

Falco Builders Letter



Jacob Brouwer and his new Falco.

First Homebuilt Falco in Holland

by Jacob Brouwer

During my whole flying career, which after 8 years in the Dutch air force, was for the rest spent in airline flying and instructing in light aircraft, I have always had considerable interest in constructing a homebuilt airplane. In Holland, this was a thing that one could only dream of, because of the massive bureaucratic hurdles which made such an undertaking sheer impossible. Until in the eighties some of the rules for homebuilt aircraft were changed and construction under stringent supervision became a possibility. So, when I visited Sun and Fun in Florida and seeing all these beautifully crafted flying machines, my decision was taken. I was to build my own airplane!

I had been building wooden racing yachts in the past, which probably influenced my decision to build something fast and good looking, and preferably in wood or fiberglass. I also know that my plane had to be more or less acrobatic, should have a good range and be able to fly IFR. Although the latter is not allowed for experimental aircraft in Holland, it comes in handy when the weather turns bad on you.

Soon I had a lot of info-packs and videos for kits like Glasair, Lancair, Velocity,

RV's, etc. I made several trips to the USA to visit the shops where these were made and to make demo flights. Some planes were fancy looking but had poor flying qualities—I will not mention names here—others had good performance, but did not look so good or were of inferior quality. At last—of course “at last” as will be the case with every Falco builder—my attention was drawn by the Falco. This was the plane that suited my ambitions.

I ordered the plans and discovered that due to the dimensions of the plane and the method of construction, I first had to find a workshop. Since I wanted it to be near

In This Issue:

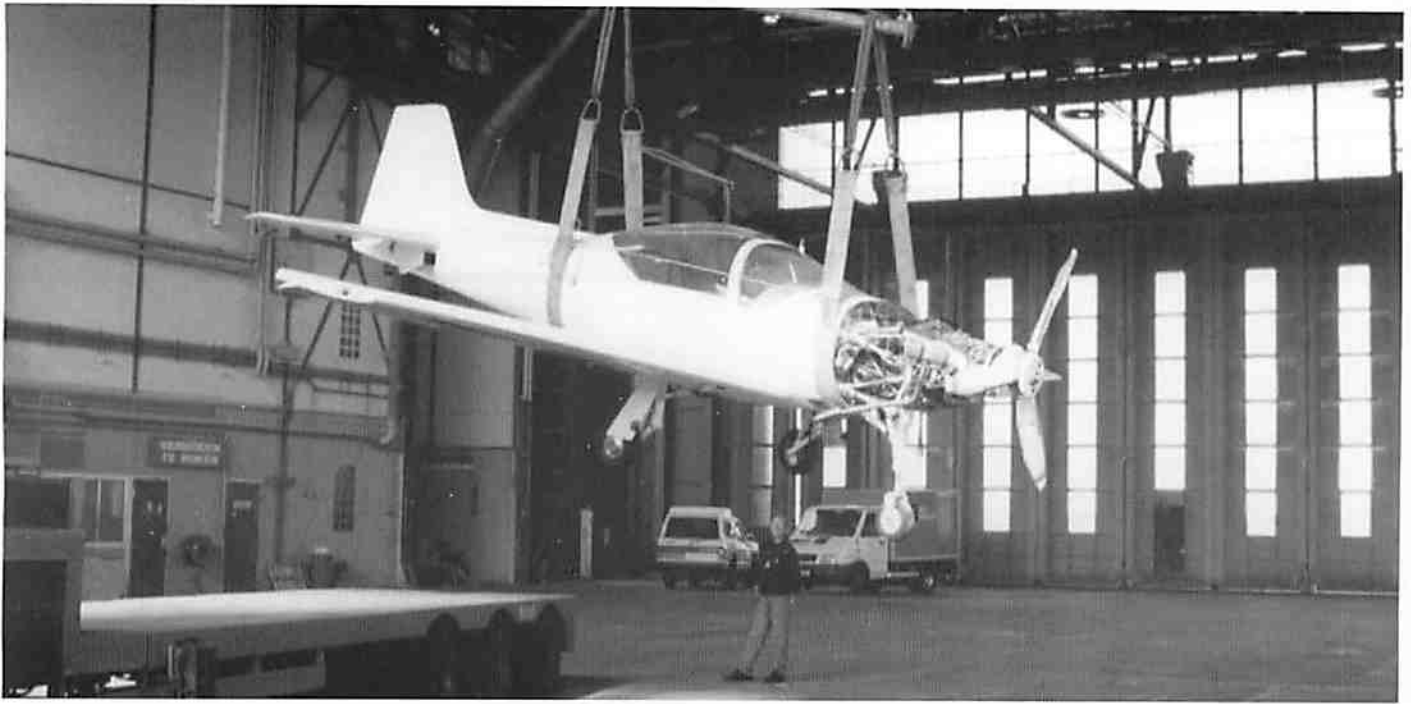
- 5 Charles Wagner Flips His Lid
- 6 The Glider, Part 17
- 8 Boring Falcos
- 10 Moving the Falco
- 12 Construction Notes
- 13 Goings On at Sequoia
- 14 Sawdust
- 14 Susan's Corner
- 14 Calendar of Events
- 15 Mailbox

our home, we decided to construct a new two-car garage. We is me and my girlfriend Petra. We spent a good two years on this project, in the meantime also enlarging the house with another room. When this work was finished, and I was about to order the first kits, I saw an ad in *Trade-a-Plane* in which somebody offered a partly completed Falco. Having spent a lot of time already in the construction of our house, I sensed an opportunity to cut short on building time. I called the phone number in Florida and yes, it was still available, but some serious buyers were coming next Sunday. Of course, these could be the words from a salesman, but I decided to have a look at it anyway. Since it was Thursday, the only thing I could do was get on a flight the next day.

The partly finished plane I saw the next day convinced me that a very good job had been done here, everything had been crafted very neatly and the measurements I took were exactly according to the plans. I was convinced that someone had done this job with great care and only had to sell because he ran out of money. That same day I was the owner of some nice pieces of a Falco. Two weeks later, we came back to load the parts in a container, together with the kits for gear retraction and electrical system, which I had picked up in Virginia some days before and sent this to Holland where it arrived two weeks later.

Since I am co-owner of a small charter company with a maintenance base at the Amsterdam Schiphol airport where we rent some hangar space, I decided to assemble the airplane in the attic of our shop/office there, where I would have to use a crane to put it down on terra firma later, but where I would be able to work without too many people disturbing me. Another advantage here was the vicinity of several big airline maintenance bases and the then-still-active Fokker company, with experts in every field of aviation construction and a wide array of special tools, which proved to be an immense help during the following three years of building.

Some parts like the fuel system, part of the landing gear, the gear doors and door re-



traction system, instrument panel, I made myself, while the more difficult parts like the nose gear, oleo struts, engine mount and cowlings were ordered from Sequoia. I made some what I considered minor modifications that later turned out to have far greater implications than I first thought. As an example, I angled the right half of the instrument panel 20 degrees toward the pilot in order to improve the vision on the instruments in this part of the panel, in particular on the LED's in the radios and the GPS. This in turn meant I had to modify the front fuel tank, the instrument panel mounting, the glare shield and the right control stick.

The end results is really what I expected it to be, a real improvement which looks



good, and I am very proud of it. Still, I doubt if it is worth all the extra effort I put in. So my advice to anyone building a Falco: don't modify the plans unless you are certain of what you are up to. The plans are really good and where I had any questions they were solved by sending a fax to Sequoia and receiving an answer overnight. I also added a cabin exhaust with a push-pull control on frame No. 6. I know from experience that these cockpits with bubble canopies can become very hot in summertime (yet, even in Holland), and this will increase the flow in the cockpit considerably.

The end result is a good looking airplane even though I still have to finish the paint on the cowlings and have to add the fancy Falco striping to the white color. Since I opted for the IO-360 engine, I had to modify the cowlings in order to accommodate the front cylinders and also the lower cowlings on one side where it touched the exhaust. In order to satisfy the Dutch environment regulations two exhaust-end mufflers were added which I ordered from a German company called 'Liese'.

They made these specially for the Falco, and they fit exactly in the exhaust port where they are hardly noticeable. They really make this Falco a quiet aircraft, compared with other Falcos, Glasairs, Lancairs and others with straight stacks. I also had to use a three-blade constant-speed propeller, to reduce noise. It is a wood-and-epoxy prop made by MT in Germany. It is almost the same prop they use for Mooney and Extra, and it performs well. The price is comparable to the standard Hartzell prop, but it weighs far less—only 46 lbs including

the spinner. An advantage of this prop is that it has no fatigue limit.

All the inspection-hole covers on the aircraft are made of aluminum sheet, with countersunk screws which gives a smooth appearance. I also expect them to stay in better condition in time than the wooden panels. The main gear doors are made of aluminum, with stiffeners on the inside. Since they are not as thick as the fiberglass doors, they are almost flush with the underside of the wing. Also they are very rigid so I hope they will not open slightly during flight, as I notice with other Falcos. I installed the gear and the main doors with the aircraft wing in the vertical position. Even though the access was excellent, I spent a lot of time adjusting the doors. The nose gear bay cover is made of stainless steel, stronger than fiberglass at almost the same weight.

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The canopy is the 'normal' Nustrini. Since I am 6' 1", I had to make the seat cushions half the original thickness. This created just enough headroom, but next time I think I will opt for the 'elevated Nustrini'.

With all the extras I added, like inverted fuel and oil system, an interior decorated with gray leather and with the surface on the outside made smooth with epoxy and microballoons before painting, it is not a light aircraft with just over 1,300 lbs empty weight, but the CG is right in the middle of the certified range, and I will be able to do acrobatics up to 6 g's with partly filled tanks.

With the aircraft almost finished, I had to apply for the Certificate of Airworthiness. This used to be a difficult and lengthy process in the Netherlands, but a few years ago the rules were changed, and I think we now have the easiest system in the world to get a kitplane certified. The idea is that when building a proven design, the builder is the only one responsible for the quality and the safety of the airplane as far as building and flying is concerned.

So now you only have to find an A&P who certifies that in his opinion no serious defects can be found and the airplane is built according to the plans without major modifications, you must have the avionics, instruments and weight and balance checked by a certified person, satisfy certain noise requirements and send all the paperwork to the authorities. If everything is OK, you receive your experimental C of A within weeks.

One of the restrictions of this C of A is that you are only allowed to fly within controlled airspace with prior permission from ATC. Since my first flight was to be from Amsterdam International Airport, which is becoming one of the busiest airports in the world, this turned out to be a problem. Obviously they could not have me test-flying over the airport amidst arriving and departing IFR jet planes. On the other end, however there are a lot of nice long runways on the airport, and I would use one of these to do all the taxi tests up to flying speed, the last test being a short hop into the air with subsequent landing. However if no problems would arise at the first takeoff, the first flight had to end at a small uncontrolled airfield about 40 minutes flying to the south of Amsterdam.

I was amazed how all systems just worked fine the first time I tested them. Apart from a leaking front fuel tank, no problem turned up. It was a weld in the cavity of the tank where the radios find their place,

which had opened under the compression caused by the installation of the tank. Of course, this had not been welded properly. I had to take the tank out for repairs which is including the re-installation a lengthy process so I added at the same time two inspection holes in the tank which may save me at least two days work in case more leaks develop in the future, or if something drops into the tank! If you add these holes, be sure you use a good tank sealant when closing the inspection panels, otherwise this solution is worse than the cure!

When the C of A arrived all the ground testing had been completed and the plane was ready for the first flight. Since I am an experienced pilot with almost 20,000 hours flight time and lots of experience in light airplanes, I never had any doubts who would be the first one to fly this airplane. Now this crucial moment had arrived, I

reconsidered and wondered if I had been critical enough. After consultations with some expert friends, we concluded however that I was best suited for the job.

The plan was to wait for good weather—which may take a long time in winter in Holland where low ceilings and visibilities may last for weeks—and then take off in the afternoon when the airport is relatively quiet between two peaks of international in- and outbound traffic. In order not to disturb the airport authorities too much with this 'experimental first flight' and not to feel the pressure of a lot of spectators, the decision was made to keep this first flight kind of 'low profile'. Only two friends would be there as assistants, one on the ground and one in a chase plane. Also ATC was informed about the nature of the flight (fire brigade and ambulance could be alerted by them and could be there within minutes).



I got my own runway for takeoff and took all the time in the world to make sure everything was perfect. This first takeoff proved to be nothing spectacular. The plane took to the air like it had been flying for several years already. At 1500 ft, I reduced power in order to keep the speed low, which proved to be sort of a problem because this plane was designed to fly fast even with gear and flaps down. Since I had been flying Falcos before, I was familiar with the light controls but even then I was surprised at how effortless one can fly this airplane. After a few minutes, the chase plane caught up, the pilot confirmed to me that everything looked okay, and that it really was a nice airplane.

The route to the turf aerodrome we were heading for was across typical Dutch landscape with meadows and farmlands, divided by small waterways, hardly any trees and only some high-tension wires to watch for, so there were lots of emergency landing fields if needed. Everything went smooth however and while enroute I performed some of the flight tests.

Since the chase plane was there all the time, I used this opportunity to cycle the gear and have the main gear doors checked—the nose gear doors are not installed yet. This worked out fine. Thereafter I did some slow flight with turns which proved to be nothing spectacular. After 45 minutes, we approached the destination airfield, where I did not get the green gear down light upon gear selection. A check on the emergency handle confirmed the gear-down condition and an uneventful landing was made. Later it proved to be the same problem that landed a Lockheed Tri-Star in the Everglades some twenty-five years ago—only the light! You may be familiar with this story.

Although there were no family and friends to welcome us with champagne to celebrate on the spot, and nothing abnormal had happened, it still was a great sensation to fly for the first time with this Falco. Of course, the construction has cost me a lot of time and has been the cause for some headaches occasionally, but I feel it was worth it. Now I am getting more nervous than before, because I want to fly every day and the weather has not been very good. Up till now I accumulated only 4 hours and still a lot has to be tested and confirmed, and although the airplane is flying, still a lot of work remains to be done.

One problem that turned up is the exhaust pipes running too close to the cowling, coloring the paint on the outside—a reason



may be that the mufflers give too much backpressure causing the pipes to be hotter than without them. I am modifying the cowling so as to create more room for the pipes and will add so-called cool-mat on the inside of the cowling next to the pipes.

Many people ask me how fast it flies, and I must say I don't know yet. I tested the speed range now from stall speed to 180 knots. It cruises at 165 kts IAS on 22" and 2300 rpm, but I still have to calibrate the airspeed indicator and see how fast it will go with 25" and 2500 rpm—which is about 75% power—and with the nose gear doors installed.

At the higher speeds, I notice a slight tendency for right roll, so I added a small trim tab on the left aileron, which cured this problem.

Looking back on the project, I must say it was worth every minute of my time. I have to thank many persons for their help and advice, like the people at Sequoia and Hans

Sonntag from Germany who let me fly his Falco and advised me on the silencers or Henk van Rooy, who's help was invaluable, and many others. Without people like them, a project like this is unthinkable.

Looking forward I see my next project, which I already started. I am building a house with a hangar in France on a private aerodrome called Vendee Airpark, situated near the Atlantic coast between Nantes and Bordeaux and incidentally also between two famous wine regions, the Bordeaux and the Loire. An airpark is something quite normal in the USA, I know, but unique for Europe. We sold our house in Holland and with the money gained between I bought this plot. Once finished (end of this year?), I will use the Falco to travel between my rented apartment in Antwerp, where I now live and my house in France—it should be a two-hour flight. Although a private aerodrome, Falco owners are of course always welcome.

Charles Wagner Flips His Lid

I must complain bitterly. The drawings I got showed no provision for fuel tank covers so I had to make alterations to accommodate these after the fuselage had been sheeted. This was awkward and not ideal. However I copied the principal of the front tank cover for the rear. Because of this being an afterthought I made no provision for a Dzus fitting and left the cover loose.

Yesterday, my inspector asked me to run the engine up to full rpm, 2600, I did not have my headset in the aircraft nor any tools. The inspector sat in with me and we closed the hatch, ran up to the desired rpm checked the prop governor and shut down. Bloody hell! The propwash had lifted the rear fuel tank cover and we couldn't get the canopy open, the cover was at 90 degrees to the canopy.

We could get the canopy open a couple of inches and started shouting to the very few passers by and waving a red A4 notebook the inspector had taken notes in. Having no tools there was no hope of closing the flap from inside, the hinge it was rather stiff with primer. There was little point in exerting brute force on the flap, as the likelihood was that we would do a fair amount of damage without solving the problem.

I was rather worried, it was a new aircraft, the engine was hot, what would happen if we had a fire. Tim, the inspector, was not amused, I didn't ask him what he was thinking. Aircraft taxied by and we shouted and waved like maniacs. The wind was against us. A Cessna 150 went out, piloted by an acquaintance of Tim's.

We asked ourselves, Have we an emergency or have we not? We had. Reluctantly we morsed SOS on 121.5 carrier wave. Atlantic House, tracking all the North Atlantic traffic, was a hundred yards behind my hangar. Vehicles went by, we were sure, looking for the emergency and never once glanced in our direction.

We hadn't wanted to disturb Prestwick traffic, however, we changed frequency to 118.15 and gave them the dots and dashes. Sod all happened except I began to think that I might need a pee. I did not relish the thought of Tim and me peeing into the airplane before it had had its first flight. This ridiculous situation continued for over an hour and a half. We gave Atlantic House and Prestwick Tower a thorough going over.

The Cessna 150 came back. The passenger got out. We waved, we shouted, Help!



And when there was no response and he walked to the clubhouse the cries changed to You, deaf, blind bastard, Help! No response. The pilot checked the aircraft over, tied down, took an age, and started walking to the clubhouse. We yelled Help! In unison, Help! I stuck my fingers thro the canopy gap and waved as best as I could. He walked on. Help! And he walked on. He's not turning into the clubhouse, is he, is he, no! he is, no he's not. The pilot walked on; he came towards us, one final Help!

We were saved. I leapt out and relieved myself on the grass at the side of the taxiway.

It seemed Prestwick Tower had got the message that something odd was happening roughly in our direction, their transmissions were being disrupted. They asked the Cessna pilot to have a look and check. He took his time. Atlantic House heard nothing because of the buildings in between and this did not become an amusing and embarrassing story in *Pilot* magazine.

While we were having a coffee in the clubhouse the airfield police came screeching by. People housed near the airfield, quite some distance away, on the side opposite where all the passers by were passing by had heard our cries, carried by the wind.

Alfred, make provision for these fuel tank fill flaps in earlier drawings and make sure that the rear cover closes when the canopy opens. It would be better if you had one of these fancy locking covers, like a motor bike fuel tank filler cover rather than a door.

I hope to fly within a couple of weeks or so, I have to go to Lithuania on business on Saturday for a week.

Charles Wagner
Glasgow, Scotland

Maybe you ought to complain to the designer of your specific fuel tank lid! We've always used screws, Dzus or Camloc fasteners on the access door. I agree I should detail that out for you, and have been meaning to do it, but everyone else has used a fastener on both access panels.—Scoti

The Glider

Part 17 of a Series

by Dr. Ing. Stelio Frati
translated by Maurizio Branzanti

38. Basic 3-View Drawings. Having established with approximation the overall required elements, we follow with the preparation of the general schematic design of the plane, thus drawing in the appropriate scale the three basic views, making provision for the loads and their required space.

First we draw the side view in 1/10 scale, drawing the fuselage shape, providing for the various loads allocation but also considering aerodynamics and aesthetics.

In this phase, we can take care of the so-called aesthetic aspect, in such a way that the design and the relationship between the various components results in a shape that is pleasant to the eye. Nature itself teaches us that generally designs that are aesthetically pleasing are also aerodynamically shaped.

Obviously, however, judgment should be left to the expert who knows and understands the nature of the phenomena associated with flight. At all the times, keep in mind the structural and aerodynamic requirements and reach a compromise to obtain the best of all factors.

The design of the fuselage is influenced almost entirely by the arrangement of the cockpit. Indeed, we can say that the fuselage of a glider is tailored around the pilot, with the need to reduce the cross-section to a minimum.

In a single-seat design or with two seats in tandem, the maximum width of the flight deck can be 60 cm on the outside. The interior dimension should not be less than 54 cm. The same can be said for the height, which may vary from 100 to 110 cm as a minimum. We have therefore established the preliminary requirements of the fuselage as a starting point.

We will sort out later the location of the wings, the horizontal empennage, the forward skid and eventually the landing gear.

39. Centering. Having established the location of the various elements and that of the loads, before we continue to define the aircraft's design, we have to verify its centering. That is, we must make sure that the total of all the aircraft's weights, fixed and moveable, will fall within 25-30% of the



Richard Clements had now painted his Falco.

mean aerodynamic chord of the wing. This location for the center of gravity of the aircraft is essential for good stability.

Remember that the mean aerodynamic chord is the wing chord at the geometrical center of the wing.

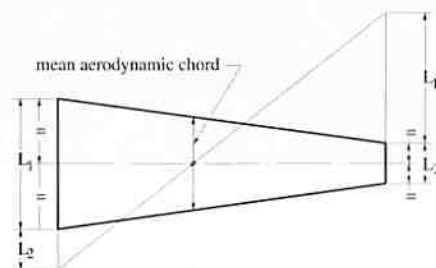


Figure 7-1

In gliders, there is no variation in the load during flight therefore centering is a singular operation. It is obvious that the determination of the center of gravity does not require the pilot's presence. However in a two-seat side-by-side configuration, it is necessary to determine the centering with one and two people to check if the center of gravity fluctuation falls within the allowable limits (25-30% of the wing chord for longitudinal stability).

The determination of the center of gravity location can be found either analytically or graphically.

In both cases, we first design the longitudinal section and the location of the various loads are established. The determination of the location and values of the various loads is not a simple matter at this stage since it's not always possible to know in

advance the weight distribution of the aircraft's structure.

It is essential that the estimates of the weight of the components be made with great care, because the accuracy of these estimates will determine whether there will be a good or bad outcome in the design.

This analysis will be easier for the experienced designer who may use data from previous projects. It is very difficult to obtain detailed data on weight from aircraft built by others.

Analysis of Partial Weights. To help you with this difficult task, we will give you some average values of structural weights for various components for gliders.

Wing. For wings with a single spar and a torsion box at the leading edge, fully covered and complete with aileron controls and with wing root fittings, we have the following weights per m^2 of wing surface: for a wing of small aspect ratio (8-10), with external bracing: 4.5-5 Kg/m^2 , cantilever: 5-5.5 Kg/m^2 ; for a cantilevered wing of medium aspect ratio (12-15): 5.5 to 6.5 Kg/m^2 ; for a cantilevered wing with high aspect ratio (18-20): 6.5 to 8 Kg/m^2 .

Empennage. For the horizontal empennage with plywood-covered stabilizer and fabric-covered elevator, complete with all the attachments and controls, the weight varies from 3 to 4 Kg/m^2 respectively for aspect ratios of 3.5 to 4.5. The position of the center of gravity for monospar wings can be placed at about 30% the wing



...and it's a wild paint scheme!

chord. In the horizontal empennage instead the position is 40% of the chord.

Fuselage. The determination of the fuselage weight by empirical methods is more difficult. We can give some values relative to the total weight W (in Kg.) of the fuselage in relation to its length L , measured in meters; but as far as the longitudinal distribution of weights, it will have to be considered according to the internal arrangements and will vary from type to type.

For a single-seat and polygonal truss type fuselage without landing wheel, or for monocoque fuselage with landing wheel and plywood covering, complete with vertical empennage and canopy, we have

$$W = 6L + 20$$

For a two-seat design (side-by-side or tandem) with dual controls and complete as described above:

$$W = 6L + 50$$

The pilot with parachute is considered to be 80 Kg.

Center of Gravity Determined Analytically. Based on the partial weights, let's now proceed to determine the location of the center of gravity.

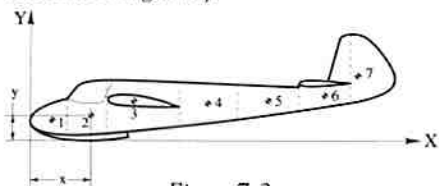


Figure 7-2

The longitudinal section of the glider is subdivided in stations, and to each we fix its weight and the position of its center of gravity.

We select two reference points on the two axes of coordinates. Typically, we will select the tip of the nose as the 'zero point' in the horizontal (X axis), and this is usually called the 'datum'. We'll use the bottom of the skin or wheel as the 'zero point' in vertical (Y axis), often designated 'W.L.O.' for 'water line zero'.

Let's call x the distance from the datum, and y the distance from W.L.O. Multiplying this distance by the weight gives us the static moment of the station relative to each axis and referred to as index M_x and M_y respectively for the X and Y axes:

$$M_x = W \cdot y \quad M_y = W \cdot x$$

All the moments for each axis are the summed and there are referred to as Σ .

Dividing then the summation of the static moments, ΣM_x , and ΣM_y by the summation of the weights, ΣW , which is the total aircraft weight, we get the respective distances x_{cg} and y_{cg} from the X and Y axis for the center of gravity CG.

This distances are expressed by the following relationships:

$$x_{cg} = \frac{\Sigma M_y}{\Sigma W} = \frac{\Sigma(W \cdot x)}{\Sigma W} \quad [24]$$

$$y_{cg} = \frac{\Sigma M_x}{\Sigma W} = \frac{\Sigma(W \cdot y)}{\Sigma W} \quad [25]$$

For convenience the values of the individual operations are summarized in a table. We show as an example the calculation to determine the center of gravity for a glider in the 15 m. category.

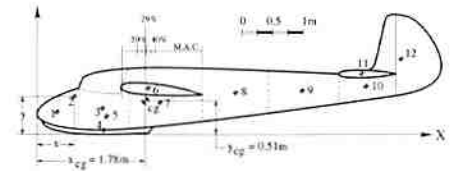


Figure 7-3

| Sta | W Kg | x m | M _y | y m | M _x |
|-----|---------|--------|----------------|--------|----------------|
| 1 | 6 | 0.35 | 2.10 | 0.32 | 1.92 |
| 2 | 5 | 0.61 | 3.05 | 0.58 | 2.90 |
| 3 | 19 | 1.05 | 19.95 | 0.39 | 7.40 |
| 4 | 5 | 1.08 | 5.40 | 0.04 | 0.20 |
| 5 | 80 | 1.12 | 99.60 | 0.27 | 21.60 |
| 6 | 90 | 1.75 | 157.50 | 0.77 | 69.30 |
| 7 | 18 | 1.96 | 35.30 | 0.51 | 9.17 |
| 8 | 7 | 3.10 | 21.70 | 0.62 | 4.34 |
| 9 | 5 | 4.25 | 21.25 | 0.70 | 3.50 |
| 10 | 4 | 5.25 | 21.00 | 0.78 | 3.12 |
| 11 | 7 | 5.20 | 36.40 | 0.97 | 6.79 |
| 12 | 4 | 5.85 | 23.40 | 1.23 | 4.92 |
| | 250 | | 446.65 | | 135.16 |

$$x_{cg} = \frac{\Sigma M_y}{\Sigma W} = \frac{446.65}{250} = 1.787m$$

$$y_{cg} = \frac{\Sigma M_x}{\Sigma W} = \frac{135.16}{250} = 0.54m$$

Boring Falcos

by Clive Garrard

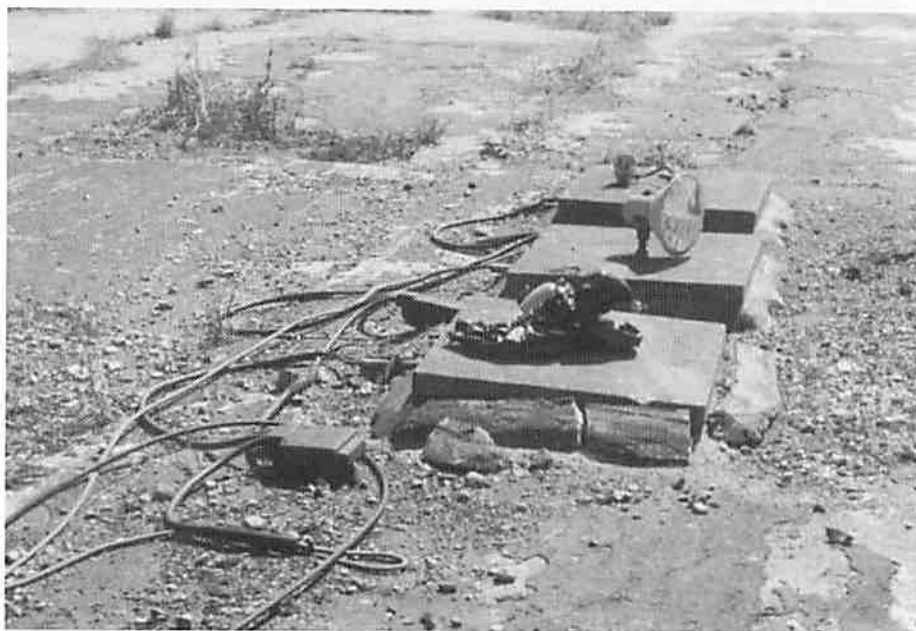
Back in August last year, I had the misfortune to have an accident in G-OCAD, following a partial power loss on take off. The gear was still down, and there was runway left, so I landed again. However, the runway end was looming very rapidly and with a harvested field full of 6 ft diameter bales beyond, I steered towards an old perimeter track in an attempt to stop safely. Here (if I had any), my luck ran out completely and an unforeseen low concrete block knocked off the nose gear, followed by the inevitable destruction of the propeller, together with damage to the spinner and lower cowling. A second block sideswiped the starboard main gear leg—destroying the brake assembly and denting the disk.

I have related the above facts, not in order to report the accident for any reason, but simply as a lead-in to two further items that may interest past and present builders of this superb aeroplane.

While we (David Nowill, Gordon Blunt and myself), were carrying out the repairs (which we were relieved to find were 99% confined to the metal components), we observed that the side load strut mount had been moved outwards at the bottom, by about 1-1.5mm. David and I discussed the problem, and we decided to slacken off the bolts, retract the gear and with the mount having realigned itself, retighten them. This appeared to be satisfactory, but after a couple of flights we noted that the mount had moved out of position again.

It was obvious then, that we had some damage that we had to investigate and repair, but with the annual due in a few weeks, we decided to resolve it at that time. During that period we mulled it over, and I stated my belief that the bolts must be bent and the holes in the main spar deformed—which would allow the position shift. David agreed with this theory, so I ordered a new set of nuts and bolts in anticipation, while we continued to discuss how we might effectively close up the damaged holes. At first, David thought about making a jig plate, through which we could drill larger holes, into which we could then insert some specially made bushes. While this would have positioned the holes accurately, it would not have aligned them, but at the time, that was our best shot at a solution.

The annual date arrived and after dismantling the gear linkage, we removed the mount—which confirmed our damage



Top: Skid marks on the runway where Clive tried to escape to the side.

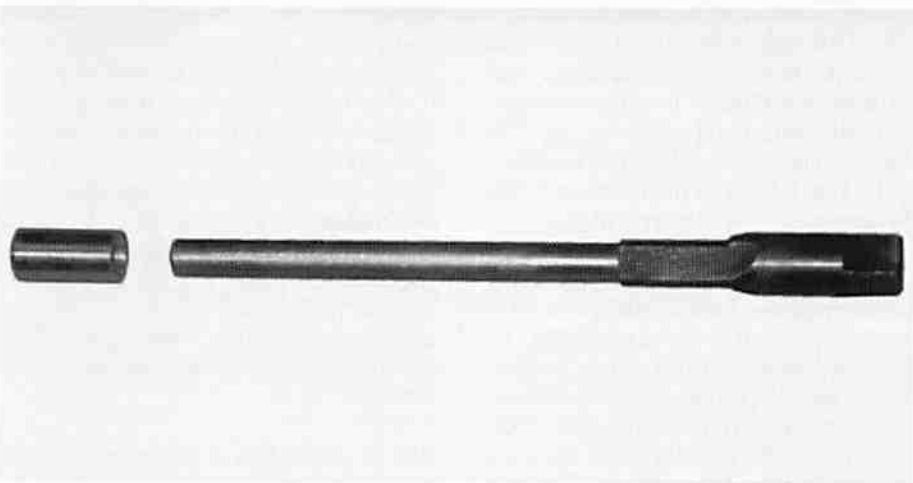
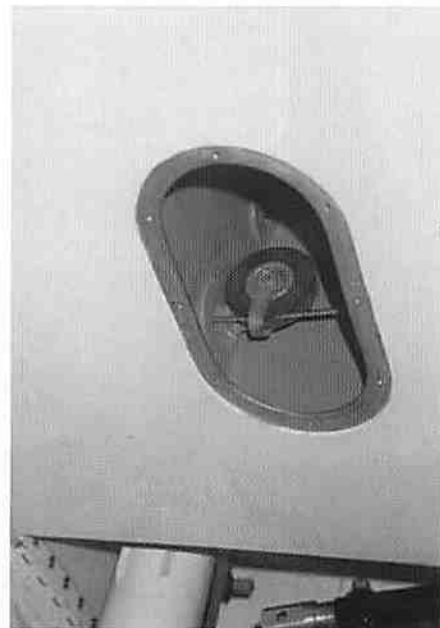
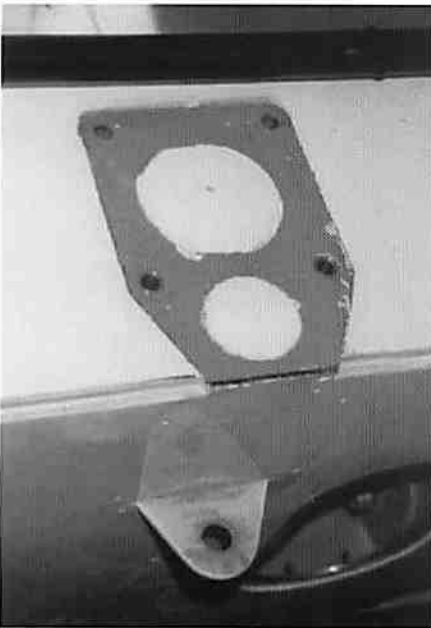
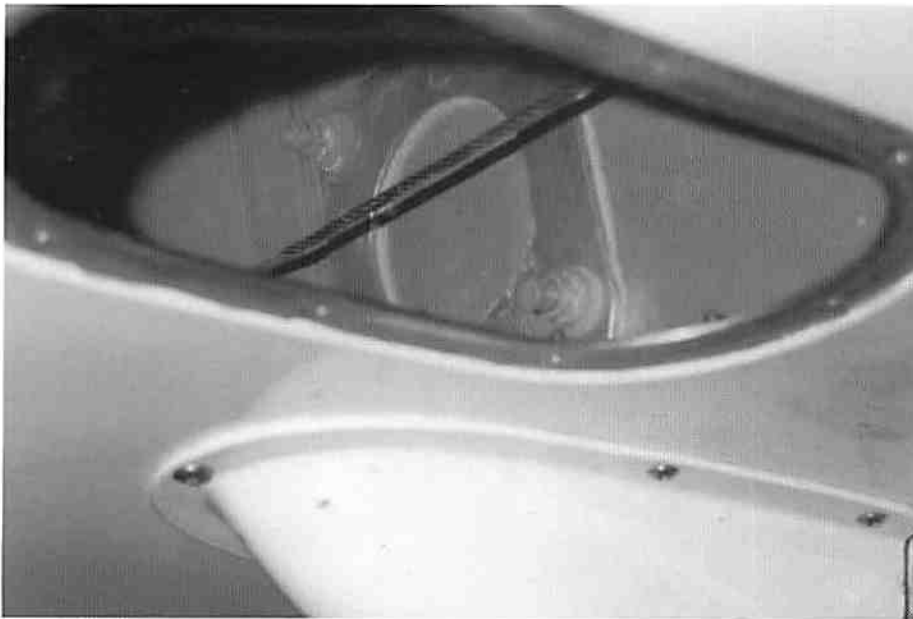
Above: Clive advises other Falco pilots to avoid these types of concrete blocks.

theory completely. The two lower bolts were bent about 20mm from the head and the corresponding holes were ovalled. It was in the Aero Club bar, over a couple of beers, that (if I may say so), I had a flash of inspiration. I said to David, "What we really need is a boring tool that has a long mandrel at its front that will go right down the undamaged sections of the holes in the spar and which will, therefore, be self-aligning." He, with great alacrity and vision knew exactly what was required—indeed, by the following day he had made the perfect tool, tested it in some oak and turned some aluminum bushes ready for the actual repair. The envisaged jig plate was not needed!

When the tool was connected to a variety of universal joints and short extensions

from a Snap-On socket set and powered by an electric drill, the boring was an absolute dream and only took seconds to perform. After insertion of the new bushes, the gear and links were reassembled and we were immensely gratified and relieved by the mount settling back exactly into the pre-accident position. If any builder finds himself with the same situation to resolve—the tool is available from us on loan—all he has to do is contact David or myself.

This now brings me to the second half of this story and some of you may have already deduced what is coming. How to get at the nuts at the front of the spar? There are no access panels built into the Falco at those points—although the construction manual does suggest they can be installed if desired, but no drawings support that



notion. However, in our case, with the wing fully skinned and already an integral part of the fuselage, we discovered that the aileron cable forks would not pass through the pulley guards mounted on the inboard side of the wing ribs No 2. This rang alarm bells for the future—because what do you do when you eventually need to remove the cables for inspection/replacement? After much wailing and gnashing of teeth, we concluded that we sensibly had only one course of action and that was to attack the problem then, rather than later.

We determined from the drawings where the pulleys were and the size of hole that would be needed to gain working access. Of course, there was none of the normal framing already built in and the inside of the skins was fully varnished. We devised a scheme that involved an internal aluminum sub-plate, which could be fed through the hole once made and then secured in position.

The access panel itself was made from aluminum the same thickness as the skin, so it automatically remained flush with the outer wing surface. Fitting the sub-plate meant scraping the varnish off the inside (not an easy job!), followed by bonding it into position with epoxy and backed up by countersunk machine screws. The screws are meant to be permanent and passed through the epoxy and were bedded into it. The heads were subsequently cleaned off flush with the wing surface and filled as necessary, before the final glass cloth was installed.

In addition to adding the panels, we made our own pulley guards—ones that were complete 'U's, rather than the specified 'L's. This system still keeps the cables completely trapped but allows free passage of the cable forks as and when necessary.

So by a remarkable piece of serendipity, we had exactly what was needed—access to the nuts previously mentioned. It was only after we had completed the repair that I realised the importance of those holes—making them now, in a completed/painted aeroplane, does not bear thinking about! I should add that this earlier modification to the wing was thoroughly investigated at the time by the PFA and approved by them. Again, if anyone needs more details—like the size and position for the openings—we will gladly supply them.

Contact me by telephone at 44 (0) 1858 545423, email at clive_beth@msn.com or David Nowill by telephone at 44 (0) 116 2593215.

*Top: Under the port wing, looking aft at the nuts on the front of the spar.
Center left: Under the starboard wing, looking forward showing the removed bracket and the new bushings installed. Center right: The pulley guard in the starboard wing, looking aft and out toward the wing tip, with the main gear leg visible.
Above: The spar boring tool and a bushing.*

Moving the Falco

by David Gibb

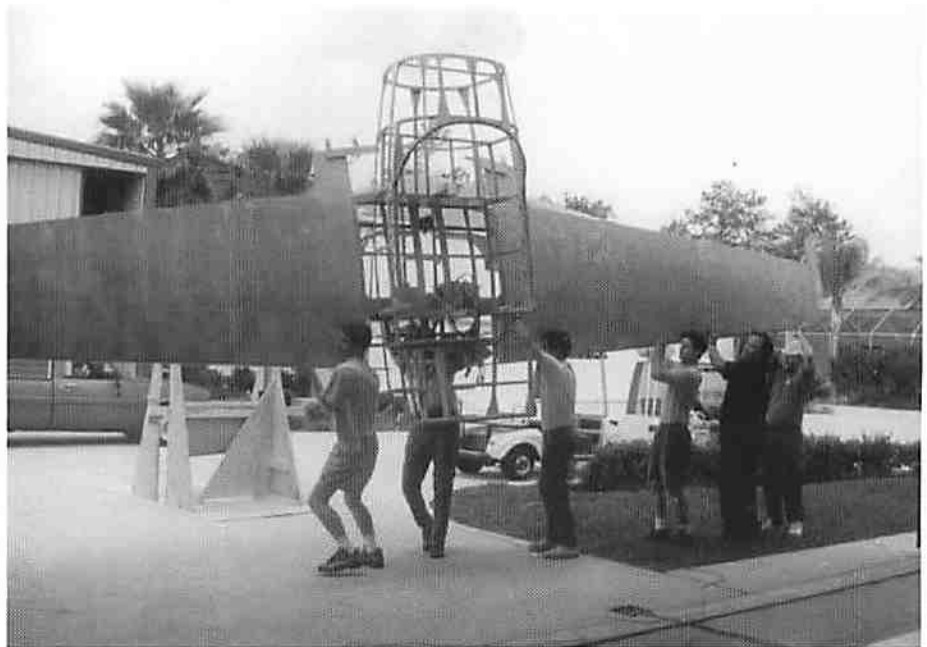
In late November of 1996 I heard Jim Kennedy was interested in talking to me about selling his Falco project. Those who know Jim are aware of his meticulous construction standards. The opportunity presented me with two problems. First, I was well into my own Falco project with the tail section completed and the wing jigs built. In addition, our shops are 2000 miles apart; mine in Minnesota and Jim's in Florida.

Jim was 18 years and 5000 hours into his project. The wing was covered and fuselage frames/longerons were glued and resting on the strongback jig. Over the years he had acquired all the kits, a 600 hour IO-320, new prop and books filled with various articles and builders letters Sequoia had released on the Falco. As an aside, I have spent hours reading all the information he had collected and appreciate even more the early builders and their pioneering journeys.

Transporting this airframe was not going to be easy. While the wing had structural strength, the fuselage was at a fragile stage. Splitting the fuselage at Frame #8 and transporting the project firewall down left us with a structure 27 feet long x 4 feet wide x 8 feet 4 inches high. We figured if we could focus on safe movement of the primary structure the rest of the load would be incidental.

Jim headed the design of transportation jigs, and I focused on logistics. Many options were considered including a flatbed, a rail piggyback, and building a custom trailer. The largest rental trucks fell short in length and height. With a January temperature swing from +70° in Florida to -30° in Minnesota I was also concerned with rain, snow and other weather we might encounter, as well as the change in humidity. I thought I had a truck/rail solution that might work, but I could not be assured exclusive use of the trailer. I just about fell over when the insurance quote alone came in, in excess of \$6000. As I learned later, classifying the load as aircraft parts rather than as aircraft would get insurance at 1/10th the cost.

During my search for suitable transportation, I was put in contact with a retiring trucking firm owner/operator in his 80's who was intrigued by the challenge of moving a homebuilt and stepped up to the challenge. He scheduled exclusive use of a 52 foot air ride trailer, a husband/wife tag team that would drive nonstop, and a date to be ready to load. The only hitch was we would have the standard two hour window

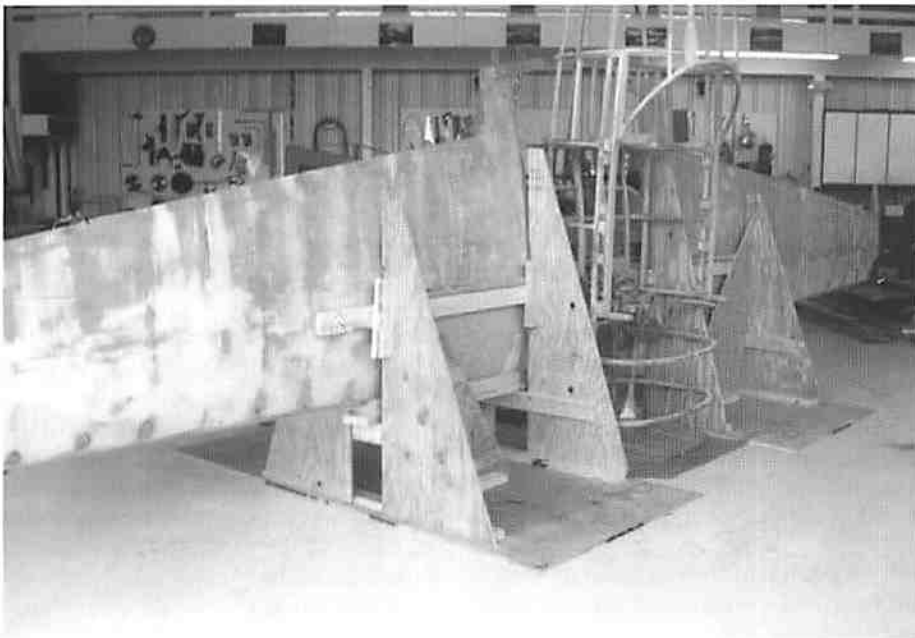


to load the cargo in Florida. As luck would have it the move date ran concurrent with Biker Week in Daytona Beach (motorcycles by the thousands), and our tag team was into the biker craze. Jim traded truck keys even up; his Ford Ranger for their Kenworth, and the drivers were off to biker activities.

The moving jig design evolved over many faxes over several weeks, and Jim's engineering approach to problem solving. By the time I flew to Florida in late January, the jigs were all precisely pre-cut and awaiting assembly. Typical of Jim, the workmanship on the jigs was up to the same standards as that of the airframe. The final product was a sling that would support the primary structure by the leading edges of the wings. The design would allow the firewall to "float" 1-2 inches off the floor. The tail section was carried with the rudder

and elevator hinges anchored to a 4 x 8 foot sheet of plywood. The result was both fuselage frame #8's were up in the air. The engine and extra plywood were individually crated as were many of the larger parts. On the advice of our truckers everything was anchored only to the trailer floor with nothing to the sides or top of the trailer. As they explained, when a semi travels down the road rocking from side to side, the corners do not stay true right angles. This movement could be rough on any fragile structure.

The actual loading took just over 6 hours with help from a number of Jim's neighbors. Spruce Creek, the fly-in community where Jim and Doris Kennedy live, is filled with pilots who understand the fragile and personal nature of our cargo. Space was not a concern since we had exclusive use of



the trailer. We loaded the engine, crates, boxes and propeller in the front of the trailer, and partitioned that section off. The two main structures were loaded in the center. Last to be loaded was the plywood and jigs used for setup.

Our tag team departed Daytona Beach Wednesday evening and were scheduled to arrive in Minneapolis on Friday morning. Through GPS our Falco could be tracked within 3 minutes via the trucking dispatcher. I met the team as they exited the freeway and escorted them the last 2 miles to our shop. While motorcycles were nowhere to be seen (keep in mind it was -30°F before the wind chill) the Mall of America gave our drivers a diversion while we unloaded. My teenage son lined up 8 schoolmates and a teacher so we had plenty of muscle (some would argue no

shortage of expertise either, but that is another story). In less than two hours we were unloaded, set up, and starting the environmental conditioning. To get Florida humidity in our heated Minnesota shop, we used a combination of humidifiers and the steam equipment used for bending wood. At 48 hour intervals we would adjust the humidity downward until we reached a moisture content appropriate for our part of the country.

My Christmas present, a laser level, was used to do the final leveling. I recommend this tool be added to the "must have" tool category. With its laser beam accuracy, alignment was, and continues to be, a snap.

Four items were critical to the successful move as measured by no nicks, scratches, or cracking of wood. First was the thor-

ough planning. Countless faxes and phone calls preceding the move made the execution run like clockwork. Second was a buyer and seller both committed to a successful move. Dividing the workload allowed Jim and me to keep focused. Third was support from Alfred and Susan at Sequoia and input from Dave McMurray, my builder-mentor on the West Coast. The fourth was leaving the long drive to professionals. The total transportation and insurance cost was just under \$3500 and worth every cent. While they drove, I flew commercial and was mentally ready for the unloading at the other end.

It has been 12 months since the move, and Jim still checks in from time to time. At this point we are skinning the fuselage and hope to have a flying Falco by the turn of the century.

Construction Notes

Jacob Brouwer sent us details of the silencer that he installed on his Falco. These are made by Hermann Liese Flugtechnik.

Hermann Liese has been making a few standard models of silencers that are used on a wide range of aircraft in Germany, where government regulations require a minimum noise level for the aircraft, or you can't fly the plane at all.

Hans Sonntag installed the Liese 76 x 150 mufflers. While they work and meet the government noise limits, they extend out underneath the aircraft, and they were difficult to install inside the cowling.

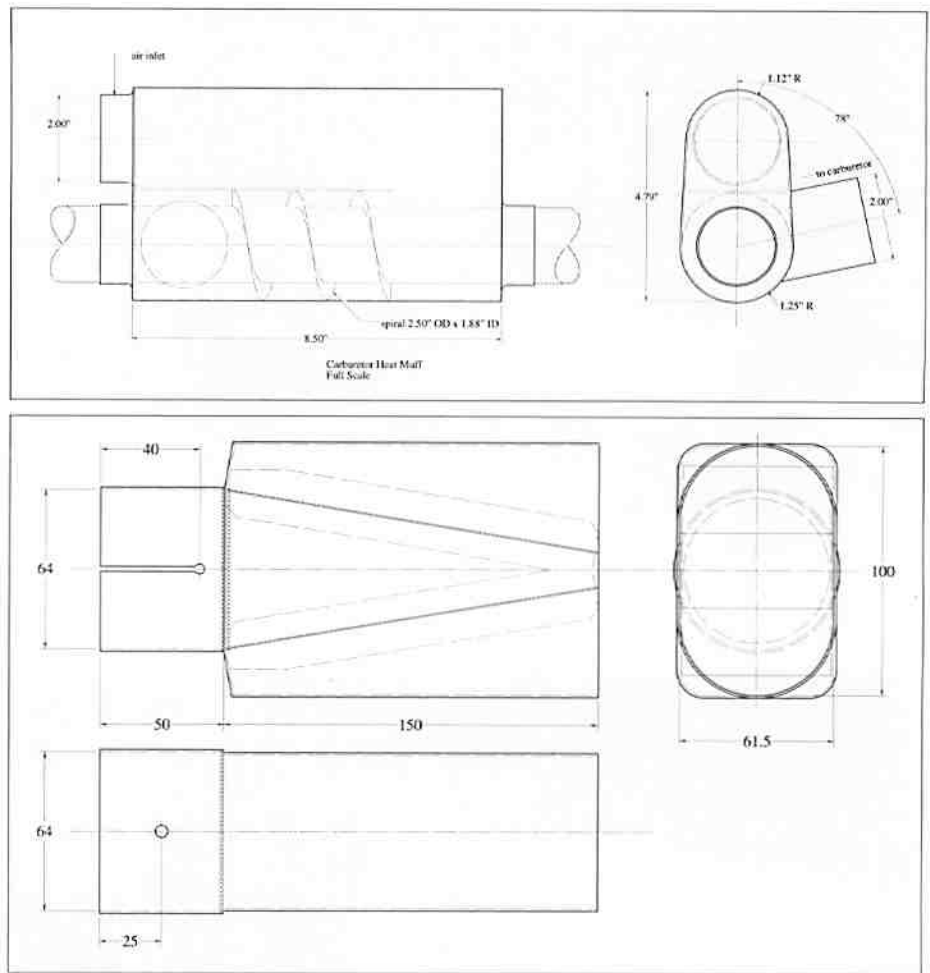
As a result of these problems and after consulting with Hermann Liese, Jacob Brouwer decided on the smaller 60 x 150 mufflers (Liese V60). These mufflers are mounted on the end of the exhaust tailpipes, and each of them will accept 140 hp with an exhaust back-pressure of 2" HG. A pair of these mufflers are routinely installed on 285 hp Beech Bonanzas.

We have included a drawing of the mufflers. These are made of stainless steel, and they fit over the exhaust tailpipe with a worm-type clamp that has an integral pin that fits in the 5mm hole and a matching hole that you drill in the tailpipe. While you may be tempted to try to fashion your own from these drawings, please be aware that these drawings do not show the internal loovers that are part of the design—and which we didn't draw because we don't know the details.

It's difficult to say how much power and speed these cost, but they do get the noise



Liese silencers installed on Jacob Brouwer's Falco.



Top: Charles Wagner's heat muff. Above: Liese V60 silencer design.

levels down to the strict German limits. They cost about \$1,000 and if you're interested, please contact Hermann Liese Flugtechnik, Truderingerstr 2, D-82008 Unterhaching, Germany. Telephone: (089) 6113249, Fax: (089) 61501647.

Glyn Russell is in the process of finishing his Falco and was curious about the material that Steve Wilkinson used to wrap his exhaust system with. Steve replies, "The wrap is called Thermo-Tec, it's used on race cars and hot rods, and it's listed under 'exhaust wrap' in the Aircraft Spruce catalogue. Also, the naysayers who seem to gravitate to aviation will warn you that it causes exhaust cracks and other dire consequences. About a year ago, I was talking to the president of Borla Exhaust Systems, perhaps the preeminent manufacturer of aftermarket exhaust systems for Ferraris, Lamborghinis, Porsches and a wide variety of race cars, and I asked him about this. He said that was nonsense. If you wrap a cheap mild-steel tubing exhaust system with it, yeah, it'll crack, he said. But wrap any kind of quality stainless system, and you won't have to worry about it. Mine has been on for 400+ hours (I change it at every annual, since I inspect the pipes, and you can't re-use it) with no cracking."

Charles Wagner has installed a Lycoming O-320-E2A engine with a Bendix carburetor on the bottom of the engine with the air intake on the front and hot air for carburetor heat on the side. Charles found it difficult to come up with a heat exchanger which would fit in neatly, since there is little room in the engine compartment between the exhaust pipes and the cowling.

Charles came up with a carburetor heat muff which works quite well, on the ground at least. It is located at the front of the engine, under the alternator and starter motor, on the exhaust pipe from the starboard front cylinder. Charles says the minus point is that it is close to the landing light. The air intake hose to the muff also gets pretty close to the exhaust, but this is marginally improved by moving the air intake flange on the front starboard cowling a couple of inches outward.

We do not know if this design heats the air sufficiently to deal with carburetor ice. As I recall, the requirement for the temperature increase is something like 100°F. However, this design appears to be cleverly thought-out, and other builders who are working on this might be interested in seeing what Charles has done.—Alfred Scott

Goings On at Sequoia Aircraft

Stan Harper is now flying his Falco—we'll have a report in the next FBL—and he developed a minor problem with the landing gear retraction. He found that the green gear-down light was still on when the landing gear was fully retracted, and as a result, the landing gear would not extend electrically. He was able to extend the gear with the hand-crank.

On inspection, he found that the gear-down limit switch had been poorly adjusted and had permanently bent the roller actuator for the microswitch. This limit switch is mounted on the aft face of frame No. 1, and the mechanism was set up so that when the gear was fully down, the tab on the screwjack had pushed into the roller actuator so that it took a permanent bend.

The result was that, even when the landing gear was fully up, the little leaf-spring roller actuator which surrounds the microswitch was still pushing on the microswitch and causing the system to 'think' that the landing gear was still down. To fix this, Stan is replacing the microswitch and roller actuator, and adjusting the mechanism so that it does not 'bottom out'.

John Oliver also reports a minor problem with the landing gear retraction system. In this case, the circuit breaker tripped on occasion when they tried to extend the landing gear in flight. John found that the check nut at the bottom of the nose gear adjustment screw was backing off due to vibration—even though it was a 'stop nut'. Once before, he found that the nut had completely departed the airplane.

You may remember that Jonas Dovydenas once had a near-disaster when this nut backed off and the adjustment screw turned 90 degrees when the gear was fully up. Mr. Frati suggested installing a roll pin through the shaft of the adjustment screw, and we have supplied these. John Oliver called Jonas and found that Jonas had not yet installed the roll pin, but instead had put Loctite on the nut, and he has since flown it for 250 hours without the nut moving. So John has done the same thing, and they will be inspecting this nut after every flight until they are certain it is not moving.

After tightening the nut and checking the system over, John and his son Paul took the Falco up and tested the system. They found that the circuit breaker would trip at the end of the retraction cycle about one out of four attempts. John concluded that they



Oliver Barth's Falco in Germany still carries U.K. registration.

were attempting to retract the nose gear too far, and so he backed off slightly on the adjustment. The system works fine, but only time will tell if it is a permanent solution.

John mentioned that in testing the system, he found it helpful to hook up a multi-tester to the gear-up and gear-down relays on the right side of the instrument panel. This way, by looking at the multi-tester, he could tell when the limit switches had closed. To do this, he used two long lead wires with alligator clips on each end.

Stanley Harper and Jacob Brouwer now have their Falcos in the air. Charles Wagner and Willard Hoffler are both in taxi-testing now. Glyn Russell, Kim Mitchell and many others are getting close to completion, so we'll be seeing a bunch of new Falco-births soon.

Someone asked me the other day if I had made plans for 'succession' in my business. In fact, I am beginning to think about that.

First let me explain that there are no business problems at Sequoia motivating this. Sequoia Aircraft has no debt, and it is a self-sustaining business. However, in ten years I will be at an age that most people consider 'retirement' age. I am in good health, but if something should happen to me, it would be a bad thing for both my family and Falco builders if I did not have a successor in place. For years I have been a compulsive 'workaholic', and the Falco is the result of enormous efforts on my part. However, with our girls off at college, Meredith and I would like to do more traveling and enjoy life more. At the same time, there is much about the Falco project that I find irresistible, and there are many things on which I want to continue working.

In a word, I am simply torn between a desire to keep at this forever and the realities that I should make plans for the future so that the Falco would go on without me. So I am beginning the process of looking for someone to come into Sequoia Aircraft in an ownership position. My principal interest is in finding someone who has the abil-

ity to keep the Falco going for many years to come, and this will require a unique individual. I expect that this process will take at least five years, and I hope that all of you will see this as a positive thing and will help me in finding that special person. In the meantime, things at Sequoia will go on as normal.

Please be assured that there are no problems in your continuing to deal with Sequoia. We have a very large inventory of parts. Typically we order most parts in lots of 50 aircraft at a time, and at any given point in time we will be in the process of re-ordering some parts that are getting low and with other parts we will have up to 50 aircraft-sets on hand (except in the case of stampings and screw-machine parts, where we make enormous quantities of 500 airplane-sets because the price break is so extreme with volume production.)

From time to time, we change suppliers of various components for the Falco. When we began with the Falco, we had some difficult times getting high quality engine mounts made, but for quite some years now we've had a one-man shop who has done absolutely superb work for us. The man has had some health problems and has recently closed his shop.

We have a long-standing relationship here with a large fabrication shop that does our landing gear and many other welded components, and they've always supplied us with extremely high quality parts. (Their best welder cannot read or write, but he's done nothing for 20 years but weld, and he is widely considered the best welder in the city.)

So we turned to them for the next batch of engine mounts, and they have made superb jigs from the previous engine mounts that ensure that every single tube is in the same place on every engine mount. We make engine mounts in lots of ten parts, and the other day we received the first batch of 20 engine mounts. And I'm delighted to tell you that the new engine mounts are indistinguishable from the previous ones.

—Alfred Scott

Sawdust

- **Design Defect!** Call in the product liability lawyers! The SeaWind amphibian had been flying since 1997 and had logged about 40 hours when the pilot encountered a rather unique problem. The canopy on the aircraft acts as a large magnifying glass, and when open, the canopy focuses the sun's rays on the backs of the rear seats. The other day, the pilot was inspecting some damage to the left rear seat. "When we looked over at the right seat, smoke was curling up from a hole burned deep into the back of the right rear seat. The whole process took less than a minute."

- Stelio Frati's SF.600 Canguro twin turboprop utility aircraft was built in small numbers of SIAI-Marchetti and has now been relaunched by VulcanAir, which has set up a production line in the former Partenavia works at Naples. One VulcanAir-built Canguro is already flying, with another due to be completed by sum-

mer. The company has plans for a stretched PT6A-powered development.

- We're all taught to fear wake turbulence from big heavy airliners, but imagine the surprise of the English pilot taking off in a Robin just after an Antonov An-2, the huge, slow Russian biplane. However, as the Robin was climbing, it suddenly rolled to the left through about 80 degrees for no obvious reasons. The pilot fought to get the plane back under control, but the nose dropped steeply and the airplane spiralled in and crashed. Damage was extensive but both pilots survived with whiplash injuries and minor cuts. Although the An-2 is technically a 'light' aircraft, at full gross it is seven times the weight of the Robin, and has about twice the wing span.

- Congratulations to Stanley Harper for getting his Falco into the air—ahead of Jacob Brouwer, in fact—but Stanley is a slow writer, and we'll have a full report in the next FBL.

Susan's Corner

Well, hello spring! It sure took its sweet time getting here—I thought winter would never end. It has continued to be quiet but steady through the winter, but I can see where we're heading for another big ordering binge on parts here pretty soon.

For all you that have been following *The Glider* articles, those are now up on the web, and at some point, all the back issues of the Falco Builder Letter will be there also. What a wonderful thing this new technology is.

We have finally gotten our new engine mounts in stock, and they really look wonderful. We used to have a guy in California do them, but for various reasons, he closed down his operation, so we are now getting them done locally. I always hate to see a good supplier close down his business, but we have certainly found a superb replacement for the work.

As usual for this time of year, we all need to begin thinking about Oshkosh '98. If anyone is going to want a room, now is the time to let me know. Alfred and I haven't even had a chance to talk about it, so I don't yet know if we'll be there.

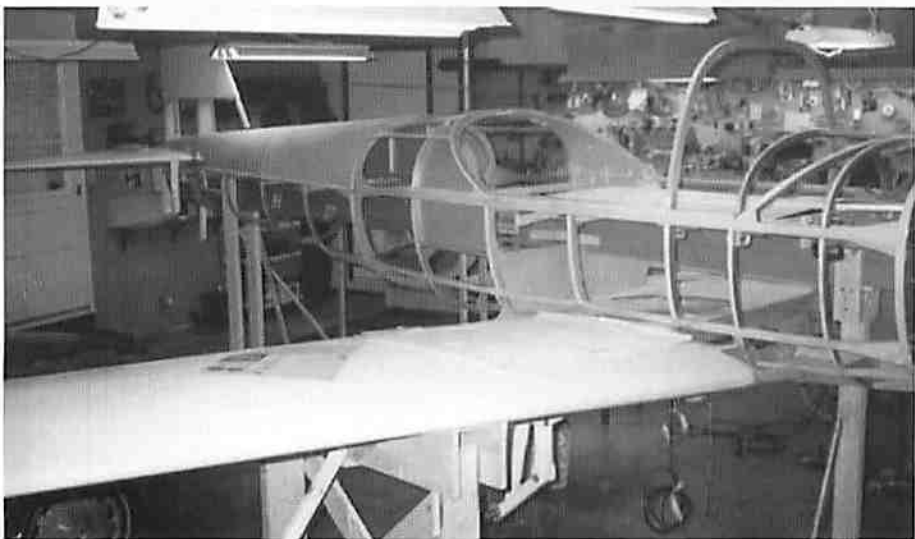
Stuart Gane is looking for a friendly, helpful Falco builder in the U.S. to help him and a few other U.K. Falco builders purchase some Carlisle 5.30x6 tires. They've found that these are the best size for their Falcos, because they have better clearance than the Goodyears, but Carlisles are no longer being imported into the U.K. for some reason. They're looking to buy a batch of 12-16 tires, so if you would like to help, please contact Stuart at destec@globalnet.co.uk

Remember to keep me posted on all your building progress. And especially now, with e-mail, it's even easier to stay in touch.—Susan Stimmitt

Calendar of Events

West Coast Falco Fly-In. September 10-13 at Eureka, California. Contact: Dave McMurray, (800) 276-6394 (days) or 442-4024 (evenings) or at P.O. Box 111, Eureka, CA 95502. Fax: (707) 445-5790, e-mail: BMcmurray@AOL.com

The Great Oyster Fly-In and Gathering of Stelio Frati Airplanes. November 7 at Rosegill Airstrip, Urbanna. Contact: Dr. Ing. Alfredo Scoti at Sequoia Aircraft.



Top: Gordon Cook's Falco. Above: Bill Roerig's project.

Mailbox

Last month I noticed a whole stream of aircraft tearing past our house... being such a fine day I sat and watched. Led by a very impressive sounding Lancair IV, I saw something that looked a lot like a Falco (I told Vicki, but she thought I was going mad from spending so much time in my workshop.) Then various aircraft from 310's to 172's.

Turns out that it was an event here called the Great Northern Air Race which is a cross country air race that is carried out around the top of New Zealand's north island. The winner, which I observed, was a Lancair IV and second place went to Luciano Nustrini in his Falco (now ZK-RNA). I think I was as delighted to see him racing again as he was to be in it!

He said, "I entered in the Northern air race at the last minute and, with Giuliana, I enjoy a lot to race again after sixteen years out of the races. We were second for a right 48 penalty, and the gap from the winner was for 12 points! Next time it will be better! ERNA is not as fast as before, but still very good." Good on ya, Luciano!

George Richards
Auckland
New Zealand

Last week I flew in formation with the Pinguino, but ERNA is much faster and to maintain the formation, I had to set the MAP at 15-16!

After 16 years out of the races, I entered at the Great Northern Air Race and, after 2000 km in six legs I finished surprisingly second—with ERNA and Giuliana, of course.

Luciano Nustrini
Titirangi
New Zealand

Believe it or not, I am back to work on the Falco! Had the airplane for sale, but couldn't seem to be able to live with the idea of parting with what has been a long-term dream. There was a fellow here from San Francisco with cash in hand but, at his own admission, he was really not qualified to do the job. Thank heavens he decided to say 'no thanks'.

So what I have begun to do is say, I will take it a part at a time, and start with the most difficult job remaining. I began a month ago and now have built new ailerons and flaps, metal, of course. Haven't decided what is next, but it will be next biggest monkey.

March 1998



Seven Nustrinis in a Falco. October 15, 1972 over Florence, Italy. At first it appears that there are 'only six' in the Falco, until you notice the other head just over Luciano Nustrini's shoulder.

When I built the ailerons, I was surprised to find that the ailerons have a deeper section at their leading edge than the wing section at that point. That is a trick discovered by Kelly Johnson at the Skunk Works to prevent aileron flutter. Does the homebuilt have that configuration?

Gar Williams
Naperville, Illinois

To my knowledge, the ailerons and flaps of the production Falcos were intended to be directly 'in line' with the shape of the wing, and the same airfoil contours are used for both wing, aileron and flaps. On the Corporate Disgrace, the top of the ailerons are 'in line' with the wing contours, however the upper wing surface bends down behind the aft wing spar (I've always thought that this was simply poor workmanship). As a result, the air flow re-attaches to the aileron, and the rate of roll is substantially faster. This is a well-understood phenomenon in aerobatic circles, but I'm not aware of any relationship this has to flutter.—Scotti

This afternoon, I flew a friend of mine to an airport near Philadelphia to pick up his Beech Duke, which he'd just had annualled. We took off one after the other, me first, and 50 minutes later landed at Orange County (home base), again me first. We had no contact or sightings en route, and I guess he did whatever Duck owners do—climbed laboriously to 15,000 feet, turned on the pressurization, adjusted the power on his turbocharged 740 hp to

ensure that he wasn't burning a total of 60 gph... but whatever, I went to 7,500, set normal cruise and beat him. He was both embarrassed and impressed.

Admittedly, I was getting a TAS of 180 knots at 2,400 and 23.5" in the cold air—best yet, as far as I know. I think the airplane is creaking and settling into some kind of state of best rig, since my speed seems to be slowly creeping up. And when I outrun Beech Dukes, I know it isn't an ASI problem.

Stephan Wilkinson
Cornwall-on-Hudson
New York

I recently purchased the Falco built by Tony Bingelis, that crashed at Watsonville. I now have almost every part needed to finish mine, and I hope that I will have another flying Falco in about a year. I will keep you posted.

I also want to inform you about the first Golden West Fly-In and Convention, September 25-27. The airshow will be held at Castle Airport in Merced. This is a former B-52 airbase with a 11,000' runway. If the Falco group is interested in attending, I can arrange to have them parked as a group, and I can also arrange for rooms to stay. If interested, please contact me at (209) 632-6558, fax: (209) 669-6332.

Frank Spyskma
Turlock
California



Congratulations on a very impressive web site. Very professional and interesting reading. "Heavens Gate" couldn't have done better.

*Perry Burholm
La Jolla, California*

I have been working on Falco S/N 1299 for 6 months now. I have the horizontal stabilizer and vertical fin almost complete. I have to say without a doubt that building the Falco is the most enjoyable project I have attempted. I plan on using the 180 hp engine because of the price difference on the propeller. I'm also using Aerolite glue where assembly time permits and Penacolite everywhere else.

After receiving my plans and studying them for a few days, I couldn't imagine building anything this complex, but after I finally started I found it to be extremely simple, but very time-consuming. But who cares.

*Ed Pogue
New Lebanon, Ohio*

Welcome to the net. Just got the newsletter to find out you were officially on board. A suggestion, as I re-read old newsletters over the Christmas holidays, it dawned on me that a searchable database by keyword would be a great asset in finding these old hints and tips (e.g. What was that type of grease I was supposed to use for the screwjacks? Search keyword 'grease'.) I found the hardcopy summary that Steve Wilkinson had done, but figured that an electronic version would be more valuable and easier to keep updated.

Construction status: tail and fuselage skinned forward to about frame seven. Wing spars glued in (we're non-conformists, working with the fuselage first), ribs

made. Many metal fittings made. Arguing about standard vs. raised Nustrini canopy (to be solved via Oshkosh). Thinking about engines—prefer 180 hp.

*Mike Weibe
Ancaster, Ontario, Canada*

The IFR attitude indicator failed very early on in the flying of G-OCAD, but to date we have not had other cause to pull the instrument panel, so we have let it spin away to its heart's content and ignored it. However, we will be doing our annual soon, so intend to have it looked at with the intention of a repair. If that proves impossible, we will fit something else. Have you identified an alternative yet? Most of them seem to be about 6-7 inches long. From the drawings, that would seem not to be a problem, but can you confirm this?

*Clive Garrard
Leicestershire, England*

Go with an R. C. Allen RCA 22. In our files, we have a note that the Sigma-Tek 23-501-06-16 is too long for the Falco.—Scoti

In reference to Bill Roerig's letter in the last newsletter, I also had some interference with the flap hardware, not the motor but the rear of the gearbox. I had aligned the flap torque tubes at the wing rib location and then installed the flap motor and gearbox to the location of the tubes. The end of the gearbox hit the bottom of the inboard seat belt mount at the bottom. The motor is in the outboard position. I removed some material from the seat belt mount for clearance. I felt I could live with a 20g system just fine.

Project report: Will start the installation of the canopy if it ever dries out enough to get back in the garage. My Falco is all finished

as far as the woodwork is concerned, and I will try to finish and have her flying for the 2000 Oshkosh.

I've been told my project will grace the first issue of *Custom Planes* magazine sometime later this year. Thanks for steering them my way.

*Bob Brantley
Santa Barbara
California*

Congratulation on your home page. I'm glad to see this addition, and hope it truly becomes a gathering place for all Falco builders. I've already spent an hour or two trying to probe all its recesses, and look forward to the new additions already planned.

My Falco is coming along, albeit somewhat slowly since I started float-sanding the wing. This has to be the least stimulating and most tedious of all the labors expended to date. Another 20 or 30 hours should see the float-sanding completed, and then on to more interesting things.

*Gary Wilburn
Clarksville, Virginia*

After receiving the last builder letter, I immediately took the opportunity to look into the Internet. Nice page. There is a lot of nonsense on the Internet but nevertheless it is a comfortable tool for communications.

For almost four years, I had no time for my Falco since I was assigned as Fleet Chief for our new Airbus 330 fleet about 3-1/2 years ago. The airframe of my Falco is complete, wing, fuselage and tailsection is almost finished and in a few weeks I will start with the microballoon and fiberglass work.

*Cipriano Kritzinger
Wegberg, Germany*