

# Falco Builders Letter



Above: Pawel Kwiecinski and his Falco at Farmerville

## First Flight:

### Pawel Kwiecinski

Another Falco completion record has fallen. Pawel Kwiecinski's Falco flew for the first time on October 9, thus becoming the 15th Falco to fly. When Pawel began construction on September 18, 1986, his intention was to build the Falco in six months, primarily because he had to rent a shop and didn't want the rent to add up.

Pawel Kwiecinski moved to the United States from Poland about seven years ago. Pawel is a doctor and his partner's father, Adam Slodowy, was in the U.S. for about six months. Although Adam had never built an airplane before, he was a master craftsman, the author of several 'how-to' books and television personality—for 15 years Adam had a show on Polish television called "Do It Yourself." Could he build a Falco? Sure.

The race was on. Pawel rented a shop and bought some lumber, a radial arm saw and an air compressor. Adam began building tables, racks for materials,

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## Around the Falco Patch

The Falco was smooth and solid, but a quiet sense of terror swept over me as the horrible situation came to me. We were going 282 mph—42 mph over the red line—and the pilot didn't even know it.

An hour before I had arrived at the SF260 fly-in at Farmerville, Louisiana. There are nearly 40 of the big-iron Italian machines in the country now, and each year the truly insane owners descend on this northern Louisiana airport for two glorious days of pig-out on Frati airplanes.

Blame it all on Homer Woodard, the gentle, slow-talking host of the event. Homer is the chairman of the local bank,

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## Goings On at Sequoia Aircraft

I continue to work on the construction manual in fits and starts. I tend to bounce around and work on one thing for a couple of weeks and then another. Let me tell you what I have done. All of these things will be put in final form and sent to all of you, but if you need a preliminary copy, let us know.

Falco Construction Manual. Chapter 26, "Fuselage Assembly, Part 1" is a 17-page description of jiggging the fuselage, setting the fuselage frames, longerons and stringers in place. Chapter 27, "Fuselage Assembly, Part 2" is presently 23 pages and covers lots of little installation details: nose gear bay walls, installing P/N 717 nose gear screwjack support, cockpit flooring, luggage compartment, cockpit side walls, battery box installation, exhaust port framing, and nose gear screwjack support assembly. Chapter 28, "Fuselage Assembly, Part 3" is just a three page outline of the next things to do and some notes on skinning the fuselage.

The *F.8L Falco Flight Test Guide* is still in constant revision. Chapter 1 "Final Inspection" is a 20-page final inspection procedure. Chapter 2 "Flight Testing" is 16 pages on the initial flight testing. Subjects include: the test pilot, flight test philosophy, the handling characteristics of the Falco, starting the engine for the first time, special considerations for overhauled engines, initial taxi tests, brake conditioning, controls authority taxi tests, the first flight, gear retraction tests and subsequent systems checks. Chapter 3 "Advanced Flight Testing" covers aerobatic maneuvers and tests that only an experienced test pilot should attempt: flutter testing and spin testing. Please do not ask for this until you are a couple of months away from the final inspection.

The *F.8L Falco Flight Manual* is an improvement on the original flight manual but can still be improved. Needed are

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## Pawel Kwiecinki's Falco

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and a plan table. Since Adam spoke no English, Pawel sat down and translated the entire construction manual dictating to a cassette recorder. Adam found the plans easy to read since the plans conventions are the same in all countries.

Adam built the tail group in three weeks at a time when they were still setting up the shop. The ailerons and flaps took 17 days, and then Adam began on the wing. The wing was finished and the fuselage started by the beginning of February, and Adam went back to Poland.

Adam had been working on the plane 10 to 12 hours a day, and Pawel put in a couple of hours each night. A couple of weeks before Adam left, Irek Mikolajczyk (EE-rik Me-ko-LAH-chik) started working on the Falco, and he kept up Adam's full-time schedule. Irek had recently moved to the U.S., and Pawel met him shortly after his arrival.

Irek continued to work on the plane with Pawel. The canopy took two weeks, and Pawel broke out a bottle of champagne to celebrate the occasion. Pawel used the "high Nustrini" canopy, and this caused most of the problems—extending the canopy skirt and fitting the windshield. By the middle of June, the woodwork was essentially complete and the painting began.

The painting took much more time than expected, in all eight weeks from start to finish. The painter who did all the spraying worked part time since he had another job painting boats. He only worked a couple of hours each day and then on Sunday. Irek continued on his full-time schedule, sanding and working on other details. Pawel continued to work evenings. A fourth man put in about 3 hours a day sanding primer. He wanted to lose some weight and by the time the plane was painted, he had lost 25 pounds.

Throughout the construction, the emphasis was on building a beautiful Falco, not just a quick one. So even though the construction went quickly in calendar months, they spent all the time they needed to do each step right. In all, Pawel thinks they spent about



*Above: Irek Mikolajczyk taxis out at Farmerville*

500 hours sanding the paint. He was striving for as smooth a finish as possible, but he came to the conclusion that we have to accept the Falco for what it is—a wooden airplane. You will always see some flaws.

They worked overtime to fly the plane by Oshkosh, and by the time of the show, the Falco was painted in the final topcoat of Porsche red. Karl Hansen had matched the color of his son's Alfa Romeo, and Pawel wanted to match the color of his Porsche 928S. The painter was used to Allgrip, but they did not make the color. Unhappy with that answer, Pawel called up the president of the company and said he wanted some Allgrip to match his Porsche. It turned out the president had a Porsche as well and already had a private stock of the proper red paint. Pawel was in business.

With Oshkosh over, there was no self-imposed deadline, and the project began to slow down a little. Little, last-minute things began to hold up the construction. Moving the airplane to the Waukegan airport was a major event. The airport was 35 miles away, and the shop did not have a large door. Pawel had to get a contractor to knock the concrete-block wall down, put the Falco on a trailer and get it to the airport. There were many false starts. There were building permits required. Pawel had a busy schedule. They needed good weather to move the Falco, and they didn't want to tear the wall down until the plane was ready to be moved.

They were delayed at least a month on the move. Each week Pawel would call to tell me that they were going to move the Falco on Saturday, but then the weather was bad, or the contractor didn't show, or something else. At long last they got it to the airport and assembled the plane. The mechanics at the local airport hooked up the engine. Unforeseen little problems kept delaying things. Pawel would schedule the FAA inspection, then he would find that they needed a couple of hose fittings for the fuel flow transducer, so the inspection was cancelled. Next time it was the sump fitting for the inverted oil system.

Somewhere along the way, Pawel spent so much time with the Falco that he shirked his domestic responsibilities. It cost him a marriage, but not in the usual homebuilt airplane tradition of "5 years, \$20,000 and a divorce." The lady simply said, "Marry me or go live with your Falco!"

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For the past several years Pawel has owned a fixed gear Piper Dakota. He put about 200 hours a year on the plane, but he had no experience flying highly maneuverable airplanes with a control stick. Pawel was "of course" planning to do the first flight in the Falco, but after reading of our sternly worded *Flight Test Guide* he dropped the notion at once. Test flight duties were turned over to the highly qualified Irek Mikolajczyk.

Irek comes from a famous aviation family. His father was a pilot as were all of Irek's brothers. Irek's older brother has been the perennial acrobatic champion of Poland, and Irek usually came in second or third.

They followed the *Flight Test Guide* to the letter and had a very successful experience. Ground engine run, taxi tests and controllability tests were all done by the time the FAA inspector arrived. She was amazed at the workmanship, saying that she had not seen anything even close to this in her seven-year career with the FAA in Chicago. She said the finish was as good as the best glass jobs and better than any wood airplane she had seen.

Irek flew the Falco on October 9 for the first time. He found the plane very similar to the Zlins he had flown before and had no trouble with the plane at all. This is the payoff of a careful ground check—Pawel, Irek and the mechanics each took turns with our 20-page final check list.

On the first day, they flew the Falco stiff legged for 2-1/2 hours in all. Irek did stalls and slow flight, and before the day was over he took Pawel for a ride. I always write down the builder's comments after a first flight. Pawel described the plane in short sentences, "It's great! It's fantastic! It's a wonderful plane! It's a nice toy! It's a great thing!"

He also said, "I want to thank you for talking me out of doing the first flight." The Falco was not at all like his Piper Dakota. Pawel didn't remember the exact empty weight, but he recalled that it was something like 1170-1185 lbs without radios.

Irek and Pawel worked hard to fly off the required hours, and a week later they flew the Falco to the SF.260 fly-in at Farmerville. They had a single comm radio, a hand-held nav/com and a nice river to follow.

The finish on the Falco is indeed exceptional. I was very impressed with how smooth the plywood-skinned ailerons and flaps were. I had been worried that the flat areas on the top might not turn out well, but they were beautiful.

N9171Y is painted with the same scheme as Karl Hansen's, but with the darker Porsche red and with black stripes. The black stripes are very distinctive and do not blend in with the red as I had feared. The higher canopy is not particularly noticeable. No one commented on it without prompting.

The seats and side panels are covered with padded black leather. The rest is covered with black leather cemented directly to the plywood. This is a practical solution, but I noticed that there was a substantial difference in the appearance. The padded leather looked smooth and comfortable, and the rest looked hard and rough. The leather picked up imperfections in the finish, and the shiny black surface emphasized them. In retrospect, the interior would have been better if padding was used under all of the leather.

I flew in the Falco with Irek and found that there was plenty of headroom for me. I'm six two and can't ride under a standard Nustrini without bowing my head. In the air, it's the same Falco we all know, except that we timed the rate of roll at 4 seconds to the left. That's a second slower than my old Falco. The seven-second gear retraction time is a joy. That's almost three times faster than the Corporate Disgrace, which is supposed to get it up in 13 seconds but never does.

Irek put on an airshow at altitude with the Falco. He has a small problem at the top of a hammerhead, a trail of oil follows the plane down from the top. The cure for this is thought to be re-routing one of the hoses to eliminate a dip in the line and to use six quarts of oil instead of topping it off at eight.

Pawel did not keep any accurate records of the time spent to build the plane, but he talks about 4,000 hours including painting. He said the construction went smoothly but there was a definite increase in "think time" once they passed the construction manual. The canopy was the worst part, and Pawel underestimated the time for painting and last-minute things. With their experience, Irek says they could build two Falcos side-by-side in eight months without painting. Get your own painter. Pawel's painter says the Falco was his first and last airplane. He is sticking with boats.

All of the radios are installed now, and Pawel is working on gear doors and other little things. Irek now has a regular job and is giving Pawel aerobatic instruction on weekends. They plan to put the Falco into airshows, but Irek feels he needs about 5 months of practice before he does low-level airshow aerobatics.

—Alfred Scott



## Around the Falco Patch

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and while most of the oil-patch banks are struggling with bad loans Homer's isn't. Over the years, Homer has owned a variety of airplanes, but since the SF.260 came into his life, the others have either been sold or are sitting out in the weeds. The Marchetti, he once said, "is the nicest thing I ever did for myself."

Until recently Homer had two of them, one just to "fix up and sell" and to keep him flying while he put a new engine in the other. And Lordy, what an engine he stuffed in that airplane! It started out as a fuel injected 300 hp Aerostar engine, but by the time High Performance Engines had overhauled, polished, ported and balanced the engine, it put out 340 hp.

It's an awesome sight to see Homer take off in the big-engine SF.260. The acceleration is rapid, and the airplane bellows by with a loud, brassy engine note that could never be mistaken for an ordinary 260 hp engine. It's equally startling to turn and see Homer standing next to you watching the whole thing.

"How the devil did you do that, Homer?"

"No. I'm Huey." It's Homer's identical twin brother.

The sky overhead was abuzz with SF.260s, which exhibited a curious behavior. Any lone SF.260 was quickly joined by others which flew in formation—like ducks. They were all flying like that, never going anywhere in particular, but there were always others obediently flying along side. While I was watching this marsh bird behavior, a red Falco with a blaze of white down the side appeared overhead. Karl and Shirley Hansen circled and landed.

A combination of events brought three Falcos to Farmerville. A year earlier I had taken my old Messerschmitt Monsun to Fox 51 for Frank Strickler to sell, and within a month the airplane was grounded. A flying club in Germany had demonstrated once again that a metal airplane will fatigue and break from repetitive overstressing. In an act of incomparable stupidity, the FAA grounded the entire fleet and then required an exhaustive \$1,500.00 inspection in Philadelphia to check the wing spar carry-through for fatigue. To



no one's surprise, no sign of fatigue has been found, but having grounded the fleet the only way for the FAA to save face was to order the silly inspection. All this because one abused airplane broke. More Bonanzas have suffered in-flight structural failures than Messerschmitt Monsuns have been built!

The ultimate bureaucratic idiocy befell one owner who had recently suffered a fuel exhaustion accident. He had just replaced the main spar carry-through and had not even flown the airplane when the inspection order was issued. Before he can fly his plane, he must inspect the new carry-through for fatigue. He's appealing and arguing, but his reasoning stands no chance of prevailing.

So I had to get the Messerschmitt back to Frank in Texas. Karl Hansen had decided to see if Frank could get his price for his Falco, and I thought that a weekend of playing with Falcos and SF.260s might be a pleasant change. Al Aitken flew the Messerschmitt. I took the Corporate Disgrace. Karl flew in from California, and Pawel Kwiecinski said he'd come, too.

I had never flown in Karl's Falco and was anxious to try it out. Before the sun went down, we decided to take it up for a short flight. Karl put me in the left seat, and we fired it up. Karl has increased the rake of the seat for more headroom, and I found it slightly awkward. Not only do you sit at an uncomfortable angle, but the throttle and flap switch are nearly out of reach, even for a long-armed baboon like me.

My old Falco has a single heel brake and an enormous amount of slop in the ground steering. In contrast, I found the ground handling of Karl's Falco a vast

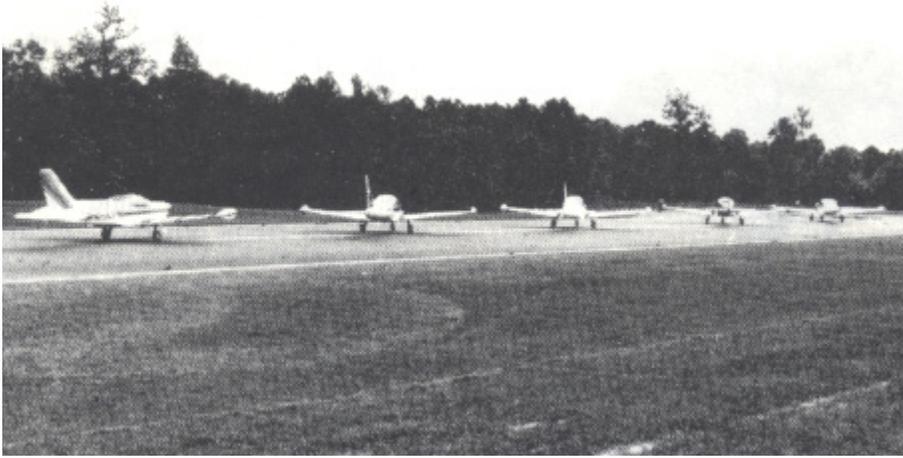
improvement. Ground handling does not get any better than this, and if you have a problem on your first time out in a Falco, it is because the airplane actually goes where you point it with no delay.

On takeoff, my Falco lumbers along for an eternity before the tired old 150 and the inefficient cruise prop finally get it up to flying speed. It's a whole new ball game with a 160 hp engine and a constant speed prop. Shove in the throttle, and you charge down the runway and lift off with such authority that it's difficult to believe that the engine and airframe are both made in America.

With the gear and flaps up, we throttled back and set up a cruise climb. I was just flying along enjoying the scenery when Karl said, "Look at the airspeed." 150 knots! The Corporate Disgrace can only reach that in a power-on dive.

As we circled for altitude, I remembered that an SF.260 was in the air. Gary Fritzler was up getting reacquainted with his airplane after a year's absence. His nose gear collapsed at Oshkosh '86, and the plane had just been repaired. With a number of speed mods, turbochargers, intercoolers and a High Performance engine, Gary's 260 is the fastest of them all, so I just had to dare him to a race.

We slowed down and circled over the lake while Gary formed up on us. He slid along our right wing, and then we poured on the coals. At the start Gary was going a little faster so he moved ahead slightly until we got up to speed. Now Gary was not interested in seeing a Falco beat him, so he did what any self-respecting pilot would do—he cheated! With his turbochargers, he had the advantage at higher altitude, so he put us into a climb and kept cranking in the boost. Before we called it off, we



had gained about 2,000 feet.

Nobody claimed victory, but it was apparent to all of us that the two airplanes were very close in performance. From what I saw, it appeared that Gary was pulling away from us a little, and Gary later said he thought the two planes would be very close in speed at lower altitudes.

Like a lonesome duck, we closed up with Gary and flew in formation. Karl Hansen, in the right seat, was flying the plane, and I was impressed with how well he flew formation. With the prop still at 2,700 rpm, the plane responded quickly to his power changes. We were in close formation, and Karl settled into the regimen of formation flying—left hand on the throttle, right hand on the stick and eyes glued on the other airplane.

It was a lovely sight. The sun had become an orange ball on the horizon, and it bathed us with a warm light. In this light, the afternoon haze became a brown murk, and the terrain below was now in shadows and difficult to see. I suggested to Gary that we do a low pass over the airfield. He lowered the nose, and we slid down toward the dark slice in the piney woods.

I glanced at the airspeed indicator. *What is this?* The needle was on the left side of the gauge, and it was moving. I saw it go by the red line, through 220 knots, and then it hit something and stopped moving. *Wait-a-minute! Karl!* I said something to Karl about being over red line, but he was so intent on flying that he only stirred and grunted like a half-asleep drunk.

You do not react as quickly as you might think to such situations. Had it been my own plane I would have reacted more

quickly. I am accustomed to the panel and to the instruments. In my own airplane a glance at the indicator is all I need, but in Karl's Falco I hesitated. *Am I really seeing what I think I'm seeing?* I have no sense of the time it took for me to realize what was happening and then to do something about it. I see it all in slow motion.

*I don't need to be told the danger of what we are doing. I know that we are dancing with flutter, I know that all airplanes will flutter at some speed, and when they do they usually break apart. We are flying faster than the plane was designed to fly, faster than it has ever been tested, and I know that we could die at any moment. I realize what is happening, and I am afraid.*

*I tell Karl we are going too fast, but he grunts and keeps on flying. He doesn't seem to understand, and Gary doesn't know. I push the button on the stick and tell Gary we're over the red line and to please slow down. He starts to slow down. "What's your red line?" I tell him it's 208 knots. "What's that in miles per hour?" "Two forty." Our plane moves closer to the SF.260, and I see that our wing is moving behind the tip tank, into the disturbed air of his wing. That could excite aileron flutter, so I yell something to Karl about keeping our wing away from his. He manages a flustered grunt, and the Falco moves slightly to the left.*

I began to relax after the airspeed moved under 200 knots, and I noticed that my hands were drenched with sweat. They were still wet when we landed fifteen minutes later. I studied the airspeed indicator and decided the gauge was probably indicating 230 knots when it hit the stop. At a density altitude of 4,000 feet, that calculated out to a true airspeed of 282 mph. Later Gary Fritzier said he was indicating 265 mph when I called him to slow down, so maybe we

were going 283 mph. Who knows? But flutter is a function of true airspeed, and we had flown the Falco 42 mph faster than the red line speed. The Falco's design speed is 264 mph and years ago some brave, parachute-equipped Italian test pilot flew the Falco to that speed for the certification. We had flown 18 mph faster.

We flew over the field and flushed up two more ducks, which immediately formed on our left. This did nothing to contribute to dry palms. It was my first ride in a formation flight of four, and we were sandwiched between two on our left and one on our right. While such a flight of four might look smooth and graceful from the ground, there is a surprising amount of relative movement among the airplanes. I also had no idea how skilled the other two pilots were.

But as you can see, we made it. We landed and while I headed toward the beer cooler to calm my nerves after our high speed let-down, the unfailingly cheerful Hansen chuckled, "You can always trust a tree." Maybe, but freedom from flutter has more to do with design, engineering, controls balancing and cable tension. If it's true that luck is a byproduct of design, then I'll just accept it as luck.

There are only three hangars at the Farmerville airport, and all three are Homer's. The airport operator has long since closed up shop and moved on to other lost causes. The SF.260 gang was a lively bunch who had taken up residence in the largest hangar. "Siai", a fluffy bedroom slipper of a dog—what some call a "drop-kick dog"—is the group's mascot, and he bounded joyfully around the assembled group.

A group mascot is one thing, but this squadron actually had their own undertaker. The friendly fellow who kept following us around, buying everyone drinks in the bar and pouring us coffee in the morning, turned out to be the local mortician who said he just liked to hang around pilots. Maybe, but it made me nervous.

Karl Hansen put the canopy cover on his Falco saying that he likes to think of the Falco as the female of the species and with those big Marchettis around, he thought he'd better cover her up—you know how Italian men are. It didn't do a bit of good. The next morning we arrived to find another red Falco out there. It turned out to be only Pawel



**Above: It is always a good idea to be nice to Marchetti pilots.**

Kwiecinski's new bird.

There was a big barbecue in the hangar on Friday night, Homer's two-alarm armadillo chili in the hangar for Saturday lunch and a banquet at the local Holiday Inn on Saturday night. In between we all took turns trading rides. It was like having your own personal Oshkosh, but without the fiberglass fishbait. More fun, too.

There were 19 SF.260s and 3 Falcos there, and we lined them all up on the runway and took pictures. One ex-Marchetti owner showed up in his Beech Duke and rolled it over the field without spilling a drop of scotch in the back. I was impressed at how well the 160 hp Falcos held their own in formation flying with the 260 hp SIAI Marchetti. The planes are so similar you had to look twice to tell if it's a Falco or SF.260 taxiing by.

One thing the SF.260 definitely has on the Falco is the sound of the engine. The Falco has a staccato bark, but the six-cylinder engine has an almost-musical tone. There is a husband/wife matched pair of Falcos in Italy, but none in the U.S. Jack and Cindy Rouse have their matched pair of blue SF.260s. One of the weekend's events was to assign all pilots CB-style handles, like "Magnum" and "Turbo". I never did understand why Cindy objected to my suggestion of "Tip Tanks".

I was interested to hear what Frank Strickler thought of Karl Hansen's Falco. Many of you have met Frank at our annual dinner at Oshkosh. He's the balding little feller with bifocals and a

'Texshus' drawl who hails from "Denton, America". That's just north of Dallas, and Frank sells SF.260s.

Over the years, there have been a number of people who have attempted to sell SIAI Marchetti SF.260s in the U.S. All except Strickler have failed. The seemingly simple proposition of importing aircraft to the U.S. has daunted an embarrassing collection of huge European companies. Frank Strickler succeeds, I suppose, because of his unbridled enthusiasm for the qualities of the Frati machine and his expert knowledge of the airplane. He has a loyal following among the owners of the airplanes. Of the 39 SF.260s in the country, Frank has sold all but seven to the original owners, and he has resold ten of them two or three times. He has even sold them in New Zealand and Germany, and there are three already-sold SF.260s on the way.

Despite his slight stature, Frank Strickler has a forceful presence by virtue of his commanding voice and considerable verbal skills. A speech by Frank Strickler is an event unexplained by modern science—it has no mass, and yet it has inertia. When you and I find ourselves in a sentence that we cannot finish, we stutter and stumble until we can find no way to extricate ourselves, and we begin again. There are no blind verbal canyons for Frank Strickler. In the same situation, his voice goes into a low grumble, but he plows on. He will twist, maneuver, reverse course—his voice rising and falling—then roll, strafe, bank, and peel out. Just when you thought he was going to crash and burn.

Frank Strickler is a Mark Twain riverboat captain caught in an impersonal world—now a pilot for American Airlines, and he flew all the jet stuff in the Air Force before that. Between sorties flying fat Americans between major cities, Frank can be found at his Fox 51 Ltd. One walk through his hangar says it all. There are two P-51s, a couple of T-6s, a rare Bücker Jungmann, a Beech 18, five or six SF.260s and a red Falco. The Cessnas and Pipers are parked outside.

I knew Frank was going to love the Falco, but I had to hear it for myself. After he flew Karl Hansen's Falco, I called him to get a report. "It's wonderful. It's so nice. It flies perfect. The only thing I don't like about the airplane is those grips Karl put on the control sticks hit the lights on the panel at full forward stick. It goes like a scalded rabbit. What's the cruise setting on that engine? I was just tooling around at 24/24 at three thousand, and it was indicating 170 knots. You can loop it from straight and level. You remember that thing James Gilbert wrote about the first time you fly a Frati airplane? It's really true."

He talked about Karl leaving the airplane. "Why are you doing this, Karl?" Shirley Hansen's chin was quivering as Karl said, "Well, now that I've built one, I think I know how to build a good one." Karl has a no-lose situation. The price is one fifty, and Karl's not going to come off the price one cent. If Frank sells it, that's fine. He'll put a profit in his pocket and build another. He enjoyed building the Falco as much as flying it. If it doesn't sell, Karl's happy to keep the Falco forever. Either way, he'll still have a Falco.

My own view is that Frank will sell it. He has a steady stream of pilots looking at the SF.260. With the price of the SF.260 well over \$200,000.00, delivery uncertain, and price not firm with the dollar falling, the Falco is bound to be appealing.

Karl Hansen reports that on the trip to Farmerville, the Falco indicated 157 knots at his normal cruise setting of full throttle and 2100-2300 rpm at ten to twelve thousand feet. He said the highest speed he has ever seen in level flight was 190 knots indicated at 2500 feet at full throttle.

Wendell Taylor reports they now have 80 hours on their Falco. No exact performance numbers yet, but on a recent

flight from Ketchum, Idaho, to Salt Lake City, they made it in one hour and one minute from takeoff to touch down. The distance is almost exactly 200 statute miles. The winds were calm, and the power setting was "not balls to the wall."

The Great Oyster Fly-In found the east coast blanketed in smoke from forest fires. In the morning the smoke had reduced visibility to 800 and a half, but it gradually improved during the day. Al Eynon and Ron Keilin flew their SF.260s from Ohio. They found the field with difficulty and then lost sight of the runway on base. Paul Sterbutzel flew his SF.260 in from northern Virginia.

The Corporate Disgrace was the only Falco in attendance. Jim DeAngelo had the good sense never to break ground, but Jonas Dovydenas made it as far as the Statue of Liberty in a Super Cub, but the visibility had fallen to a half mile and the headwinds were fierce. Pawel Kwiecinski and Irek Mikolajczyk made it as far as Ohio and couldn't get over the mountains. With only a hand-held battery-powered nav radio, they decided to do it next year. The Wilkinsons arrived by noon. Terry Smith flew in from Pennsylvania. The Wiczoreks and Aitkens arrived by four-wheel vehicles.

The big surprise was to find Francis and Wanda Dahlman there. After a year's bout with bone marrow cancer, their daughter had died recently, and they wanted to get out of the house. Francis brought along a present for me, a glass-topped coffee table made from a Falco station one fuselage frame. It really makes a lovely table, particularly when you put a lamp on it so that the shadows show the depth. The fuselage frame was a reject since one of the glue joints had hardened before Francis could get a clamp on it. Francis couldn't bear to throw the frame away, and it hung on the wall of his shop for a year until he hit upon the idea of making a table of it.

There was a record crowd of 45,000 people at the Urbanna Oyster Festival. That's a lot for the tiny town of five hundred permanent residents. We had 16 airplanes in all at the airstrip, but with all of the smoke there wasn't any flying going on.

Which was a major disappointment to Jimmy Stanley, my 12-year-old nephew. For his birthday last spring, Meredith and I gave him a ride in the Falco. Somehow, I had never gotten around to

delivering, and in truth I had forgotten all about it. Not Jimmy. The walls of his bedroom are covered with pictures of airplanes and for the past six months he has been dreaming about the ride. He and his family were staying with us that weekend, and the main event was to be Jimmy's big ride. Smoked out.

But then late in the afternoon the smoke cleared. "How about it, Jimmy? Want to give it a try?" Jimmy gave me a military "Yes, Sir!", and the veteran of sixteen viewings of *Top Gun* and I swaggered over toward the Falco. I remembered my own first experience with an airplane at his age—watching my uncle fly off to The Big City in a shiny red Staggerwing that charged down the grass, slipped gracefully into the air and then disappeared in the distance, and how for months afterward I climbed the bales in our hay barn and thought about how wonderful it must be to actually fly in a plane like that.

From the time we strapped in, Jimmy got a grin on his face that never left him. At some point on a first ride there is a moment of uncertainty, usually on the first barrel roll, when you never know if you are going to scare your passenger. This never came with Jimmy, his grin took a permanent set. We rolled, we looped, and we strafed up and down the runway right there in front of Mom, Dad, Christopher and George. The river became an obstacle course, and we pulled mightily as we carved our way through the chicanes and switchbacks.

A white SF.260 fired up and started his takeoff run just as we were strafing from the opposite end. It was reported that "Aunt Meredith" did not react

well to the sight of these two planes approaching each other at high speed. It only seemed right to make things look dramatic, and Jimmy loved it. If we had crashed in the woods the rescue team would have peeled a pair of smiling lips off one of the trees.

We formed up on the SF.260 and flew in formation, just like they do in *Top Gun*. We ran the obstacle course a couple of more times, landed, and then I watched as Jimmy hitched up his blue jeans and strode back across the grass strip. It was the ride every boy should have. Jimmy and his family had to leave, and they then spent the next two hours saying goodbye.—*Alfred Scott*



## Goings On at Sequoia Aircraft

*Continued from First Page*

better illustrations and performance information. The manual is organized in the usual five sections: general characteristics, operating limitations, emergency procedures, normal operating procedures, and performance information. The operating limitations section includes the center of gravity information. This is unusual in that it does not specify what the airplane should be, but rather the center of gravity limits of a loaded aircraft on takeoff and landing. The information is useless until you do the final weigh-in. Even then, all of you will find that no adjustment to the airplane is needed. Please do not ask for this until you are a couple of months away from the final inspection.

Advanced builder memos are a collection of future additions to the construction manual. They are assigned fictitious chapter numbers. If you ask for copies of any of these, please be sure to include the title of the chapter, since the "chapter number" might well be different.

Chapter 41 "Engine Installation" is six pages of installation instructions for the engine holes, fittings, engine controls, inverted oil system and windshield defrost system.

Chapter 42 "Cowling, Baffling and Nose Gear Door Installation" is 11 pages of installation instructions on those subjects.

Chapter 43 "Fuel System" is five pages of notes and instructions on the fuel system installation.

Chapter 44 "Access Doors" is nothing more than some notes on the details for the front fuel tank access door. Nothing else is included at this time.

Chapter 45 "Engines" is a 13-page Falco builders engine buyers guide. It covers the various engine possibilities, where to get an engine, the difference between new limits and service limits overhauls, wide deck vs narrow deck engines, alternator mounting pad, engine run-in, what an engine includes, engine specifications and a list of engine overhauls. The engine specifications part is very important. In the past, we have had a number of Falco builders get into trouble when they ordered their engines.

As the prison guard said in the movie *Cool Hand Luke*, "What we have here is a failure to communicate." The builder did not specify precisely enough, or the overhauler did not understand, exactly what was being ordered and what was being included. With these specifications, you can simply send your engine supplier a copy of the specification and say that you want to buy *that*. Do not place an order for an engine without a copy of this in hand.

Chapter 46 "Noise Suppression" is a 3-page first attempt to formally address this problem. Topics include: noise sources, the transmission of sound, sound absorption, our suggestions of what to do, and sound level tests. Just as Luciano Nustrini and Karl Hansen have done for drag reduction, I would like to see the same systematic approach to noise reduction.

Chapter 47 "Upholstery" presently stands at 13 pages, and it is far too disorganized at this time. I found on writing this that we needed a number of drawings of various designs and construction methods for the interior. I have finished the drawings, but they must still be reduced for printing. My intent is to do for the interior what we have already done for the paint scheme—to supply you with designs and materials suggestions that will allow any of you to install a classy "Ferrari" interior in your Falco. The various designs will be a series of Romper Room cut and paste drawings. All of the drawings will be printed on letter size paper, so you can make any number of copies, cut them out and compare the appearance of the various designs. I hope to have this in presentable form in about a month, but if you are at the upholstery stage now, drop us a note and we'll send you what we have now.

Chapter 48 "S-P-E-E-D" is 14 pages of discussion of every known speed mod for the Falco from the smallest little thing imaginable. Each separate speed mod is discussed in detail and we tell you everything we know. Some of the things you can do to make the Falco go faster involve serious trade-offs. For example, we don't like the idea of using flat head screws in the fiberglass cowling for maintenance reasons—it's just asking for problems. There is almost nothing in this that you need to know while you are building the Falco. These speed mods are things like gear doors, fairings, gap seals, reducing the cooling

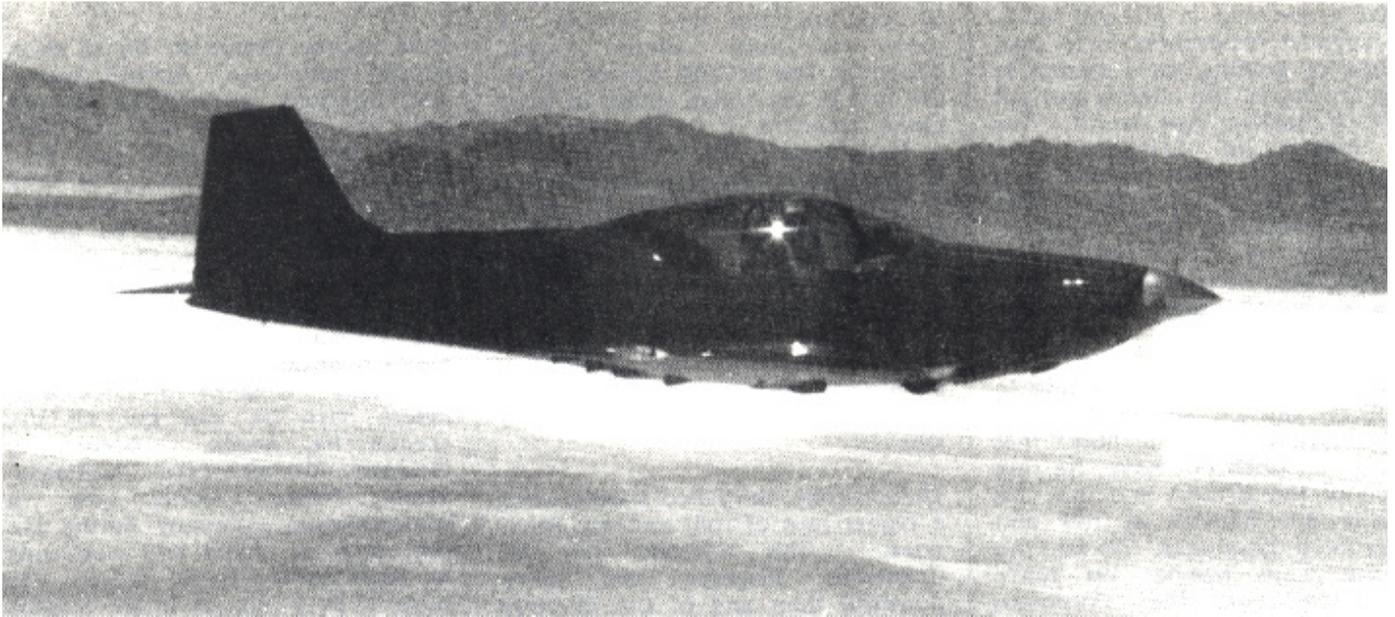
drag, etc. All are applicable only for those who are nearly finished with their planes. The only thing you can do differently while under construction are things you already know about, like flat head screws on the windshield, canopy and hinge fairings.

I also have a number of new drawings in the works. Very few of these have any new information and they are just cleaning up revisions. I have completely redrawn the nose gear drawings to eliminate obsolete details and parts. The dynafocal engine mount drawings are changed to note a number of tiny changes we have incorporated in our kit parts over the years. We have drawings for the fuel system components and the fuel system installation. In the works but not yet completed are new drawings for the rudder pedal assemblies, control stick and nose gear bay door installation. Some of these new sheets replace old sheets, so I need to prepare a coherent package with replacements for all written-over sheets or you will all get confused.

Falco builders in Canada may be interested to know that we are in the process of getting the Falco approved for aerobatics. Because the Falco was previously certified in the Aerobatic category, this appears to be a simple approval procedure.

Cipriano Kritzinger, Lufthansa pilot and Falco builder reports that the West German Ministry of Transport is in the process of changing their rules to allow construction of kit planes. I was not aware of it, but Germany has a rule that allows the construction of one aircraft of a type in the experimental category. Thus, the first builder of a Christen Eagle may be the only one. For such a modern country, this is an exceptionally stupid rule. Cipriano says that you should just go ahead and build your Falco and when you are ready to fly it, make the application. The German LBA has reviewed the Falco plans and commented that they were by far the best that they have ever seen and this is one of the factors which has weighed in the decision to change the rules.

My production Falco now has a new set of wheels and tires all around. As all of the original tires were nearing the tread, I decided to make the switch to the tires we use in the kits. Those owners of other production Falcos may be interested in this. It was our intention to use the orig-



Above: Wendell Taylor over the Bonneville Salt Flats.

inal nose gear fork, so we honed out the fork for the slightly larger axle. This was easy, but we then found that the original fork was not very straight. When we put our axle and spacers in place, the spacers had a gap of about 2mm on one side due to the out-of-squareness of the old fork. As a result, we used a new fork and found that we just had to ream up the four holes on the top.

On the main gear we had a problem in that the gear leg did not have enough clearance for the landing gear arm. The radius of the welded-on cover plate on the original arms was smaller. We had to sand the new arms to get them to fit, but this was not a serious problem.

The 5.00x5 tires on the Cleveland wheels are smaller than the original Italian tires, but I can't notice any difference in the angle of the airplane on the ramp. The brakes are the same as before—weak but adequate. I do notice a slight increase in rolling resistance while taxiing. At first I thought it was the new brakes dragging, but they are not.

I arrived at Farmerville with a Radio Shack sound pressure meter in hand. I prefer to deal in numbers when things are actually measurable. Al Aitken flew with Karl Hansen and took a number of readings, but the important ones were at the ear level. The cockpit noise level was 98 dBA at 25/2500, 95 dBA at 24/2200, and 94 dBA at 20/2000.

At 98 dBA, the noise is the same as my old Falco at my one-and-only cruise setting of full throttle. Thus, it appears

that at full throttle, Karl Hansen's Falco is about the same as my airplane, but since he uses a lower power setting for cruise, the noise level is substantially lower. The decibel scale is logarithmic, so each 3 decibels is a doubling of the noise level. 94-95 decibels is a big improvement for a normal cruise setting. We did not measure the noise level of Pawel Kwiecinski's Falco, but Pawel took my sound pressure meter home to do this later. My impression is that Pawel's Falco is about the same as Karl's.

Al Aitken timed the rate of roll of Karl Hansen's Falco at 3.475 seconds ( $103.6^\circ/\text{sec}$ ) to the left and 3.875 seconds ( $92.9^\circ/\text{sec}$ ) to the right. I flew with Irek Mikolajczyk in Pawel Kwiecinski's Falco, and we timed the rate of roll at about 4 seconds to the left. We did not time it to the right, but Irek thought it was about 5 seconds.

The rate of roll is particularly startling when you consider that my old Falco will roll to the left in just under three seconds. Pawel's is a full second slower and Karl's is about a half-second slower. To demonstrate the difference, Irek and I jumped in the Corporate Disgrace, and I showed him the way it would roll. An expression of anguish came across his face as he yelled, "Why?"

I also have to say that there is a difference in the feel of the ailerons. I know that there are those people in this world who supposedly recognize every problem in a flash, but my mind has a single forward speed, best described as "stump puller". At first, I thought the controls of

all of the homebuilt Falcos were simply not as loose as my old Falco because they did not have the worn bearings and slop of my old lady. But there is more to it than that.

Aeronautical engineer Curt Lopresti, son of the famous Roy, was at Farmerville, and we talked at length about the difference. Pawel's Falco has the same aileron travel as my Falco, and the slot is not measurably different. Curt suggested—and I think he is right—that the difference can be attributed to a phenomenon known as "re-attaching the flow".

Somewhere in Hoerner's classic *Fluid Dynamic Drag*, you will find mention that the controls of a plane can be made more powerful if the control is slightly larger than the airfoil of the wing. Thus, if the top of the Falco's ailerons were slightly higher than the wing, so that the air would hit a very slight "bump" on arriving at the ailerons, the controls would be more powerful. The bump causes the turbulent air to re-attach itself to the aileron. This has two effects: it makes the controls more powerful, and it lowers the breakout force.

This bump can be almost any unsightly rise and it will still work. The simplest experiment is to take a piece of knitting yarn, stretch it along the top of the aileron and put a strip of masking tape over it. This will create an inelegant and unsightly bump. Curt Lopresti said that when they did this to the Grumman-American Tiger, it tripled the rate of roll. As a result, they changed the

construction of the plane so that the ailerons would be higher.

I took Frank Strickler for a ride in my Falco and he has since flown Karl Hansen's Falco. He noted that Karl's Falco does not have the rate of roll of the SF.260 and that the controls are heavier in roll and lighter in all other axes. He said the ailerons were heavier on Karl's Falco than on the Corporate Disgrace.

Frank Strickler says that the SF.260 is intentionally built so that the top of the ailerons are 1/16" to 1/8" above the top of the wing. He has had a lengthy discussion with Mr. Frati, who insisted that the SF.260's aileron travel (it is the same as the Falco's) should not be increased.

On my old Falco, the wing skin takes a decided dive downward at the aft wing spar. Whether this is intentional or the happy result of the poor construction of my Falco may never be known, but if you lay a straightedge along the last couple of inches, it will hit the ailerons—the tops of which are 2 to 3mm "above" that line. Thus, it appears likely that this subtle difference is responsible for the higher rate of roll. Remember, too, that my Falco has aluminum controls, and the rivets stick up as well. This would contribute to the effect.

Frank Strickler thinks that re-attaching the flow to the top of the ailerons will improve the rate of roll and make the ailerons feel lighter. I have written Mr. Frati about this and have yet to hear from him, so I can't report what he thinks. It seems to be a reasonable line of investigation. I think what makes sense is to time the rate of roll on your Falco several times each way, then install the masking-tape-and-yarn bump, and then time it again. That way you will get a clear indication.

Something is clearly wrong when a Falco does not have the rate of roll of the SF.260. The two airplanes have the same wing—airfoils, twist, taper, etc.—but the ailerons on the SF.260 are one bay shorter, so there is less aileron area. Secondly, the SF.260 carries all of the fuel in the wings, either in wing tanks outboard of the landing gear or in tip tanks. This means that the SF.260 has a higher polar moment of inertia. Thus, to attain the same rate of roll as the Falco, the SF.260's ailerons must generate a greater rolling force, from their smaller area. Remember also that all but the earliest SF.260's have aileron servo tabs, which make the ailerons lighter but

which also make the effective area of the ailerons smaller.

Theoretically, the Falco should have a higher rate of roll, and my Falco does. The ailerons on the Corporate Disgrace are more powerful than any of the SF.260s and are lighter as well.

It is too early to start declaring solutions for everyone. The first step is up to those Falco builders who are flying to do the masking-tape-and-yarn experiment. If that dramatically lowers the stick force and increases the rate of roll, we will know we are onto something. I would then suggest more experiments with yarn—a second row, a higher bump, temporary stick-on vortex generators, etc.

Vortex generators are those little tabs of sheet metal sticking up on the top of the wing. They are installed on many airliners, business jets and military fighters. The tabs are installed so that they kick the air alternately to the left and right. They are installed on the wing in front of the ailerons. On some airplanes, they dramatically increase the rate of roll. (I'm just repeating what engineers have told me. I don't understand the concept of vortex generators at all, although I can understand why air encountering a bump will re-attach itself.)

If these tests reveal that the Falco's rate of roll can be increased by these methods, it appears that there are several methods of construction which could achieve these results. The easiest would be to duplicate the Corporate Disgrace's slight dip in the upper wing skin in front of the ailerons. The other obvious method would be to redesign the ailerons so that they would be about 2mm higher. We all have more thinking to do. More installments to come. Watch these pages.—*Alfred Scott*

## Construction Notes

Sitka spruce seems to be in short supply these days. Aircraft Spruce and Specialty and Wicks Aircraft both are completely out and don't know when they will get any. Wick's Bud Meyers told me they have an inch-high stack of spruce orders waiting for wood to arrive. Trimcraft and Western Aircraft have spruce in stock. Trimcraft is really not in the spruce business, but they are always willing to supply the needed spruce if you are ordering their kits. Western Aircraft's Jean Peters says he can get all the spruce he needs. Spruce is Western Aircraft's only business. Jean Peters works for a transportation company during the day, and on nights and weekends he saws spruce to fill orders. He buys 4" by 8" spruce in 22' lengths and then cuts it to order.

If you are going to install a Christen inverted oil system in your Falco, take note—this little problem cost Pawel Kwiecinski a *week*. The Christen system connects a line to the horizontal screen on the right aft end of the oil sump. You have a choice of two fittings, and you must use a Christen P/N 804-A Angle Fitting. The straight fitting will not work due to an interference problem with the engine mount. The Angle Fitting, fortunately, is a swivel fitting.

At various places in the Falco construction manual, we mention using Loctite to hold things in place while you drill. The bushings between the half-inch shafts and the universal joints of the retraction system are one such case. Loctite is an excellent adhesive, but what if you ever have to get the pieces apart? Falco builder Chuck Hubscher mentioned that his company uses Loctite for temporary attachments, and he let me in on a little secret. At around 300°F, Loctite let's go and turns to an oily substance which does not harden again when it cools. So whenever they need to get something apart, they just break out a propane torch.

When it comes time to cover the plywood, all you need is a 1-1/2 to 2 ounce cloth and some West System epoxy. Wicks sells a lightweight cloth like this.

I don't know if it is worth the effort, but some Falco builders go for even lighter weight cloths. Before he started on his Falco, Craig Bransfield built model airplanes. For his tail feathers, he bought an ultra-lightweight cloth

from a model-builder who sells the stuff as a side business. The 6/10 oz cloth is excellent for surfacing work and flexible enough to accommodate compound curves well. It is 38" wide and comes in 15' roll for \$23.85, or 30' roll for \$41.35. Add \$3.75 for overseas air mail and handling. Order from Dan Parsons, 11809 Fulmer Dr., N.E., Albuquerque, NM 87111. Telephone (505) 296-2353. Visa, Mastercard accepted.

Our wing drawings show a nifty way of installing the access panels using aluminum inserts and machine screws. Jim DeAngelo was the first to do this type of thing, but he used Rivnuts epoxied in the spruce. This has the advantage of nice, reusable metal threads in the wood.

I liked the general idea, but the outside of a Rivnut is smooth, there's a shoulder on the face, and it requires an installation tool. There must be a better way. One day I found exactly what I was looking for, an insert made for the injection-molded plastics industry. The little aluminum insert had a coarse diamond knurl and a blind end, so you could epoxy it in place and not worry about epoxy getting in the threads from the far end. They were cheap and available in quantity. So I drew them on the new wing drawings—see Drawing No. 201, Detail J.

Then I lost the product literature and couldn't remember who made the silly thing. Recently, I found the name of the company again, and we quickly bought a supply. I think that once you use a couple of these, you are going to start putting them everywhere. Rather than sprinkling these among the various kits in the quantity needed, we have put together a bag of 50 of the P/N 837-17 inserts and the required 6-32 machine screws—that's enough for an entire airplane, I hope—and added these to the tail group kits. If you would like these little things, it's \$10.00 for 50 inserts and 50 screws, so just request it with your next order or Brenda Avery fan letter.

Some of you may have been aware that I was working on a new gear ratio for the retraction system motor. Karl Hansen was experiencing some problems with the motor when he installed the full gear doors. His motor raised the gear in about 10 seconds and then stalled with about two turns to go. Karl would pull the circuit breaker and then crank the gear up the rest of the way.

The retraction system uses two relays to control the motor. Forgetting about voltage drop under high current loads, I foolishly located the gear-up and gear-down relays on the aft face of frame No. 6, where they are fabulously convenient for maintenance. When I realized my mistake, I changed the system. I changed the 15 amp circuit breaker to 20 amps, the 16 gauge wire to 12 gauge, and re-located the two motor control relays to the front face of frame 5. Richard Brown was in the process of installing the electrical system when we made this change, and he did almost all of the changes, leaving only a short section of 16 gauge wire in one of the connectors on the back of the instrument panel. His gear came up in 7.5 seconds—a big improvement.

Still, with Karl's motor stalling, I thought I should change the ratio. I designed a new gearbox and we made a prototype. We sent this off the Karl who installed it in his plane. Karl was delighted with the results. The gear came up with the motor hardly working at all, and the motor never stalled. The retraction time was increased to 16 seconds. Karl didn't mind the slower speed, but I didn't like it at all.

Initially I could not figure out what had happened since I thought I had only changed the gear ratio for 20% more motor revolutions. I had forgotten that you multiply the ratios of the gears—I had been adding them.

Then Pawel Kwiecinski flew, and he reported that his gear came up in 7 seconds. I was stunned. I had originally designed the system using torque figures at the manual crank that Dave Aronson and George Neuman had provided. Based on the power curve of the motor, I calculated the gear would come up in 9 seconds. From the power curve, seven seconds was faster than the no-load speed of the motor—impossible.

The power curve was based on 12 volts, and I always knew that 14 volts would put out more power. The relationship between voltage, motor speed and stall torque is a simple linear one with which I've only recently become acquainted. Recalculating it all again, it shows that with very little voltage drop, the motor will easily pull the gear up in 7 seconds.

Voltage drop is a vicious, self-feeding spiral. The voltage drop is minimal with the larger, shorter wires, but in Karl's

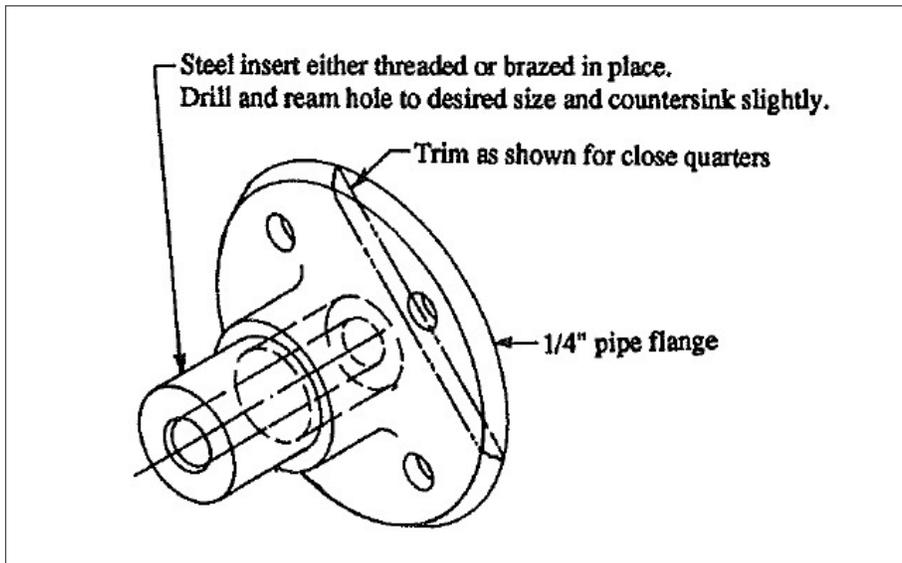
Falco the voltage had dropped to about 7 volts at the time the motor stalled. I have concluded from all of this that the original gear ratio is correct and that the larger, shorter wires are absolutely essential. So, we are sticking with the original design, and I am consoling myself by comparing the \$2,000.00-plus cost of the one-off gearbox to a year's tuition for my college education. In my next life, I'm taking a course in electrical engineering.

Just prior to ordering the electrical kit, we usually get a call for our opinion of the two batteries. The Gill PS6-11 is a standard lead-acid battery that is rated for 35 amp/hour. This is the standard battery used in aircraft. It is a very good battery and has lots of cranking power. Because the acid is a liquid which can spill if you turn the battery upside-down, this battery is not suitable for negative-g aerobatics.

The Globe Gel/Cell U-128 is a 27 amp/hour battery which can be used for negative-g aerobatics. This is a lead-acid battery, too, but the acid has been converted to a jelly with the same process that's used to make Jello from juice or napalm from gasoline. The Gel/Cell batteries have a reputation for short lives, averaging something like 1-1/2 to 2 years.

A recent development is the "sealed lead-acid, starved electrolyte, flat plate, gaseous recombination" battery. Unlike the Gel/Cell, this type of battery is completely sealed and gives off no gases when it is being charged. Although these batteries are in the same amp/hour category as the Gel/Cell, the manufacturers claim that a very low internal resistance allows a higher starting current and voltage. (We don't know if this is true or just advertising hype.) These batteries have an expected life of 6 to 8 years.

Gates makes a 2-volt battery that looks like an oversized flashlight battery but with two heavy wires coming out of the end. You are supposed to assemble these into the voltage needed. A more convenient, already-packaged, battery is the Electro Marketing 12-volt, 28 amp/hour battery. The battery looks identical to the Gel/Cell, and it appears that this battery can be installed with the installation hardware supplied in our electrical kit for the Gel/Cell battery. Electro Marketing, 7842 East Gray, Scottsdale, Arizona 85260. Phone (602) 991-0110.



Above: John Rawlings's Bushed Drill Guide.

If you don't plan to do any negative-g flying in your Falco, get the Gill battery. Overseas builders will find the Gill battery much easier to find. Shipping is not a problem in the U.S., so if you want to try the Electro Marketing batter, go for it. The only difference in our electrical kit is that the battery hold-down bar and the two bolts are of a different length. They are easily exchanged, so you can always change your mind later.

Pawel Kwiecinski is in the process of having radios installed in his Falco. He decided to install a KNS80 Rnav. King insists that an avionics cooling fan be installed for this radio, or they will not honor the warranty. The fan that the avionics shop wanted to install was ridiculously large, and they were able to hang it from the bottom of the radio stack. The fan is a big square thing with a bunch of holes. You are supposed to hook tubing to each outlet and point one tube at each radio. That's great for rack-mounted radios in corporate jets, but downright silly in the Falco.

Dave Aronson had an avionics cooling fan in his Falco. It was a tiny fan like you will find at Radio Shack, and it was mounted somewhere to the side or above the radio rack. It was mounted on the airframe, not on the instrument panel. The thing was wired with a fuse to the main battery relay and ran whenever the master switch was on. The same avionics shop installed the radios in my Falco. They told me I should have a fan installed, but concluded it was impossible. I have no fan on my KX165's, and I have not had any problems although I normally only have one radio on at

one time.

Anyway, I have recently re-designed P/N 621 nose gear control rod, and we will be supplying P/N 621A with the kits in the future with one fewer bushing. A preliminary copy of the drawing is available on request. The redesigned part eliminates the silly practice of reducing the diameter at the aft end and then installing a bushing to increase the size back up to the original 3/4" diameter. There is a long story behind the original design, but it's not very interesting.

In our last production run of the main gear screwjacks, a mistake was made in the location of the threaded boss for the gear doors. This was caught in production, and we effected a little repair which does not affect the strength of the part. As you receive it, the threaded boss is in the right place and as a happy byproduct of the repair, the seat for the spring is already installed. You do not need to drill through and rivet P/N 602-3 in place. With the welded boss installed, those of you who are making your own screwjacks can do the same thing by making a long aluminum seat and let it rest against the threaded boss.—*Alfred Scott*

## Tool Talk

The sketch of the "Bushed Drill Guide" is a handy little gadget to be used whenever bolt holes should be drilled close to 90°—which is most of the time. The bolt hole should be predrilled in the metal part, the metal part positioned, clamped and the bolt hole spotted (shallow drilled) through the hole in the metal part. Remove the metal part, locate the bushed drill guide to the spotted hole and drill the bolt hole through the bushed drill guide. Those shown on the sketch are common steel inserts which should last more than the requirements of a Falco, but if the desire is to go first class, hardened steel bushings of the appropriate sizes are available from tooling supply houses like Travers Tool. They are called, appropriately enough, 'drill bushings' and should last several lifetimes.

Incidentally, for best results, the length of the bushing—the contact length of the drill—should be no less than 4 times the diameter and no more than ten times the diameter of the drill. Personally, I prefer to limit this kind of drill bushing usage to 1/4" diameter.—*John Rawlings*

Dave Gauger reports that he found a wonderful tool to save himself from an embarrassing situation. Somewhere in the process of gluing on a tail rib, he got the rib out of alignment and wanted to remove it without destroying the rib or damaging the spar. He bought a No. 49107.02 Flush Cutting Saw for \$32.95 from Garrett Wade (800-221-2442) which did the trick nicely. This is a Japanese dowel-cutting saw, and you pull to cut. The teeth of the saw do not have any set to them so they will not scar the surface of the spar and the thin blade will follow the surface of the spar. The kerf is almost paper-thin so there is a minimum of lost wood.

Highland Hardware has a similar, and probably identical, saw. Their No. 05.64.27 Flexible Flush-Cut Saw lists for \$16.95. Highland Hardware, by the way, now has an excellent 80-page catalogue. Highland Hardware, 1045 N. Highland Avenue NE, Atlanta, GA 30306. Telephone: (800) 241-6748 or (404) 872-4466.

A lot of Falco builders have purchased moisture meters, and by knowing the moisture content of the wood you can avoid some frustrating experiences. While we have some mention of various companies in the construction manual, we don't recommend any specific mod-

els. We list four companies who manufacture these instruments, but most of what I have seen in advertisements and catalogues is for the two leading manufacturers, Delmhorst and Lignomat. Each company will sell you moisture meters direct, although the items are also available through mail-order houses.

First, let's review the Delmhorst instruments. The G-30 is their top of the line moisture meter. This is a serious industrial instrument with a large meter which indicates from 6 to 30% and requires a separate electrode.

The 4-pin electrode is the lumber-yard version and requires a mallet to drive the 5/16"-long pins into the wood. This electrode is primarily used for checking fairly dry 4/4 wood.

The 2-pin model, with 1-1/8" pins, is designed for checking stock of any thickness at any moisture content. There are a variety of insulated and non-insulated pins. The insulated pins will read the moisture content at any specific depth indicated by the built-in depth gauge. A 2-lb built-in hammer drives the pins in and back out again with minimal risk. This instrument seems to be a gross overkill for the Falco builder, but if you want one, Highland Hardware will sell you the G-30 meter for \$200.00 and the 2-pin electrode for \$45.00.

Next down the line is the Delmhorst Model J-1 pocket size moisture tester with a 6 to 30% range. The 2-pin electrode is an integral part of the instrument. Any of the external electrodes may be used, in such case the instrument must be ordered as J-1/C-167. Because of the meter movement, this seems to be the best Delmhorst meter for Falco builders. Trendlines (800-343-3248) will sell you the meter (their catalogue No. DEJC) for \$149.95.

The Delmhorst Model J-88 is the least inexpensive, with the meter of the other versions replaced by a series of LED discrete step indicators for 6, 8, 10, 13, 15, 19, 22 and 25% moisture content. Highland Hardware will sell you one for \$99.95.

For complete information, call or write Delmhorst Instrument Co., P. O. Box 220, Boonton, NJ 07005, telephone 800-222-0638 or 201-334-2557.

Lignomat's Mini-Ligno is a pocket tester with discrete step LED indicators for 6,

8, 10, 12, 14, 16, 18 and 20% for \$110.00. The 2-pin electrode is an integral part of the instrument. The instrument has a two-position hardwood/softwood selector switch.

Lignomat's serious instruments are their Lignometers, and each version is available in meter or digital version. Of these, I'd suggest the digital version, Model H30d (\$149.00) with a range of 4-30% with E10 Drive-In Electrodes (\$52.70). The H30d has a selector switch for 4 wood groups. Obsessive Falco builders can spring for the automatic temperature compensating HT60 (\$339.00 plus electrodes) or the HT100 (\$440.00 plus electrodes).

Any company with a sales manager named Grete Heimerdinger has to know something about moisture in wood, so for complete information, contact Lignomat, P. O. Box 30145, 14345 NE Morris Ct, Portland, OR 97230 or call 800-227-2105 or 503-257-8957.

I subscribe to *Wood and Wood Products*, a furniture and cabinet industry magazine. One of the regular features is a questions-and-answers column with a noted expert. A surprising amount of the problems mentioned in the column come down to inadequate knowledge of the moisture content of the wood the shops are using. Martin Guitars actually has an entire system of humidity and temperature controls—alarms go off if the humidity gets out of the desired range.

Trying to control the moisture content of the wood for your Falco may be like giving hand signals to a blind man, but you can avoid distressing situations by knowing the moisture content of the wood. If you skin with too-dry plywood, you can end up with dips between the ribs—look at the wing on the Corporate Disgrace.

It does pay to have some idea of what you are dealing with. The discrete step indicators are all you need to stay out of trouble. For more accurate information, I'd suggest the Delmhorst J-1 or the Lignomat H30d.—*Alfred Scott*

## Brenda's Corner

From time to time we get calls from builders who ordered a kit a year or so ago and finally get around to checking it and discover something is missing. Please, please check your shipments when you receive them and let me know immediately of any damaged or missing part. While we will cheerfully replace a damaged or missing part, it really is not fair to expect us to do so a year after the kit was shipped.

We get letters and telephone calls frequently from people who purchased the information packet several years ago, and want to order a new one because theirs has been worn out from being read so many times. When someone orders the information packet we ask what magazine they saw our ad in so we can keep track of advertising costs versus responses.

A few weeks ago I received a call from a gentleman ordering a packet who said he had cut the ad out of the *Wall Street Journal* several years ago and had been carrying it in his wallet all this time. He said that when things got too hectic, he would pull the ad out and dream about the Falco. He didn't order the brochure because he knew that with his business schedule, building a Falco would be impossible and having the brochure would be extremely frustrating. But now he has had enough of the rat race and has decided to drop out of "Corporate America", and the Falco is his first priority.

For those people on your Christmas list who have everything, remember we have the Falco garments which make the perfect gift. And the Falco patches (which come in several sizes) can turn an ordinary present into one that will always be remembered. What Falco builder's wife wouldn't want a Falco patch ironed on that special dish towel chosen just for her? The possibilities are just endless.

Usually the week after Christmas, our office hours are not our normal hours, so if you are planning to order anything during that time, it would be a good idea to get your order in before Christmas. Also, you should allow for a few extra days in shipping time because of the holiday rush (UPS not us).

Best wishes for a joyous holiday season.—*Brenda Avery*

## Sawdust

- Congratulations to Jim DeAngelo, who took the award for the best home-built at the 11th annual New England Regional Fly-In at Orange, Massachusetts.

- Falco builder, photographer Jonas Dovydenas has a new book out. *Nevada, A Journey* is a collection of his superb photography of the landscape and faces of our most barren state. His earlier book *Chicago Houses* was published by St. Martin's Press. Collector's editions are available for \$225.00, but us pikers can just order the hardcover edition for \$37.50 from Undermountain Press, Box 778, Great Barrington, MA 01230.

- We regret to inform you that Brian Fox, of Doncaster Sailplane Services, died on October 31 in a boating accident. Since 1980, Doncaster Sailplanes Services has served as our representative in the United Kingdom, receiving a tiny commission on plans and kit sales in return for assisting Falco builders. Mrs. June Fox has decided that she is not able to continue running the homebuilder supply business on her own and is closing the business.

- For sale, two IO-320-B1A engines, 500 hours since chrome major overhaul to new limits. \$6,250.00 each. The engines are off a Twin Comanche which was involved in a belly landing. The props struck the ground. Seller says the cranks have been checked with a dial indicator on prop flange and show no bend in the crankshaft. Contact Butch Emery, Rt. 2, Box 176, Weslaco, TX 78596. Telephone: (512) 565-3333 after 5 PM. Assuming the crankshaft is straight, these engines are a good deal. We would suggest making the sale conditional to an inspection by your own A&P, who will probably advise splitting the case and inspecting the crankshaft.

- Jim Shaw, family and Falco have now moved to Metairie, Louisiana, for a hardship duty assignment on the outskirts of New Orleans.

- 1957 Series 2 Aviamilano Falco for sale. Fully restored 1985. Only beached once. Leather interior. Sequoia nose gear and canopy. Lycoming O-320-A3A with C/S prop. 150 kts cruise at 7.5 gph. 850 hrs TTAF. Available with U.K. export CofA. Offers over \$85,000. Contact Derek F. Simpson, 6 Marywells, Meppershall, Beds SF17 5NF, England



**Top: The F1300 Jet Squalus enters evaluation with the Belgium Air Force. Above: a Series IV Falco in Germany.**

or call (0462) 812695.

- Falco media collectors will have to go to Japan for the latest on the Falco, an interview with Steve Wilkinson in *English Journal*, a video-tape-and-magazine combination directed at Japanese businessmen who want to learn English. The interview is distributed on video tape along with a magazine which includes a printed transcript of the interview. Steve is interviewed by the lovely Consuelo, a six-foot-tall, semi-pro tennis player who towered over the minibus of tiny Japanese. See the latest *Polish Wings* newspaper for an article of Pawel Kwiecinski's Falco.

- The Belgian air force will conduct a

flight evaluation program of the Pro-mavia F1300 Jet Squalus in December, marking the first service evaluation of the single-engine, turboprop-powered trainer. Belgium has a potential requirement for up to 40 of the trainers. New Zealand, the Philippines and Bolivia also have expressed interest in evaluating the Jet Squalus. The first aircraft has accumulated almost 100 hours of flight time.

- The FAA has a new Advisory Circular on how to obtain a Repairman's Certificate if you've built your own homebuilt. Obtain AC 65-23A from your nearest FSDO/GADO, or write FAA, 800 Independence Ave, S.W., Washington, DC 20591.

## Mailbox

Falco building stopped while building a hangar and restoring a '47 Cadillac convertible. Now I have to renew my "permit to fly" on my Jodell D11. Always seems to be something to slow me down with the Falco. Same with my partner.

Russell Woods  
Christchurch, New Zealand

Having worked from prints all of my life, I can appreciate the quality of the Falco plans, but maybe even better is the help of fellows like Jerry Walker, K. Brumfield, Buzz Glade and Tony Bingelis. All wood finished and some metal fittings. Will start assembly when I return to Michigan next spring. Too many vacations (I'm retired) slow the Falco progress.

Elmer Kunse  
New Port Richey, Florida

In a recent newsletter, one of the Falco builders referred to using Aerolite glue. He's absolutely right about the glue being easy to use and the quality of the joint. However! I submitted wood samples glued thus for strength testing to our Federal Air Office in Switzerland. No problem with strength, however the glue was rejected because it is too brittle. Now I know for a fact that this glue has been used on at least two homebuilts here, and they said okay. The reason it was rejected on my project is because the airplane is built, and designed, for acrobatics and the Federal Air Office says: for that you use a more resilient glue. I'm using what's called Aerodux here, an old tried-and-true resorcinol (I think). Anyway, just a note of prudence vis-a-vis acrobatics and a brittle glue.

Leland Johnson  
La Chaux-de-Fonds, Switzerland

The objections to Aerolite are completely and totally absurd. I've never heard such nonsense. The original production Falcos were built with Aerolite, and they are certified in the Aerobatic category. The Falco gains its strength from larger spruce cross-sections, and the glue joints are not more highly stressed than in a normal category aircraft. Aerodux is a resorcinol, and it is a very good glue, although it requires good clamping pressure and precise fits. Aerolite has better gap-filling characteristics, and it is easier to use for many joints. I think you should appeal the decision. The Falco does not require a "less brittle" glue. Aerolite is fine with us and is, in fact, the glue specified by Stelio Frati. We do not have any joints in the plane which require a "more resilient"



**Above: Dr. Hans-Heinrich Kühne and his Series IV Falco. This Falco was converted to one of our Nustrini canopies a couple of years ago, and it resulted in a speed increase of about 3 knots.**

glue. In our view, Aerolite and resorcinol are both acceptable. —Alfred Scott

I have been asked by the inspector of my project if you will supply either a certificate or letter stating that the parts supplied in the Sequoia kits are made according to the Falco approved plans and to the specifications required. It is necessary in the U.K. to have all material and parts certificated in this way, and I trust this will not be too much trouble for you.

My project has outgrown the garage, so most of this summer has been spent in building a workshop large enough to accommodate the new member of the family.

Stuart Gane  
Farmington, Gloucestershire, England

We are happy to supply a letter certifying that all of the parts supplied in our kits are made in strict accordance with the Falco plans and specifications.—Alfred Scott

I thought I'd better let you know I'm still flying. I just got back from a Florida trip. I spent a few weeks before departure doing speed mods and was happy with the results. From here to Florida was 13.1 hours, two stops and I averaged about 188 mph chock to chock with little pro or con wind, and one ILS. I picked up almost 3/4" rime ice in Montana and Wyoming, but the rest of the trip out was nice. It was a lousy trip home from Ohio with rain, snow, ice and 52 knots of headwind over the Rockies. I won't say too much about the average speed on

that trip, but the lowest ground speed I got was 120 knots. The bird performed flawlessly. 306 hours on the bird—not too bad for a little over two years.

As you know, I saw Karl Hansen at the CAFE this summer and liked his performance so I copied some of his mods plus a few of my own. I did four cruise speed runs at 10,000' under radar here, two into and two downwind (forecast 7 kts), and I averaged 176 kts with the highest 194 kts and the lowest 166 kts. I was running 22" MAP full throttle, 2300 RPM and 25° under peak EGT. I don't fully trust the radar ground speeds but from that and my trip it looks like I'm up to almost 210 mph ground speed. Fuel is averaging right at 7.5 gph above 10,000. I had one leg of 4.6 hours with 6 gallons remaining.

The primary speed mods were gap sealing and drag cleaning. I closed the spinner-to-cowl gap down to a little over 1/8". I was a little worried about rubbing, but I haven't seen a mark with 4 g's. I used some dense foam and formed to the spinner/cowl, finished with micro and painted. I closed the gaps between the flap and aileron to about 1/16" with the same material. I can see no difference in handling or rate of roll. I countersunk every exposed screw—spinner, cowl, canopy and all streamline fairings that were attached with small round head screws. It all netted right at 10 knots. I also fitted the nose gear doors. After making a second spring and minor adjustments, it works like a jewel. My nose gear doors have too large a blister which

is probably costing me so I may remold some new ones some day.

I did a little in the engine compartment. I wrapped the exhaust stacks with Fiberfrax and heavy duty aluminum foil as Karl Hansen has done to help on the vapor locking. I replumbed my blast tube for the gascolater, but I haven't been in high enough ambient temperatures to know if it does any good. I also plumbed my breather tube into the exhaust as per a few of the EAAers and with the help of the FAA maintenance expert. Works great after about 40 hours and no more dirty belly.

I think the ATC controllers are beginning to recognize the Falco. I had a lot of nice chats with them going and coming, much to the displeasure of our airlines, and hardly any controller flubbed the name. Still would like to see you develop an aileron trim. My rubber band is almost worn out. Take care and don't burn out.

John Harns  
St. Maries, Idaho

*Before any of you starts doing all of these speed mods, please request and read our "S-P-E-E-D" memo which covers all of the speed mods ever known to be done to the Falco by Luciano Nustrini, Karl Hansen, John Harns or others. I worry about closing up the gap behind the spinner. If and when the spinner hits the cowling, you are likely to lose the entire cowling in one violent explosion. This was a problem with Pitts Specials some years ago, and I put the admittedly large gap there for safety. I also question the use of flat head screws on the spinner and cowling.—Alfred Scott*

I had my Falco painted by a professional auto-painter in May. He did such a terrible job that I have sanded down the entire Falco for another try next week. It will be white with red trim *à la* Karl Hansen's Falco. The upholstery will be red leather with white seats.

I have also ripped off the fabric covering on the control surfaces. They have all been covered by plywood. The fabric just did not match the rest. The first Falco on the Norwegian register will be CN-JAN. I just had to have my name on it. I'm coming to the U.S. in January. I'll start my flight training for the ATP at American Flyers in Florida. That's not the only reason my Falco is not flying this year. Still no engine and prop—\$\$\$!



Top: Jan Waldahl sent us this photo of "My Falco seeing the sunset for the first time." Above: The painter who became a missionary after attempting to paint Waldahl's Falco. Note the four-wheel trailer.

The painter has left for Africa to become a missionary. Best for him!

Jan Waldahl  
Sandane, Norway

I have enclosed a photo of my Nibbio with me inside and Dennis Rossier the previous owner taken in Gruyère, Switzerland, just after we landed on my first flight in the aeroplane. We then struck up a deal for me to purchase it. Dennis and I flew it back to the U.K. about two months later. That was last November (1986). Unfortunately I am still unable to fly it as the British CAA, and I cannot get enough information out of Italy for it to be accepted on the British register although I have been granted U.K. letters. These will be G-OWYN. I hope to do some filming and send to

you showing the similarity between the Nibbio and the Falco. The basic needs on this airplane is a paint job. The airplane is in excellent condition with 550 hours total time.

John Wynn  
Cambridge, England

*We printed a photo of this Nibbio in our last builder letter.—Alfred Scott*