Falco Builders Letter

Jim DeAngelo Flies

Jim DeAngelo had planned to make his first flight on June 15, the thirtieth anniversary of the first flight of the Falco, but bad weather kept his inspector from arriving in time. This caused a delay of a few days, and Jim flew his Falco on June 19. The Falco has a 160 hp IO-320-B1A engine and weighs in at 1,237 lbs. The first flight was for about 1/2 hour. The right wing was heavy, which has since been corrected with a trim tab. The voltage regulator was faulty and has been replaced.

Jim flew his Falco for the first 25 hours in a semi-stripped condition. No fairings were installed, and the cockpit was stripped bare for inspection. The right seat, center console covers, luggage compartment floor and aft bulkhead were all out of the plane during these flights. This is really a very sensible idea, as Jim was able to check things out with ease. On one early flight, he noticed that one of the fittings in his fuel system was slightly wet, so he just grabbed a wrench and tightened up the fitting in flight. A

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Karl Hansen Flies

Karl Hansen flew his Falco on July 23. All plans had been made to fly off the required 25 hours, paint the Falco, and bring it to Oshkosh. Two things prevented this from happening. One of our suppliers, despite numerous calls to stress the urgency of getting the last few parts made, simply let us down, and Karl spent valuable time making the same

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In This Issue:

The Chilean Air Force Falco Flies

While at Oshkosh, we received a call in Richmond from Santiago, Chile, advising us that the Chilean Air Force had recently flown their Falco. I have no information other than that and am hoping for additional information.

The Chilean Air Force began work on the Falco in June 1981. They wanted everything right away, and I—grossly underestimating the amount of work left to do—thought I could do it all in short order. It was then that I adopted the work schedule of nights-and-weekends that still goes on.

The Falco was built by a small team of men working under Capt. Bragheto at the Il Bosque base near Santiago. The project had a number of interruptions. The delay in shipping many of our kits caused part of this. The other delay was caused by the loss of a number of kits in shipment. The Chilean Air Force has a highly computerized procurement system which requires a requisition number

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Jim DeAngelo

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few days later, he found his aft fuselage filled with fuel due to another loose fitting.

On the early flights, Jim found his Falco would indicate 150 kts at 3,500 feet and 23"/2300. He reports that he will true out at 185 mph at 23"/2300 at 9000 feet. Jim has flown his Falco to 15,000 feet, and it was still climbing at 500 fpm and would indicate 110 kts. On this flight, Jim noticed that his ailerons looked "puffy", and the fabric was depressed between the ribs when he landed. He then remembered that he had not installed any pressure relief holes in the ailerons. Jim has since drilled a few holes, and reports that the fabric did not pull loose.

Asked about his Falco, Jim says "The airplane will live up to your expectations. It's a magnificent machine... a true airplane. The more you're in it, the more you enjoy it. It does shine when you get up high; it's a different airplane."

(Several years ago when I flew my Falco to California, I noticed that the Falco had remarkable performance at altitude. All of the airplanes that I had flown before seemed to become lethargic above 10,000 feet, and the performance would deteriorate dramatically. With my Falco, I did not notice the same kind of performance degradation I had seen in other aircraft. On that flight, I saw nearly the same indicated airspeeds at 12,000 feet that I did at 8,000 feet, and with my carbureted engine I always have the throttle fully open. I've never really understood this phenomenon, and I haven't mentioned it before since it sounds like black magic. Now that a number of Falcos are flying, the builders have noticed the same thing. For whatever reason, the Falco seems to be much happier at higher altitudes than most airplanes.)

Jim DeAngelo's Falco, N684JD, has a Nustrini canopy and is painted in the Modena paint scheme, with blue and black stripes on white overall using Imron paint. The interior is an attractive blue hound's tooth fabric. I haven't flown in the Falco yet, but Jim and others report that it handles nicely. The noise level is low, and Jim reports that he flies without headphones or ear plugs quite often. Jim has had some problem with the reception of his navigation radios, so he took his Falco to a local radio shop who tested the antennas and found that they pegged the needles in all quadrants. The technician went back into the shop and told his associates "See that airplane out there that doesn't have any antennas... it's got perfect reception!" The problem turned out to be in the connectors on the back of the VOR indicator head.

Beginning as a mechanic for the USAF many years ago, Jim has been flying for 20 years and had previously built a Stolp Acroduster. Jim owns a bakery in Wallingford, Connecticut, where he and his wife, Anita, live. Jim had not been looking for another project, but when he saw the Falco he was hooked. Jim began his Falco project in May 1981, and built the Falco in a nine-foot wide garage. He had to extend the garage 10 feet aft and another 10 feet on one side to accommodate the Falco. Jim used all available kits and will tell anyone who will listen that his attitude is "If someone else makes it, buy it." Jim's shop was incredibly cramped, and it is amazing that he was able to build the Falco in such a small space. Indeed, the first time Jim was able to look at the entire airplane was when it was assembled just prior to its first flight. In the shop, the tail section was effectively in a separate room!

Jim has been flying his Falco regularly and by late August had accumulated over 50 hours. The Falco is based at the Meriden-Markam airport just south of Hartford. Jim brought it to Oshkosh and will be attending various airshows this fall, so be sure to have a look if you get the chance. It's a lovely Falco!

—Alfred Scott

Karl Hansen

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parts. The other problem was that the painting was to be done professionally. After the primer coat went on, Karl broke out the sandpaper and passed it around. At this point, the paint shop informed Karl that they really only taped and sprayed—sanding they didn't do. Since he wanted it just right, Karl pulled the Falco out of the shop and decided to give up on making Oshkosh.

Since Oshkosh, Karl has been flying off the remaining required hours while sanding things out. The Falco came in at 1,190 lbs empty, and N805SH has the Nustrini canopy and a 160 hp IO-320-B1A. The Falco is going to be painted in the first couple of weeks of September. The paint scheme will be the same red and white scheme pictured in our advertisement.

Karl Hansen is a retired USAF pilot and has been invited to bring his Falco to a show at Beale AFB, home of the SR-71 Blackbirds. He hopes to get a few photos of the Falco with a Blackbird—it should make an interesting picture.

While I've only seen photographs of it, Karl's Falco is my candidate for the Falco most likely to win awards at airshows. The instrument panel has a full stack of King radios and an autopilot. His Falco has the Nustrini canopy—beats me how a big guy like Karl can fit in it, but he does. The upholstery is extremely elegant, particularly the seats. The fabric and carpet are simple and plain, but the overall effect is just right. Karl is going to get very tired of trying to convince people that his Falco really is a homebuilt aircraft.

Perhaps the most impressive thing about this Falco is that Karl, a first time builder, built the Falco in one year and eleven months. Karl used all of the kits, except that he built his fuselage frames using the "bare bones" laminations kit. Since he is retired, Karl spent much of his time in the shop working on the Falco, but there were always interruptions, vacations and hunting trips so he averaged about 20 hours a week. Karl encountered relatively little difficulty in building the Falco, but admits that he spent about four hours of "think time" for every hour of actual work. Karl's son, Steve Hansen, is a partner in the Falco, and Steve did much of the wiring. Brother Don Hansen helped out occasionally, but Karl really did most of the work. When he started the Falco, Karl was talking about building two Falcos—one for himself and one for Steve—but when asked about his plans now, Karl says "That's like asking a woman who's just had a baby when she is going to have another!" But he readily admits that he could do it again much quicker.

When Karl talks about the Falco, the word that most often comes up is "sculpture", and he says that the Falco is really a sculpture in wood. Karl is very pleased with the Falco—before he flew it, he had never flown in a Falco, so he did not exactly know what to expect. Many ex-military pilots have reported that the Falco's handling is nearly-identical to that of a T-33, and Karl confirms this. The Falco has flown well from the beginning. It will indicate 150 kts at 23"/2300 and 165 kts at 25"/2500. This is without a nose gear door or wheel well doors, both of which he plans to install.

At Oshkosh, Karl told me he had already had his first "forced landing". In fact, he had a clogged injector nozzle so the engine was running on only three cylinders. He landed the Falco quickly and planned to clean out the fuel system before flying it again. Renato Cairo says that at General Avia the procedure is to put some fuel in the tanks, then use the electric fuel pump to circulate the fuel back to the tank. This they do by disconnecting the fuel line from the engine and adding a hose which dumps the fuel back in the tank. After some of this, the fuel strainer is checked and cleaned. The process is repeated until no debris is found in the fuel strainer.

Karl Hansen hails from Roseville, California, which is near Sacramento. He retired from the USAF in 1969, following his last five years of service as a Lockheed EC-121 Super Connie pilot in the Vietnam area. He had been flying his own Cessna 175, which has now been taken over by his son. Karl's only previous experience was in building model airplanes, and he found the Falco not too much different except for working to a much larger scale. Congratulations, Karl, for a beautiful "red Eyetalian machine"!

Chilean Air Force

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and purchase order number. Unfortunately, the original purchase order was not given a number, so the system broke down and shipped parts did not have the paperwork to automatically tell the clerks where to ship the parts. Fortunately, the lost parts were eventually discovered in a warehouse in Washington.

The Chileans have a long history of aviation innovations, almost all of which escape the notice of us in the U.S. (We seem to have an extreme case of tunnel-vision; after all, how many of you had heard of the Falco before we started to sell the design?) The Chileans, for example, were the first to convert the old radial engine Sikorsky helicopters to turbine engines.

Like all countries, Chile is interested in developing its own aviation industry. Many countries have tried this, with varied success. The least successful have been indigenous designs, which usually result in average airplanes designed and produced at enormous cost. The Finnish Valmet Leko trainer, for example, is a fixed gear 200 hp trainer that is vastly inferior to the Falco yet costs the government of Finland $365,000.00 per aircraft. For the price of the Falco plans, the Chilean Air Force got an unheard-of low cost for the design, bettered only by the Taiwanese who never paid Pazmany for his plans.

The most successful program has been in Brazil, and the government-funded-but-now-private-and-profitable Embraer built Piper aircraft from kits supplied from the U.S. Chile has adopted the same strategy, license building from kits four aircraft. These are the Pillan trainer (a tandem design made mainly from Piper components), the Falco and two designs from CASA in Spain. Of these, the Falco is easily the least expensive, and at the time the project was begun, it was envisioned that the Falco would be used as an acrobatic trainer and for sale to the Chilean Aero Clubs. I am hopeful that the Chilean Air Force will build additional Falcos, a decision I don't expect to be made soon. I suspect that the Falco will undergo an extensive evaluation by all potential users of the aircraft.

Tony Bingelis Flies

Tony flew his "Flea Market Falco" on Saturday, August 31. His Falco, N84TX, weighed in at 1,176 lbs. Tony has the Nustrini canopy, and his first priority is to lower the seats. Tony used some modified Cessna seats, and he needs more headroom than he presently has.

The performance of Tony's Falco is right in line with the rest of the 160 hp IO-320-B1A engined Falcos. At 3,500' and 85°F he indicates 179 mph at 25"/2500. So far, Tony has about 3 hours on the Falco and is seeing 160, 170 and 180 mph indicated. He says "In the air, it's a joy...a nice little miniature fighter". The engine temperatures are right where they should be.

Tony's Falco is painted white with a red, black and gold stripe down the side in a slight variation of the Modena paint scheme. The Falco is painted with acrylic lacquer, which Tony said he didn't want to use, but it was the only paint that he was able to use with his available painting room (his driveway). Tony made his own cowling and confesses that his Falco is "the nicest Falco I have seen".

Tony has been flying homebuilts for a long time, having built two Emeraudes. The Emeraude has nice handling, so Tony said he felt right at home with the Falco, except that he is not used to seeing the high speeds on his airspeed indicator. Tony has found the Falco a mild airplane for approach to landing and that it lands a lot like his Emeraude. One wing has been "heavy", but Tony found that the problem was actually that he needed some right rudder trim. While he likes the Falco in the air, Tony has a few gripes about the airplane "in the hangar", since he still has a few little details to fix. The right shock absorber is not holding pressure, and we both suspect a poor seal at the base of the Schrader valve. Tony taped two stall strips in place on the wing, and one of them has already departed the airplane. He plans to fine-tune the location of the stall strips before installing them permanently. For some reason, Tony reports that his feet are hot in his Falco. This is not a complaint I have heard from others, and Tony plans to move the exhaust pipe out about an inch, since the left exhaust pipe is making a noticeably darkened area on the bottom of the fuselage. He is also having some trouble with his governor, and he is planning to replace the one he has now.

Tony Bingelis is well-known to most Falco builders, if only for his monthly column in Sport Aviation. The Falco is Tony's sixth homebuilt aircraft. Tony was one of our earliest Falco builders having purchased the sixth set of plans sold for the Falco way back in May of 1979. As such, Tony is a veteran of the early plans woes and is one of those builders who learned all of the hard lessons most of you take for granted now. Tony and Morine Bingelis live in Austin, Texas, and I suspect that Tony will be flying his Falco to a number of local air shows. A few years ago, a skeptical friend doubted that Tony was building a 200 mph airplane and as a consequence of the argument Tony signed a piece of paper saying he would burn his Falco if it would not go 200 mph. But Tony is also quick to point out that he never said when he would burn the Falco! On a cool day, I suspect Tony could take care of that bet now, and especially if he does some little cleanup work and installs doors on all of the gear.

Congratulations, Tony... it's been a long hard road for you, but I hope the Falco makes it all worth while.

Oshkosh '85

Every year the EAA announces during the show that Oshkosh has set a new record for attendance, leading cynics to conclude that the press releases are written in advance and released whether they were true or not. Last year saw a drop in attendance, and the usual press announcements were met with cries of derision from a disbelieving press. This year was one of those years when the prepared press releases would have been right on the money. Whether it was the good weather or the Concorde, there is little doubt that the show drew record—nay smothering—crowds. It would appear that the only thing that would draw bigger crowds would be the SR-71 Blackbird, something the EAA is reported to be working on. I would endure any crowd to see that thing fly, but there are real technical problems in the way. For example, the SR-71 takes off with very little fuel and must be refueled by an airborne tanker within ten minutes.

But for the Falco builders there, Oshkosh '85 will always be remembered as the year that Mr. Frati first came to Oshkosh. Mr. Frati and Renato Cairo arrived in Chicago on Friday afternoon, having flown nonstop from Frankfurt, Germany. The plan was to meet them with an SF.260 and a Falco and fly them to Oshkosh. Jim DeAngelo and Homer Woodard were the chosen pilots, but weather prevented Jim from arriving in time, so Homer picked them up in an unmentionable spam can!

It took Mr. Frati a few days to recover from jet-lag, but as the week went by, he became more comfortable as he got to know more people. For those of you who did not come, you missed something rather special, and I'll try to relate some of my impressions. (English builders can watch the pages of *Pilot* for a far more entertaining account from Steve Wilkinson, whose writing style is an elegant verbal waltz that I can't approach—but we will reprint his piece on Mr. Frati in the next builder letter.)

As Renato Cairo said "There are only two things in Mr. Frati's life: work and airplanes... and they are the same thing". No one seems to be able to remember when Mr. Frati last took a vacation; indeed, he seems more comfortable in his work than anywhere else. He is a quiet, shy and unassuming man who spends most of his time at his office in an industrial suburb of Milan (some distance from an airport) where his aircraft are built. Mr. Frati showed me a photo of the Canguro with members of his company posing with the aircraft, then pointing to the group said "My family". This is a revealing remark, since most of those who work there have been with Mr. Frati for years, and there is a sense of devotion, respect and affection for Mr. Frati that I sensed was the primary reason they were all there.

General Avia is a unique company and a type of institution that exists only in Italy. While all major U.S. companies have their own research and design divisions, Italian companies frequently share the same independent design-and-prototype firms. Pininfarina, Bertone, Giugiaro and other such firms design cars for any company who hires them. They design the car and build the prototype, and then the factory takes on the production. With automobiles, this type of design work is almost always contracted for in advance. For example, Fiat may hire Pininfarina to design a small four seat car, whose specifications are spelled out by Fiat. General Avia—the only independent aircraft company in Italy, where all others are state owned—does not design aircraft that others want. Mr. Frati and his band will listen politely to anyone, but money alone does not cause them to design an airplane.

What happens is that Mr. Frati and his team begin to conceive of an airplane which they think is needed. The design progresses on the drawing board in the preliminary stages, during which time it may be shown to interested companies. When they "come to believe in the design, General Avia builds the aircraft." When I told Cairo that many people were curious as to how they could finance such an operation, he replied with a smile and his dark eyes flashing "You should just tell people that we are crazy!"

At that point the construction begins. Like all such work, there are preliminary drawings that must be done, but as the construction progresses, the traditional process breaks down. Mr. Frati spends much of his time in the shop working with Renato Cairo who is in charge of the shop and all construction. The design exists in Mr. Frati's mind as much as on paper, and little details and changes are worked out in the shop as often as on the drawing board. Through all of this, Mr. Macabruni and his team of draftsmen follow the progress and note the changes, at times even photographing the parts made. Most designers work exclusively at the drawing board, and Mr. Frati's method of working is unique and is possible only with a crew of people who have long worked together.

There are many impressions that people have of Mr. Frati that are entirely untrue. I told Mr. Frati of the reputation he had of being somewhat unapproachable—the man who was as famous for not replying to a letter as he was for his fast, beautiful airplanes. He listened in complete disbelief, amazement and laughter.

Others view Mr. Frati as passionately interested in speed. After walking the flight line at Oshkosh and viewing with dismay the small wings and tail surfaces of the many hot little airplanes, Mr. Frati and Cairo got into a long discussion, ending with Cairo explaining to me that Mr. Frati never designed or wanted to design such "racing" aircraft. His aircraft are always intended to be flown by the average pilot, thus they have more generous tail and wing surface areas—balanced designs rather than extreme ones. You had a sense he didn't even approve of such designs except in such limited cases as A. J. Smith's racer built for his own use (which A. J. told us he'd flown to 300 kts indicated in a test dive).

But the view of Mr. Frati's passion for the elegant design is a correct perception. He wanted to know why I had not painted my Falco (sorry, I haven't the time) and told my wife, Meredith, that if he had a paint can and a brush, he would paint it himself! Meredith is fluent in French as is Mr. Frati, so they got along well. Passing one crude homebuilt Mr. Frati said something that Meredith could not understand, then she realized he was speaking English, and the word was "Rotten!"

Then during an airshow, when all of the guys who never went to war re-enacted the "glory" of bombing and the air reeked of the smell of cordite, Meredith asked Mr. Frati if he didn't find this exciting. He replied that this meant a different thing to him than it did to her, since he remembered when these same planes were dropping bombs on him in Milan, and once the building he was in was bombed and a wall destroyed. The bombing in Milan was very heavy and effective, and Mr. Frati was among those in the city.

As you know, the dress at Oshkosh is always informal—some people don't even wear shirts—but it took some talking to persuade Mr. Frati that a coat and tie were not essential. He only made it for one day and wore at least a necktie for the rest of the show, but he felt more comfortable in that dress. He also commented on the number of flags he saw flying at businesses and in front of homes, a custom he said that Europeans had lost.

Mr. Frati got his first look at a homebuilt Falco early one morning at the Appleton airport. For two days, Jim DeAngelo was unable to land at Oshkosh—the field was closed to arriving traffic since all parking spaces were filled. I didn't see it, but Brenda Avery said that Mr. Frati had an almost childlike look of wonder as he first saw the Falco, a design he'd created thirty years before and which had just recently been built in a lovelier form than ever before. He grabbed the wing tip and shook it, promptly breaking the plexiglas wing tip light cover. If it had been anyone else Jim DeAngelo would have reached for his shooting iron and wasted the offender on the spot, but instead he turned to Anita and said with a smile "Mr. Frati just broke my Falco!" In this day of designer jeans and sunglasses with their "Design by ..." labels, only Jim DeAngelo can—with considerable pride and affection—use the label "Broken by Frati".

Larry Wohlers brought his Falco to Oshkosh and gave Mr. Frati a tour of his airplane. Larry now has about 200 hours on his plane. Larry's Falco weighs in at 1,146 lbs, still the lightest Falco yet built. Larry usually cruises at low power settings, but still indicates 180 mph at 23"/2450. Flat out, it will indicate 202 mph, but he's never bothered to figure out what the true airspeed is—it's fast enough for him. Larry says "I fly with some Bonanzas, and you can get away from them pretty easy."

I think Mr. Frati was unprepared for the reception given to him by Falco builders and others who admire him. He spent the week signing autographs and accepting compliments, and always with a graceful and appreciative nod of the head. There was a genuine feeling of affection as well as respect. Other designers when they realized that this was "*The* Stelio Frati" would get slightly wide-eyed and ask for an introduction.

On Sunday night, *Flying* magazine had a party to which we were invited. Nigel Moll, executive editor, has been in love with Frati aircraft since his first flight in an SF.260 at the age of 14. During dinner, Mr. Frati, Renato Cairo, Nigel Moll and I had a long talk while poor Brenda Avery bravely kept the headphone salesmen at the same table from butting in—"Say, you from It-ly?"

The questions were largely technical. On composites, Mr. Frati's is not enamoured and thinks they should be used for secondary structure. He has used composites for decades and noted how Boeing, Lockheed and other major airframe companies used composites. He did not see entire airplanes being built of the material, except for a few experimental research aircraft.

Of the Voyager, he thought the aircraft a fantastic thing, but observed that his experience was that technology progressed in small incremental improvements—and the Voyager was a giant step forward entailing too many risks and too many unknowns for him.

Nigel asked Mr. Frati which of his designs were his favorites. Mr. Frati immediately said "Falco" and then started to think of what the other four would be. Then, after some thinking and discussion with Cairo, named them in chronological order: Rondone, Trento, Falco, SF.260 and Delphino. All of them basically two-seat aircraft. The next evening, Steve Wilkinson asked Mr. Frati similarly to name his favorite designs, and Mr. Frati replied "It is hard for a designer not to be proudest of the airplane that has sold in the largest numbers, so the SF.260. But then there is the Falco...."

Throughout the week, many questions were put to Mr. Frati. As Mr. Frati speaks little English, Renato Cairo served as interpreter. Cairo's English is excellent, and with many questions Cairo would simply give the answer without translating the question to Mr. Frati. Remember, Cairo has worked with Mr. Frati for many years and knows the construction and design of Mr. Frati's aircraft as well as Mr. Frati. Renato Cairo is a very impressive man, who handles himself well and can speak expertly on many subjects. I don't know if he has an engineering degree, but it is immaterial since he has attended the Stelio Frati school of design for many years and is as knowledgeable as most experienced aeronautical engineers. During the dinner with Nigel Moll, Nigel noticed something that I had failed to see: while Cairo did most of the talking, Mr. Frati listened carefully and would occasionally *correct Cairo's English.*

Nigel asked if they used computers in their design. The university at Milan has a Univac which they use occassionally for finite analysis, but that is all. Mr. Frati, in fact, still uses a slide rule.

When I was in Milan several years ago, I saw a number of drawings and models of aircraft that Mr. Frati had worked on, but which had never been built. There was a business jet, a high wing transport with two Fiat Topolinos inside, a Mosquito-like tandem bomber, a tandem SF.260-like trainer, and numerous two and four place piston singles. We asked Cairo to tell us about some of the Frati designs that had died still-born. Mr. Cairo replied that he would like to talk about one in particular, a design of about twelve years ago. The airplane was very similar in design to the Cessna Citation jet, but with two tractor turboprop engines—similar to the prop fan designs being talked about now as the wave of the future.

Nigel Moll asked if any of Mr. Frati's designs had been considered for production in the U.S. Mr. Frati said that one had, but he did not want to talk about it. Naturally, this sets everyone's minds going as to whether it was Beech, Piper, or Cessna. In fact, it was none of the major aircraft companies, and the whole thing is a matter of limited public record anyway for anyone with some old copies of *Jane's* and a little deduction. A number of years ago, Mr. Alexander Berger imported a few European designs under the Waco name. The SF.260 was the Waco Meteor; another Siai-Marchetti design and a French airplane were also imported and sold with a Waco name. Mr. Berger was President of Allied Aero, which owned Franklin engines. There was some discussion about installing a Franklin engine in the SF.260. Allied Aero purchased a license to build the F.15D Picchio, which was identical to the F.15E but with a 250 hp turbocharged Franklin 6AS-350 engine. Unfortunately, Mr. Berger died suddenly just one week before the prototype flew, and the project was abandoned.

The Canguro has been built in three versions. The first had turbocharged Lycoming engines, which were subsequently replaced with Allison turboprops. General Avia also designed and

built a retractable gear version of the Canguro, working furiously to have the airplane ready for the Paris Air Show. The work was finished in time, and they were prepared to fly the airplane to Paris when the instructions arrived from Siai-Marchetti to disassemble the airplane, and load it on a truck for the trip—a decision, I sensed, that was not met with much pleasure at General Avia.

While the Canguro was designed and flew a number of years ago, it is only now approaching production at Siai-Marchetti. The Canguro was being considered by Federal Express, but Cessna won the contract with its Caravan in a close competition.

Mr. Frati's latest design is the Jet Squalus, a single-engine jet trainer being built for a consortium in Belgium. The airplane uses the same Garrett F109-GA-100 engine used in the new USAF trainer. This engine delivers 1,330 lbs of thrust. They are also considering a 1,500 lb-thrust Williams Research engine. The Jet Squalus is a utilitarian design with simple construction designed for low maintenance. The Jet Squalus has two seats side-by-side. Some of you may have seen an article in *Flight International* with a three-view of the plane—unfortunately the drawing has only a passing resemblence to the Jet Squalus. Plans call for a shock-mounted wood skid down the center of the belly of the plane. This is for possible gear up landings, and this feature will likely be installed only on the prototype.

Mr. Frati also had with him a three view drawing of yet another new design that is in the consideration stage, of which I will say little except that it is something of a larger Canguro.

On Tuesday afternoon, the EAA conducted their "manufacturer's showcase" in which kit manufacturers were invited to fly their designs. Jim DeAngelo flew his Falco with Mr. Frati in the right seat. Mr. Frati was installed in the Falco amid a nervous circle of camera-clicking Falco builders. One of Jim's mottos is "you don't push" and prefers to check everything out and fly at moderate power settings. Even after some 30 hours of flying his Falco, Jim throttled back and cruised around the pattern. Jim is the son of an Italian immigrant, and while Jim never learned Italian he has all of the arm-waving head-bobbing shoulder-shrugging and combination of English and Italian words that allow him to communicate nevertheless. After the flight, Jim reported that the flight had been an arm-flailing affair between him and Mr. Frati, with Mr. Frati gesturing for high rpm and full power, and Jim trying to explain his conservative you-don't-push philosophy with hand language.

For Jim it was difficult to hide the emotion, and he was rather choked up and misty-eyed after the flight. He later said that the three most special aviation events of his life were the first flight of his Acroduster, the first flight of his Falco and the ride around the patch with Mr. Frati at Oshkosh. He could not express why it affected him so—it just did.

The dinner on Tuesday night was a lovely, warm affair. It was not so much a Falco Builders Dinner as it was a Stelio Frati Appreciation Night. In all, there were 102 people at the dinner, and we gathered at our private bar and rattled at the mouth at each other. Nigel Moll handled the introduction of Mr. Frati, and Mr. Frati was greeted with a standing ovation from all present. We didn't have the usual how-I'm-doing-on-my-Falco talks. Frank Sanders was there and is forming a five plane aerobatic team of SF.260, but I suppose he is not ready to give up his Sea Fury yet. In one of the funnier moments of the evening, Tony Bingelis said that Mr. Frati must be a very brave man "for riding in a homemade airplane built by an Italian baker who can't even speak Italian." You had to be there. Steve Wilkinson asked Mr. Frati how it felt to ride in a homebuilt Falco thirty years after it was first designed, and Mr. Frati said it was just like the first time he flew in the Falco prototype.

Mr. Frati gave me a silver tray in appreciation for the work I have done on the Falco. It has a drawing of the Falco on it along with an inscription, and it has already been put to good use in our house. I had intended to do something similar for Mr. Frati, but in the rush of preparing for Oshkosh it had been overlooked. Frank Strickler, whose Fox 51 Ltd. imports the SF.260, presented Mr. Frati with a drawing of the SF.260 which had been signed by all of the SF.260 owners.

We gave out the Compasso d'Oro decals to Jim DeAngelo and Karl Hansen. (Jimmy Shaw did not make it to Oshkosh, and John Harns arrived the following day due to some problems with his brake system.) Mr. Moretti, marketing director of Agusta, was there and served as interpreter for a short, eloquent speech Mr. Frati made. I don't remember all that Mr. Frati said, but his opening line was "I am so happy to be in the country of the first flight and the moon walk." He went on to say how he had read about Oshkosh for many years, but he was overwhelmed by the show. He was pleased to see the homebuilt Falcos and to meet everyone involved with the Falco and the SF.260, and he thanked everyone for the kind welcome given to him.

I hope Mr. Frati enjoyed coming to Oshkosh as much as everyone else enjoyed his visit. My only regret is that we did not have more Falcos for Mr. Frati to see. At this time, eight Falcos have flown that have been built from our plans, and two more should fly very shortly. Next year, we should have a dozen or so there if everyone comes. When the week began, Mr. Frati and Renato Cairo stayed in tight formation, but as the week progressed, Mr. Frati took to wandering the flight line with Falco builders and others that he had gotten to know. I began the week thinking that this was probably going to be the only time that Stelio Frati would ever come to Oshkosh, but at the end of the week I had the feeling that Mr. Frati's "family" had grown a little larger and that he might come again. I know I speak for all of you when I say thank you, Mr. Frati, for coming, and we all hope you will return soon.

Flying John Harns Falco

John and Pat Harns planned to arrive on Monday night, but the brake system developed some problems, so John elected to fix the problem before bringing the Falco to the world's busiest airport. From the beginning, John's brakes were soft, and they got softer and softer with time. Before Oshkosh, John and Pat had flown to Jacksonville, Florida, and were on their way home to Idaho when they came by Oshkosh. At that time, John had about 50 hours on his Falco.

John attributed his problems to the nylon tubing used in the brake system. It sounded more like air in the lines to me, but John assured me that he had bled the lines a number of times, and this did not cure the problem. He replaced the nylon tubing with Aeroquip hose, and the brakes were fine. I still can't accept that nylon lines are to blame. Larry Wohlers has used them on his Falco as have all other builders. Most homebuilt aircraft at Oshkosh use nylon for the brake lines, and these aircraft had not had the same problem. John purchased Weatherhead nylon tubing, a brand I am not familiar with. He said you could feel the tubing expand when you pressed on the brake pedals. I've talked this problem over with a number of people, and the only explanation that I can come up with is that John ordered nylon tubing and received polyethylene tubing by mistake. Polyethylene tubing is not nearly as strong as nylon and would behave exactly as he reported.

John and Pat finally arrived Wednesday night and thus missed meeting Mr. Frati. Much of the flight to Florida and back had been IFR. Even though he used polyurethane paint, there were occasional places on the leading edge where the paint had flaked off—though not to the extent as on "The Corporate Disgrace". John and I flew his Falco down to Oshkosh on Thursday morning and played around with it a little.

John's Falco is very nicely finished and flies well. He has no drain holes in the bottom of the wing, tail or fuselage so the bottom of the plane is very smooth. In the past few days, the Falco had been through all kinds of weather, and I found about an inch of water standing in the bottom of the fuselage under the luggage compartment (I felt in the wing and found it dry). I don't know how the water got in there, but it was there just as big as life. I think drain holes in the bottom of the fuselage are a must item, particularly after seeing that little puddle.

John's Falco has the standard canopy, and I was comfortable in it (I am 6' 2"), but it still did not have all of the headroom possible since John used some automotive seat tracks which are not as compact vertically as ours. For John and Pat, the headroom is fine, and that is all that really matters.

This was my second ride in a homebuilt Falco, and it's always a pleasant surprise to feel the acceleration of the airplane on takeoff. My old Falco is very slow on the roll due to the fixed pitch prop, but with the 160 hp engine and constant speed prop the Falco charges right down the runway and is into the air in short order.

John is still having trouble with his landing gear motor circuit breaker popping on gear retraction. He is the only one who is having this problem, and I attribute it to friction and lubrication. John had replaced the grease on the screwjacks with an oil with Teflon in it. This cured the problem for a while. I think the problem reappeared when the oil was squeezed out by the loads on the screwjacks. Karl Hansen is using a Shell grease with molybdenum-disulfide in it, which has worked well. Another possibility, suggested by Dave Bowen, is to try Phil Wood grease. This is a lightweight waterproof grease used for racing bicycle axles. Dave used to own a bicycle shop, and it is very important for cyclists that the friction be the lowest possible.

With the gear up, we circled around the field waiting for John and Midge Oliver to take off in their Piper Archer. As there was some delay, we took the opportunity to feel the airplane out and do a few rolls. John's Falco flies very nicely, and the controls are silky smooth. What else can I tell you? It's a Falco, and all Falcos handle basically the same when it comes to control pressures and response. I did notice that the rate of roll was slightly less than my Falco's, and I understand that Jim DeAngelo's is the same. Maybe I am missing something, but I still attribute this to the gap in front of the aileron. There is nothing wrong with keeping the gap smaller, but there is a trade-off between cruising speed and rate of roll. Even so, I would not get terribly concerned about this. Most of the rolls you do in a Falco are only with partial aileron anyway. John was happy with the rate of roll.

I don't remember paying too much attention to the speeds, but John mentioned that the Falco seemed to be getting slower on the trip. I doubt that this is the case, and suspect instead some degradation of the pitot-static system. A little water in the pitot line could have the same effect. Before Oshkosh, John had done some air-to-air photography of his Falco. A friend had a Glasair, supposedly a 220 mph airplane, and John said they were the same speed.

John and Midge Oliver finally broke ground, and we closed in on them quickly. John passed underneath them, and then when we were a safe distance ahead rolled the Falco. After John turned back to Oshkosh, I remembered that I had told Midge that we would fly along side so they could take a few pictures so we circled back and stalked the Olivers again.

I have flown some formation flights and can attest that it is a difficult thing to do. John, with his Navy training in F.14's, made it look easy. He pulled up next to their left wing and held it there as solidly as parking one car next to another. The Olivers hadn't seen us, so we hung off their wing tip for a moment or two until John—with a considerable start—spotted us. Midge dove into a pile of luggage for the camera but couldn't find it, so we peeled off for Oshkosh.

The most striking difference between my Falco and John's is the comfort and feeling of riding in it. It's a totally different feeling. With the one-piece bubble canopy, there is a greater feeling of airy roominess. The interior, seats and instrument panel all felt and looked better. The real luxury is the low noise and vibration level. When I flew in Dave Aronson's Falco, I didn't spend too much time noticing the noise level, which was also low, but John's is—if anything—slightly quieter. There is no hiss from air leaking around the canopy. The noise is a low frequency, hollow sound from the exhaust reverberating under the canopy. The bark of the exhaust pipes varies with the power setting. At normal cruise settings, you could get along without a headset or ear plugs, but I would always opt for some ear protection. At low power settings, the noise level is comfortably low. I flew in my brother's A36 Bonanza several weeks later, and it was even quieter than John's Falco, so we still have some room for improvement.

For an airplane that once had the reputation for high noise levels, this is quite an improvement. Most builders, like John, will be satisfied with the noise level that he now has. To further improve things, you really have only two choices. One is to add a muffler, which would rob power and speed. I don't think many Falco builders would want that; in fact, most prefer the distinctive sound the engine makes to those on the ground. The other alternative is to improve the soundproofing. Once you have done the basic measures of installing sound-deadening foam on the aft face of the firewall frame and on the inside of the fuselage side walls, and after stuffing the exhaust port with Fiberfax insulation and sound-deadening foam, you have to locate the source of the noise before adding more insulation. This cannot be done by ear. Instead, you must purchase a sound pressure meter, and Radio Shack sells one for about $35.00. With this meter, you can locate the source of the noise with real precision. Once you find a "hot spot" you can add insulation and repeat the test. So far, I haven't been able to get anyone to go to this trouble, but I think it is worth doing and that the Falco can be made substantially quieter as a result. To quantify such work, you should first note the sound levels using the dbA scale with the meter at ear level and also note the engine power settings.

We landed at Oshkosh and so ended a short, pleasant flight in John's Falco. It's clear to me that the homebuilt Falcos are turning out to be exactly what we have been working on. Those areas of improvement that were needed on the original airplanes have now been done, and the improvements have been effective. The differences between one kit-built Falco and another are going to be largely in appearance—the paint scheme, level of finish, upholstery, etc. Everyone is getting good, respectable speeds, and the attainment of Nustrini-like speeds will only come with full gear doors and little refinements.

Goings On at Sequoia Aircraft

As always, a good portion of the summer is taken up by Oshkosh. This includes the preparations for the show, the show itself, and a few lost weeks after the show is over. The show is so exhausting that it takes a few weeks to recover and get back up to speed.

The new construction manual seems to be doing the job. Most builders report that they spend from 3 to 4 hours of "think time" for each hour of construction time. Builders also report that having done something, they could do it again in a fraction of the time. For example, one builder reported that he took about 2 months to build the right aileron and flap and only one week for the left. The purpose of the manual is to get all of these lessons down on paper so that builders can do things in the most logical and easiest fashion.

The process of writing the manual is one that takes place in stages. After talking to builders about how they did things and what problems they encountered, I then write a section of the manual. Then, this portion of the manual is released to a few builders who are working on that section, and they follow the manual and report back with suggestions for improvements. Steve Wilkinson and Jonas Dovydenas were the first to use the section on the tail group. Their progress was good, but there were points of confusion. Using their comments, I revised the manual and did a series of illustrations to make things clear. Jim Slaton has been the first to use the latest version, and he reports that the construction of the tail group went smoothly and without any real problems. He was able to build the entire tail group in about a month. Jim did not find that he was wasting time as earlier builders did with "think time".

There have been several milestone Falco builders: Larry Wohlers who built the first homebuilt Falco, Dave Aronson who finished the first kit-built Falco, and Karl Hansen who is the fastest builder so far. Jim Slaton is my candidate for the next milestone. If he can keep up the pace, and if I can keep ahead of him with the manual, I think he'll beat Karl's completion time handily. It's going to be a year of hard work, but when it's over, we should have made a giant step in speeding up the construction of the Falco.

For those of you who have been waiting until we got some Falcos flying and completed the construction manual, you have run out of excuses! You can now start the construction of the tail group and proceed. I don't think you can catch me now.

I get a lot of questions about how long the Falco takes to build, and I don't like to answer the question. I don't think there is a good answer to the question, nor do I think it is important. Most of the quoted building times for homebuilt airplanes are hopelessly optimistic, and some are outright lies. The notion of an instant airplane is a silly idea—there is no such thing. From talking to people behind the scenes at Oshkosh, I have concluded that all of the kit-built airplanes take roughly the same amount of time, which is to say that the average building times are about 2,500 hours, the fastest builders do it in 1,200 hours and some builders take 7,000 hours. It seems to be more a factor of the builder than the design, and I don't think choosing a plane for its quoted quick-build time is a good idea.

One thing seems to be indisputable. The kits and a good construction manual make all the difference. The engine installation of a homebuilt airplane is typically half of the construction time, and I think Karl Hansen only put in 3 or 4 weeks to do the engine installation, cowling installation, baffling installation and the rest of the work forward of the firewall. I can still knock some time off of this. The wiring, instrument panel and instrumentation are complex on the Falco, but they go together rather smoothly. The challenge now is to get the basic airframe assembly time down.

It is interesting to note the reaction of people at Oshkosh to the Falco. An awful lot of people regard the Falco as the best homebuilt airplane available. Many of the latest designs at Oshkosh compare themselves to the Falco—usually misquoting specifications and performance—but I take it as a compliment and good advertising for us. A lot of people wander into our booth who will never build an airplane, but it's common to overhear someone telling a friend "This is the one you want to build."

The other thing that happens is that people come into the booth and spend hours drooling over the airplane. They pore over the drawings, watch the slide show over and over, take pictures of the instrument panel, and just stare at the photographs of the Falco. They are hooked on the Falco, and it's nice to see people drool over your product like that.

We are now in the final process of completing the baffling kit. All parts are now made in final production form, and I still have a couple of weeks left riveting the parts together. We have had something of a snafu on the trim tab controls kit. I let our supply get too low, and there will be some delay on some of the parts. The biggest problem is with the cable, which was supposed to be shipped to us about a month ago but which has been delayed for reasons I don't understand.

During the next few months, the aviation magazines will begin to work on articles on the Falco. While I can suggest things to them, it is always their decision which airplane they want to photograph and fly. In addition, most magazines do not like advance word to get out about what they are going to have in their magazines. We plan to do an advertisement around Jim DeAngelo's Falco and later one around Karl Hansen's red machine.

I've had many comments that the Tool Talk and other tidbits of advice and technique have been very helpful for builders. I keep thinking we have exhausted the supply of new ideas, and then I get a flood of new things. Keep your cards and letters coming in—they are widely read and appreciated.

Construction Notes

I have done some work on the main landing gear wheel well doors. Those of you who have installed the doors have reported that the geometry of the linkage was difficult to figure out. Dave Aronson, John Harns and Jim DeAngelo all said they had to crank the gear up and down about 1,000 times to get things adjusted right. I thought this problem was going to take me months to solve, but I was able to work things out in a couple of days. Trial and error is not the way to install this linkage. It operates according to a few simple rules which will allow you to adjust the linkage quickly and accurately. I will be incorporating these details into the wing drawings, but if you are in a hurry, drop us a line for our Advanced Builder Memo on the subject.

I have also done some additional work on the nose wheel bay doors. These are clamshell doors which are installed on the bottom of the fuselage and cover up the opening between Sta. 1 and 3. The mechanism that we will be using is the same that Luciano Nustrini has on his Falco. I wrote Nustrini for some essential information, and he sent me all of the parts off his plane! We have an Advanced Builder Memo on this as well, and will be incorporating these details in the plans as soon as practical.

Builders who have been installing the Century 1 autopilot have had a clearance problem since there is a plug on the back of the gyro which hits the fuel tank. As a result, builders have had to move the instrument panel aft slightly, which causes problems of its own. Karl Hansen's Falco has the autopilot, and he was able to install it without moving the panel. Son Steve worked out something with the plug which I don't understand. He did something like "inverting the plug inside the case". Makes no sense to me, and I hope to get details on how this was done.

While I was at Oshkosh, I met Jan Gougeon of the Gougeon Brothers of WEST system epoxy fame. Jan is in charge of all testing. I asked him about using a fabric with the epoxy as a moisture protection layer, and he said he highly recommended it. For one thing, he said, a lightweight fiberglass cloth does not actually add any weight since it displaces the heavier epoxy resin. Additionally, with the fabric you get a consistent thickness of resin, something you have little control over with only epoxy on the wood. Obviously, you get additional protection from abrasion, but the main reason he likes the cloth is that is significantly stiffens the plywood.

For those of you who are flying, I have asked for information on the sublimating chemicals used by NASA to determine the extent of laminar flow. I plan to write up something about how to mix, apply and test your airplane. The chemical is applied to the wing and dries. You then go fly the airplane, and the chemical sublimates (same thing as evaporation except that it's a solid-to-gas conversion instead of liquid-to-gas) and clearly shows where laminar flow is taking place. This would be particularly helpful for those of you who fly your Falcos in primer initially. You could find out where you are tripping the air and turning it into turbulent flow. By far the largest amount of drag of an airplane is from the wing (50 to 60% I seem to remember) and with laminar flow the drag can be cut by 20%. This will have a huge effect on speed and is one of the reasons Nustrini's Falco is so fast.

I am working on the wing now and noticed that there is a possible simplification. On the drawing for fuselage frame No. 5, note that there are two 30x15 seat supports and one 20x15 member which is used to support the plywood skin on the inboard side of the wheel well bay. It seems simpler to me to make the inboard pair as one 60x15 piece, particularly if you are going to use the wheel well doors. There may be reasons to make this as two pieces of spruce, but they have not occurred to me yet.

When you order your engine, you should exercise great care to make sure you order the right model of engine. Jim Martin ordered an engine from Dick Waters and found it would not fit his engine mount. After investigating this, it seems to have been a matter of confused communication, but you should be very specific when you order an engine if you want to avoid a repeat of this problem.

With a number of Falcos flying, we can always use photographs of the airplanes, as well as construction shots. Most of you use color print film, but this is useless for publication work. For publication we need either a black and white print or a color slide. The best air-to-air shots are taken in the late afternoon or early morning when the shadows are long on the ground and the lighting is "warmer". Most such shots are taken with Kodachrome 25, which requires a fast lens, or Kodachrome 64. For air-to-air, you should use a 105mm lens and the photo plane should have a removable window or door. For ground shots, be careful to avoid a cluttered background of other planes and always have the sun at your back. In a typical photo session for a magazine, the photographer will shoot more than ten rolls of film. To get a really good shot, you have to use a lot of film. The large prints we had at Oshkosh were all made from Kodachrome 25 and 64 slides.

Questions & Answers

Q: The control cable fork does not fit the bottom of my control stick. What do I do?
A: I keep forgetting to mention this. When the sticks were made, the supplier missed the change in the drawing I did for the cable fork end. Ream the hole to .250"Ø and file to the thickness shown on the drawing. There isn't a lot of "meat" left on the bushing, but the loads are low, and it will be fine.

Q: It might just be time for a listing of the current "latest drawings"—so very many new sheets and changes were made since the last list was published. And, your construction manual, for which you could charge a fee.
A: The new plans index is effectively such a list, and we checked it very carefully. As for charging a fee for the new drawings and construction manual, this has been a difficult decision. I have decided to keep it free for the present. My reasons are that everyone should have the new drawings and the new manual—it would be difficult working with builders who had different information—and my hope is that the manuals and drawings will cut building times and get more Falco projects underway. In short, if you appreciate the support we give, you can support us by purchasing kits.

Q: The Aerolite I purchased had only very brief instructions on the label. Are there more complete instructions available?
A: Ciba-Geigy publishes their Instruction Sheet No. GR.3d, dated October 1982. You should be able to get this from Wicks or Aircraft Spruce or by writing to Ciba-Geigy Plastics and Additives Company, Duxford, Cambridge CB2 4QA, England. We will be adding this to the Falco Construction Manual in the near future. If you would like a copy, drop us a note and we can make one for you.

Sawdust

Sawdust is a little piece of wood, so what more appropriate title for a section of miscellaneous short items?

• Ray Purkiser has just moved his Falco to the airport and expects to fly in the next few weeks. A big rollout party is scheduled for September 21, and Ray wants to have the first flight done by then.

• Richard Brown has purchased Bret Miley's Falco project. As he is in the construction business, Mr. Brown made short work of retrieving the Falco. He took a large trailer to Big Piney, loaded the Falco and was home five days later. This gives him a big head start on the project, which he hopes to finish in record time.

• Kas Thomas's new book *The LPM Engine Operating Guide* was mentioned in the last builder letter. I now have a copy and can recommend it highly. Lots of useful information you won't find elsewhere. Every Falco builder should have a copy.

• Nothing to do with Falcos, but Steve Wilkinson's brother, Alec Wilkinson, is the author of a new book just released titled *Moonshine, A Life in Pursuit of White Liquor*. Reviewed in the latest issue of *Time*, the book is about a North Carolina revenue agent's life breaking up illegal stills. A wonderful story about a legendary and colorful personality, whose view of flounder is "I don't eat nothing with both eyes on the same side of the head".

• Nigel Moll's just-released *Oshkosh* is a photo essay of last year's Oshkosh airshow. Two pictures of Dave Aronson's Falco are included. If you have never been to Oshkosh, this book captures the essence of the show.

• In the news lately is Falco builder Vern Raburn who is President of Symantec, a new personal computer software company with a blockbuster artificial intelligence program expected out soon. Although a new company, the roster of people at Symantec reads like an All-American team of programmers and superstars of their field. Vern's expertise is as a businessman and in marketing, and thus does not fit the usual hacker mold. With Microsoft, he was in charge of bringing Multiplan to the market, and then did a repeat performance with Lotus 1-2-3, whose success is widely attributed to shrewd marketing.

• Between work on his Falco, Jonas Dovydenas has been doing some traveling—to Russia on one occasion and into Afghanistan on another. Entering through a mountain pass from Pakistan, he spent several days in the mountains with the rebels watching Russian planes bomb other rebels across the valley and taking photographs for an article on the war.

• The spring issue of *Wood News*, published by Highland Hardware includes the article "Sex and the Woodworker", George Frank's account of an affair he had in 1926 in France with an innkeeper's daughter. The only possible reference to wood is the handle on the knife the innkeeper used to threaten young Frank in case the daughter caught a disease he suspected Frank of having—instead Frank picked up a separate ailment from the young lady.

• More obnoxious than Oshkosh's worst case of mental dog-bite—those wild-eyed aviation Granola-heads who haunt our booth with suggestions for making the Falco out of paper and other similarly exotic materials—are the independent long distance salesmen who call on businesses. We get at least one call a week. We've finally found the perfect solution—when they call, Brenda just tells them that we don't have a telephone and hangs up.

• The Fifth Annual World's Only Oyster Fly-In and Gathering of Stelio Frati Aircraft takes place on Saturday, November 2 at Rosegill Farm Airstrip, Urbanna, Virginia. New features this year include Jim DeAngelo's FIRST EVER ATTEMPTED ITALIAN OYSTER ROLL, a unique combination of Falco acrobatics, pasta and live oysters guaranteed to thrill all who are courageous enough to watch—Falco acrobatics you can sink you teeth into. As always, the airshow will include PARKE SMITH & HIS AMAZING INVERTED OYSTER BITE and Alfred Scott's acrobatics while simultaneously EATING OYSTERS, CHEWING TOBACCO AND PLAYING "THE MUCKING OF GEORDIE'S BYRE" ON THE BAGPIPE. Especially welcome are unusual aircraft. Beech, Piper and Cessna products tolerated. No electric oyster knives permitted.

• Quentin Rench's "Millennium Falco" was mentioned in Steve Wilkinson's "Letter from America" in a recent issue of *Pilot* magazine in England.

• Speaking of Steve Wilkinson, he aims to be the slowest Falco builder on record. First flight is to be done by his daughter, Brook, age 5. Brook signs the inside of all parts for the Falco before they are closed.

• And speaking of little girls, Sara and Kakee Scott remind everyone that their daddy does not like to be called "Al". They suggest "Alfred", "Mr. Scott" or "Daddy" as more preferable alternatives.

Tool Talk

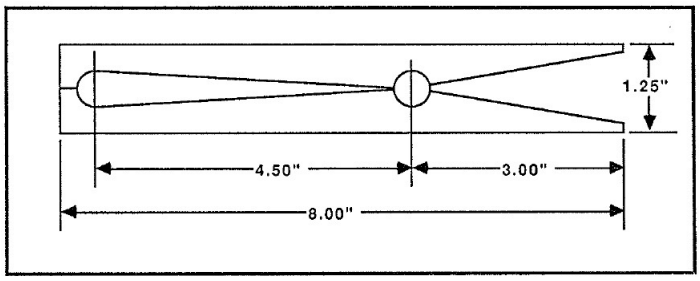
Tool Talk
Falco builders who have Disston Abraders swear by them, and other builders report they can't find them. Jim DeAngelo has used a similar product for three years and reports that they work great. Manufactured by D. G. Products, Co., 209 Carrlands Drive, Dayton, Ohio 45429 (513) 294-1192, the sanding tools are made of heavy gauge steel with tungsten carbide grit brazed on. Prices are suggested retail, but may be purchased direct from D. G. Products for 20% off postpaid in the U.S. The following models are available:

Tool No.	Description	Price
F-100	1.5"x9" flat. Grit on one side. 1/2 coarse, 1/2 fine	$6.95
F-101	1.5"x9" flat. Grit on one side. Fine grit full length	$6.95
F-102	1.5"x9" flat. Grit on one side. Coarse grit full length	$6.95
R-200	3/4" radius. Grit on one side. 1/2 coarse, 1/2 fine	$6.95
R-201	1/8" tangent radius tool. Grit on one side. 1/2 coarse, 1/2 fine	$6.95
R-202	3/4" diameter round tool. Coarse grit one side, fine grit opposite side	$6.25
R-203	1/2" diameter round tool. Coarse grit one side, fine grit opposite side	$4.95
R-204	1/4" diameter round tool. Coarse grit one side, fine grit opposite side	$4.95

The tangent radius tool is bent to a 70° included angle with a 1/8" outside radius at the bend.

Builders using epoxy should purchase a can of PR88. This is absolutely the best hand protection creme you can get. It is a white glycerine-based creme which you apply to your hands. You can work with paints, epoxies and the like without any effect, then wipe your hands dry with a paper towel and finally wash with water alone. You can rub your hands with the creme, then spray them with paint. After the paint is dry, you just wash them with plain water, and it all comes off—truly amazing stuff. You can purchase it from Wicks or Aircraft Spruce. A small plastic cup is $3.95, but I recommend the 1 liter container which sells for $19.95.

From Steve Wilkinson. "I'm probably the last person in the world to have discovered it, but the ideal dispenser for the formic-acid catalyst for Aerolite is one of those little wedge-shaped, sponge-like foam paint brushes sold in hardware stores as cheap substitutes for sash brushes. After using an ordinary brush for months—numerous hasty trips between bottle and wood to get enough acid on the wood quickly enough to keep it damp—my painter friend Jim Catalano, an ex-Pitts builder, suggested one of those sponge brushes. The head holds enough formic acid to wet most of a skin sheet, they're painfully cheap, and the handle is short enough that the brush just lives in the capped acid bottle—no need to squeeze out the little sponge every time you use it."



Ron Sorensen's "El Cheapo Clampo"

Steve also reported that he had purchased some board sanders from Eastwood Company, 147 Pennsylvania Avenue, Malvern, PA 19355 (800) 345-1178. These are ideal for smoothing microputty and are standard equipment at all body shops. You'll find that most auto paint stores sell them. The sander has a wood handle and uses 2-3/4"x17-1/2" sandpaper strips which are retained by quick-acting clamps. In case you don't find one locally, the one you want is Eastwood's P/N 6317 Large Board Sander, and they sell paper in 36, 40, 80 and 240 grit. I've been able to get 120 grit locally in Richmond, and I get the sandpaper is boxes of 50 sheets. Steve plans to mount one in a yard-long piece of hardwood to use for float sanding, but I am pessimistic about this idea since the bottom of the sanding board is rubber covered—but it might work.

From Ron Sorensen. "Thought maybe some other builders might be interested in the enclosed "El Cheapo Clampo". I was too clumsy to staple or nail the wing rib gussets in place so I spent an afternoon making these things, and they worked great (at least for me). Made a total of 69 (37 large and 32 small) in about four hours and at a cost of less than $10.00. To date have used them only for gluing the wing rib gussets and panels but will find other uses during construction, I'm sure."

Ron Sorensen's clamp is a brilliant, elegantly simple design. It is made from a piece of wood 1.25"x.75"x8". You drill two 1/2" diameter holes, saw it down the middle and then bandsaw it as shown. A short piece of 1/2"Ø wood dowel is used as the "hinge bolt", and rubber bands are wrapped around it to provide the clamping pressure and to keep the pieces from falling apart. This concept can be easily developed to include a bolt and wing nut for greater clamping pressure.

Cheaper yet is Jonas Dovydenas's method of clamping his leading edge strips in place. He simply looped a string over the leading edge strip. One end of the string was tied to a nail driven into the table, and the other end was tied to a very large bolt which was used as a weight. What the hey... it's simple, and it works.

And for his water level, Jonas writes, "Easy way to make a water level: get a male and a female Gilmour Posi-Clamp hose end for 1/2" hose and attach to some 1/2" vinyl tubing (transparent, of course). Then get lengths of garden hose, as needed, and attach tubing to each end. When you're done with the plane, you can go back to watering the lawn."

And from Allan Hall. "I don't have much to contribute to the cause as do many other builders, who tell about clever methods of sawing tapers, applying skin and clamping ribs. These schemes have been a big help to me. Being possibly the oldest Falco builder—I should be the smartest—instead of the dumbest. Only one means of showing up all of those smart guys would be a staple-pulling contest. One of the things I learned on the Eastern Shore is how to use an oyster knife. By inserting the rounded and sharpened end of any oyster knife under the staple—and a quick twist of the wrist—the staple is flicked out—with no tell-tale marks on the plywood!"

The July/August issue of *Fine Woodworking* had an article on building your own wood moisture meter. It costs about $30.00 and is made from parts purchased from Radio Shack. Steve Wilkinson also spotted the article and is going to make one.

Brenda's Corner

It was a pleasure seeing so many of you at Oshkosh this year. The best thing about Oshkosh is meeting Falco builders, their families and friends. That makes all the hard work and grind of the air show worthwhile. This year Oshkosh was even better than last year. First, we had three homebuilt Falcos on the flight line and second, Mr. Frati was there. It was wonderful meeting him and Renato Cairo. You should have been with us in the mornings when we were driving into the air show. Mr. Frati could not get over the number of airplanes parked there. He said there were more airplanes there than in all of Europe. On Monday morning, a lot of people were leaving, and the airplanes were taking off as fast as bullets being shot out of a gun. He couldn't believe what he was seeing. His camera wouldn't come out of its case fast enough.

Another thing that makes Oskhosh really neat is talking with people who are interested in building the Falco but just can't quite make up their minds to make the commitment; and then a couple of weeks after we get back from Oshkosh, the mail comes and there's their purchase agreement and application. Of course, those of you who stayed around the Falco booth and talked with these people deserve a lot of credit for the new builders. They see your enthusiasm and commitment, and that is probably one of our best selling tools. Now, don't you all start asking Alfred for salesmen's commissions—he'll want me to pay them out of my salary!

A number of you asked me to send you things after I got back to the office. I have checked everyone off my list, so if you haven't received what you wanted please let me know, and I'll get it off to you right away.

Just as a reminder, the following is an excerpt from the Component Purchase Agreement which all builders sign before they purchase any kits or parts:

Loss or Damage in Transit: Once the carrier accepts the Purchaser's order, it is the carrier's responsibility to deliver the order to the Purchaser in good condition. Purchaser should use extreme care in receiving shipment. Purchaser should note any discrepancies on the Delivery Receipt before signing. Seller cannot be responsible for shortage or damage encountered during shipment if Purchaser has not made these notations upon receipt of shipment. Claims must be reported in writing within 30 days after receipt of shipment.

Recently, we have had a couple of builders contact us about shipments that were damaged when they received them. While we will be happy to assist you in any way possible to resolve any problems with a damaged shipment, we cannot assume responsibility for it. Once the shipment is picked up from our office, we no longer have any control over it. It is your responsibility to contact the carrier, report the damage, and make the claim. Do not return the damaged shipment to us.

Please let me know if there is anything I can do to assist you.—*Brenda Avery*

The gear is cycling very nicely. Going down the gear stops two handle turns from solid and raising it goes up to about one tight turn from lock. It tracks very good on the runway, I think it's the nicest plane I've ever flown.

Firewall forward is working great. I seem to be getting 2-1/2" HG boost from the intake NASA scoop over density altitude corrected for temp. By the way, temps at ground and flight altitude have been running 22° to 35° C. Here still the air ducts have kept me very comfortable. The clear canopy (tinted) hasn't been any problem, to my surprise.

The fuel system is working fine. One thing, we have the transducer for the Silver Fuelgard between the fuel pump and the filter. There is just enough vibration from the fuel pump to make the flow read high when the pump is on. I would recommend putting the transducer farther from the pump to avoid this problem.

On radios, we have them all working great; two KX155s, KN64 and AT150A. We're using the specified copper strip antennas. With the wood airplane, there is no blanking out. I hear people all around. For example, I was letting down at Modesto at 3500' and was getting final approach calls from Lincoln nearly 100 miles astern.

I am working on cruise charts but won't be specific until the final painting is done with and at least the nose strut covered. However, one thing I have decided on is a cruise climb at 110 kts. It seems like that speed still climbs between 12-1400 FPM. A long range cruise dopes out at 11,000' and 20"/2000 at 135 kts IAS for 6 GPH at 184 mph TAS. All in all it flies like it's supposed to, and wonder of wonders the Century 1 autopilot works like a charm.

I've done some loops, rolls, lazy 8's, etc. and flutter tested up to about 195 kts IAS. Everything seems rock solid with very little trim change. You can believe that I am enjoying it but time sure passes slowly when you're trying to get it flown off. Hope to fly down to Steve at Merced tomorrow, and the 25 hours will be up. Steve is anxious to get it down there and get it ready for final painting. Should have our red "Ferrari" before the end of the month.

Karl Hansen
Roseville, CA

Six gph at 184 mph works out to over 30 mpg, so with 43 gallons—including the header tank—Karl's range is better than we quote, and it will be better still once gear doors are installed.

The cross-over exhaust system will give you an increase of 7 to 8% power, so Karl's 160 hp engine will put out about 170 hp without any induction boost. Each inch of M.P. is good for about 5 hp so with 2-1/2" of boost, Karl would be getting about 180 hp from his engine. This much boost seems to be more than is possible. Induction boost should be figured from the zero ram M.P. limits given in the engine handbook, which is about 29.2" for the IO-320-B1A at 2,700 rpm. The simplest check is to note the manifold pressure before starting the engine, then take off and fly down the runway at full throttle and note the manifold pressure. The difference between this reading and the engine-off M.P. is boost above ambient, to which you would add something to allow for the normal zero-ram volumetric efficiency of the engine. Bear in mind that the manifold pressure boost is a benefit only when the throttle is fully open.—Alfred Scott

I am still working on my new home and workshop and hope to complete it by the end of the year. After that I am looking forward to starting my project. Thanks for the excellent newsletter. Keep up the good work.

Klaus Pinsch, New Fairfield, CT

My project remains in the packing boxes from my move from Trenton to Winnipeg. I have just purchased a house, so I will be able to unpack and begin work again. See you at Oshkosh.

Ron Tidy, Winnipeg, Canada

Recently received the package of new drawings, and they are great. Were they done with your laser printer? Because if so, that certainly is the way to go. They are simply fantastic! I have spent a lifetime in actual hardware design activities, and these are among the best I have ever seen. SO DON'T STOP. You are certainly to be commended for making the Falco possible for the average guy stumbling around on this planet.

I have now completed all the fuselage frames, all the tail ribs and beams, and all of the wing ribs. Hopefully I can find the time to finish all of the remaining wood components by the end of this year. I do not plan on making any of the non-wood parts and will finish the project with your kits. Although I am progressing slower than some other builders, I am progressing and thoroughly enjoying the effort. During the past year I have been fortunate to see both John Harns's and John Shipler's projects. Both gentlemen were kind enough to spend their time with me, and from each of them I received ideas and methods of fabrication that will ease and enhance my project. I had never seen a Falco prior to these visits and believe me, I came away duly impressed with the lines and the real life size of the airplane, and the quality of your kits.

Ron Sorensen, 1000 Oaks, CA

We use the laser printer for the construction manual and many of the illustrations in that manual and for other things such as this builder letter. But the blueprints are still drawn by hand. We have two computer-aided drafting programs now. They are very useful for the repetitive illustrations for the construction manual, but they are not capable of doing the quality of drawings I do for the construction drawings.—Alfred Scott

I saw two members of "Team America" fly at Medford Airshow this past weekend. One pilot was Chuck Lischer from Sacramento Area, the other was from West Germany, don't remember his name—talked to pilots afterward. Chuck did a maneuver I had never seen before. He walked the rudder while in a knife-edge pass. He commented that other pilots couldn't do this. Anyhow, I enjoyed seeing the SF.260s fly.

Fuselage and tail feathers complete (woodwork). Wing structure complete. Presently contouring ribs and spars for skin and will be starting flaps and ailerons soon. Almost ready to invert wing and fuselage for skinning wing lower surface. Instrument panel and control sticks installed.

Rex Hume, Williams, Oregon

Fuselage frame 8 and back off jig, complete. Rudder, elevator complete. Frames forward of frame 7 partially sheeted, still on the jig. Commenced main spar, completed forward spar. Wing ribs purchased. Propose reassembling both halves of fuselage, inserting main spar to check level with tailplane and water line and check the "perpendicularity?"

of main spar with centerline. Thereafter propose making up wing on forward section of fuselage and wing spars.

Charles Wagner, Glasgow, Scotland

Plan to start building early 1987. The reason for this is that I am approximately 40% of the way through an Isaacs Fury Project. A detached garage/workshop of internal dimensions 27-1/2 feet by 12 feet is nearing completion which will enable the Falco to be constructed using the split fuselage approach. While I appreciate the advantages of using the kits, to keep construction cost to a minimum all the wood parts will be made from raw material along with the metal fittings where possible. The quality of the plans is excellent, and although I have not yet started on construction, I always find the newsletter interesting. Also hope that the exchange rate will improve in my favour in the future.

Trevor Fulcher, Essex, England

At present time I have all wing and tail group ribs and tail spars built. Although I have not built any parts for one year, I am still very interested in my project. I have spent the past year building a new home here in Weatherford. I hope to start building again on my Falco this fall. Please keep the letters coming.

Thomas Langston, Weatherford, Texas

I haven't made much progress because of two other projects I've worked on in the last year and a half. I'm also President of EAA Chapter 45 this year and the next, which is taking a good portion of my time.

Status of my project: all fuselage rings are made. All wing ribs are made. All wing spar wood is cut and machined. Horizontal stabilizer spars are made. I machined several main gear parts. All horizontal stabilizer ribs are made. No assembly started as yet.

Ernest Lanyi, Elizabeth, PA

With my ERNA, I flew until last April with Italian marks of registration, and now I am waiting for a New Zealand registration, but I hope to have clearance to fly in a few days.

Luciano Nustrini, Auckland, N. Z.

Thank you for all of the drawings and other information. Progress? Hardly noticeable. Working from the rear end, I'm up to the vertical fin. According to my production curve—the Falco will be ready to fly on my 106th birthday—hope I'm ready!

Allan Hall
Vista, CA