Falco Builders Letter

Proud parents after the first flight, Rita and Jim Petty.

First Flight, Jim Petty

Years ago, I received a call from my lawyer. He wanted me to meet with a friend of his, Hunter Taylor, who had just moved to town and who had once worked at Lockheed on the C-5A. When Hunter arrived, I was in the process of laying out the shape of the instrument panel using the old geometric method of drawing a series of lines.

"What are you doing?" he asked. "Laying out an ellipse," said I. "My God, that method went out with the Egyptians!" said Hunter, who went on to explain that there is a formula for an ellipse and that you could crank out the points on the curve with a programmable calculator. I thought that was great, and asked Hunter to send it to me.

After the equation arrived, I put all the necessary steps into my calculator and cranked out the points. I went into shock. The points were way off from the curve I had drawn, and I lay awake all night in fear that all of the fuselage frame shapes were wrong. The next day, I finally proved that the shape of the fuselage frame was, in fact, not an ellipse at all, but a completely different shape. I did this by constructing the curve from two equal-length sides, and the proof fell in the fact that the shape was not a circular arc.

But I became intrigued with the idea of generating the fuselage shapes accurately from a formula (something I can now do in a few seconds in my CAD program), and I tried to interest mathematically-minded friends into solving the Falco fuselage curve problem. Everyone always said, "That looks pretty simple", and then gave up after a few days. Hunter Taylor would always go into this big song-and-dance about how he took all of the most advanced math courses in engineering school, and how understanding the concept was more important than knowing the answer, but he never actually produced an equation I could use.

I tried another friend, a college math professor, who always argued with me about why I would want to know this or that. John Oliver got his son interested in the problem, and the result was an awkward computer program that approached the answer incrementally but which could never solve directly for the coordinates at any given point.

It was clearly a difficult problem, and one day I called Jim Petty to see if I could interest him in working on the problem. "Oh yeah, that is pretty difficult," said Jim. "I solved that the other day, and it took about 30 minutes. I've got the formula somewhere."

That was my first inkling of what sort of grey matter resided between Jim Petty's ears. Since then I've called Jim on countless occasions with a math problem. Our Benchmark performance testing program is entirely built around Jim's equations, and one of the leading CAD programs on the Macintosh is filled with his equations—even though Jim has never even seen the program and doesn't use a Mac!

Jim has a PhD in aeronautical engineering and worked at the Air Force's Wright-Patterson Research center in Dayton. He has worked in hypersonic flow and on turbine engines for the last 17 years. Some of the engine work was on solving problems with the F-100 engine and others in the field, but most of it was R&D work toward the future. He was the first program manager for the F-119, the engine used in the new stealthy F.22 advanced tactical fighter. Jim worked in the part of Wright-Patterson that is now called the Wright Laboratory, which at its peak employed 2500 people and had an annual budget of over $500 million.

Jim was also a member of the base aero club, where he flew T-34's. His plan was to buy an airplane when he retired, but when we came out with the Falco, Jim had

In This Issue:

Top: Jim (far right) and friends roll the Falco over during construction.

to build one. "I had been a Falco admirer since the mid-50's," he said, and he just had to have a Falco.

Jim ordered his plans in 1980 and began the process of building right away, but he was never in a hurry. He took his time and decided from the beginning to really not push on the construction. For one thing, he wanted to be careful that he didn't burn out, and also he was quite busy at work. There were a couple of years when he didn't do anything on the plane, but finally he retired 1-1/2 years ago and since then he's got busy on the Falco. On February 17, he finally got the Falco in the air—14 years and two months after he started.

But before we get into the Falco, lemme tell you something about the other half of the Petty family. Rita Petty is, in my book, every bit as remarkable and special as Jim. She worked as a medical technologist at the Children's hospital, and then got a masters degree in biology and worked in research.

It's always the quiet people who surprise you, and you'd never guess from the soft voice on the telephone what Rita is really made of. She's a physical fitness freak, and started running in the late 70's. Rita likes to compete in marathons and 'iron man' triathelons, and they have a wall full of plaques and awards. And if that's not impressive enough, consider this: for the last ten years Rita's been fighting cancer. She's already reached her lifetime doses on most of the drugs and continued to compete in marathons and triathelons while going through chemo. Sheesh!

Back to the Falco, it has a 160 hp IO-320-B1A which Jim got from Don George about a year ago. The plane weighs 1,273 lbs empty with a 68.5" CG. The panel has a Narco Mark 12D+, Narco transponder, engine analyzer and a hand-held GPS.

It's a perfectly conventional Falco, distinguished only by a slightly longer wing fillet than normal. Jim said the fillet didn't seem right so he extended it back about 5-6 inches beyond the fuselage break line. Jim originally planned to install full wheel well doors, but after hearing about the difficulties others were having, he changed his mind.

Steve Bachnak flew his Falco to Dayton and gave Jim a couple of hours in his plane. Jim said this was a big help and he had no difficulty on the first flight, which lasted for 40 minutes and was flown with the gear down. The airplane has required a trim tab on the rudder and may yet end up with a tab on one aileron. Jim flew the first 25 hours off in 28 days and in that process flew the Falco to the red line, pulled 4.5 g's and rolled it a few times.

Jim says the Falco flies well. "It is the easiest plane I've ever flown." It's a lot better handling than the T-34, and so far he's only messed up one landing in which he touched down too fast. The roll rate is 90° a second, and the plane's maximum speed is right at 200 mph. Jim thinks he will get another 5 mph when he installs the hinge fairings.

Thus far the problems with the plane have been minimal. In the early part of January, the Falco fell off a jack, which punched a hole in the bottom of the wing. Fortunately, it was easy to fix and did no permanent damage. Right now the circuit breaker pops when the gear is retracted in the air, yet it works perfectly on the ground. Jim doesn't yet understand why this is happening, and he also has a mysterious problem with short-period rpm changes of about 30 rpm over 2 seconds above 2400 rpm.

The Falco is in gray primer and the interior is unfinished, but Jim is starting to talk to people about painting it now. By all accounts, N627SF is an immaculate airplane. Congratulations to Jim and Rita on getting the 45th Sequoia Falco into the air.

—Alfred Scott

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

Paper Tiger?

by Harry Foerster

Mr. Foester lives in Luxembourg and has a long association with the Libyan military establishment.

I have read with delight about your invitation to Col. Qadhafi in the Feb/Mar 1995 issue of *Air & Space*. I hope you meant this as I understood it—a great joke.

As a lover of beautiful designs, and maybe even art, you cannot possibly be so naïve to believe that 'Number One' (as Col. Qadhafi is referred to in Libya) has received your invitation, and even if he has, that he would know what an SF.260 is or who Frati is. With all my inside knowledge of Libya, I assure you he has not received your letter, because you scared to death all of those who would have handled your letter. This is because the only one who doesn't know that Col. Qadhafi hasn't got an Air Force, is 'Number One' himself.

I shall explain. I have worked for many years in Libya, and I think I should repaint your picture about this country and its (widely believed) military strength. I will not even try to explain the Libyan system, or more appropriately 'non-system'. After some 14 years of experience with those guys, I assure you, I still understand nothing about Libya—and I consider myself somewhat intelligent and politically astute.

An American aviation figure, who travelled with me to Libya in early 1990, made (after we left the country and had been ushered through all the controls and checks into the waiting 727 of LAA) the best, most pointed and most accurate statement I've ever heard in all the years: "If ever some outsiders would try to screw up the Libyan system, they would fail—there is no system."

Coming to the subject of the SF.260: *Flight International* on 20 May 1978 reported that 250 SF.260's had been ordered by Libya. *AviMag* on 1 April 1979 reported that Libya "could acquire up to 250 SF.260's" (and they are correct, insofar as the order was not yet signed for and the total number was open at that date.) "Air Forces of the World" lists 230 SF.260's as a given fact. (They also list 10 TU-16 "Badgers", which I have never seen in Libya, and I've had the chance to see about 16 air bases in that country. Which leads me to the point that I've *never* seen an *armed* SF.260 anywhere.) And *Interavia* on January 1987 lists 200 SF.260's, which to my knowledge

is the correct figure. (They also list 9 C-47's as LAAF inventory, but the last two have been destroyed in the April 1986 attack on Binghazi.)

The bad thing with all those publications over the last 15-20 years (the last being the annual "World Air forces Directory" of *Flight International* in 1994) is that they repeat again and again the original numbers of real or imagined orders. Losses are not taken into consideration.

Everybody knows that Libya has aircraft losses like any other country. Everybody knows that a good number of the aircraft and choppers were destroyed during the U.S. attacks of April 1986. Between the end of 1986 and 4 January 1989, when U.S. Tomcats downed two Libyan MiG-23's over the Mediterranian, I have recorded a further 67 aircraft and choppers as destroyed, captured intact or defected to Egypt, Italy and Greece.

This number does not include any SF.260's, although there have been some captured in Chad and brought to N'djamena. Maybe they have been sold to private collectors like the L-39 Albatross that appeared in June 1992 in the U.K., fully operational and in Libyan markings.

Back to the SF.260, to my knowledge the contract was signed at the end of 1979 and early 1980, after long negotiations about payment (small amount of cash and larger amount of Libyan light oil). The total number was 200, of which about 30 were to be delivered in three batches and ferried with mixed Italian/Libyan crew to Tripoli, while 170 would be delivered partly assembled in crates over a period of 10 years—later extended to 12 years. Assembly took, and maybe still takes, place in Sebha, almost exactly halfway between Tripoli and the Chadian border, in one of two large hangars built by Bulgarians in the early 80's.

Delivery of the 30 complete SF.260's was between 1980 and 1983. Assembly in Sebha started in 1982/83, because the first hangar was not ready earlier. 'Assembly' is really not correct, because components like flaps, stabilizers, ailerons, rudders and others have been, in fact, built in jigs without Italian supervision since 1988.

Anyway, your dream figure of 190 SF.260's has never existed, in terms of operational aircraft. Taking the captured aircraft in Chad into account, plus the remains of about 10 SF.260's I discovered within the perimeters of the Sebha Airbase (in Libya, all is left where it is) during a MI-8 ride, plus a figure of about 90 SF.260's I was given in 1990 as losses over the years, it is obvious that out of the production rate of between 15-20 aircraft per year after 1983, an assembly of more than 20 operational SF.260's at one place on any given date would have been a major achievement for Libya.

In 1991, I was told that a further 40 SF.260's might be ordered. Whether this ever happened under the political circumstances since 1991/92, I do not know. I have enclosed a photo which I took on September 9, 1991 at Sebha Airbase. Some have full camouflage and some are just primered. (My interest was in the MiG's—obviously. Just to mention, the MI-8 in the background crashed a month later and burned out completely. The only fire truck on duty arrived, but didn't have a drop of water/foam in the tank. This, Mr. Scott, is Libya!)

A Libyan Air Force, to my knowledge, does not exist. Libya is an Arab country and that means family business. The armed forces, that's family business. The Air Force, that's family business. Believe me, you have to see with your own eyes that the Air Force Commander-in-Chief, Col. Sherif Rifi of a leading family in the Sebha district, has absolutely nothing to say and no one to order in Binghazi, Tubruq or Al Kufra (different families, be careful). He has not even been in the position to arrange for me a cockpit visit of one of those rotten old MiG 25's. They are under the command of another colonel!

A long way to go, sir, before you and I know anything about Libya.

The Glider

Part 10 of a Series

by Dr. Ing. Stelio Frati
translated by Maurizio Branzanti

Chapter 4
Flight Stability (con't)

23. Lateral Control Surfaces
To change the airplane's equilibrium in the longitudinal axis, or to return the plane in the original position of equilibrium when the built-in stability is not sufficient, we have control surfaces that move in opposite directions on the outboard wing trailing edge. These are the ailerons, and their rotational movement changes the curvature of the wing and therefore the lift.

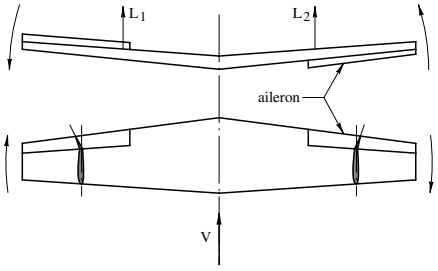


Figure 4-11

The down-aileron will increase lift while the raised one will decrease it, and this produces a rolling movement. However, the down-aileron will produce more drag than the up-aileron, which results in a yaw movement opposite to the one desired. This negative reaction is very perceptible in gliders due to their long wing span and low weight.

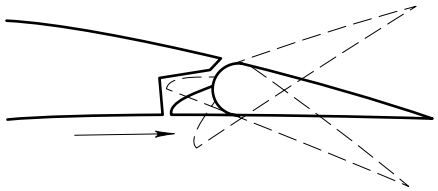


Figure 4-12

To eliminate this, the best method is to increase the drag of the up-aileron to compensate for the additional drag of the down-aileron. This is accomplished by extending the leading edge of the aileron so that it will extend below the surface of the wing when the aileron is up, but which will be inside the wing with the aileron is down. Ailerons on gliders are generally not aerodynamically compensated for the same reasons explained for the elevator.

F.15B Picchio

Wing Twist. As we have seen, the lowering of the aileron will increase wing lift, but this is only true if the flight conditions are for less than maximum lift. If the aircraft is in flight conditions where the wings are producing maximum lift, as it is often the case in gliding, the lowering of an aileron will not increase wing lift. On the contrary, this could cause a sudden wing stall, possibly resulting in an entry into a spiral dive.

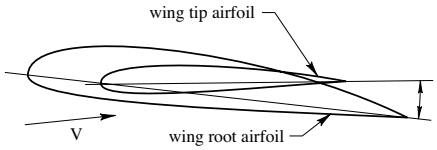


Figure 4-13

It is possible to eliminate such problems by twisting the wing negatively, in other words by building the wing so its extremities have a lower angle of attack than the wing center section. With this design, the ailerons will be more effective, even at a high angle of incidence.

With such a wing, the center portion will stall before the extremities. Because the ailerons are still very effective, there will still be sufficient lateral stability to prevent a spiral dive, even in the critical condition of an imminent stall.

Together with the wing twist, changes in the chord and thickness towards the wing tips are made to increase the overall stability and efficiency. In practice, the aerodynamic twist (relative to the incidence for maximum lift) is kept between 4 and 6 degrees in gliders. The geometric twist (relative to the airfoil chord line) turns out to be between 2 and 4 degrees, since the airfoils adopted for the wing tips generally have a higher incidence relative to the maximum lift than the airfoils used at the wing root.

Aileron Differential Ratio. By increasing the drag of the up-aileron in compensating for the negative moments, we would also worsen the aerodynamic characteristics of the wing. Therefore the idea is to reduce the increased drag of the down-aileron by reducing its angular travel when it is lowered. This is accomplished by designing a differential control system that causes the down-aileron to rotate at a lesser angle than the up-aileron.

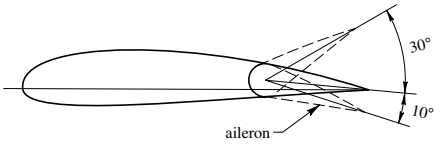


Figure 4-14

This will not necessarily diminish the moment of roll. On the contrary, practice has shown that the up-aileron is more effective than the down-aileron, especially when reaching the conditions of maximum lift as we have previously mentioned. This differential control will give us a double advantage: a full, or nearly full, cancelling of the negative yaw moments, since the drag of the down-aileron with respect to the up-aileron is diminished, and an improvement in the lateral stability, especially at higher incidence, since reducing the movement of the down-aileron also reduces the chance to incurring a loss of wing lift.

In modern gliders, this differential is quite high, 1:3 in the case of one sailplane. For an average value, we can adopt a ratio of 1:2. The maximum rotational angles are 30 degrees for the up-aileron, and they vary between 10 and 15 degrees for the down-aileron.

24. Directional Stability

Directional stability is accomplished by installing a vertical tail surface, or fin and rudder, at the aft end of the fuselage. This location puts the resulting center of side-force lift behind the center of gravity, thus if the aircraft is turned about its vertical axis, a resulting stabilizing force will be generated that will return the aircraft to its original position.

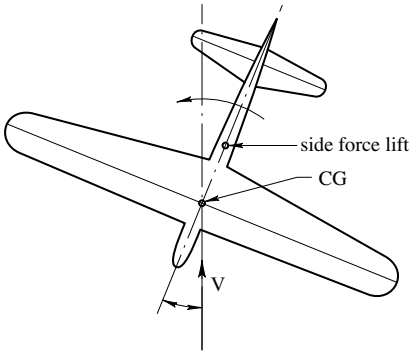


Figure 4-15

We have to keep in mind, however, that a center of side-force lift that is too far behind the center of gravity is detrimental to the lateral stability, since a drop of the aft fuselage will result and a corrective action will be required, like increasing tail lift. But in such conditions an increased dihedral will be required also to prevent aircraft slip. Lateral and directional stabilities are therefore related to each other, and each has an effect on the other. Thus a large dihedral requires a larger vertical surface and vice versa.

F.15A Picchio

The dimensions of the vertical surface are also dependent on the shape of the fuselage. The larger the keel effect of the fuselage, the smaller the required size of the vertical surface. On this subject we should remember that a fuselage of circular, or nearly circular, cross-section will have a rather a low keel effect. It is not convenient for the fuselage to have a small circular section, and it is better to have a taller and flatter section for structural reasons. For the correct size of the vertical surfaces that insures static stability, you must rely on wind tunnel experiments for the particular model in question, try different sections and choose the most appropriate one. These results will not enough to guarantee stability; our concerns are with dynamic as well as static stability.

Since wind tunnel tests are not very practical for these kind of aircraft, the only avenue left is a comparison with similar existing aircraft that are known to have good flight characteristics.

25. Vertical Empennage

From the examination of various gliders, we have obtained an empirical formula for the determination of the area of the vertical tail that may be used as a first approximation. This formula takes in account the wing span, the distance of the surface hinge from the center of gravity and the total weight of the aircraft.

[15]

where S_{vt} is the area of vertical tail in square meters, b is the wing span in meters, W is the total aircraft weight in kg, and d_h is the distance of rudder hinge line from the center of gravity. The coefficient K may have the following values: 0.0035 for small gliders with short wing spans, 0.004 for medium-size gliders, and 0.0045 for large gliders with long wings.

Vertical Tail Features. As in the case of the horizontal tail, symmetrical airfoils are always used to produce the same aerodynamic reaction on both sides of the aircraft from the same amount of anglular movement. In the vertical empennage, the fin is a fixed forward part, and the rudder is a moveable surface.

Rudder Area. In gliders, the area of the rudder is always a large percentage of the vertical tail area, generally between 60%-75%, and the rudder is normally the only control surface that is aerodynamically compensated. The percent of compensating area is normally between 15%-20% of the rudder. The angle of movement is generally 30 degrees to either side.

Rex Hume's Falco

by Jack Cox

This article was originally printed in the Winter edition of Sportsman Pilot, *a wonderful quarterly aviation magazine published and edited by Jack Cox who has been the editor-in-chief for over two decades of EAA's* Sport Aviation *magazine.* Sportsman Pilot *is also a bargain, and costs just $8.00 per year ($9.00 for those outside the US). To subscribe, send check/money order to* Sportsman Pilot, *P.O. Box 2768, Oshkosh, Wisconsin 54903-2768.*

It's a marvelous experience to be able to interview and write about pilots such as the subject of this article, Rex Hume of Williams, Oregon. Born in 1923, he will be 72 this spring, which is a span of time that cuts across the most amazing of all eras of human existence, at least for those of us who love flying. Think about it. In his lifetime, Lindbergh flew the Atlantic; both the North and South Poles were reached by air; the great National Air Races were broadcast live on nationwide network radio; Pearl Harbor was bombed to pull the U.S. into the wars already raging in Europe and Asia; the jet age, atomic age and supersonic age came in rapid succession; the Korean conflict ushered in the age of "brushfire" wars; the space age began; and humankind first set foot on another world.

There may never be another 70 year span of time in which so many startling changes take place. Certainly humans will someday launch out into the solar system, and eventually into the galaxy and beyond, but the difficulty of doing so is likely to be so great that long periods of development will be necessary between each step along the way. Many of us have lived through substantial parts of the aerial age, but not all of us have been participants in the great events that shaped the 20th Century. Rex Hume has that distinction, and he's still at it. Without intention or overt effort, indeed by default as much as anything, homebuilding has found itself becoming the mainstream of general aviation over the past decade and a half, which is exactly the period Rex spent building and flying his homebuilt Falco.

Rex was born and grew up in the little town of Carlisle, Indiana. Enamored virtually from birth with aviation, he built models, devoured every aviation book and magazine he could lay hands on, was transfixed by radio programs and movies on flying, and headed for California to "get into aviation" as soon as he graduated from high school in the spring of 1941. After completing a three month course in aircraft engine maintenance at Santa Monica Tech, Rex was hired by the U.S. government as a civilian employee at McClellan Air Force Base in Sacramento at a salary of $1,320 a year, which was good money at the time. He was at McClellan that December 7 when the Japanese bombed Pearl Harbor, and was immediately set to work unpacking machine guns, cleaning the cosmoline off them and installing them in aircraft to defend against the invasion of the West Coast that was feared at the time. Rex was also still at McClellan when Jimmy Doolittle's B-25's were flown in for modifications needed for the famous raid on Tokyo. The work was top secret, but everyone on the base knew something unusual was afoot. They just didn't know what or where or when it was to take place.

Rex was at McClellan for about 9 months. During that time, the draft age was lowered to 18 and he was required to register for induction.

"As soon as I registered, I thought, 'Well, I might as well start at the top and get in this thing.' I picked Naval aviation and was accepted as an aviation cadet."

Rex was initially sent to Monmouth, IL for 3 months of "flight prep," which was just the first step in a weeding out process intended to provide the Navy with the best possible candidates for flight training. Surviving flight prep, he was sent to Las Vegas, New Mexico to learn to fly in a War Training Service (WTS) program run by Highland University. Las Vegas, NM has one of the highest airports in the country (this is where Lyle Shelton set the 3 kilometer world speed record in 'Rare Bear') and the trainers being used were 65 hp Aeronca Chiefs but the lit-

tle Airknockers handled the altitude with no problems, Rex recalls.

"The worst thing was the snowbanks. A lot of guys groundlooped into them and ended up washing out."

Rex made it through the WTS phase and was sent to the University of Georgia at Athens for preflight training. After about 6 months however, the Navy decided it had too many pilot candidates in the pipeline, and Rex was told to choose some other career path. He opted to go to the aviation mechanics school at Norman, Oklahoma, but after about 6 months there, he was recalled for flight training! Back he went to Athens, then finally was sent to Memphis NAS for primary flight training in Stearmans. He flew those narrow geared cadet humiliators for about 150 hours, then was sent to Corpus Christi, TX for basic and instrument training in the SNJ. Next came Pensacola and multi-engine transition in the SNB2C (Twin Beech). By this time the war was over, and faced with a 2-year extension of his enlistment and an 8-week wait for assignment to PBY's, Rex decided it was time to move on. He resigned from the Navy, moved back to Santa Monica and went to work for Douglas.

For a time he was involved in the conversion of C-54's to civilian airliners, then was transferred to the Experimental Department as a mechanic. There, the work was quite interesting, involving the AD series, the Skystreak and exotic birds such as the F3D.

After getting out of the Navy, Rex began using his GI Bill benefits to get his civilian licenses. He had about 250 hours of military flight time, so it was just a matter of taking the writtens and flight tests for his Private and Commercial licenses, plus instrument, flight instructor, multi-engine and single engine sea ratings. He also obtained his A&E (now A&P) license, which was little more than a formality since that was the work he was doing at Douglas. In 1948 Rex thought it was time to begin enjoying the fruits of his labor, so he bought a Monocoupe 90A and flew it until 1950. That year he met a young lady named Margarete, fell in love and married.

"I thought I wanted to be a sailor, so I sold the Monocoupe and bought a sailboat. One trip on the ocean was enough of that, however, and I've kicked myself ever since for selling the airplane. I've even considered building a replica of a 90A, it was such a good airplane."

During this period, Rex was also very actively involved in the CAP. He earned all the CAP ratings and was the operations officer for Squadron 43 at the Torrance, CA airport. He was also a check pilot, search instructor and search base commander. He flew a lot of search and rescue missions in L-4's, L-5's and L-16's.

In 1955 Rex bought a Stinson 108-2, the small-tail version with the 165 Franklin. He really enjoyed that airplane because he could take his whole family along, which by this time included a son, Larry, and a daughter, Karen.

On the job front, Rex had transferred again, this time to pre-production modification, but that was not the assignment he wanted. He was angling for a flightline job, and when it was not forthcoming, he left Douglas and took a job with North American where he worked for three years as a final assembly inspector on F-86D's. Ultimately, however, he went back to work for Douglas, landing a spot as a preflight inspector in the Experimental Flight Test Department.

"I was actually doing the walk-around inspections for the test pilots. The field service inspector would turn the airplane paperwork in to the flight office, then I would pick it up, go out and check over the airplane and sign it off for the pilots. I always had fun going back in and telling them, 'I just took it around the pattern and it's O.K. for you now.' Later, I went into missiles and space work for a while, then ended up on the Pregnant Guppy and Super Guppy. I was involved with the flight test program and also in hauling missile stages to Cape Canaveral."

In 1961 Rex sold the Stinson and bought into a partnership with his Palos Verdes neighbor, Mel Heflinger, and another friend in a Harlow PJC-2 that Mel had located in San Diego. He worked for the next 7 years on the restoration, but sold out to Mel when he moved to San Diego. (Mel and his Harlow were featured in our Spring 1983 issue of *Sportsman Pilot*.)

"I was on the DC-8's, -9's and -10's. I was on the DC-10 program all the way from inception through putting it in service with the airlines. I was a customer service rep with responsibility for engine indicating systems and whenever anyone had a problem, I had to go and take care of it. The longest trip I made was to Rome, where Italia Airlines operated the -10. In 1975 the airline business was slowing down and I was laid off, but I went right to work with Aurora Industries in San Diego—Chula Vista, actually—doing the very same thing I had been doing at Douglas. That didn't last too long, however, and I was laid off again. That ended my aerospace work. I was with Douglas for 27 years, but that's the way you usually end up when you work for companies that deal mainly with the military and the airlines. For the next few years I did a number of things. I built houses and went into the roofing business for a time. In 1979 I saw Sequoia Aircraft's ads for the Falco plans and decided to build one. I had always liked Navions and had been thinking about buying and restoring one; then I saw the Falco and thought, 'Look at the shape of that—it's a 2-place Navion. I think I'll build one.' I started the project while we were in San Diego, then took it with us when we moved to Williams, OR in 1984. I lost a year up there building a shop big enough to finish

the airplane. I renovated an old 30' x 30' barn and finally had room to mate the wing and fuselage."

Rex started out with the small components—wing ribs, tail components, etc.—and would eventually make all the wood parts except for the fuselage frames, which he bought from Little River Aircraft. The airframe is basically spruce and Finnish birch plywood.

"On the average, the plywood is 2 mm thick, 5 plies of .080 thick veneer. It is about half the price of U.S. plywood. Because of all the compound curves, all of it had to be prebent. You have to soak it in water, then clamp it over a form and let it dry. The wing to fuselage fillet on this airplane is wood instead of the fiberglass most Falco builders use. I figured if the Italians could do it, so could I. It took a lot of steaming and bending and a lot of scarfing, too. It is all scarfed together, with blocking underneath. I used the FPL 16A epoxy glue, which I like very much. The only resorcinal glue in the airplane is in the fuselage frames I bought. All the plywood skin is covered with Stits fabric and there are 25 coats of paint on the airplane. I flew it for a year before the color coats went on. I had a friend paint it for me. He used Du Pont acrylic enamel, and there are two coats of clear on top of that."

Rex would buy the landing gear, canopy, engine mount and other metal parts from Sequoia Aircraft. The engine he chose was the 180 hp Lycoming O-360 A1A, but he made a few changes for the Falco installation. It has an AN fuel pump instead of a diaphragm type, and the gearing in the accessory section was changed a bit. A new Hartzell CS prop and spinner were bought through Sequoia Aircraft early in the game for $2,700.

"That prop costs about $5,700 now, so I made the right decision in buying it years ago."

Rex says he is the only builder he is aware of who has a metal cowling on a homebuilt Falco.

"I made up the pattern in fiberglass and had a guy up in Oregon beat it out for me in aluminum. He normally does antique car fenders. He's one of those craftsmen who can make anything you want out of a sheet of metal. Between the two of us, we built two cowlings. I made a pattern out of fiberglass and he made one to match out of metal. I've got a lot of money tied up in that cowling!

"There's not much fiberglass in the airplane. I have the full complement of gear doors, and they are fiberglass. I've got more labor in that landing gear than anything else in the airplane. It just takes a lot of fiddling. Right now it is trouble free, it's working beautifully.

"Another thing I did that is unique to my airplane, as far as I know, is my canopy lock. I designed my own and it works well. It uses the same key as the ignition and allows you to lock the canopy from the outside. And as you can see, I chose to use the standard canopy rather than the low-cut racing bubble. I did it for the head room. I don't like to fly with my head cocked forward. This airplane is more like the original Falco's built in Italy. It has the standard canopy and the air scoop for my carbureted engine. I don't do any upside down flying, so I don't need fuel injection. I'm from the old school, I guess."

Rex's Falco has two fuel tanks, each holding 22 gallons. One is mounted ahead of the instrument panel and the other is aft

of the baggage compartment. There is no fuel in the wing. The airplane is certified for IFR and has, among its other goodies, a 618 loran, KX 155 and KX 97.

"I made the first flight in the airplane on June 27, 1989. I hadn't flown since I'd sold the Stinson in 1961, so I got my medical, got about 2 hours in the right seat of a friend's Falco, did some landings, then I got my BFR in a 172 and crawled into this thing. I did several taxi runs, then flew it. Went up to 4,000 feet over Grants Pass Airport, flew it around a little, did some stalls and came in and landed it. Very uneventful. It was a little bit out of trim. I had to put a fixed tab on the aileron and another on the rudder, but after I got them properly adjusted, the airplane flew beautifully. That was five years ago, and I have about 194 hours on it now (this was at the Merced, CA fly-in last June). That's not a lot of time for 5 years (about 38 hours per year), but at 71, I'm not trying to build time anymore. I don't just go out and bore holes. There has to be some reason, some place to go. I like to go to fly-ins and I enjoy taking part in the Oregon Air Tour. I went to 14 air shows and fly-ins last year and camped out at most of them. I enjoy that, because we'll all sit around late at night talking airplanes."

Rex's Falco came out weighing about 1,250 pounds. He says he cruises it at 165 knots at 2,350 rpm, which is full bore and 21.5 inches at 8,000 feet. On climbout, his VSI is pegged at 2,000 fpm, and that's good enough for him. He hasn't bothered to time any climbs.

"I just go out and fly the sucker. I really enjoy it, and it has all the performance I need."

There is a perception in the homebuilt world that the Falco is, at least, a time consuming airplane to build. Asked his evaluation of it as a project, Rex said: "To me, this is not a complex, hard-to-build airplane. It just takes a lot of hours. It is labor intensive. I had 7,000 hours over 10 years in mine before I took it to the airport, then I stopped counting. There's nothing difficult, it's just a big model airplane, a big wooden model. You just take it a piece at a time. I think that's what scares people—they are afraid to start one of these things. They think in terms of the whole project, but you build a lot of little things and eventually they all come together. Of course, there were nights when I'd lay in bed at three o'clock in the morning solving problems. But I didn't burn myself out. I'd work 4 or 5 hours a day, then I'd go do something else—go fishing or something. And if I ran into a problem, rather than mess it up, do something wrong, I'd turn out the lights, lock the door and walk away. A lot of problems solved themselves that way. Including the engine, prop instruments and avionics, I've got about $60,000 in the airplane. It has been a lot of fun, though, and I really enjoy it. I've given one official Young Eagle ride in it so far, and I also flew another kid on the Oregon Air Tour. He was flying with his grandfather in a Fairchild 24 and there was a little concern about one of the legs that required a high altitude takeoff, so I was asked to take the boy on that leg. I did and when we got out of the airplane, he said, 'Boy, I want to go with you the rest of the way!' When they got home, he wrote me a nice letter, thanking me for the flight. I've got it on my hangar wall, along with all my posters, pictures, Reno tickets, patches and stuff. It kinda made all those years in the shop worthwhile."

And you say you wonder where the next generation of pilots will come from?

A Falco Mid-Life Without a Crisis

by Glyn Russell

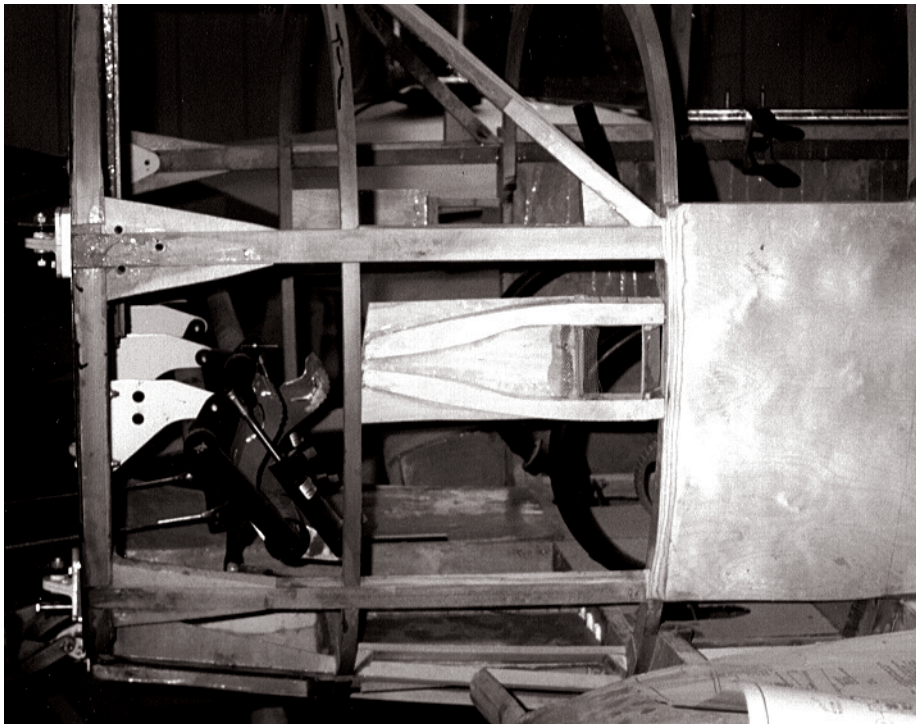
For several months now, I've wanted to write and share some thoughts and ideas about my Falco project. The problem that I have found has been that I've spent all my spare time trying to satisfy my obsession with building the Falco and no time doing much of anything else.

These thoughts will be primarily directed to relatively new or less experienced builders since I'm only about halfway finished—maybe.

The first thought that comes to mind is: Don't let yourself be overwhelmed by a 1000 square-foot pile of engineering drawings and a highly detail builders manual when you first receive them. When I got my plans package, I laid the drawings out on the den floor and started peeling through them. My feelings for several days were, "I'll never be able to build a Falco". I was totally overcome by the size and scope of the project.

Then I read completely through the builders manual. Never having built a plane before, this just added to the feeling of inadequacy. After several days, I gradually overcame these feelings. Now I'm three years into the project and feel very comfortable that I'll be able to complete it. This will be with a lot of help from Alfred who is available when I get as far as I can go on my own. One thing I've learned about Alfred—and I'd like to interject here—you may not always like the answers but he'll give them to you in a very candid, helpful way. He knows what he's doing and generally what you are doing. He'll help you.

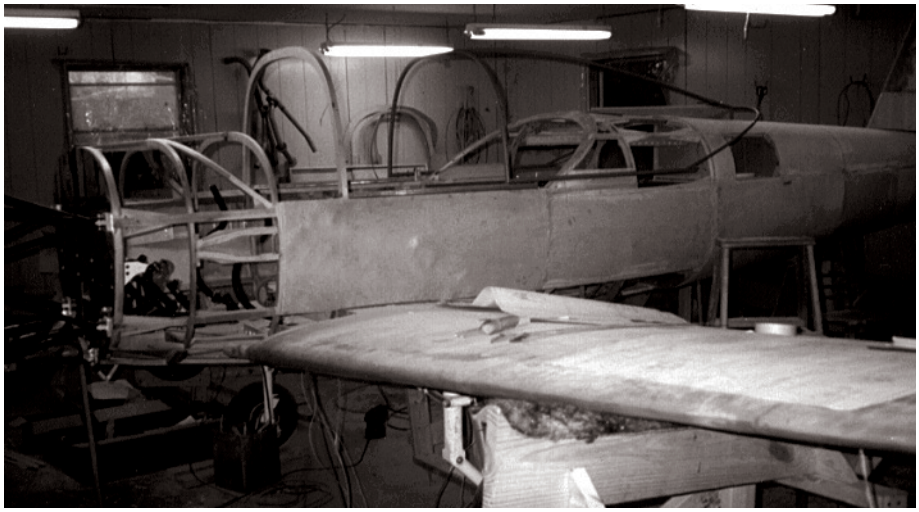
The next thing I'd like to share is: Work at a steady pace but don't try to get in too big a hurry. I remember vividly when I had just started my project, rushing home one Saturday about noon, grabbing a bite of lunch and hurrying to the shop to start ripping rib capstrips. A few minutes later, I had accidently waved the back of my hand across the table saw blade and the blade didn't wave back. The result was some severed tendons on the index and middle finger, a cut thumb and three months of light duty while the healing took place. A good rule has always been to keep your fingers out where you can see them when working with saws and power equipment. I want to also encourage you to always use extreme care when working with this type of equipment. It'll hurt, discourage and slow down your project.



Glyn's granddaughter, Erin Jade Gillott, 4, tries out the Falco controls.

A few words on glues. I have used some Aerolite and some T-88 in my Falco. I look back now and wish I had used only Aerolite. It has wonderful gap-filling properties. Also, a very important trait is that it is unaffected by high temperatures. The use of T-88 will require that I paint my plane white or some other light color. This is okay, but I would like to have had the option of a red or other dark color.

I thought the T-88's inability to sustain a good solid joint in hot weather was just hogwash. Trying to disprove this, I painted two boxes, one red and one white and placed them outside in the Alabama sun during the heat of a summer day. At 100°F outside temperature, the red box registered 115°F with my meat thermometer inside while the interior of the white box was the same as the outside temperature, or 100°. No change because the white reflected the sun's rays. Some test blocks were glued with T-88 and cured. I placed them in my wife's oven at 130°F. After two hours, the glue joints failed my destructive test using



Glyn Russell's Falco three years into the project and the 'hangar'.

a claw hammer to apply striking pressure. While this last test was not very scientific because I was unable to measure accurately the striking force of the hammer, it satisfied my that T-88 is not a satisfactory glue for high temperatures. That sold me on white/light colors for my plane, I think it'll be just fine with them on it.

I've used and have been very well pleased with the West System epoxy for coating the wood in order to prevent moisture absorption. In the beginning of my work, I tried several coating products. For me, the West System is way ahead of any other product. Every builder hasn't found this to be true. Several builders have reported in the Falco Builder Letter that they have had trouble with the West System setting up too quickly. This hasn't been a problem with me.

One of the reasons that I started using T-88 was that I got a lot of migration of the West System epoxy under the masking tape when I was coating the interior of the plywood which was used to cover the tail and wings. There was enough migration that I was concerned about getting a good bond with Aerolite. Aerolite doesn't adhere to epoxy but epoxy will bond to epoxy. So T-88 will and did bond to the West System epoxy which had migrated slightly under the tape.

Here's the solution to this problem. Buy a roller cover which is made of foam rubber and is designed for varnish applications. Most paint stores will have this product. You'll probably want to use a 3-1/2" roller. Just use your band saw and cut the foam cover down into 3-1/2" increments, stick it on your short roller and roll away. This reduces the amount of epoxy that you apply which does two things. It keeps your weight down and reduces the migration of the epoxy to almost zero. Alfred will keep reminding you that reduced weight is important.

One suggestion here about masking tape. There are several grades of adhesion. You may want to experiment with some of them. Some are almost impossible to take off the wood after they have been used. A way to help with this is to not leave them on the wood for more than a day or two. Leaving it longer makes the adhesive cling tighter and the epoxy on the edges doesn't help much either. As you apply the coats of epoxy, you should consider changing the tape out after each coat is dry. This will waste some tape, but it will make your job much easier when removing the tape. Leave it on a couple of weeks, and you'll need a knife to get it off.

You will find a bandsaw invaluable when cutting your wood, either spruce or plywood. If you need to buy one, consider getting one that will run up to 1/2" blades. The 1/2" blade will come in very handy when you need to resaw some wood to size, cut corner blocks, etc.

Another tool that has been a lifesaver for me is the Dremel Moto-Tool. For working in reduced space areas, it's something that you will crave. Hint for your family to buy you one for some occasion. If all else fails, buy your wife one for her birthday!

Well, I wanted to be entertaining, concise and helpful to someone out there. I hope this may be of help to some builder. I guess one out of three isn't too bad!

(*Note: While I don't want to quarrel with the assertion that epoxies soften with heat, I would like to point out that the generally accepted relationship between paint color and temperature—see the chart in the construction manual—is much worse than is revealed by Glyn's tests.—Alfred Scott*)

Construction Notes

Cecil Rives had a curious experience with his Falco. Quite suddenly his flaps refused to go down in flight, even though they still worked fine on the ground. He called to inquire if we had any ideas, and in discussing it, he mentioned that the problem had begun immediately after putting his plane through its annual inspection, and that in that process he had greased the lead-screw of the flap actuator.

First off, you don't need to grease this lead-screw except at enormous intervals—probably every ten years or so. It's a ball-screw device that has very little internal friction because steel balls roll between the grooves of the thread and annular rings inside the nut. It already has a certain amount of grease on it, and it will last a long, long time without any additional lubrication.

The flap actuator is a curious device, something known as an epicyclic ball-screw. How and why it works the way it does never ceases to amaze me, and I scratch my head as I describe to people how it works. Between the nut with its annular rings inside and the lead-screw, there is a sleeve—essentially a piece of steel tubing with holes that trap the balls. When the sleeve is allowed to turn freely, the path of least resistance for the balls causes the nut to move along the length of the screw. Stop the sleeve from turning, the balls will spin in place, and the nut will cease to actuate.

Another curious thing is that the greater the load on the screwjack, the greater the tendency to want to actuate. Conversely, if there is no load on the actuator, just the slightest amount of drag on the sleeve will cause the lead-screw to spin aimlessly in the nut.

Some years ago we had a problem with a batch of actuators that 'wouldn't actuate' and after some complaints we sent them back to our supplier. After much discussion, it was determined that the screwjacks had been over-greased, and that the grease between the nut and the sleeve was causing enough drag on the sleeve that it wouldn't actuate. They simply wiped all the excess grease off.

We concluded that this same phenomenon had probably struck Cecil's Falco, however after wiping off the excess grease, the problem persisted. Cecil finally went digging into the bowels of his airplane to see what he could find. He found that on the back face of the actuator motor, there are six flathead screws which hold the gearbox together. These seat into some dimpled star-type lock washers, and this causes the screws to stand proud of the surface of the gearbox. Two of these screws were hitting the actuator supports. Cecil ground away some of the metal on the actuator supports, and the problem disappeared.

Weird as it sounds, I think all of this makes some sense. I think the problem was caused by a combination of excessive grease and the problem of the screws hitting the bracket. With the flaps fully extended the screws would cause a side-force on the nut causing a sideways binding action on the sleeve. In addition, any upward pressure on the flaps would contribute to this action by pressing sideways on the nut. It sounds mystical, I know, but I think that's what happened.

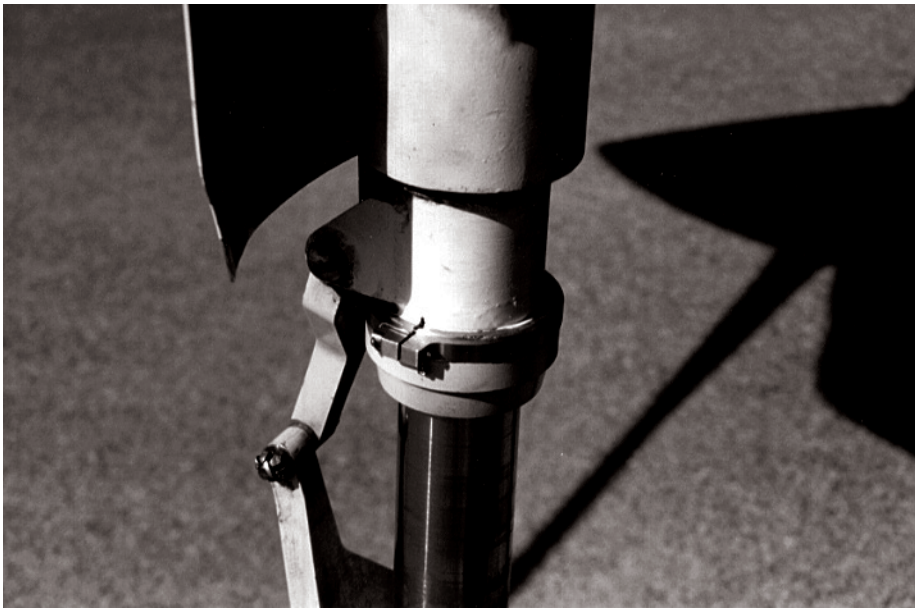
Steve Wilkinson sent this report: "It occurs to me that one very important item I forgot to include in my March 1993 Builder Letter summary of how to annual your Falco was the need to grease the prop. Any builder who uses my checklist—silly fool—should add the following paragraph:

"Remove the spinner and grease the propeller hub bearings. This should be done at least at every annual. The most important thing about the procedure is to *remove the second grease fitting on the opposite side of the hub from the one to which you're applying the greasegun*. If you don't do this, there's nowhere for the grease you're displacing with clean grease to go, and you'll blow out the prop seal. Grease should come out of that threaded hole pretty quickly, say after a stroke or three. If it doesn't, stop greasing: there's something wrong, and you may blow the seal anyway. If grease is coming out the hole freely, examine it; what you want to do is push out the dirty grease *and* any corrosion-causing water that might have found its way into the prop. If there's substantial water, that's another sign of a problem. Replace the removed Zirk fitting, check the prop for signs of missing static-balance fittings, and replace the spinner."

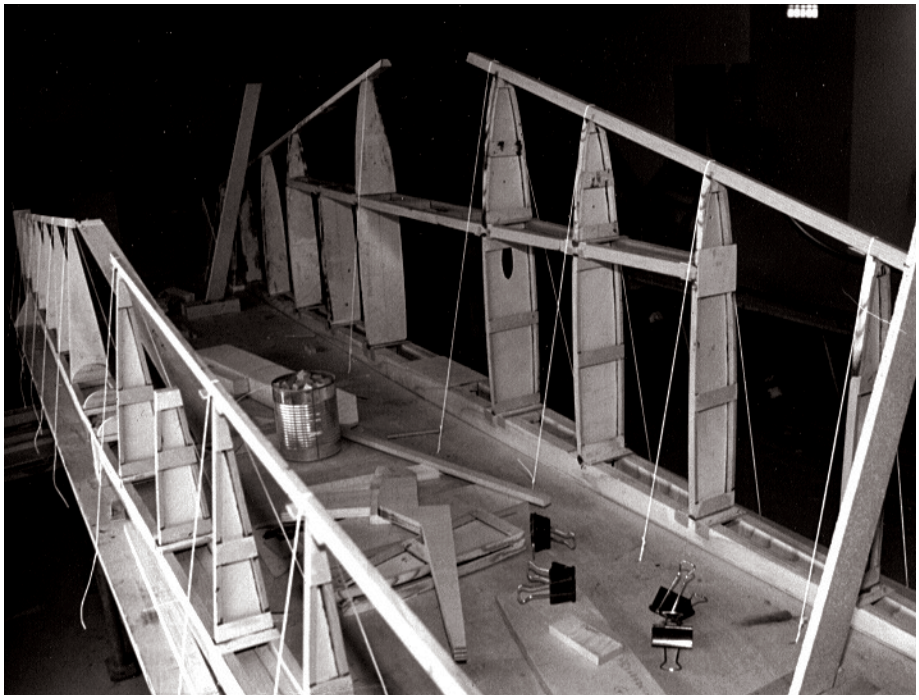
A couple of builders have asked recently for advice on overhauling an engine. In both cases, the overhauler wanted to install higher compression pistons in a 180 hp engine for additional power and proposed other power-boosting changes.

There are all sorts of things you can do to a Lycoming engine today to improve it. The most obvious thing is a lightweight starter. Terry Capehart has developed a nice aftermarket oil filter—Steve Wilkinson has one on his. Unison (formerly Slick) has a new electronic ignition system that's fully certified and which has two magnetos that continue to work if the electronic system craps out. Steve Wilkinson is going to get one of these and install it as well.

There are also lots of other things you can do to the inside of any engine. Some are sensible things and others aren't very wise. These generally fall into two categories: things that reduce vibration and things that increase power.



Rex Hume developed a minor problem with the nut of the nose gear working loose. Crude as it may sound, a good way to fix this sort of thing is to take a dull chisel and slightly deform the threads that the nut runs on. Rex decided to go the high-tech route and made this stainless steel collar which does the same thing. One thing about the dull-chisel method, it's certainly lighter and cheaper!



Fedrigo Gilbert's elevator and stabilizer take shape.

Reducing vibration is always a good thing to strive for. The simplest thing is simply selecting standard components off the shelf that match very closely in weight. This includes pistons, and connecting rods—and many people make a big deal about matching the weight of each end of the connecting rods. All that stuff is fine and dandy.

There are also other anal-retentive things like roller tappets and additional oil jets in the engine. I'm not qualified to comment on these things, but I don't think you're taking any real risk following the advice of a reputable overhauler on these sorts of things.

Where I have trouble, though, is with the power-boosting modifications to the engine. There is a direct relationship between engine power and reliability. Unless you're out to win races at any price and take all associated risks, I'd stay away from power-boosting modification. I'm most suspect of high-compression pistons, particularly when installed on second or third run-out engines. With each overhaul, the cylinder heads get a little closer to engine centerline, so if you add high-compression pistons, you're walking too close to the edge. The Lycoming marketing manager once told me he's seen lots of high-performance kitplanes with the cylinder heads completely blown off the engine because of this.

Opinions among experts vary on the subject of porting, polishing and flow-balancing. A little polishing and flow-balancing that smooths things out and reduces vibration is probably not a bad thing. More aggressive porting and polishing to boost power is one of those things that probably involves some trade-off in power for reliability.

Overall though, I'd always advise making your decision strictly for reliability. What I want in an engine is the most reliability I can get my hands on—a black box that will pump out power over the Alleghenies, Lake Michigan, the wastelands of eastern Wyoming or the Sawtooth Mountains of Idaho. If you've ever flown over territory like this, you come to appreciate that getting there is infinitely more important than arriving a few minutes earlier.

Speaking of lightweight starters, Sky-Tec's Tom Williams called the other day to say that they are going into production soon on a new starter that promises to have no interference problems on the Falco. Finally! The new starter is the P/N 149-12LS, where the 'LS' stands for 'left solenoid'. This is exactly like the new lightweight starter introduced last spring except that the solenoid is rotated to the left side of the airplane.

This eliminates the problem of hitting the landing light on the Falco, and from my analysis it will also miss the oil cooler as well—we still need to have that confirmed by a Falco builder, but it looks like it won't be a problem when I lay it out on our engine installation drawings. Tom says the new starter should be available around the first part of June.

A builder wrote the other day. He's starting the tail group assembly and wants to install an electric servo to operate the elevator trim tab, using a Mac trim servo mounted in the fuselage and with a push-pull cable to the tab as per our plans. He asks for my advice.

From what I've seen of it, the Mac trim servo is a well-made device that has built-in stops. It's been used on lots of homebuilts, and I'm not aware of any horror stories. That's the good part.

Unlike other modifications, the idea of an electric trim system does not upset me greatly, but I worry about a number of things. The first question is why bother at all? People who have not flown a Falco frequently become interested in the idea of installing electric trim because the airplanes they have flown require a lot of trimming. Electric trim seems like a nice feature.

As any Falco pilot can tell you, the elevator trim wheel on a Falco is more lonesome than the Maytag repairman. You just don't trim a Falco that much, and it's so easy to do with the wheel. The manual system is very light and infinitely more reliable than the electric device. What happens if you lose electrical power? What if the motor fails? What if an electrical fault causes the motor to run to the end of its travel and then burn out? Electric trim systems in production airplanes are always in *addition* to manual systems, and that's certainly not true with this sort of system.

I'm also bothered whenever anyone, early in the construction, starts becoming a re-designer of things to solve imagined problems. It's a worrisome syndrome that often leads to other, more adventuresome and dangerous modifications. In general, my advice is don't do it. Instead, try to get religion on doing things exactly according to the plans. After all, you don't hear a single finished-and-flying Falco builder out there bemoaning the lack of electric trim, and there's a great benefit to having everyone doing the same thing. That way, when there are problems, we can all learn from them. There's safety in numbers in this sort of thing.

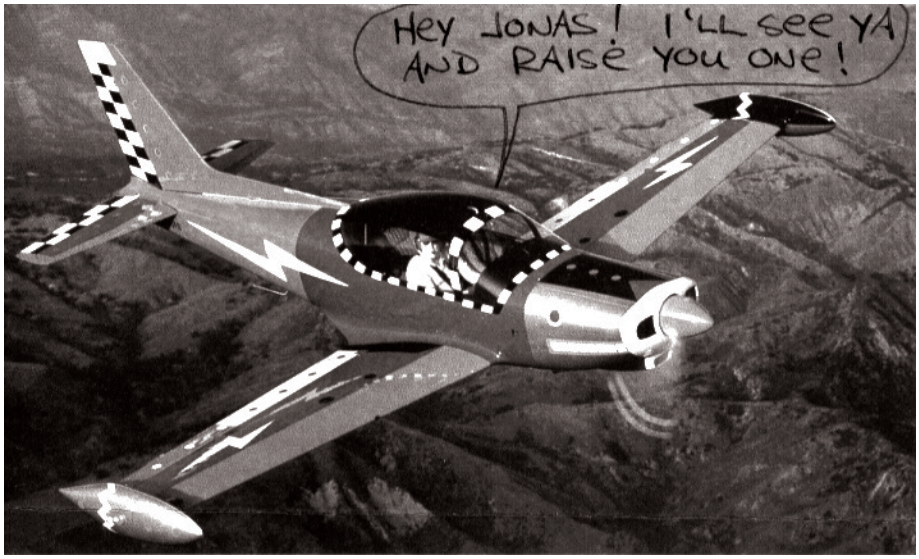
Cecil Rives sent a sketch of a door he installed on the nose gear upper drag strut to seal the opening in the firewall that the nose gear screwjack goes through. At the bottom of the opening, Cecil filled in the opening with silicone rubber compound molded to fit the upper drag strut in the gear-up position. At the top, he cut a piece of .040" aluminum to 60mm wide and 90mm tall and attached this to the upper drag strut with angle brackets and machine screws. As I understand it, the purpose is to seal the firewall.—*Alfred Scott*

Sawdust

• Now come the repli-planes. For years the auto industry has been plagued by kit cars that turned a Ford Pinto chassis into a 'Bugatti' or other classics like a Mercedes roadsters. This is beginning to happen in aviation but the planes are more than cosmetic clones, and some of them are downright interesting and fun. At Oshkosh, and with the appropriate wild look in my eye, I used to delight in shocking owners of Staggerwings by asking, "Say, can you build this out of fiberglass with a VW engine?" Now someone in Alabama is building a modern Staggerwing design called the Lionheart of composites, but with six seats and a Pratt & Whitney engine. The Russian Technoavia Finist is a modern Beaver that looks like a promising design, and now there's a Rotax-powered replica of the Fiesler Storch being offered as a kit in Australia.

• Drug runners. "After deciding to build a timber aircraft over 6 years ago, a check of local regulations revealed that Australia wouldn't allow the use of acid-catalysed glues in primary structures. Although I wasn't able to use Aerolite, I had to find out what we were missing and proceeded to have Aircraft Spruce supply some. Being basically quite mean, I had to find a way of getting it here. The package of glue was delivered to Oakland, CA, for my brother, David, to bring on his next trans-Pacific delivery. He was present when I finally opened it, and I saw him go sort of pale. The aircraft he had flown in was an agricultural Aries (yes, 90 knots to Hawaii and beyond) with precious little cockpit for an extra parcel, so he taped it above the control cables in the fuselage, then promptly forgot it until Brisbane when customs expressed an interest in what was inside all the hatches! Fortunately, it was dark and the customs man had mislaid his glasses so David didn't go to gaol that night—you see, the white powder of the Aerolite had been packed in an unbranded plastic bag inside an unbranded box. It's not difficult to imagine the glee of a lawman thrusting his finger or, more likely, tongue into the undisclosed powder."—*Stephen Friend*

• Media watch. See the Feb/Mar issue of *Air & Space* for 'Ollie, Mu'mmar and Oysters' about our invitation to Col. Qadhafi and later in the issue there's a piece by Steve Wilkinson about taking his Falco to a fly-in breakfast. In the next issue, Steve lives out a school boy's fantasy, comes out of the sun to buzz the the 40th class reunion of his old school, streaking down the length of the football field, interrupting the homecoming game, and whistles off into the distance snubbing the whole affair.



Top: Paint scheme from hell. Above: As Stephen Friend prepares to take his Falco to the airport, neighbors conduct the traditional Australian Garden Hose Ceremony.

• Burn it, but Lordy don't think about flying in it. In the April issue of *Car* magazine, this is what the erudite and opinionated L. J. K. Setright has to say: "Wood is quite dreadful stuff. It splinters, it warps, it shrinks; it creeps, it splits, it swells, it cracks; it reacts badly in some ways to moisture, badly in other ways to dryness, badly in yet other ways to light, to heat or to infestation; and it may do any of these things, or many of them in crazed combinations, even when left entirely alone. What it does under stress is quite dastardly, frequently treacherous and generally incalculable. There are, I admit, savants of materials technology such as Professor J. E. Gordon, one of the very best technical writers—who applaud wood as 'nature's composite' and infer all manner of useful lessons from it; but even he, being a person who admires boats, must be suspect. Wood is excellent for making trees, but is otherwise not to be trusted. Wood is not an engineering material."

Calendar of Events

Oshkosh '95. Spend a week with the sexiest 40-year-old on the planet. Plan now to attend the Fortieth Birthday Party for the Falco. All Falco owners are ordered to attend. Expect a massive turnout—Marcello Bellodi is going to bring his Falco from Brazil. The EAA is reserving parking for Falco, but you must arrive early.

West Coast Falco Fly-In. September 7-10 at Coeur d'Alene, Idaho. Contact: Larry and Ann Black, (408) 378-4857 or at 3945 Bucknall Rd, Campbell, CA 95008.

The Great Oyster Fly-In and Gathering of Stelio Frati Airplanes. November 4 at Rosegill Airstrip, Urbanna. Contact: Dr. Ing. Alfredo Scoti at Sequoia Aircraft.

Susan's Corner

Spring has sprung here in Virginia and fuselage frames are springing up at Sequoia along with the daffodils.

We've had a chance to finish up some projects in the warehouse, so I'm ready for the spring rush when the warmer weather gets everyone fired up about working on their Falco projects.

Oshkosh '95 is completely booked. I do have a waiting list, so let me know if you want to go and need a room, and I'll let you know if I get a cancellation.

A reminder to those of you who need to order individual parts occasionally—please remember to order by the part number. That way I'll be sure to ship the correct part.

We now have the new components for the new installation of the down-limit switch. We've added these to the electrical kit. If any of you need these, please let me know.

One noteworthy piece of personal news—by the time you get this newsletter, I will have gotten married. Some of you met Tim at the Oyster Fly-In back in November. Well, we just decided it was now or never, so we tied the knot on March 25th.—*Susan Stinnett*

Goings On at Sequoia Aircraft

Gosh, Susan didn't leave me much room, so I'll be brief.

The main thing I've been working on is the fuselage frames. We are now putting frames 8 and 9 together. We should start assembly of frame 7 in a day or two. Frames 10 and 11 will follow in a few days, and that will leave only frame 1.

The hard work is all in the jigs, and I don't want to minimize the amount of work that is required on that stuff. The real benefit of a good set of jigs is that you can then knock out the parts without any difficulty. While the jig-making process has been tedious beyond belief, it's nearly over. So far, all of the jigs have been working well, and we have this stuff down to a science.

By the time you get the next newsletter, we will have completed all of the fuselage frames. That means we will be back to the old position of being able to ship all of our kits on the same day the order is received.—*Alfred Scott*

Devoes to d'airport—Gwen and John are almost ready to fly.

Mailbox

I'm coming along fine—shooting to have the wing nearly done by the West Coast Fly-In in September. I spent the last month and a half building curved parts: wing tips, seat supports, wheel well parts, etc. I've made all the fiberglass covers for the bottom of the wing and even the main gear doors.

Dave Nason
Kent
Washington

My Falco goes along very well although I do not have enough time for building. Status: elevator and stabilizer skinned, fin and rudder skinned, and nearly all fuselage frames completed. My next big project is the main spar—wish me luck, please.

Martin Steinwender
Vienna
Austria

This message is, for me, not the happiest. I apologize for not letting you know earlier but I have been hoping for some form of salvation. The message is, "Ole number 816 no longer exists." 816 being the serial number you issued to me.

As you may recall, my efforts were damaged by the flood of 1986, and I bought some parts to replace those affected. That year, there was very little notice of a problem, and the water level reached six and a half feet in the hangar. In 1993, there was adequate information and all aspects of the possibility of a flood equated to 1986.

Obviously, everything would be copacetic if the plane was hoisted to the ceiling with only part of the landing gear exposed to the water and enclosed in plastic bags. In the real world, because of the massive dike breaks upstream from the hangar, the water depth reached 14 feet and stayed like that for six weeks.

The result was total devastation! The wood had no more strength than soft balsa. The aluminum parts were deeply corroded.

The steel parts were deeply rusted. The chemicals in that water ate everything in sight. Even out of sight.

The primary reason for my not writing has been the hope that I could find a sponsor. However, that apparently is not to be. Also, as my wife points out, "Why do you want to get involved with a project like that at your age?" (73) So under the circumstances, I will have to call it quits. It has been pleasant working with you, and I wish you well.

John Rawlings
St. Peters, Missouri

This is sad but understandable news. Beginning in 1983, John Rawlings has been working on his Falco, largely from plans. At the time he started, he was working as a toolmaker at McDonnell Douglas and has subsequently retired. His project was damaged by a flood in 1986 and then completely wiped out by the massive flood of the Missouri river in 1993.
—Alfred Scott

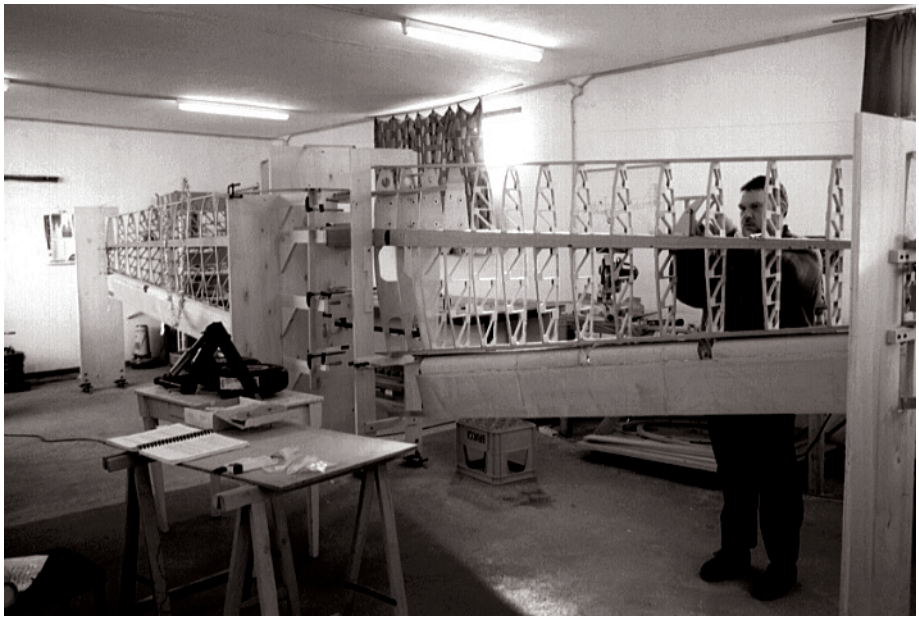
After a long rest during which Falco production reached an almost zero level, I took up building again. The fuselage is finished except for skinning the bottom between #1 and #3. At the moment, it's a bit scary for me to cut the fuselage at #8. I will probably install the wing spars first, and it might be handy in aligning the thing.

I owe you some information on Timber-Tix, that famous Dutch product, which I used a lot for construction purposes in my shed. In my opinion it is very easy to use but is not gap-filling. I would dare to sale on a boat constructed with his material, but I cannot recommend it for structural gluing of aircraft. I am enclosing six pages of DIN norm material, which to my opinion will not change your mind. A DIN norm is something like your ASTM or SAE standards.

Marcel Morriën
Wijk bij Duurstede
The Netherlands

I had finally gotten around to doing some initial tests with Timber-Tix, gluing some wood blocks and then breaking them. I found the glue to be very easy to work with and very strong. I've always wanted to see some results from an independent testing laboratory, and the documentation that Marcel Morriën provided was just that, but unfortunately I find it hard to make sense of because the data sheet that cross-references the English-language standard is in Dutch. Marcel says the data shows that the glue still has an adhesive strength of more than 1160 psi after being boiled for 6 hours in water, however the classification is one for non-structural adhesives. It gives no clue as to what the limitations of the glue are, nor why it is not considered a structural adhesive.

I am, therefore, still confused.—Scoti



Above: Guglielmo Nicoletti, Guglielmo Leggeri and Oscar Colombini in their shop in Cumignano, Italy.

The fuselage frame arrived safely after a rather complex journey. Apparently, they missed two ships and were eventually landed in Sydney. It took a further two weeks to get them from there. Guido generously allowed me to fly his Falco for an hour a while ago. Wonderful! Better than the SF.260, but a little hard-riding on the ground. I may have to regrade my strip.

Ian Ferguson
Dookie
Australia

What a fantastic plane the Falco is! No, I have not flown one yet, I am referring to the construction process. On 25 May 1994, I received plans number 1244. Construction started on 2 August 1994. I have only completed the tail group hinges, rudder, elevator spar and the required elevator ribs. The construction manual and blueprints are the best I have ever worked with. Our EAA Chapter had everyone bring their construction manuals/plans to our September meeting so that those who are not currently working on a project could get ideas on what to build. My set of Falco plans stole the show. Everyone from plastic plane builders to RV builders were amazed by the clarity, detail and engineering that goes into the Falco.

David Carroll
Kenneshaw, Georgia