Falco Builders Letter

The Five Hundred Dollar Burger

A Motor Flight Edith Wharton Would Have Been Jealous Of

by Jonas Dovydenas

I'd left Lenox three days before. I walked out of the terminal at John Wayne Airport, headed to a Burger King down the street, and ordered a Coke and a Whopper. I threw the Whopper in the dumpster and sipped the Coke. The LA sun was shining. A warm breeze was blowing. The palm trees were rustling. I was certain it was all Photoshopped, but I didn't care. I was a happy man. I had wrestled for over two months with the flap improvement kit. I did an annual while I was at it. When I was done with that, one thing or another kept me kept me busy and pretending I was a mature, middle-aged, dependable man. Finally, on the morning of Friday, April 11, I'd had it. The weather looked good, the Falco was ready. I kissed the family goodbye and was gone.

I had called some friends in Washington thinking I would spend the night there. A severe cold front was on its way down from beyond North Dakota, and a smaller warm front was sitting a little way up from the Gulf. The briefers thought I would run into the cold front by four or five PM. But the late afternoon was calm, a little hazy and warm. I decided to keep flying until I couldn't any more. I landed in Winchester, Virginia, topped off, left messages for my friends in D.C. and was back in the air in 15 minutes. I crossed the Blue Ridge Mountains over Front Royal, barely visible a few miles on the left. I skimmed over the ridges into West Virginia. I followed the descending terrain, flying low, looking at the landscape and wondering at the mystery of such a simple pleasure.

Edith Wharton, who built a house in Lenox near where I live, bought a Pope Hartford car in 1904 and began touring. She had a driver, and she had servants prepare basket lunches. She would take a friend and launch herself into the countryside. The Pope Hartford was open, hard-riding, and noisy, though perhaps not as noisy as a Falco. But it was a thrill of a higher order than anything available in any conveyance before the motor car. She called her trips "motor flights". Americans, in those days always on the lookout for more freedom, took to driving in a car with an exuberance which lasted until...

When did we notice it was over? For me, it was when I put my Land Rover behind the barn after a quarter million miles and five or six coast-to-coast trips. After living in it for months photographing Nevada. After driving from Salt Lake City to Riverside, California on gravel roads. After a friend and I delivered a repossessed Thunderbird from LA to Boston in 56 hours, when we were young. When I started flying. And finally, I lost all interest in cars when I started flying the Falco.

Edith Wharton would have loved the Falco. She would have recognized it immediately as a touring car with a canopy and wings, a machine for real motor flight, not just a metaphor. The Falco makes the car seem a pitiful contrivance. Slow and clumsy. Subject to traffic jams and the lunatic antics of other drivers. The constant attention required to drive a car becomes a hypnotic bore on a long highway. You can only pretend to fly in a car, when in fact your four furiously spinning wheels are stuck to the earth. And of course, you're screwed if they're not.

Yes, Edith Wharton would have loved the Falco. She would not have been able to take her corpulent companion, Henry James, along but she would have recognized the greater pleasure of flying solo. Thoughts like these drifted through my mind as I descended into Charleston airspace and an effortless landing into a fragrant spring evening, something that never was in a Lenox April.

The front came through during the night. At five, when I looked out my motel win-

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dow, the ceiling was down to a couple of hundred feet, but it was not yet raining. It didn't look like I was going to go anywhere soon, so I went out to the airport to find a hangar for the Falco. By the time I pushed it under a roof, it was raining hard. I got some towels and began mopping up the puddles inside the cockpit. I never drilled a drainhole behind frame six, so I had to access that space and mop up a cup of water. Normally if I am going to leave the Falco on the ramp in the rain, I tape up the canopy, the gas tank access and the battery hatch.

I rented a car and went to see what there was to see in Charleston. I walked over to the State Capitol. It happened that the state legislature was in its last day of cranking the law-and-sausage-making machine. Several dozen bills had to be passed or amended, some hearings concluded. The rotunda was full of people. I strolled in through a side entrance and immediately fell in love with West Virginia. There were no metal detectors manned by uptight thugs. People were milling around everywhere, going quietly in and out of the spectators' galleries without interference from the State Police, who were actually calm and polite.

On the ground floor a group of protesters with graying pony tails were singing folk songs led by someone who looked a lot like Pete Seeger. It was a rally against a law that, if passed, would allow DuPont to destroy the planet by polluting it with whatever it is that DuPont makes.

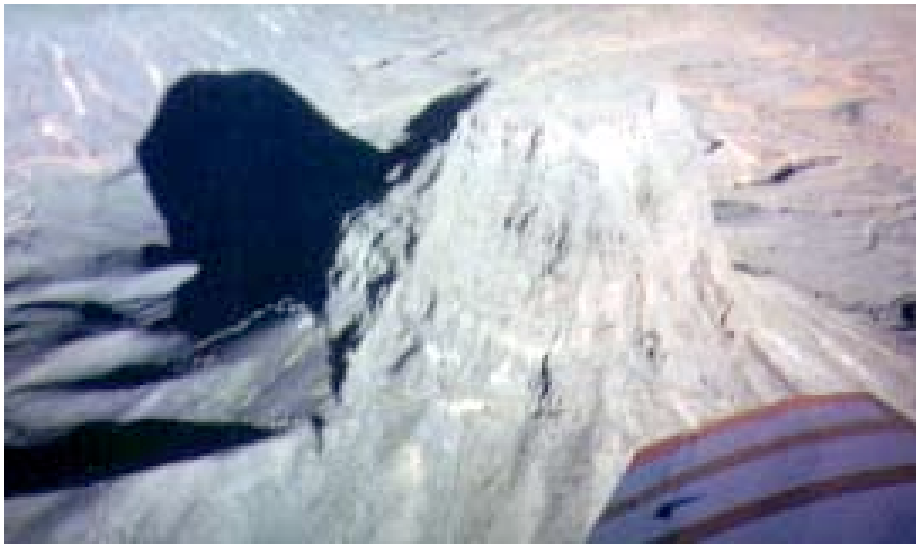
A few dozen mean-looking motorcycle guys with hefty motorcycle babes were intently huddling with a lawyer. They wanted the helmet law amended to allow anyone who had held a motorcycle license two years or more to be free to drive around with or without a helmet, as they pleased. I was on their side. People are not

sheep; a million laws will not make them so. I would be upset if the FAA required helmets, though for sure some few lives would be saved. Then a doctor came to the hearing and described what happens to a human skull traveling at highway speed when it encounters a hard object. Doctors against bikers—it was no contest.

By noon it looked like the ceiling might be lifting. I went out to the airport and waited. By three I was out of there, flying through brilliant, white showers. The rain stopped, but as the temperature dropped a dark, misty ceiling threatened to come down to the ground. By then I was in Kentucky. If there was to be scud-running it would be over flat ground. I landed in Lexington into a twenty knot headwind. A Super Cub towing a banner was attempting to drop it and land on the grass next to another, shorter runway. He had the crosswind. He had to go around three times to drop his banner. He was not having fun. Or maybe he was if he was logging time for that job with the airlines.

I flew over Paducah and the great confluence of the Ohio and the Mississippi. Those rivers were in flood, and there were vast flats of water miles away from the banks. The temperature dropped into the forties. The northwest wind knocked my groundspeed down to 136 knots.

Henry James, who used to come to Lenox to visit Edith Wharton soon after she built her house there, remarked once that the words "summer afternoon" were the most beautiful in the language. He knew a thing or two about the English language, of course, but mostly he was, I think, seduced (and who wouldn't be?) by the Berkshire landscape, which is picture-perfect in the Hudson River School kind of way. And the Berkshire weather, which when it is good, makes breathing seem like the rarest luxury. That and conversation with Edith



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Wharton and her friends. So he savored those words not only for their sound, but for the arpeggios of pleasure they must have evoked in his memory.

My own candidates, as I flew into Arkansas, were "Piggott" and "Paragould". That sound makes my ears tingle. What is astonishing is that those are the names of two small towns not more than a few minutes of flight time from one another. That and the fact that my first wife happened to come from Piggott and that Earnest Hemingway's second (or was it his fourth wife?) Mary came from the same place, and that Senator Fulbright was born in Paragould. Those associations, pitiful as they are compared to what must have resonated in Henry James's mind, only help me appreciate the scale by which the beauty of words is measured. So, I submit, for beauty pure and simple, "Paragould" and "Piggott" are champs. Between these two words, one sublime the other as homely as English can ever be, lies the vast landscape of the entire language.

A somewhat plaintive call on the unicom frequency squelched my reverie between Piggott and Paragould. It was a soul in a Lear calling Walnut Ridge to inquire if fuel was available. I had been listening to someone in an Aeronca call out his own pathetic, slow approach perhaps five times in maybe ten minutes from a few miles away with no response. So I knew the Lear would need to land somewhere else. My own plan was to spend the night in Paragould, but when I flew over, it was the most forlorn little strip, long overdue for repaving with not even a beacon. Just a gray slash next to the village with the beautiful name. So I flew on. It seemed unwise to confront reality by landing, a hard landing indeed. A look at the chart showed Jonesboro just minutes away. That's perfect, I thought to myself. Here I am thinking of Edith Wharton, and a town named after Jones appears on the horizon. Jones was Edith Wharton's family name.

It was surprisingly cold in Jonesboro, in the forties. That's winter in those parts. A friendly teenager helped me shove the Falco into a hangar full of King Airs. While I was waiting for my cab, a Citation landed, taxied up to the door. Women in fur wraps and shimmering dresses descended, followed by men in evening clothes. They breezed through the little terminal trailing perfume and happy talk. The owner of the plane had come from a nearby town. He flew in the left seat. His co-pilot stayed to watch the plane while the group continued their journey in a limousine. Such are the wonders of life in rural Arkansas.

My taxi finally showed up. It was a Fairlane badly made sometime early in the seventies. It had a reddish body and a green door on my side that didn't want to shut. The driver was wearing a greasy down jacket, patched with duct tape. He didn't look like he enjoyed shaving, or washing, but he was friendly and cheerful as he told me his life story. When he got the chuffing old beast out on the highway, the front wheels began shaking. Both of them. Violently. "Front end's shot" he said without a trace of concern. "They ought'er give me another car, but the owner says he ain't got the money. I'm bout ready to look for sumtin else to do."

At the motel, the man at the front desk told me about Jonesboro. "This used to be a real slow town until Burger King and Walmart came in. That and a couple of big plants. The population's about double what it used to be." I was interested in how a booming town of fifty some thousand could be dry in a world of rap, Peter Jennings and a short, straight highway to

a wet county. But it was, sort of. Two long country blocks away from my motel was a Supper Club. This was good—I needed a walk as much as I wanted a drink. I thought of the half dozen times in my life that I had managed to find a drink in a dry town. It always had required some effort, which made that first drink lot more tasty than it was anywhere else.

But this was now, in Jonesboro. A perky young waitress bounced up to my table and simply said, "And what would you all like to drink this evening?" Not even pretending to be private, or brown bag, or anything. Just a big, busy, restaurant with the only bar in town. I finished my meal wondering how such a beautiful scam could be brought about, when my still-perky young waitress handed me the check, it was for something like eighteen ninety-five. I had ordered a couple of beers, had the salad bar and the prime rib special. A decent honest meal.

I was amazed. Some guy had gone to the trouble and expense of fixing things so that he could openly get around the law, and he was giving it away. It was upsetting. If I had paid triple for my beer (never mind the nine dollars for the slab of good beef), it still would have been less than what a hotel bar in, say, Chicago would have charged. So, it was no big deal and no great expense to sin in Jonesboro. I was disappointed. I'm always disappointed when sinning is no big deal.

I left Jonesboro the next morning topped off and happy that the lineman wouldn't even consider my offer to pay for the overnight in the hangar. The bright green of the new leaves and the intense morning light tempted me to fly low.

It's by far the best way to see the country. The interstates are just boulevards between cities. The two-lane highways have become overgrown by a kudzu of trademarks. Flying low is the way to see the country. Driving is like watching TV. Flying is like looking at a book of landscapes. The Falco cockpit is a chair in the air, a convertible without the hair-ripping breeze. Traffic below four thousand feet is slow. A practiced instrument scan takes a second of casual attention.

The engine, I know, will not fail me. The chance that my transponder will stop working, that my emergency procedures list will not be there when I need it, that the propeller will suddenly shed a blade, that the crank will snap, that a wing will fall off, that I will crash in a ball of fire—that's so unlikely worrying about it tells me I am either a severely disturbed individual or I'm ready to take up writing columns for flying magazines.

I sat back and enjoyed the sight of a church steeple or a small white house in the woods with a bright green roof and an immaculate lawn around it, wondering—whose? There is Kellyville, and up ahead must be Never Sweat, which I never saw.

Then suddenly the red earth announces Oklahoma. And like a scene from a movie, there is the square one-story farmhouse on a square lot in the corner of a large red field. There are cars without hoods, lawn mowers, washing machines, piles of old shingles, an outhouse, a falling-down garage, rusting farm implements, and laundry flapping on several lines tied to the back porch and some trees. A Hollywood set for an Okie movie. It has to be—ordinary people are not capable of such perfection.

I landed in Clinton for fuel. There were four Cessnas without engines and a cannibalized Shrike Commander on the ramp. Three men were doing what looked like a top overhaul on one of the Cessnas. I called my family, ate an itty-bitty, fifty-cent bag of Fritos for lunch and took off heading for Amarillo, where I was routed around some T-37's doing pattern work. They looked like daggers flying overhead. I flew over some feedlots and looked for an increase in power, but I guess I wasn't low enough for the methane to show up on the EGT.

A high, thin whine was coming from somewhere in the front. I tried to localize it by probing under the panel with the mike of the second set of earphones. I suspected the vacuum pump. I landed in Winslow, Arizona after my first full day of flying. The vacuum pump hose didn't

seem blacker than usual. I decided to deal with it in the morning.

It was seven, and there was no one in the flight office except a bunch of crash-test dummies, looking a little spooky. The door was locked. An Indian from the Mayfair Motel came out to pick me up. He told me he's going broke, that not enough people were coming through town. He charged me $19.95 for a room that had seen better days. I asked him which was better—the "Mexican Bar and Food" or the "Chinese Restaurant", both a stroll away from the motel. "I never eat out" he said. From the smell of the curry, I wished he would invite me to eat with him. I chose Chinese and watched a Navajo couple eat their entire meal without comment.

In the morning I had *huevos rancheros* at a Navajo diner. The man sitting next to me at the counter started talking. It was clear to me I better listen to him because he was in pain. Seems his wife is a frivolous socialite. He loved managing his pizza restaurants, she was on the verge of asking for a divorce. But the immediate problem is that his eighteen-year-old daughter ran away with her boyfriend, and he had tracked her down in Winslow. She was in an apartment motel across the street as we spoke. He knew his life was getting shaky. I told him the problem seemed to be the mother, not the daughter. He was relieved to hear that. Clearly, he loved his daughter. He told me he's from Front Royal. I told him I flew over his house two days before. And I told him not to be angry with his daughter. "Be grateful you found her." I left Winslow without doing anything to the vacuum pump. The buzz was gone, and there was not a cloud in the sky. The engine was running smoothly. I landed in Alexander, New Mexico for fuel.

I called a friend in Santa Fe on the chance he was there, and I could have lunch with him. A machine answered. I left a hello message. I flew up Monument Valley to get a good look at Shiprock. I took some photos, and soon I was over Prescott where I heard someone say on the radio "Prescott tower, this is Two Two Tango, leaving your area." I once thought that would be a good tail number.

Soon I was flying into the heat of the desert. I flew over Twenty Nine Palms and contacted SOCAL traffic control as Palm Springs was passing by on the left. I came in over Santiago Peak at 7500', the famous LA aviation soup nowhere in sight. Orange County was 8 miles away when the controllers handed me over to the tower.

I was high, and I came down fast and when I entered the pattern as I thought I was cleared to do, the tower came on in a voice with anger and panic, as if two heavies were about to collide. "What are you doing? Make a right turn now." I realized I had extended my downwind and was about to enter NAS airspace several miles north of the Orange County Airport. I thought I was number two on 19L. There was a 757 on final for 19R, and there was no other traffic on downwind in front of me that I could see, other than the Cessna on final. I turned right and asked for instructions.

"Circle the UC Campus". Something that looked like a campus was several miles away, and I flew in that direction. It seemed to me I was being directed to re-enter the pattern. After a few minutes of circling I asked Tower what he wanted me to do, and he vectored me into the downwind leg, the one I had just left. I was number three. I landed and taxied to the ramp. Shaken by my sloppy performance, I went over what happened. I was too high too close to the field when I was handed over.

I should have asked SOCAL Control to let me contact Tower about twenty miles out. On the other hand, Tower panicked when he could have simply directed me to turn right, go around, instead of vectoring me. He was working the heavies landing on 19 Right, and three or four of us little pesky guys on the left runway, so he was stressed. I think controllers like that should spend a few days in Oshkosh to learn about directing really dense streams of traffic. On the other hand, the next day in the LA Times I read that a Brazilian A310 veered in front of 747 coming into LAX. The Brazilian was setting up for a landing on the wrong

parallel runway. That must have stressed the hell out of a bunch of people.

I finished sipping my Coke as my friend Dale pulled up in an incredibly white BMW. I was spending the night at his house, and he told me about Orange County as he navigated the freeway. "This used to be all Lima bean fields. Eddy and John Martin started the airport. Eddy was a barnstormer, and he was everything else you could be if you had an airfield. During the war he tested and delivered P-38s for Lockheed. My father knew both of them. Eddy once offered to take me up when I was a kid. Now this field is named after John Wayne, who tried to have the airport shut down because the planes taking off to the south flew over his house, which annoyed him."

Dale fixed us drinks and we cooled off in his pool. "You see that on my new roof? What kind of bird would do that?", he said pointing to a huge blob of white bird poop. "I don't know Dale, but if he was on a mission, he's getting the Distinguished Flying Cross right now. Can you reach it with your hose?" I replied. "Boy, I doubt it. Looks pretty high, I'm gonna have to tell the gardener to bring a ladder", he said. I was beginning to relax. Nothing does it like small talk with a good friend.

The next day I said goodbye to Dale and his wife Ann and departed John Wayne around noon. I wanted to be in Utah that evening when the light was right to photograph the desert landscape with a camera I had mounted on the fin of the Falco. It was the chief reason I went on this trip. My first landing was in Palm Springs, where my wife had FedExed my camera mount. Earlier when I had called her to tell her I forgot to pack it in the rush to get in the air, she said "Are you sure you want to be a photographer?" "Maybe I could just fly, and nothing else."

By evening I was in Utah over St. George, where the red Painted Desert begins. I flew low over the rocks, up canyons, over mesas. I did split S's to get the right angles. I worked and frolicked all alone. At dusk I landed in Escalante. There was a list of six motels and their phone numbers on a piece of paper taped to the inside of a phone booth. I called a number on the list. The number was disconnected. I called the other five numbers and heard the same message. Maybe aliens had taken over the town. I didn't want to find out. It was almost dark and a ridge near the runway was making me nervous. I got back in the Falco and took off for Page, the nearest airport. I cleared the canyon wall easily and climbed to 8000 feet. It was smooth, as only night flight can be. The lights of Page were shimmering sixty miles away. That twinkling glow is the best CDI there is.

Page was humming with tourists. I noticed the hum was French when eating dinner in a restaurant near my motel. Then I noticed everybody was talking more intensely than Americans would over a meal. The clothes were casual, but expensive. The T-shirts on the teenage kids were a little off, with strange messages like: "We Are Your Children and We Will Kill You When We Grow Up" or "America Best Gear Company". Back at my motel the woman at the desk told me the French were arrogant and demanding. The Germans not as bad, which surprised me. "But I guess their money is as good as anyone else's" she said. Behind her, high up over the counter wall was a large photograph of a solid-looking kind of businessman. The black-and-white print had been tinted brown and pink. "My husband founded this business, and it's been good to us. He passed away fifteen years ago", she said noticing my glance.

The next morning I took photographs of Lake Powell. As I was taxiing behind a Cessna 207, I noticed PATROL was painted in large letters across the wings. I called on Unicom "Cessna ahead of me, what does "patrol" on your wings mean? "We are with the National Park Service". Okey dokey, I thought. You ain't gonna catch me flying over your goddamn precious canyon, it's been photographed to death as far as I am concerned. And I flew east into the badlands of orange rock and a thousand other canyons that are in the heart of the Navajo nation. No tourists below me, no fanatics there whose rage would be stoked by one decibel of airplane exhaust. No nothing—just vast space and me in it, through it, over it, feeling like the eye of God on the day of creation.

By seven that evening I was in Bartlesville. I called on the radio about 25 miles out to see if anyone was still there. "I'm closing up now, but I'll wait for you," was the reply. "Are you gonna need the courtesy car?" The courtesy car. It never ceases to amaze me, that simple, artless desire to be helpful you find at most rural airports. Was the whole country once like this? Or was it always a special instance, the fraternity of airmen?

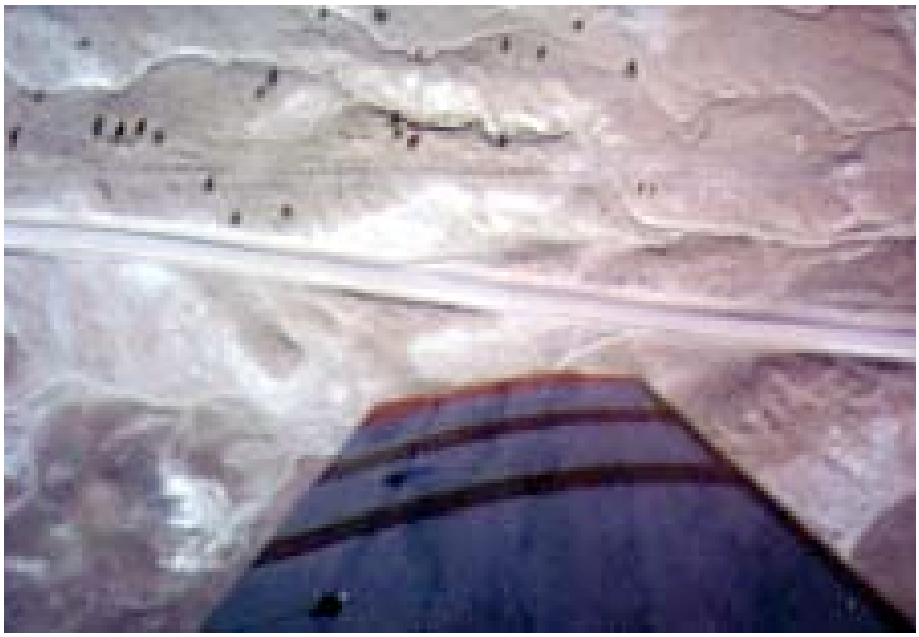
The next morning my TV was on at six. The weather channel folks were happily chatting up a storm. There was a classic weather pattern slowly spinning itself into a frenzy of wind and snow on the East coast. The Dreadful Noreaster. A noreaster with a possible blocking high-pressure area that could make it spin in place for days, like a stuck yo yo. So my last day was going to be a race. I had a meeting on Saturday. Here it was Thursday morning. I took off from Bartlesville by seven thirty, punched in PSF on the Northstar, just to get the suspense up, and settled in for a long day.

I almost made it. It was an easy flight without a single deviation, brushing St. Louis and Indianapolis airspaces. I had a light tailwind, but it was not enough. The ceiling turned 1500' broken, 3000' overcast in northern Ohio. That worried me because if the weather was marginal in Ohio, it was always much worse in Western Pennsylvania.

Soon I was in and out of snow showers, in and out of scud, flying as low as was—what's the right word?—prudent. I was hoping to break out near Scranton, then fly over the plateau into the Hudson Valley before the really bad weather came in. I began deviating to the south, following the hem of IFR conditions. I would see some clearing, and turn North, only to encounter snow or low cloud.

Finally I punched in "Nearest Airport" on the GPS, and started a one-eighty, in and out of cloud. I figured Williamsport was somewhere in a southerly direction, away from the crap. But names I didn't recognize scrolled by, followed by things like 1800' TURF. The Northstar is a wonderfully soothing instrument, but, I was finding out, not always. Finally, Williamsport came up. Distance 11 miles, heading 100 degrees. That information lowered the heart rate considerably.

In a few minutes I was calling Tower, on the ground, and in a hangar where I stayed for two days, while a spring blizzard raged in the Berkshires. Just like the happy heads on the weather channel said it would.



The Glider

Part 14 of a Series

by Dr. Ing. Stelio Frati
translated by Maurizio Branzanti

Chapter 6
Applied Aerodynamics (con't)

32. Summary

Sample of an Aerodynamic Calculation for a glider. Let us try a simple example of the aerodynamic calculation of the flight characteristics of a glider. The aircraft will be a glider with a 15 meter wing span. The basic data is:

Wing	
Span	15 m
Area	15 m^2
Aspect ratio	15
Chord, root	1.4 m
Chord, tip	0.6 m
Airfoil, root	NACA 4415
Airfoil, tip	NACA $2R_1$12,
Angle of incidence	
Root	0°
Tip	–3°
Tail	
Horizontal area	2.1 m^2
Vertical area	0.9 m^2
Airfoil	NACA M3
Fuselage	
Max cross-section	0.48 m^2
Total weight	250 kg.
Wing loading	16.7 kg/m^2

The architecture is for a glider with high wing with trapezoidal shape, and a monocoque fuselage with plywood skin. The cockpit is closed, well-streamlined and faired to the fuselage. The glider has a ski and a wheel that is partially protruding.

Aerodynamic Characteristic of the Wing. Let us start our calculation with the most important component both aerodynamically and by construction, the wing. From the data we see that the airfoil is the NACA 4415 at the wing root and NACA $2R_1$12 at the tip with a 3° twist. The wing has, in other words, a negative twist of 3°. The airfoil variation from the fuselage to the tips is linear. From the airfoil tables, we get the values of the aerodynamic characteristics C_L, C_d, C_m for an aspect ratio of 5.

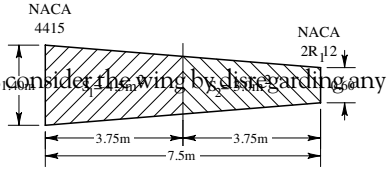


Figure 6-5

Let's consider the wing by disregarding any tip radiuses. Let's obtain the reduced coefficients for the two airfoils. The partial areas *S1'* and *S2'* are:

The wing area is:

Therefore the reduced coefficients are, for NACA 4415:

and for NACA $2R_1$*12*

For clarity, let's make a table with the values of C_L and C_d for an aspect ratio of 5 for the two airfoils and include the new calculated values with reduced coefficients.

α°	C_L	C_d	.6 C_L	.6 C_d
–3.	05	5.0033		
0.	13	7.0082		
3.	24	5.0147		
6.	35	9.0215		
9.	46	5.0279		
12.	57	2.0343		
15.	65	8.0395		
18.	74	0.0445		
20.	78	5.1096		

NACA 4415

α°	C_L	C_d	.4 C_L	.4 C_d
–6–		.15		.06
–3–		.06		.024
0.		040		.016
3.		118		.047
6.		275		.110
9.		380		.152
12.		485		.194
15.		591		.236
18.		685		.274

NACA $2R_1$12

We now know the reduced coefficients C_L and C_d. To obtain the coefficient for the complete wing, all we have to do is add these together taking into account that the airfoil at the tip, NACA $2R_1$ 12 is twisted at -3° in relation to the airfoil at the wing root, NACA 4415. For example, at 0° we have

The values obtained and the one for efficiency $E = C_L/C_d$ are shown in the following table:

α°	C_L	C_d	E
–3–		.025	.0067—
0.	058	.0063	9.2
3.	163	.0095	17.2
6.	262	.0156	16.8
9.	389	.0254	15.3
12.	495	.0395	12.5
15.	589	.0535	11.0
18.	681	.0727	9.3
21.	746	.0947	7.9

In these calculations, great precision is not important. Calculating to the third or fourth decimal place is useless if you think of the number of unknowns caused by the interference of various elements, all of which would be impossible to take into account. For example, establishing that the plane's minimun sink rate is of 0.6784 m/s or of 0.68 m/s is exactly the same thing. Therefore has you have probably already noticed, the values are rounded off.

We have calculated the values for C_L, C_d and *E* for an aspect ratio of 5.

We must now calculate the change in these values for the aspect ratio of our example.

We'll disregard the variation relative to C_L, because it's too small be be of consequence. But let's calculate the change in the drag

where AR_1 and AR_2 are the values of the aspect ratio between which the variation exists. In our case, AR_1 = 5 and AR_2 = 15, we have

at each value of a, thus for C_L, we have the value of correction for drag.

For example at $\alpha = 0$, $C_L = .058$ so we have:

and the value for C_d' for AR = 15 is:

All the ΔC_d are therefore calculated for all the values of C_L.

In the following table we see the coefficients C_d for $AR = 5$, the change ΔC_d, and the resultant values C_d'.

α°	C_d	ΔC_d	C_d'
	AR = 5	AR = 15	
–3	.006	7.000	1.0066
0	.006	3.000	3.0060
3	.009	5.002	2.0073
6	.015	6.005	8.0098
9	.025	4.011	8.0136
12	.039	5.020	8.0187
15	.053	5.029	5.0240
18	.072	7.039	5.0332
21	.094	7.047	2.0475

As a result we may now have the characteristics C_L, C_d, and E for the complete wing for an aspect ratio of 15.

α°	C_L	C_d	E
–3	–.02	5.0066	—
0	.05	8.0060	9.7
3	.16	3.0073	22.3
6	.26	2.0098	26.7
9	.38	9.0136	28.6
12	.49	5.0187	26.5
15	.58	9.0240	24.5
18	.68	1.0332	20.5
21	.74	6.0475	15.7

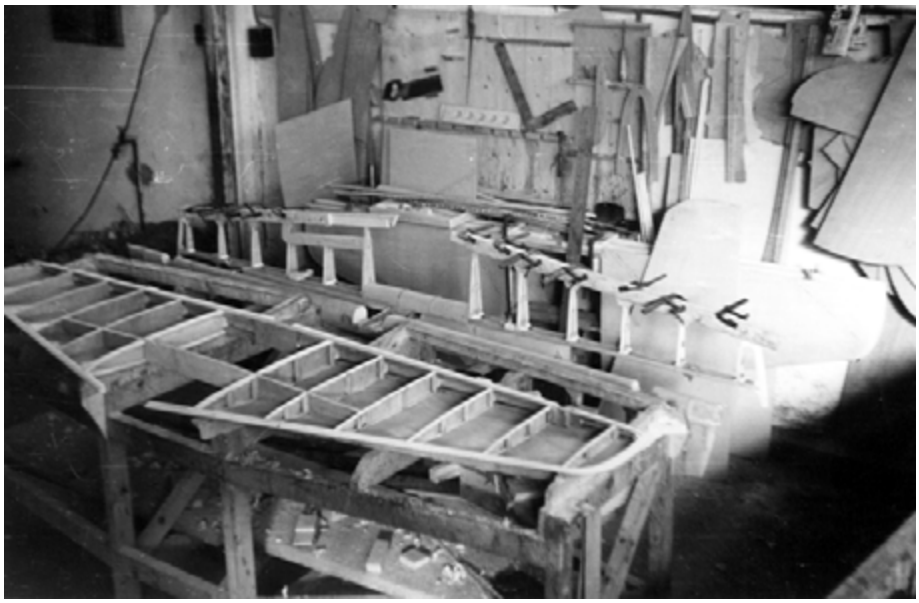
Characteristics of the Complete Glider. To obtain the aerodynamic characteristics of the complete aircraft, you must add to the wing's lift and drag values those of the various other elements that make up the glider, such as the fuselage, empennage, landing gear, bracing struts, etc. In our example, we will ignore the lift components of these elements.

Additional Coefficients. To determine the additional coefficients of drag, let the fuselage with skid be $C_d = 0.05$ and since the fuselage cross-section s is 0.48m², its coefficient to be added will be

where the wing area $S = 15m^2$.

The minimum drag coefficient of the empennage airfoil NACA. M.3 is $C_d = 0.004$ and since the empennage surface S_i is 2.10 + 0.9 = 3m², the additional C_{dt} will be

And for the wheel, let its dimension be 300 x 100 and the drag coefficient = 0.15. Since its calculated cross-sectional area is 0.03m², the additional C_{dlg} is



that we will use in its entirety even through the wheel is only protruding half way. This is to take into consideration the interference drag with the fuselage.

The additional total coefficient C_{dT} will then be $C_{df} + C_{dt} + C_{dlg}$

that we will slightly increase to allow for interferences and set it at

By adding this constant value to the value of C_d of the wing in the various configurations we are left with the coefficient of drag for the total aircraft.

As we have previously mentioned this procedure is not exact, since it does not take into account for the additional changes in drag caused by interference. These changes, while almost neglible at small angles of incidence, will increase at higher angles of incidence and may even double at angles of incidence over 15°. Since you cannot obtain exact data on fuselages, it is simpler to proceed in this manner, even if it is not precise and add a constant value for additional drag. The characteristics of the complete aircraft are thus

α°	C_L	C_d	E
–3	–.02	5.0096	—
0	.05	8.0090	6.4
3	.16	0.0103	15.8
6	.26	2.0128	20.5
9	.38	9.0166	23.6
12	.48	5.0217	22.8
15	.58	9.0270	21.9
18	.68	1.0362	18.8
21	.74	6.0505	14.8

We can observe how the value 23.6 for maximum efficiency E is similar to the total efficiency of other gliders of this category, which average around the 24 mark.

Goings On at Sequoia Aircraft

We're in a re-order cycle here with lots of parts. One of these is the main landing gear shock absorber struts. As most of you know, we have had a considerable amount of trouble with the ones that were part of the first batch of parts. The struts have had a pattern of leaking which has driven many of you to the limits of your tempers and patience.

We've never made any secret of the problems or of the reasons for the leaks, but we've simply had to live with a certain amount of problems until we were ready to order new parts. Many of the struts have worked fine and have given us no problem at all.

But you learn from your mistakes, and so when it came time to make the new struts, you can bet that we took steps to insure that we won't have such problems again.

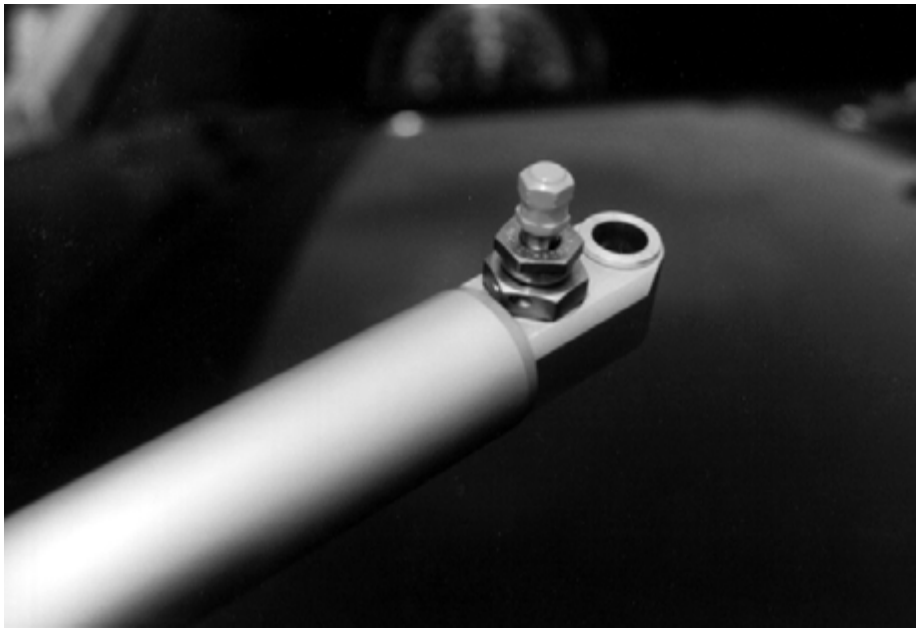
Some of the problems came from the surface finish of the piston under the Shrader valve. On the first batch, we simply did not realize the critical importance of producing a smooth surface in this area. It's an easy thing to achieve, and the new struts have smooth surfaces in this area.

Other problems have come from porosity in the welds at the top of the piston. As originally made, the upper fitting was a shrink-fit in the cylinder, TIG welded and then ground smooth. The problem was that we were never able to get rid of all of the porosity, and this was by far the biggest source of our problems.

On our latest batch, we assembled the parts with a process variously called silver brazing or nickle brazing under vacuum. The parts are coated with a paste that is about 75% metal, put in a furnace under vacuum, and the temperature is brought up to the melting point of the brazing material. With the surface area involved, this is a far stronger part than you would get with welding and there is simply no possibility of there ever being a leak.

And finally you come to the plating process. In the past we used a standard chrome plating process and then we would grind the plating afterward to insure the OD was within tolerance. We have had a few problems with the chrome plating, with surface smoothness and some flaking of the plating.

In the new struts, we have used a process known as Armoloy 'thin dense chrome' plating. It is a proprietary process that is used in many applications, and it produces a very high quality surface finish. In conventional plating, the process causes thicker deposits of chromium on edges and high points on the metal, and thinner deposits in 'valleys' next to a high point. With this process, the chromium is deposited in a highly uniform coating regardless of the shape of the part being plated. Unlike conventional chrome plating which produces a highly reflective smooth surface, the process produces a dull satin finish. (You should not attempt to polish the surface.) In every way, the thin dense chrome process is a superior one, and I'm confident we've seen the last of the leaking problems with the shock absorber struts.

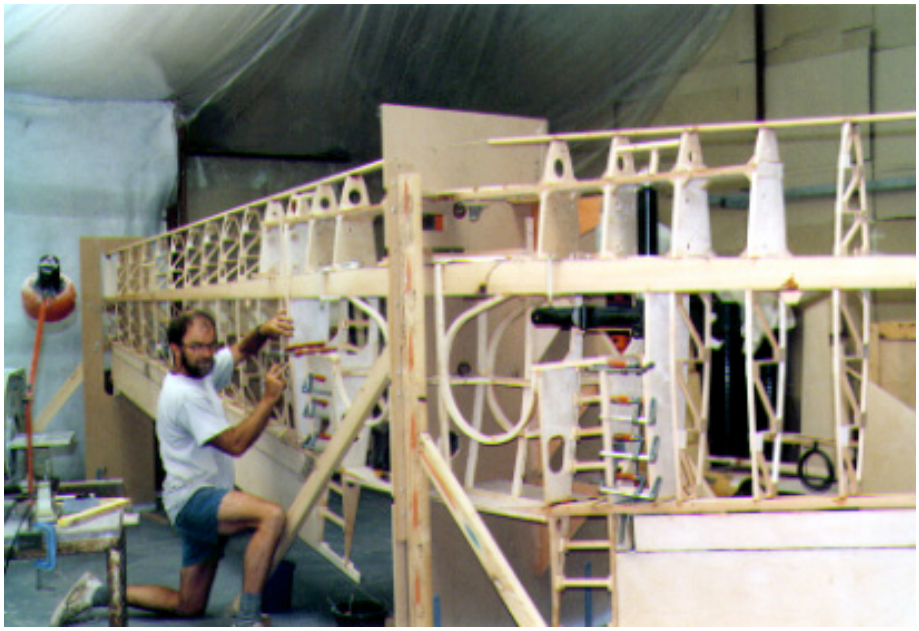


Top: The thin dense chrome finish of the shock struts. Above: Drew Done's Falco.

All of you have spent many hours poring over the Falco drawings, often marveling at the detail and quality of the drawings. Over the years, I've probably spent at least 10,000 hours bending over the drawing board while producing these things. It's painstaking, slow work, and it's often physically painful as well because of eyestrain and back-aches.

Throughout this process, we have always had some sort of electronic devices around the office. First there were simply electronic, programmable Hewlett-Packard calculators. Then we bought an IBM System 6 word processor, a $20,000 machine the size of a desk with an integral daisy-wheel printer and a tiny six-inch screen on which you could see three lines at a time, and it also had a simple database capability for storing names and addresses.

To use it, you had to be trained by IBM, and I was never able to do the database



Drew Done is building his Falco at Merimbula, NSW, Australia.

stuff. On occasion, if I wanted to copy and paste a large section of text, I would get Jean Bowen to do it for me, and while the process was going on, I would retreat to my office in fear and hope the whole document would be preserved. I kept hoping that we could somehow use the machine for our drawings, but it was never to be.

We subsequently bought some Apple Macintosh computers and put them to work for word processing and the mailing lists. It was an easy-to-use machine with superior graphics, and I kept hoping that I would be able to do drawings on the computer and somehow use them with our construction manual. That was always the promise of the machine, but whenever I tried any of the programs, I was struck with the feeling of being defrauded—even when the programs were free, beta-test copies. While you could draw some things, there were always so many 'parts of the puzzle' that were missing.

Over the years, I bought, tested and looked at every CAD or illustration program I could find. In every case, they were always long on promise and short on delivery. You were always led to believe that somehow *this* program was the *best*, and that you could 'do it all' with the program. Yet when you actually tried to use it, you were left with a feeling of wanting to line every person at the software company against a wall and mow them down with a machine gun—so intense were your feelings at the distance between the promise, the possibilities and the actual thing that resided on your machine.

Frank Christensen, of Christen Eagle fame, was similarly interested in the subject of drawing on a computer. He bought an IBM FastDraft system and used it for some of the Eagle drawings and all of the Christen Husky drawings. When he moved to a Macintosh, he looked at all of the various CAD and illustration programs, and he settled on a program called PowerDraw—now known as PowerCADD—that was produced by a small family business in North Carolina. I became a beta tester for the software, later wrote some macros, and when they developed the ability to write your own external tools, I was the only one outside the company involved in the process.

We would make suggestions for improvements in the software, and I would write tools which would solve various problems, but in time it became evident that the little software company had neither the interest nor intention of refining the software to the point that it would become a really useful thing to have. Yet it contained an element of genius in the way the basic program worked, and it was clear that they were doing a lot of things very well.

To put it mildly, I finally threw up my hands and gave up on the idea of suggesting, cajoling or screaming at software companies. I did something which, in retrospect, was an act of madness and passion. I wrote my own.

Not the whole program, mind you, but I used PowerCADD as the base and wrote a complete set of drawing tools called WildTools which adds to the base program. I began by duplicating all of the basic drawing tools that come with the program, adding a minor improvement here, and another there. Over time, it became obvious to the coterie of CAD fanatics who hovered about the program that I was adding features at a faster rate than the software company, and people began making suggestions to me.

I would incorporate the suggestions and over a period of time, WildTools grew to an enormous stack of paper—now over 2500 pages of programming and larger than the base program. While many people were involved, Frank Christensen and I were the two principal co-conspirators, and in the process of working on this, I became aware of the enormous benefits of opening yourself up completely to criticism and seeing it as a friend of the product. Often wars would break out, and I would get screaming e-mail insults from people who felt strongly about something that I didn't yet grasp.

In programming, I found it easy to see the product that was something completely re-

moved from myself, and I came to see the rain of insults and flame mail as a virtue. Whenever I'm on the receiving end of it, I always remind myself that criticism is a form of showing interest in a subject and that you can learn a lot more from your critics than you can from your good buddies.

WildTools began as a process of eliminating frustrations. When I began, I wanted to put my fist through the computer screen every ten minutes or so. But when we came out with the first version of WildTools a couple of years ago, the business of drawing on a computer was dramatically easier and all of the basic frustrations were gone. You could draw pretty much anything.

Then over the next year, I continued to add to the tools and somewhere in the process something magical happened. Everyone involved in the process describes it in essentially the same terms—that somewhere in the course of that year the business of drawing on a computer crossed a threshold. Drawing on a computer started to be simply *wonderful*. It became fun. People routinely report productivity gains of 25, 50 and 100% over the course of a day. Falco pilots and WildTools fanatics have in common the same sense of enthusiasm and haughty arrogance that no one else has what I have.

Then in February, I was working on an isometric drawing for the Falco brake system using WildTools, which has some specialized tools for isometric drawing. In some ways the process was easy and in other ways it was difficult, and I began to analyze why and how these things might be made easier. In this process, something 'snapped' in my brain, and I suddenly realized how to 'do 3D in a 2D program', and over the next three weeks I created the basics of WildTools 3D, a set of over 60 tools which makes child's play of drawing isometric and axonometric drawings.

But programming is an obsessive activity, and it involves long periods of intense mental activity. The ability is both a strength and a curse, and you spend entirely too much time living in your own head. As you get better at it, the more intolerant of error you become, and as you push yourself you become more difficult for others to deal with. In time, I was aware that I was becoming increasingly difficult, irritable and dismissive of other people. I would have flashes of anger, and it became difficult to sleep. At times I would wake up at 4:30 in the morning, tormented by some programming problem that was eating at my brain, and I would be at the office by 5:30 banging away on the solution—sometimes on Sunday morning.

Parke Smith, who introduced many of you to the Falco at Oshkosh years ago, gets his first ride in a kitbuilt Falco with Steve Wilkinson.

During much of last year, I was aware that I was developing a low-grade depression problem, but I would bounce back by exercising and slowing down on the work. Then in early December, I found myself in deep trouble. I knew I was really burned out, and I felt completely aimless and hopeless. Nothing really interested me, and I began to drink more than I should.

I began to read articles about depression, and I started asking friends who had been through it about what they did, and what worked. Some were quite open about it, and others would talk about it only with their office door closed. I finally realized I was in a hole that I couldn't get out of on my own.

In some ways, men are their own worst enemies. It's difficult to admit weakness, and men routinely drown without calling for help. We're supposed to be 'John Wayne', and tough enough to take care of ourselves. If we have a problem with our hand, we'll readily go to a hand doctor and say "fix it". No problem with stomach, foot, lungs or liver. But our brain is the most important organ in our body, yet it's difficult for a man to walk into a psychiatrist's office and ask for help.

But that's what I did, and it's been a life-changing experience. There's something wonderfully empowering about admitting that you can't do it all yourself—you start picking the people who will help you.

At the outset, I knew little about depression, but it's a very common malady. At some

Steve Wilkinson's and Trip Jones's Falcos at Rosegill Farm airstrip.

point in their lives, depression hits one out of every four women, and one out of every eight men. It can occur for any number of understandable reasons such as a death in the family. The chief causes in women are hormonal (typically after childbirth) or low self-esteem that rises out of a lack of appreciation of the enormous burdens of child-rearing. In men, the typical cause is from excessive work, which was the case for me.

But whatever the cause, the effect is that there is an organic, chemical change in the brain. Often mental illnesses are a mental manifestation of a chemical problem. That's the case with manic-depression, and every mother knows what will happen to her children if she lets them have too much sugar. There's a chemical in the brain called serotonin, and depression is when you don't have enough of it. You become irritable, ornery, exasperated with other people, listless and sink into dispair. Brainwashing is nothing more than stress-induced depression, and then they have putty to work with. If it goes too far, you have a 'nervous breakdown' in which your nervous system shuts down completely.

And what's ironic is that it's one of the most treatable maladies around, 65% of cases are cured by medication alone, and it rises to 85% when the treatment includes some counseling—simply talking about how this happened to you and how you can avoid it in the future. There are a wide range of medications, Zoloft, Prozac, Luvox, etc., and they all work to increase the levels of serotonin. My doctor put me on Luvox and that night I slept like a baby and when I woke up I hadn't felt better in 20 years.

I've been on the stuff for about 6 months now, and I will *not* work nights and weekends anymore. I sleep like a baby, have much less interest in alcohol, don't have flashes of anger, and generally feel like a real human being again. The sun is shining, even on rainy days.

You begin to see your former self in a different light, and it's not always a pretty picture. I now realize this is a problem that's been 20 years in the making, and I had the problem for much longer than the past year. In some ways, it's like waking up from a 20-year drunk, and you look back at some of the things you've done with a sense of wonder, and others with a sense of shame.

Some people can hardly bring themselves to talk about this sort of thing, but I don't care who knows. I suspect there are many of you who are reading this who have been through the same thing, or are going through it now, and I hope reading this will help you deal with the problem.

It's easy to spot the symptoms of a glassy redness in the eye and a tendency to snap at your spouse. What made it easy for me was the realization that this is a problem of chemical balance, like getting the pH of your pool right, and when you get your head clear, you can get a *lot* more work done in the course of a day, and you have a much better relationship with everyone around you.

What the heck, all of you have known I had a crazy streak all along—if not, you wouldn't all be building a Falco! But I thought you might be interested in hearing a bit of how the Falco plans have led to this other activity. With this newsletter, we're enclosing some literature on WildTools and PowerCADD, and if you want to do some drawing on a computer, I can assure you that you need to look no further.

While I'll continue to work on WildTools from time to time, I will be spending more of my time putting these tools to work on updating the Falco drawings. I've already begun this process. At this time, I don't have a specific plan on when the drawings will be distributed, but we'll keep you posted on our progress.

During the Oshkosh convention, Meredith and I will be at Chautauqua, in upstate New York, and since our Falco builder dinners only seem to draw a crowd if I'm there—heaven knows why!—it doesn't make sense to schedule one for this year. Let's all plan on Oshkosh 2000 for the 45th birthday party of the Falco.

—*Alfred Scott*

Construction Notes

Stephen Friend faxes, "It might seem a little late to be asking this question but is the wiring diagram for the marker high/off/low switch and resistor value correct? I have an RST marker and appear to be getting power only in the 'high' position."

As far as we know, the drawings are all correct. The intent of the resistor is simply to dim the lights at night. Nothing more. The dimmed lights are something you cannot easily see in daylight at all, so you'll need to test this in darkness.

David Sheidler notes that the elevator and rudder trailing edge ribs supplied in our kits are solid spruce as compared to the built-up spruce-and-plywood ribs shown in the drawings. Correct, we made this change some years ago because they're easier to manufacture and are just as strong. We have not made any changes to the drawings yet, but we'll get to that in time.

Bill Roerig asks, "I'm wondering what the specifications are for the main gear wheel alignment. There is very little that can be done about it anyway, but I'm curious as to 'toe in/out'. Camber? I've got 1mm toe-in at 14" diameter."

The Falco main gear wheels are supposed to be directly in line with the centerline of the airplane, and there's never been any specification on the limits for toe-in or toe-out. There's also precious little you can do about it, and I doubt there's much to worry about here in any event since airplanes are rarely built perfectly to the plans and the worst that would likely happen would be a little tire wear.

Bill also asks about the design of the screwjacks for the main gear. He says, "I take it from the drawings that P/N 603 screwjack end will be compressed into P/N 512 screwjack to give a positive lock on the side load struts. But, why then the springs arrangement?"

The Falco's landing gear is a mechanical screwjack design, with the desired intent that the three screwjacks will all arrive at the gear-down position at the same time. However, real life is seldom so perfect, so the design has springs to allow for imperfections in construction and for expansion and contraction of the airframe and components over time. The intention of the design is that the side load struts and the nose gear drag struts will go down and go 'over center' thus providing a mechanical lock. The screwjacks have springs in them to provide about 40 lbs of pressure on the struts to hold them in this over-center, locked position.

Top: John Devoe. Above: Bob Bready and Tony Petrulio

And from deep in Australia, Ian Ferguson faxes, "When rigging the undercarriage doors, I have found it difficult to satisfy all three parameters, i.e. doors closed, both gear up and down and also main gear doors missing the wheels. In the inverted position, the screwjack springs compress under gravity. If they are kept from compressing, then the doors easily miss the wheels giving more latitude for other adjustments. While one is not likely to be retracting the wheels in the inverted attitude, one feels that positive separation would be desirable in view of the chance that aerodynamic effects might compress the springs in some circumstances. One could add a little skid to the edge of the doors to take care of momentary contacts. What is the accepted solution to this problem? I understand it is not unique."

First, it is an act of insanity to try to rig the doors with the plane inverted. You really should do this in the upright position only.

Second, I wouldn't give a moment's thought to the problem of what might happen during the retraction cycle if the plane were suddenly to go inverted and the springs were to compress. It makes more sense to worry about being struck by lightning.

And on the rigging, almost everyone ends up with a gear linkage setting that causes the doors to be tight shut with the gear up and with a less-than-desirable situation with the gear down.—*Alfred Scott*

Accident Report: G-OCDS

This report is for a 1958 Aviamilano Series 2 Falco. The location of the accident was the Fairoaks Airport, Surrey, England. The airplane sustained damage to the nose gear, cowling and propeller. There were no injuries.

I prepared the aircraft for general flying by filling the main fuel tank with 12.5 gallons and left the wing tanks empty. During the warm-up checks, I noticed that the gear-up red light was not functioning, but the gear-down green indicator was fully serviceable. Given that the Falco has visual, mechanically operated indicators on which I mostly rely, I decided that this did not represent a reason to snag and ground the aircraft.

I carried one passenger.

I took off on Runway 06 at Fairoaks with 8 octas cloud at 1500 ft and visibility around 5 to 8 miles. After takeoff the gear cycled up successfully, and all indications were within limits. Due to visibility below VFR minima, I decided to return to the airfield when I reached Guildford and conduct circuits and landings instead. I joined normally for runway 06 and requested a touch-and-go which was approved. On downwind, I selected gear down at 110 kts. The gear did not cycle down. I checked all levers and circuit breakers and found that the landing gear circuit breaker had tripped. I moved the gear lever to the full up position. I pressed in the circuit breaker and selected gear down.

The aircraft yawed strongly to the right, but the gear cycled down successfully. My initial reaction was that the wheels had lowered asymmetrically. Upon consideration (after landing), I realized that this was impossible and wondered whether my passenger had inadvertently put weight on the rudder pedals, given that he had earlier fouled the control column with his knees.

I canceled the touch-and-go, requested a successfully. I then taxied back to the apron and informed the tower that I would be going out again, pending a visual gear inspection. I conducted a thorough visual inspection of the gear, the main gear and the nose gear. I could see no indications that there was any failure, no oil leaks, all connections were sound and bolts and locknut were in order.

I decided that I would report the incident and seek advice from the aircraft maintainer later, but as I believed that the aircraft was in a serviceable, flyable condition, I decided to continue the circuit and landing exercise solo.

I requested taxi and was instructed to proceed to 06. I completed all power and pre-flight checks and when ready to depart was advised of a runway change and therefore backtracked down 06 and took off on 24, requesting 2 circuits and landings.

After takeoff, at 100 ft, I selected gear-up. I did not expect to see a red gear-up light as it was unserviceable, but I watched the mechanical indicators carefully and front and left indicators cycled normally. However, just before the cycle was complete there was a slight bump/bang from the area of the nosewheel. However, the indication showed the gear up.

I proceeded to downwind and dropped the speed to 85 kt before selecting gear-down. The gear appeared to cycle normally whilst I maintained a wary watch on the main gear indicators. The wing indicators on the left showed the gear down, the aircraft was well balanced and I concluded that the right wheel was also down, and I awaited the green gear-down light as it is triggered by the nosewheel completing its cycle.

No green light showed, and I noticed that the nosewheel mechanical indicator showed the nosewheel had not cycled at all. I then noticed that the gear circuit breaker had popped out again. I realized that whilst I had main gear down, I could not confirm that it was locked down, and I knew that the nosewheel was not down.

I informed the tower that I could not confirm the status of the gear and requested a low-level flight past the tower to confirm the status. I flew past at 200 ft, and waggled the wings. The tower informed me that the main wheels appeared down and locked but that the nosewheel was only partly extended.

I then requested to leave the circuit before declaring an emergency. I intended to attempt to either recycle the gear or crank it down. I flew to an open area, south of Woking, changed to Farnborough radar for radar information at the suggestion of the tower and then orbited whilst I worked out a strategy for checking the wheels. I firstly opened the manual crank and attempted to crank the wheels further.

It was not possible to crank any further. I selected the circuit breaker to close and selected gear-up. The main gear cycled up successfully. I selected gear-down and watched the circuit breaker. The main wheels cycled down successfully, and the circuit breaker popped only after the main wheels were down. I concluded therefore that there must be a mechanical failure on the nosewheel or some kind of electrical fault which trips the electric motor when the nosewheel begins to cycle.

I flew around for a further 5 minutes, considering what I needed to do in order to land safely. I advised Farnborough that I wished to change to Fairoaks and had failed to secure the landing gear. I requested a second flight past the tower to confirm that following the successful rotation of the gear, that the nosewheel position had not changed. The tower confirmed that the nosewheel was still partly down. I requested confirmation of the precise position and was informed that it was about one-third down. I then requested permission to land.

The tower asked where I wished to land. I confirmed that I wished to land on the tarmac. The tower advised me that the airport manager requested that I land to the north of center line and steer the aircraft onto the grass after landing. I acknowledged the request. On downwind, I was asked to orbit to the south of the airfield whilst the emergency services arrived. The tower again asked if I preferred to land on the grass or the tarmac.

I felt that the airport preferred me to consider grass, and I therefore requested the tower to inform me of the condition of the grass. The tower clearly stated that the grass was mostly waterlogged and relayed the airport manager's confirmation that the choice was entirely mine. I again chose to land on tarmac because I feared the consequences of the propeller digging into mud. I continued to orbit and then requested the tower to confirm how long it would be before I could land as I was concerned about my fuel status. I was granted permission to land immediately and proceeded to final.

I chose to fly a flat approach at 80 kt selecting full flap at 400 ft. At 50 ft, I closed the throttle, closed the mixture, switched off the fuel pump and battery master but did not have time to switch off the magnetos. I touched down lightly on the main wheels remaining to the north of centerline and held the nose up until the elevators were against the stops. The nose fell down and the propeller struck the ground.

I did not notice the RPM at the time, and the aircraft tilted onto the ground and once the cowling struck the ground I felt

the aircraft braking very quickly under the friction. I felt I was doing little harm to the runway surface and therefore maintained direction on the tarmac until the aircraft came to a rest. I then plucked out the ignition keys, opened the canopy and ran away from the aircraft.

The emergency services were absolutely professional in every respect, preventing a fire but careful not the damage the aircraft further in the process.

I wish to commend Fairoaks Information, Farnborough Radar, the emergency services and Fairoaks flight center for the absolutely professional manner in which they conducted this emergency and helped me to escape unhurt and minimize the damage to my aircraft.

Upon examination, it was found that the nosewheel had turned through almost 90° and has been jamming against the side of the bay into which it retracts. On the Falco, the nosewheel bay is very narrow and contains a guide which centers the nosewheel steering as the leg retracts, assuming it is within the normal steering range. If this does not happen, then the wheel can foul the side of the bay or the rudder controls as it appears had occurred.

The oleo leg cylinder forging itself has an integral lug which operates within the torque link attachment brackets to limit nosewheel steering authority. The lug had been broken off by an overload failure but this is not immediately obvious unless one is looking specifically in that area. With the nosewheel now free to castor without restriction, the centering guide had missed its location and failed to center the steering.

All three landing gears are powered by a single electric motor which drives screwjacks to raise and lower the legs. Each retraction cycle is concluded by a microswitch on the nose gear which simultaneously cuts power to the motor and illuminated the 'gear up' red light as it reaches the fully retracted position. Clearly, the nosegear was fouling structure as it was retracted but the motor continued to run and resulted in tripping the circuit breaker. Eventually the screwjack drive shaft failed and, with the shaft broken, it was not possible to hand-crank the landing gear down.

The maintainer states that he has seen similar failures in the steering stop lug when aircraft had been maneuvered on the ground using mechanical tubs, as opposed to manhandling.

Susan's Corner

It's been hotter than the hinges of hell here in Richmond, and I think my brain has gone into melt-down. I've been ordering new parts hand over fist, making even more improvements out in the warehouse and bugging Alfred for more new drawings for all the parts I need to order. Since he's written his WildTools thing on the computer, he's been cranking out new drawings for me *almost* as fast as I need them.

Since I've been here at Sequoia, we've had very few problems with the shipments I've made. I use UPS whenever possible, and they're quite dependable—although they do yell at me when I forget some of the paperwork on the overseas shipments. When I have really large stuff, crates and such, going overseas, I generally use Unistar, but I never know who the actual carrier will be until they make all the arrangements.

A couple of months ago I had 2 crates going to Neil Aitkenhead in Brisbane, and Unistar had set up the arrangements through British Airways. Well, this one reeeeeeally ran amok. One crate arrived okay, but the other one went to London, then to Hong Kong, to Sydney, back to London and finally found its way to Brisbane about a month after the scheduled arrival date. So far, all I've seen from British Airways has been free air freight, but I think they can do a little better than that, considering the crate was battered, busted and broken when it finally arrived in Brisbane, and with about $700 worth of parts missing. Come on folks—write your congressmen, get us some help here!

Oshkosh is looming ahead, but neither Alfred or I will be there. He'll be in upstate New York, and I'll be in Maine. (Yippee!) A much needed vacation for both of us, I can assure you. I'm really psyched about my vacation—I haven't been back to Maine in 8 years or so, and we're having somewhat of a family reunion up there, so I'm looking forward to a really fun time.

And on another personal note—I have a new grandson—Alex Michael Howerton, and I must admit, he's the cutest and smartest baby ever. Of course, that's just my opinion, I could be biased.

That's all for now. See you in September.

—*Susan Stinnett*

Bill Motley and Susan Stinnett.

Sawdust

• There's nothing like a typo in an advertisement to blow your image. Take a look at the ad in the inside rear cover of the July *Flying* for a full page ad on the Jetcruzer 500, wherein *ultimate* is spelled "ultilmate", *fuselage* is spelled "fusealage" and *pavilion* is spelled "pavillion". Oh well, it was *Ms.* magazine last summer that spelled *feminism* incorrectly on the cover.

• Sheesh. Remember little Jessica Dubroff, the seven-year-old who was attempting to set a record as the youngest person to fly across the country? She was killed with her father and flight instructor shortly after departure from Cheyenne, Wyoming, during stormy weather. Now there's a foundation established in the name of Jessica which has sued Cessna and Lycoming for negligence in the design of the 1975 Cessna Cardinal. However, the plane was delivered 22 years ago and the recently enacted statute of repose clause of the General Aviation Revitalization Act limits manufacturers' liability to 18 years, so it's likely this lawsuit will go nowhere.

• Leper Colony. One of the realities of the aircraft business for the last 10 years has been that suppliers treat you like a leper when they hear the word 'aircraft'. Indeed, many companies simply will not sell parts to anyone in the aircraft business, but within the aircraft business and for aircraft parts, that's never been a problem. However, the other day we placed an order for some Fafnir bearings. The bearings are for aircraft, indeed on the package it clearly says "AIRCRAFT BEARINGS" in large, bold type. However, before we could buy them, we had to assure our local bearing supplier that the parts were not going into an aircraft before they would sell them to us. What other use Sequoia Aircraft would have for 50 aircraft bearings is beyond us, but that's the way the world turns these days.

Grand Unchampion. This is "The New Delhi Spirit of the Great Unwashed Compaso d'Oro" awarded to The Corporate Disgrace years ago by Dave Aronson. It features perhaps the nastiest-looking bird you ever saw, a recycled hat ornament, if you can imagine such a hat.

• Udderly ridiculous tale. Nobody believed the crew of the Japanese trawler which sank in the Sea of Japan. Their story seemed utterly preposterous—that a cow had fallen on the ship out of the clear blue sky, punched a hole in the hull of the ship, and *that's* what caused the ship to sink. Yeah, right, and what had you been drinking at the time? However, a couple of weeks later, confirmation came out of Russia that the crew of a military cargo jet had stolen a cow they found on a Siberian airfield and loaded it on for the flight home. While cruising at 30,000 feet, the cow became terrified and ran amok, so the crew lowered the cargo ramp, and it jumped out.

• Falco for sale. Ray Purkiser's widow is now selling their plans-built plane completed in 1988. The Falco has a 160 hp IO-320 engine and has 600 hours total time. Beautifully handcrafted. $69,500 or best offer. Contact Clif Purkiser, Santa Clara, CA, day: (408) 765-4468, evening: (408) 247-0769, or Sherry Purkiser, Rogue River, OR (541) 582-4420.

• A Falco took the Grand Champion Award (Plans Built) once again at the Popular Flying Association Rally at Cranfield and also the *Pilot* Magazine Trophy for *Concours d'Elegance*. It was G-OCAD, built by Clive Garrard, Gordon Blunt and David Nowill from Leicestershire. Five and a half years abuilding, first flew 21 December '96. Truly faultless, perhaps even better than Stuart Gane's (which has been rebuilt and awaits its second first flight). *Pilot* wasn't in any way involved in the judging, but I was rubbernecking incognito when one of the Falco's builders caught me sighting along the wing. "You bugger! I know what you're up to. You're looking for the ribs!" he challenged. He was right, but they were only just visible if you really looked hard. The most commonly heard remark at the PFA Rally prior to judging was, "If you want to see the champion homebuilt, don't bother to look any further than that Falco." It was the talk of the show, and rightly so in my estimation, though as a Frati-freak, I'd have to admit to a certain bias.

—Mike Jerram

• Carla Bielli reports that Richard Thompson was prescient in his 'Leonardo da Frati' cartoon in *Air & Space*. In May, Stelio Frati was awarded the 1997 Leonardo da Vinci award by the Italian Association of Industrial Engineers to recognize Mr. Frati's work as an aircraft designer.

Calendar of Events

Annual Old-Timers Fly-In and International Gathering of Stelio Frati designs is on August 15-17 at Schaffen-Diest, Belgium. Contact Guy Valvekens, telephone (32) 13 311496/335581, or fax (32)13 315060.

West Coast Falco Fly-In. September 18-21 at Angwin Airport, St. Helena, California. Contact: Blake Jessen, 323 Hillview Lane, Winters, CA 95694-2315. Telephone: (916) 795-0943, fax (916) 795-0943 or Compuserve 102670,2246.

Mailbox

In reference to your comments on John Magee's *High Flight*, I am reminded of the homily circulated in graduate school when I was in attendance.

'To quote from one source is plagiarism! To quote from two is *scholarship*!'

Steven M. Buck, Ph.D.
Seal Beach, California

Up until a week ago I have been able to fit in about 15-20 hours per week on the project, but I have a more mundane diversion at the moment, that is, cabinet-making to refit our ice cream shop in the heart of Surfers Paradise on the Gold Coast. It is our off-season, of course. However, I will be back on the Falco in a couple of weeks.

As you can see, I have framed and faired up ready for skinning the elevator and stabilizer, and I am currently working on the rudder. I intend to frame up all four tail components before I start skinning as one pre-closure inspection will do for all four items. Plus, I have not got around to getting a staple gun yet. That's next on the shopping list.

I am using the West epoxy system for all gluing and varnishing, and I am very happy with it. At this stage, I see no reason why I will not continue to use it throughout.

To date I am very pleased with the detail and accuracy of the drawings and construction manual—well done!

I have included a rather sad photo that was taken last August when I went for a check flight with Guido at his base in Toowoomba.

Neil Aitkenhead
Runaway Bay
Queensland
Australia

Neil Aitkenhead takes time out from his ice cream shop in surfer's paradise at Runaway Bay, Australia, to work on his Falco.

When I received the last FBL, I had just half-completed a pair of main gear doors which gave me no satisfaction at all.

I was very interested to see the contribution by Al Dubiak. It looked good to me so I tried the method. It worked very well in all details, including the drive belt of O-ring material butt-joined with super glue—much to my surprise. I found that some contact cement on the back of the abrasive paper caused it to adhere to the double-sided sticky tape more firmly.

My rather old electric drill could not take it and blew up—a heavy duty drill is required.

I now have a respectable looking pair of main gear doors.

I congratulate Al on a brilliant piece of lateral thinking. This may become the standard method of producing main gear doors.

Ian Ferguson
Dookie, Australia

Enclosed please find my check for $400 in addition to the complete purchase application and two copies of the purchase agreement for the F.8L Falco aircraft plans.

I may be setting a dubious record of longest Falco dream that was put on hold. My eyes were first drawn to the Falco while sitting to have my wisdom tooth pulled in a Navy hospital. I was a Lieutenant then, and it was sometime between '79 and '80, I think. I quickly filled out the form and sent in my $10 to get your info kit. Since I was stationed at the time in Washington, D.C., I called you up and came down to your previous location, met you and we drove out to the airport to view the "Corporate Disgrace" which had just arrived.

I wanted to talk with a builder, and you directed me to Joel Shankle. Well, I went over to his place in Culpeper and met Joel and his wife Carolyn. Over coffee, we rolled out his plans and went to his basement to view some of the tail group, on which he had just begun construction.

Time passed and a Lieutenant's pay, limited time and space precluded taking the next

Neil Aitkenhead and Guido Zuccoli last August at Guido's base in Toowoomba.

step. Then came marriage, a career change as I left active duty, and a family. Over the years, I stayed in touch with Joel, and saw his aircraft under several stages of construction as I would travel back to the DC area on reserve duty. I even came back down and visited you once at your current facility and saw your spar machine.

About two years ago while back in DC for two weeks of duty at the Pentagon, there was a local fly-in outside the beltway. I went over to it and saw this beautiful red Falco sitting on the ramp. I couldn't believe my eyes but it was Joel and Carolyn. What a beautiful piece of work! Time didn't permit a ride at that time but the next trip out for sure. Well... the next year out Joel invited me over for a ride. Much has been written about the Falco's handling characteristics, but actually flying the aircraft is beyond belief.

Now some 16 or 17 years later my love for the aircraft remains strong. My position within the financial industry provides the necessary discretionary income to pursue my dream, my family has been situated in the new house for three years, our daughter is growing up and now as a Captain in the Navy Reserves more of my time is becoming my own as I look toward retirement from the reserves. Hopefully, the construction process won't take as long as it has taken me to get to this point.

Alfred, thank you for having the vision, drive and determination to bring the Falco to the many builders who have persevered with this fantastic project. I look forward to the journey!

Wayne Kruger
Kalamazoo,
Michigan

It's good to see we have a man of action here!—Scoti

Gordon and I took G-OCAD to a 120+ aircraft fly-in at Alderney in the Channel Isles (off the French Brittany coast) last weekend, and we won the award for the best homebuilt. PFA rally soon!

We are unclear what the correct ICAO code is for the Falco. I have a vague idea that you mentioned it fairly recently. It is F8L* with the * being the series number, i.e. F8L4, or some other final number?

Clive Garrard
Leicestershire
England

Hmm. My memory is that the FAA here decided on simply F8L as the identifier for the Falco when you are filing flight plans and the like. On the other hand, I've never known Falco builders and owners to be concerned about being correct!—Scoti

News Flash from Napa... If you are planning to attend the Falco Fly-In Napa, get your reservations in *now*. The hotels are booking up very fast. I'll be staying at the Wind Way Inn in Calistoga (800) 572-2636. To book a room tell them that you're with the Falco Fly-In. Many hotels have already completely booked up. Act fast! You can always cancel, or sell the room later.

Blake Jessen
Winters
California

In case you know of a builder who might be interested, I have the following described engine for sale. IO-320-B1A, 2093 hours since factory remanufactured. Complete logs with good maintenance history. No damage. Complete except for starter, alternator and exhaust system. Should be an excellent candidate for a field overhaul. Price $5000.00. I may be reached at (217) 224-1500 days and (217) 222-4523 evenings.

Ray Coleman
Quincy, Illinois

I just returned from transporting a friend to a Midwest Glasair Fly-In where my unfinished "Bevis and Butt-head Ugly" Falco really got the admiring looks. Several knowledgeable members there "lusted"

over the Falco and as a consequence, I gave two flights to individuals who had admired the Falco for years and couldn't thank me enough for allowing them the actual treat of flying a Falco. As one of them said, "I'm not impressed by the other plastic planes, but the Falco, that plane I am impressed with!"

Even as ugly as my Falco currently is (that epoxy micro Camouflage Desert Storm look), it gets the oo's and ah's wherever it goes. Now if I can stop flying long enough (148 hours now) to get it finished!

I spent a week with Jim Petty last month helping him do his annual. Learned a lot. Really helped when I had to go through mine this month with the AP. Jim really has a nice one, and I'd certainly be happy if mine can end up as nice as his.

Martin Pierce
Muncie
Indiana

Concerning the aileron float. Your first note to me on the subject suggested cable tension problems. I checked them long ago and found they were close but not exact. I rechecked them after your letter and found the same, 'close but not exact'. So, I made them exact. Still had some float but not as much. Sort of the same as Cecil Rives. What I am contemplating now is to adjust P/N 781 so that at static, there will be about a 1/4" down distance. The thought here is that to see if they will zero out at cruise and what if anything happens to cruise airspeed. If there is little or no change, I will revert back to zero distance at static and live with the float. At least that way the aircraft will look good on the ground to those who see those things.

I cannot find anything else wrong. What I suspect more than anything is the instability of wood. On any given day, wood will be different dimensionally than any other day. Not much, mind you, but there will be some and the greater the distance, the more recognizable it becomes. I understand that musicians who play wooden instruments sense this when on some days there instruments seemingly sound better or different than on other days. I felt it back when I was deeply involved in piano playing. And lastly, I have noticed on some days, it is possible to see the main wing spar outline just as plainly as if there was no plywood skin covering it. On other days, there is nothing. The same with the fuselage formers.

Another subject. I wanted a GPS but did not, and do not, have a bucket of money. So, I lived with a Ray Jefferson PL-99 Loran that worked sometimes here in Colorado—questionably. I waited and finally spent the grand sum of $225 at Cabellas in Wyoming for an Eagle AccuNav Sport GPS. This GPS is made by Lorance and quite frankly does everything I believe one needs for everyday VFR flying. It does not have all the tinkertoys of the expensive jobs, but I doubt one needs them for 'sport flying'. At least I do not. Now IFR is another thing, and for that I have a Collins P101 HSI. The 'warbird' people tell me it is the only one which tolerates aerobatics.

Why I mention this is at Oshkosh '96, there were several small companies selling GPS mated to laptop PC's. The end result is a WAC map in color on the PC screen with the flight course line superimposed and your position on that line. Further, all your flight data is also superimposed along the border of the screen.

This I think is the next round of electronic aviation navigation devices for general aviation (airlines already have it). It will be developed by the small companies and then overpowered by the big ones, and the buying frenzy will begin. The big money spent on GPS today will end up like Loran. So the question is whether to spend a lot on GPS today just for 'sport flying', or buy the functional machine like the Eagle AccuNav Sport and wait for the next chapter in electronic marvels? And that is not far off! Actually, it is now but it is too clumsy (PC in your lap) for a small cockpit.

At Oshkosh this year, I carried the Falco banner as others have in the past. When Catherine and I landed Tuesday afternoon, we were parked airshow front and center. I wanted to be in the classic area where we always camp as volunteers—no deal. A crowd instantly developed and remained right up to the time we departed. Paul Kwiecinski showed up two separate days for several hours and someone else was there one day for about four hours in a Falco.

So for seven days, Catherine, my son Rich, and I stood static display for 10 hours a day—what a grind. I do not know if the attraction was simply that we were the only Falco there, the yellow paint job, or the difference in my Falco or what, but the spectators were constant. Also were the judges! Even in the evening and in the rain! The questions were endless. The main comments were: Is this the only Falco? It is superb. Why do you fly from the right? Show us the hydraulic system. And where is the Falco information booth? I wonder how many folks were seduced by my Falco the way I was with Dave Aronson's back at Oshkosh '84. And do you have a finders fee for those who were?

Richard Clements
Lakewood
Colorado

I'm at a loss to understand exactly what is happening on the aileron float. I still think it should not float at all, or at least less than 1/4". On the other hand, I'm not really sure that everyone who reports 'no float' is really seeing that. Maybe we need to get some better readings from people.

On GPS, I couldn't possibly tell you what the future holds except that it's likely to be the most exciting part of aviation and avionics. That will mean more power and capability for less money. The hand-held 'VFR' units are offering truly amazing capabilities for the money, and unless you must have a system integrated into the airplane for night and IFR work, they're clearly the best choices since you'll trash today's purchase in two years and get something much better for the same or less money.

I know all about the Oshkosh crowds, and it is simultaneously fulfilling and maddening to deal with them. We did a booth for years, but it costs about $7000 to do one, and it simply does not produce the results to justify the time, energy and cost. We get much more from spending our money in magazine ads, so that's what we do. Alas, no finder's fees are in the cards, if so we'd all be broke trying to make things even for what each of us has done for another.—Alfred Scott

I've just changed jobs and moved house, but last week I moved my Falco into my garage so I can get back into it again.

I've just published a homepage on the Internet. It has several pages about my Falco so far. I've made a point that it is not endorsed or supported by Sequoia to cover you. The address is http://homepages.ihug.co.nz/~george/myFalco.htm

I would be happy to add anything you like and host your info free of charge as long as I have my homepage.

George Richards
Hamilton
New Zealand

We checked it out and it looks great, so you can keep up with George's progress. No problem on all that disclaimer stuff—everyone please feel free to put Falco stuff on the Internet. We will suggest that you put 'Falco' in your keywords so people can find you that way.

—Alfred Scott