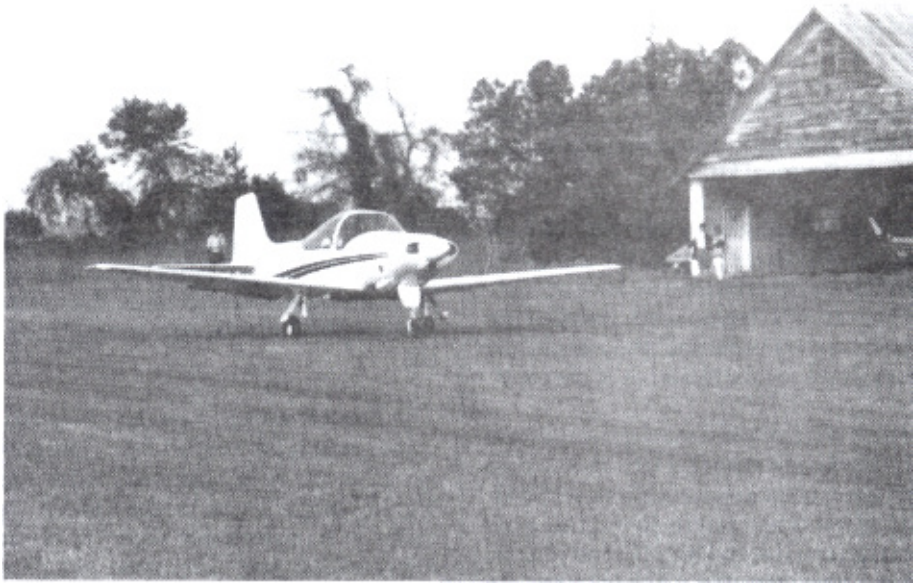
Frank Spyksma
Turlok, California

Progress is slow but steady on my Falco. I've got the elevator ready to skin, but I'm going to wait to skin the tail section all at once. Fuselage frames 9 through 11 are completed, and I will be starting on 8's soon. Also, I've started assembling the horizontal stabilizer. Sometime soon, I'll finish off the wing ribs since No. 1 is completed. It may be slow (that's okay) but I'm having fun, and it's relaxing after a day's work.

Bill Eisenberg
Corona, California

The other day Brenda Avery got a letter from Joe Rizzo, Falcophile and Bready-bunch-groupie who shows up at Oshkosh every year. Joe was really writing Brenda to thank her for her crabcake recipe, but he also mentioned going to a Stampe fly-in…

By the time we got back to Tri-Cities airport, I got a message from the airport office that I was not to leave the airport because I would be receiving some visitors in about a half hour. It could only be Bready. Sure enough, the "Stealth Falco" appeared overhead about 40 minutes later with Jonas and Bob aboard. Jonas didn't have to offer twice with an invitation to fly. I don't need to tell you what a thrill it is to fly a Falco. Although I am a little restrained when flying someone else's hard-build airplane, I could sense the honesty in Frati's design. Because the Falco does just what you ask it to do, it is an airplane that will make good pilots look good and bad pilots look bad. Jonas's



Scenes from the Oyster Fly-In. Top: John and Midge Oliver take off in their Falco. Bottom: Don and Bonnie Peterson flew their Starduster in from New York—that practically makes the Oyster Fly-In an international affair.

Falco is no exception, but he's *got* to do something about that paint job!

Joe Rizzo
Binghamton, New York

It's been a helluva year for me! First off, I broke my right arm badly at the wrist on the third of May while doing some maintenance work on our cottage. I've not recovered completely yet, but I have now regained about 50% of my right-hand strength, though still with substantially reduced mobility in the wrist, but enough so that I began working on the Falco again about mid-September, and as of this writing, I'm ready to put the plywood skins onto fuselage frame No. 1, the last of the frames I've to do. I have ordered and a phone call just now from the trucker says I will receive tomorrow all of the necessary spruce from Wick's for the wings. I have in inventory already the necessary material for the tail feathers, so I am ready to do some serious Falco building!

I appreciated reading your evaluation of the EAA after the audit. Thanks again to you for bringing it about. Thanks again for being the best!

Gary Wilburn
Clarksville
Virginia