Falco Builders Letter

Jonas in the Kunar with enhanced camo headgear. Don't worry, no one smokes this stuff, which grows in every ditch.

Nobody Shoots at Me

by Jonas Dovydenas

All of the news organizations have cut back on their reporting from Iraq and Afghanistan, so it is the destiny and obligation of the Falco Builders Letter *to make up for this.*

I have been to Afghanistan ten times and never once was I shot up or IEDeed, mortared or bombed. Not on my first trip to Afghanistan in 1985 did the Soviet pilots who dropped bombs on the villages I had just left or was on the way to, ever come close. That is bad luck for a war photographer, but good luck for everyone near me. My wife claims that definitely it was her special prayers that did it, and I believe her, though I did not have the cheek to ask her to not pray so hard, just once, so I could learn the truth about my luck.

Last August I arrived at a firebase on the Pech River a day after it was mortared. I stayed with the men of Able Company of the 173rd Airborne Combat Brigade for ten days and nothing happened. The day after I left a SPIG 9 (recoilless rifle) round landed in the parking lot, not 20 feet away from two men. One was peppered with small bits of shrapnel, and the other went down on his knees and suffered a concussion, though he was otherwise untouched and remembered the entire event. The front tires of the two Humvees near them were shredded. I might have been photographing those men when that rocket landed.

I moved between firebases and observation posts and I went with patrols looking for weapons in villages that had harbored the Taliban. Nothing happened. I went on a three day operation into a district where the company I was with had been hit every time they went in. The first time they lost two men. The last time was two weeks before their 15 month deployment ended and they were to rotate back to Italy. That was when they took me along. Nothing happened. After that, in their eyes, I became a good luck, anti-combat charm. They

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wanted me to stay until the end of their deployment, two weeks away.

My luck went beyond my immediate vicinity. As we were returning from the operation in Watapur valley, a Kiowa (Little Bird) caught on fire and fell out of the sky in a field 500 ft. away from the convoy. The crash landing was hard enough to snap the boom and wreck the hub and the rotors and the skids, but the fire went out and the two pilots walked away unhurt. It was incredible any way you look at it, but some people began to think it was my mojo working, not the skill and luck of the pilots that saved them. The convoy stopped to protect the helicopter. We were in enemy territory, strung out on a narrow road through a hostile village waiting for a big bird, a Chinook, to lift the Little Bird out. For four hours we were sitting ducks. Nothing happened. Some of the men took up defensive positions above the road, the rest stayed in their Humvees, turning in their machine gun turrets or taking turns sleeping in the one vehicle in which no one has ever discovered a way be the least bit comfortable.

Perhaps it was all meant to be. If I were a Muslim I could say *Inshallah*. But I could not mean it. It is *my* chosen fate, if you will, to take pictures of what is remarkable in an ordinary day, not Allah's. And an ordinary day of the soldiers in the foothills of the Hindu Kush, along one of the most dangerous borders in the world is not ordinary in any way. The Islamic terrorists keep coming into Kunar Province and the soldiers keep killing them. The patrols go out every day, every night. The soldiers spend hours getting ready for a mission. Then they come back, de-brief, and try to sleep, any way, anywhere they can. Then they pack up and do it again. War is hellish and ugly and there is no excuse for it, but the soldiers who fight wars do not start them, they only have to win them. Paradoxically, when they do it well it is a beautiful thing. Combat is where all the qualities of a successful personality are tested. Those who pass gain a wisdom that no other job has to offer, though all have to endure the damage, more or less. I listened to a soldier telling me about treating, under fire, a bleeding, dying comrade, desperately trying to find where the pool of blood was coming from, then having another man, also a close friend, already dead, drop on top of him. I felt insignificant in the presence of this very young man.

These photographs are part of a larger book project whose working title is "War and Peace in Afghanistan". My intent is to show, not tell. I hope my photos speak for themselves. They are ordinary images whose only intent is to show you something extraordinary.

As the Watapur operation was winding down on day two, the Afghan interpreters who were monitoring the Taliban's radio messages, called ICOM (a brand name) chatter, told me some of the things they had overheard. Early in the operation someone warned: "they are powerful". Later in the day, another voice said "We are hungry, can we make lunch now?" Finally, best of all, someone asked "We are tired, can we do jihad tomorrow?"

Was I good luck to the men of Able Company? I don't think so, those guys made their own luck, the hard way, I just came along to enjoy the lift.

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Out of the Water

by Alfred Scott

Much has transpired in Canada since Simon Paul landed his Falco in the river. Susan Arruda sent an email to Canadian Falco builders asking if anyone was willing to get involved in trying to recover the plane. We now have a stack of emails a half-inch high as a result, so it falls to me to boil it down.

The one volunteer was Bob McCallum, a Falco builder in Toronto. When he's not working on his Falco, he works in engineering and design with a company that makes machinery for putting decoration on plastic parts. Bob has designed and built Formula Ford race cars and is very resourceful and capable with his hands and tools. Bob decided to take on the project, without really knowing what was involved or what would come of it. And Simon was 6,000 miles away without any way to help in the rescue. Since then, the two men have worked well in a cooperative way.

First there was an expedition by Bob and Jack Wiebe to the Geraldton area of Northern Ontario. Jack became involved when he discovered Bob was alone in this venture and graciously offered his expertise and support. While it doesn't look too far when you look at a map of Canada, it was, in fact, a two-day 800-mile drive from Toronto to Geraldton. Then there was the problem of getting to the Falco as the accident site is in the midst of rugged wilderness.

There were many troubling things that came up. The Canadian government wanted the plane immediately removed from the water and, if it was not removed, then they would do the removal and send a bill to Simon. The realistic outcome would be that Simon would ignore the bill and give up the ability

Left: The Falco is the white dot on the far shore. Top: Jack Wiebe and Bob McCallum. Center: The rescue crew attempts to go in by land. Above: The Falco as Roy Luenberger found it when he went in by canoe.


Pulling the Falco to shore. Note the tree top section in the right horizontal stabilizer.

to visit Canada again. Fortunately for all, it never came to that.

The wreck was in a very uninhabited area approximately 20 miles from the nearest real road. There was much discussion of who might pay the cost of the recovery. Simon was dealing with his insurance company, getting demands from the Canadian government while trying to work things out with Bob. Indeed, Simon ended up in litigation with his insurance company but in the end the insurance company was absolved of paying for the recovery by the courts.

Bob made contact with Recon Air in Geraldton, who were very helpful. They are the world's largest Turbine Otter maintainers, and they do many things from turbine conversions of Beavers and Otters, rebuilding, aerospace manufacturing, and also the inevitable aircraft recovery operation—see www.reconair.net. It initially looked like recovery by helicopter was the only alternative, but the cost was estimated at around $25,000 and the insurance company was not very anxious to contribute to that cost. Meanwhile, the Canadian government kept sending Simon messages that they wanted the Falco out of the river. (Recon Air has named this previously unnamed body of water "Falco Lake.")

In June, an aerial reconnaissance was successful in finding the plane and confirming that there was no oil slick on the water. This was good news in that there was nothing that would spur instant government action.

The drive into the bush to the landing site is about two hours and 50 km from the nearest good road, and the bush trails are an immense spiderweb of trails over and through very rugged terrain. Although the plane is only about a half-mile from the trail, the 'rescue crew' spent about ten hours in the bush but was unable to locate the plane.

On return to the Geraldton airport they 'borrowed' a Cessna 337 leased by the government for forest fire detection to do another aerial reconnaissance of the site and to try to figure out where they went wrong. They were able to locate the plane and the correct road.

By noon the following day they arrived at an access point to the watercourse containing the plane, launched a boat and set off up the stream towards the plane. Almost immediately they came upon a beaver dam, which they crossed but just beyond encountered an impassable section of rocks, trees, logs, boulders and rapids where the elevation change was about two to three meters in 50 meters of stream.

They walked and forced their way through the forest around this obstacle to the next body of water, which is the second one south of the plane's location. There was however no way to get the equipment through this area. With three or four hours of work, they might have managed to clear a trail and then another hour to haul the gear through, but this still left the next small stream to navigate—and the possibility of a similar situation—to reach the next body of water containing the plane. They determined that there wasn't enough time in the day to do all that and still reach the plane before having to return out of the woods.

They made a decision to attempt to try to reach the plane either across country from the closest point or from another small trail they had spotted north of the airplane. They returned to the trucks, reloaded all the gear and checked on these alternate routes. They used a four-wheel ATV to explore the trails. The cross-country route was impossible because of swamp, dense growth, rocks and cliffs, and the north trail was even worse ending nowhere near any access to the water.

At the end of the process, Bob and Jack Wiebe decided they had to get back home. Bob had taken a week's vacation to go after the plane, and they had run out of time.

However, with Recon Air involved, the Canadian government had become very understanding and cooperative, lending their Skymasters for aerial work and backing off on their demands for pollution control booms on the reassurance from Recon Air that the recovery could be handled safely without them, and on Recon Air's word that they were working on the recovery.

Nothing much happened until September, when Recon Air president Roy Luenberger and Jim Bailey made another foray into the bush, this time with minimal equipment and a canoe. They were able to get through those portages with the canoe as opposed to the heavy boat and equipment they had attempted to carry before. With the use of logs as a ramp, ropes, straps, a lot of muscle and ingenuity, they managed to get the Falco on to shore.

Simon describes hitting a tree on the way down, and they found a one-meter-long section of tree embedded partway through the right side of the horizontal stabilizer and significant damage to the right wing from

Roy Luenberger pulls the Falco to the shore.

the tree. Most of the fairings and almost the entire belly were ripped from the plane, presumably by the water during the landing.

The engine, however, appears intact as is the prop. The engine rotates and appears to have normal compression on all cylinders. This leaves new questions to be answered as Simon's impression of his forced landing was of a catastrophic engine failure, which doesn't appear to be the case. Carburetor ice is the most likely explanation.

Later they returned to jack the plane up and place it on a crib made of logs to support it a meter or two in the air so it isn't buried by the snow this winter. On this second visit to the site, Roy removed the engine and prop and somehow managed to transport them out by canoe. They now safely reside in Recon Air's hangar in Geraldton and have been 'preserved' for possible salvage.

Removing the Falco from the water fixed Simon's liability issue, and everyone hopes that that the salvage from the remains will provide compensation for the efforts of Recon Air and its generous staff. Roy recovered Simon's digital camera, and when he got it all dried out, Simon was able to get the photographs from the memory card.

On the way back out of the bush, Roy noticed a tree about 3/4 mile from the accident site with a strangely broken top. On investigation he discovered wreckage near the base of the tree on the line of flight towards the lake where the Falco came to rest. He says that in looking at the damage to the tree and to the plane, he is amazed that the plane didn't come apart right there. Luckily the tree top appeared somewhat rotten. Roy has nothing but praise for the job Simon did in getting safely to a smooth landing. Roy has been involved in a lot of recoveries, and he says flying the Falco after the impact with that tree is testament to both Simon's skills and the integrity of the Falco.

The next step is to wait for winter, frozen waterways and snow. Roy will get to the site by snow machine and attempt to bring out the airframe on tobaggans.

It has been wonderful to see the Falco community come together and help on this. It was never easy with the problems of regulation, money, insurance companies and communication. This has been one heck of an adventure, but if nothing else, you have come away with a sense of awe for the people involved, particularly Bob McCallum and Roy Luenberger.

The Glider

Part 26 of a Series

by Dr. Ing. Stelio Frati
translated by Giovanni Nustrini

Asymmetrical spar. In the previous calculations, we considered the bending stress value for fir wood:

$$\sigma = 380 \div 400 \mathrm{kg/cm^2}$$

Almost all wood types do not have the same strength in tension and compression, but they have considerably less strength in compression than tension.

For example, fir has a compression strength of about 350-380 kg/cm^2, while the strength in tension is over 600 kg/cm^2.

For this reason, therefore, it is not convenient to build equal slabs, because if we do not exceed the admissible stress in the compressed one, we cannot exploit the material of the stretched one at its best.

The calculation of a beam with unequal caps though, is quite complex, and it must be carried out with extreme rigour.

We will follow an approximate method developed by the engineer E. Preti, whose precision is more than enough for the construction requirements of these aircraft.

Let's consider a section of unequal slabs of which the upper one is the biggest since it is the one that works by compression (Figure 9-31).

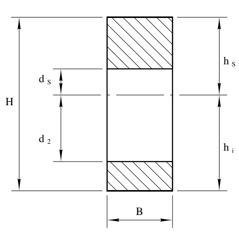


Figure 9-31

Then, let's indicate with h_s and h_i the distances from the neutral axis of the upper and lower ends of the caps respectively and with d_s and d_i the internal distances from the neutral axis.

The relation between the distances h_s and h_i is the same as between the maximum compression and tension loads σ_c and σ_t corresponding to the spar caps, so we can write:

$$\frac{\sigma_c}{\sigma_t} = \frac{h_s}{h_i}$$

Due to one of proportion properties, the previous equation is equal to:

$$\frac{\sigma_c}{\sigma_t + \sigma_c} = \frac{h_s}{h_s + h_i}$$

but since

$$h_s + h_i = H$$

we would have:

$$\frac{\sigma_c}{\sigma_t + \sigma_c} = \frac{h_s}{H}$$

from which we obtain the unknown value of h_s in function of H and of stresses σ_c and σ_t:

$$h_s = H\left(\frac{\sigma_c}{\sigma_t + \sigma_c}\right)$$

Similarly, we obtain h_i:

$$h_i = H\left(\frac{\sigma_t}{\sigma_t + \sigma_c}\right)$$

By indicating, for simplicity, with

$$a = \frac{a_c}{\sigma_t + \sigma_c}$$

and with

$$b = \frac{\sigma_t}{\sigma_t + \sigma_c}$$

we finally have:

$$h_s = a \cdot H$$
$$h_i = b \cdot H$$

By squaring, we have:

$$h_s^2 = a^2 H^2$$
$$h_i^2 = b^2 H^2$$

from which

$$h_i^2 - h_s^2 = H^3\left(b^2 - a^2\right)$$

and since this must be true also for the equality of static moments of the caps in relation to the neutral axis:

$$h_i^2 - h_s^2 = d_i^2 - d_s^2$$

by replacing, we have:

$$d_i^2 - d_s^2 = H^2\left(b^2 - a^2\right)$$

therefore, by solving in relation to an unknown value, for example in relation to d_i, we have:

$$d_i = \sqrt{\left(b^2 - a^2\right)H^2 + d_s^2}$$

the first equation giving us the unknown value of d_i in function of the other d_s.

Now, we have to obtain a second expression of d_i so as to obtain a system of two equations with two unknown values.

The moment of inertia of the resisting section with width B in relation to the neutral axis, as we can obtain by simple calculation, is given by:

$$J = \frac{B}{3}\left[\left(h_s^3 + h_i^3\right) - \left(d_s^3 + d_i^3\right)\right]$$

and it is also given by the relation:

$$J = \frac{M_f \cdot h_s}{\sigma_c}$$

By equating, we have:

$$\frac{3M_f \cdot h_s}{B \cdot \sigma_c} = h_s^3 + h_i^3 - \left(d_s^3 + d_i^3\right)$$

By using A to indicate the second element:

$$A = h_s^3 + h_i^3 - \left(d_s^3 + d_i^3\right)$$

we have:

$$\frac{3M_f \cdot h_s}{B \cdot \sigma_c} = A$$

From this relation, we obtain A, because the terms of the first element are all known.

Since by definition:

$$A = h_s^3 + h_i^3 - \left(d_s^3 + d_i^3\right)$$

we obtain:

$$d_s^3 + d_i^3 = h_s^3 + h_i^3 - A$$

By using Z to indicate the second element, we have:

$$d_s^3 + d_i^3 = Z$$

where Z is the known value, as h_s, h_i, and A are known.

This last relation is the one we seek, which combined to the previous one seen gives us the following system:

$$d_i^3 = Z - d_s^3$$

$$d_i = \sqrt{\left(b^2 - a^2\right)H^2 + d_s^2}$$

which cannot be reduced, but which allows us to determine just as easily the unknown values of d_s and d_i, from which we obtain, by subtracting them from h_s and h_i, the upper and lower cap thicknesses S_s and S_i. By assigning an arbitrary value d_s from the first equation, we obtain d_i and we then verify in the second equation if the value of d_i coincides with the previous. By varying the assigned value of d_s we can get to the solution sought through a few attempts.

Example. Let's consider the previous example, where we had equal caps and let's see what advantage we can have now with the unequal caps calculation.

Our data are:

$H = 15$ cm
$B = 8$ cm
$M_f = 85000$ kgcm

and let's suppose:

$$\sigma_c = 380\text{kg/cm}^2$$
$$\sigma_t = 560\text{kg/cm}^2$$

As we have seen:

$$a = \frac{\sigma_c}{\sigma_t + \sigma_c} = \frac{380}{940} =\sim 0.40$$

$$b = \frac{\sigma_t}{\sigma_c + \sigma_t} = \frac{560}{940} =\sim 0.60$$

therefore, the distances h_s and h_i of the caps external fibres from the neutral axis are:

$$h_s = a \cdot H = 0.40H = 0.40 \cdot 15 = 6.0\text{cm.}$$
$$h_i = b \cdot H = 0.60H = 0.60 \cdot 15 = 9.0\text{cm.}$$

and by squaring:

$$h_s^2 = 36$$
$$h_i^2 = 81$$

from which:

$$h_i^2 - h_s^2 = d_i^2 - d_s^2 = 81 - 36 = 45$$

and by obtaining d_i:

$$d_i = \sqrt{45 + d_s^2}$$

we have the first equation sought. Let's now get the value of A

$$A = \frac{3M_f \cdot h_s}{B \cdot \sigma_c} = \frac{3 \cdot 85000 \cdot 6}{8 \cdot 38} = 502$$

The value of Z is consequently:

$$Z = h_s^3 + h_i^3 - A = 216 + 729 - 502 = 443$$

The second relation is, therefore:

$$d_s^3 + d_i^3 = Z = 443$$

In the system sought:

$$d_i^3 = 443 - d_s^3$$
$$d_i = \sqrt{45 + d_s^2}$$

Let's now suppose

$$d_s = 3\text{cm}$$

From the first equation we have:

$$d_i^3 = 443 - 27 = 416$$

from which

$$d_i = \sqrt[3]{416} = 7.46\text{cm}$$

and from the second equation:

$$d_i = \sqrt{45 + 9} = \sqrt{54} = 7.35\text{cm}$$

As we can see, the system is not satisfied for the value fixed as $d_s = 3$, because the result for d_i is not the same in the two equations.

Let's try by supposing:

$$d_s = 3.2\text{cm}$$

From the first we now have:

$$d_i^3 = 443 - d_s^3 = 443 - 32.76 = 410.24$$

$$d_i = \sqrt[3]{410.24} = 7.42\text{cm}$$

and from the second:

$$d_i = \sqrt{45 + d_s^2} = \sqrt{45 + 10.24} = 7.42\text{cm}$$

The result is now coinciding and the system is thus solved. So we have:

$$d_s = 3.2 \qquad d_i = 7.42$$

from which we obtain the spar cap thickness:

$$S_s = h_s - d_s = 6 - 3.2 = 2.8\text{cm}$$
$$S_i = h_i - d_i = 9 - 7.42 = 1.58\text{cm}$$

The resisting section area is, therefore:

$$(2.8 + 1.58) \cdot 8 = 35.2\text{cm}^2$$

while in the instance of a symmetrical spar we had:

$$(2 \cdot 2.75) \cdot 8 = 44\text{cm}^2$$

The reduction of the resisting section, and therefore of the weight, is:

$$\left(\frac{44 - 35.2}{44}\right) = \frac{8.8}{44} = 0.20$$

that is by 20%, and as we can see, quite considerable.

For the dimensioning of the asymmetrical spar that we have just seen, *i.e.* with unequal caps, we must make some considerations. As we know, material near the neutral axis has little work to do, therefore, is not used efficiently.

Now, in the asymmetrical spar instance, where the upper cap is the biggest, the neutral axis is shifted up from the section and the cap material is little exploited, as we see in the section bending stress diagram (Figure 9-32).

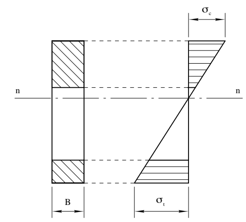


Figure 9-32

The width *B* of the spar should then be increased, so that the thickness of the upper cap is smaller and, therefore, its lower cap is not too close to the neutral axis (Figure 9-33).

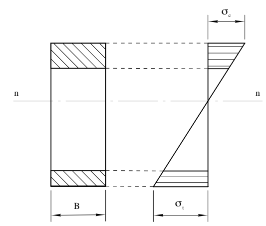


Figure 9-33

But for practical construction reasons we cannot exceed with the spar width and consequently, in very stressed sections, such as those near the attachment with the fuselage in cantilever wings, the upper cap is a lot thicker and the material is not used efficiently to carry the compression loads.

It is then appropriate to reduce the maximum tension stress, thus increasing the lower cap thickness with a subsequent lowering of the neutral axis and thus improving the compressed upper cap's working conditions. For these reasons it is not convenient to keep the tension load high to avoid strong section dissymmetry.

Based on practical experience, it has been found that for a good dimensioning of an asymmetrical spar, the compressed cap thickness should not be more than 1.5 times that of the one loaded in tension, and we can keep 1.3 as the optimal average value.

The practical values for maximum admissible stresses for fir are:

$$\sigma_c = 380\text{kg/cm}^2$$
$$\sigma_t = 480\text{kg/cm}^2$$

Later we will take the practical data of the mechanical characteristics of the various woods used in aeronautical construction.

Got Wood?

From God's own composite, Joe Harmon is making a renewable supercar.

by Robert Cumberford

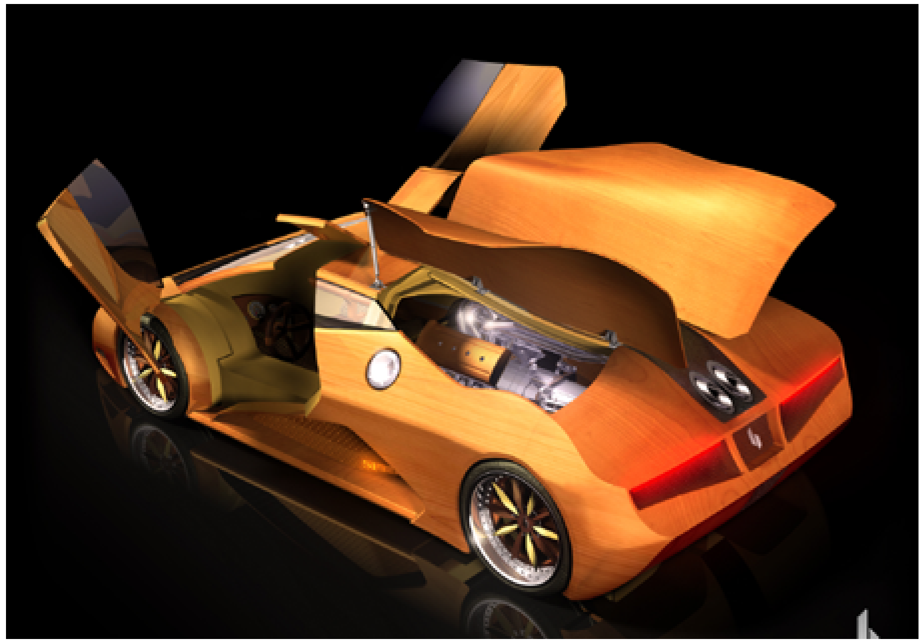
This article appeared in the January 2009 issue of Automobile *magazine. For more information, visit www.joeharmondesign.com*

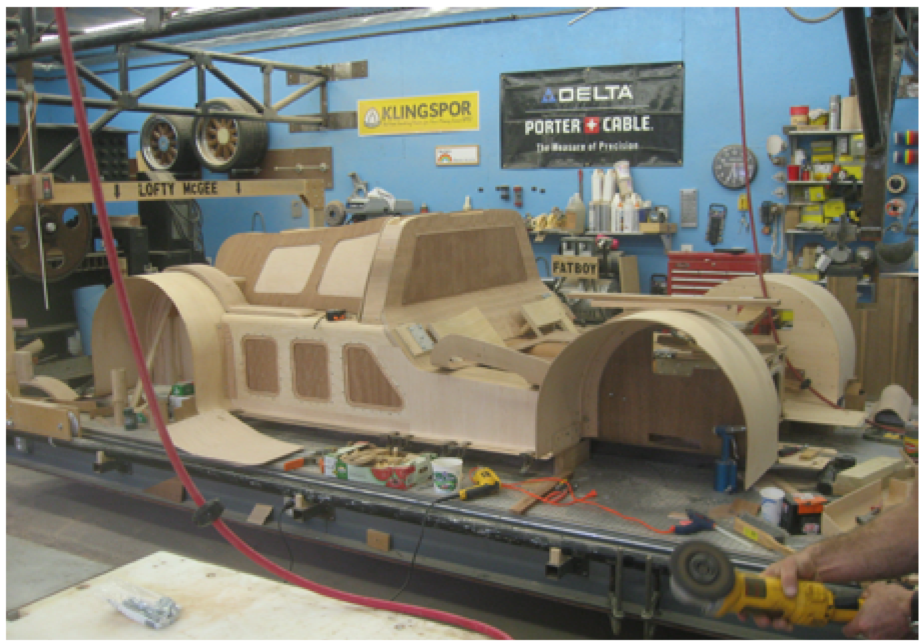
Yes, this is a wooden car. Forget the jokes. Anyone making more than mere decorative use of wood in an automobile has heard them all. And doesn't care. Wood is a magnificent structural material, "God's own composite," proclaimed the late Frank Costin, the brilliant technologist behind the glorious shapes of early Lotus cars, the Vanwall Formula 1 car, and—significantly—the plywood chassis of the Marcos in which a young Jim Clark won some of his first races.

Three years ago, Joe Harmon, a twenty-eight-year-old industrial design graduate student at North Carolina State University, thought it would be instructive to make a wood supercar for his master's thesis, including some of the running gear and—unlike the Marcos—all of the bodywork. "I wanted to show that wood isn't an antiquated, low-technology material," Harmon says.

He cogitated, querying instructors, friends, and family. All agreed it was a worthy project. Artist Ben Bruzga and fellow ID students, in particular Luke Jenkins, volunteered to do a lot of the work, and Harmon's physician father agreed to subsidize reasonable costs. That included buying a house in Durham, building a workshop/garage behind it, and investing in some major tools, such as a huge laminating press. Fortunately, woodworking tool manufacturers Porter-Cable and Delta are supporting sponsors and provided much of the equipment. Harmon met Canadian fashion design student Caroline Sulatycki when both were in Lund, Sweden, for an overseas semester and persuaded her to join him in life and in the Splinter adventure. She apparently is a demon with a sanding block, contributing enormously to the complex construction project and rallying the troops while still managing her own education at UNC Greensboro.

To achieve Harmon's goal of a fully fluid body surface, the team had to invent a wood veneer cloth to use in place of more usual glass-fiber or carbon-fiber weaves. That meant designing and developing specific looms, acquiring rolls of veneer five inches wide, slitting it into bands sixty





feet long and an eighth- or a quarter-inch wide, weaving it into cloth to place in female molds, and then vacuum bagging it with epoxy resin. Those looms—wood, of course—are works of art, using wooden clothespins machined to feed veneer strips through their jaws. With too much tension, they slipped; if there wasn't enough tension, rubber bands attached to the clothespins compensated. It was wonderfully elegant, wonderfully simple. Once it was imagined.

Imagination is the principal element in the project. Harmon pushed wood use as far as he could: every element of the steering column, apart from the metal rack-and-pinion unit, is made of various species. The transverse leaf springs are formed of osage orange wood. Even the tie rods are hickory. There is extensive use of plywood, as in the suspension control arms, but every square inch was laid and press-laminated in-house, including the impressive spiders for the composite nineteen- and twenty-inch wheels.

Those wheels represent one of the biggest unknowns. Despite a fifteen-degree conical taper meant to spread loads over more wood fibers, Harmon thinks that the massive torque of his modified Cadillac Northstar engine may rip out the centers. To get heat away from the wooden structure, he has swapped the cylinder heads left to right so the exhaust ports are inboard, with the headers coming out the top of the engine below huge vents. The transaxle is a six-speed Corvette unit, which helps push the cockpit well forward, despite the 104.8-inch wheelbase. The hull weighs about 1100 pounds, and Harmon expects the final curb weight to be approximately 2500 pounds.

Some styling compromises had to be made to keep costs down. The windshield came from a Dodge Caravan and isn't exactly what was first sketched. The body was initially executed as a wood and Bondo male model, after which fiberglass female molds were created. The final veneer cloth was carefully laid so the surface patterns lined up aesthetically, just as a good tailor juggles his cloth for a pinstripe suit. In terms of appearance, there are some minor student-level styling lapses, but overall the ironically named Splinter is a magnificent object. A year from now, we should be able to drive one of the most fascinating American projects in many years. Harmon hopes that the Splinter will help him find a good job in design. Depending on what happens to the economy, we think he might find himself manufacturing supercars instead.

Benchmark

For anyone of you who might be interested, we are quietly starting open beta testing with our Benchmark program. This is the program for flight test performance testing and analysis that I originally wrote back in the early 1990s. It worked fine, and it's the only program of its type ever created, but it didn't have a proper user interface, and I didn't have a clue how to do all that. So the program languished and was in limbo for many years. While we sold the program, we had lost the ability to even compile a new version. But fortunately, the original program never had any problems that required a new compile.

Several years ago, Matt Emerson, a programmer/IT guy at NASA approached me with the proposal that he move Benchmark to Apple's Cocoa development system. This is a revolutionary system that lets you create a program very quickly and you only have to concentrate on the inner workings of the program. All of the standard stuff that goes into making a program (event handling, saving and reading files, menus, preferences, undo/redo, etc.) are all handled automatically for you.

It took Matt a couple of years to get the program running, and in the last couple of months, I've been working on it. Because of my experience in creating WildTools, I now know what users love in a program. And it's a simple formula: the best programs turn hard work into a playful experience, to the point that it's actually fun. That means the program has lots of graphics that makes the concepts understandable and it is as interactive as possible.

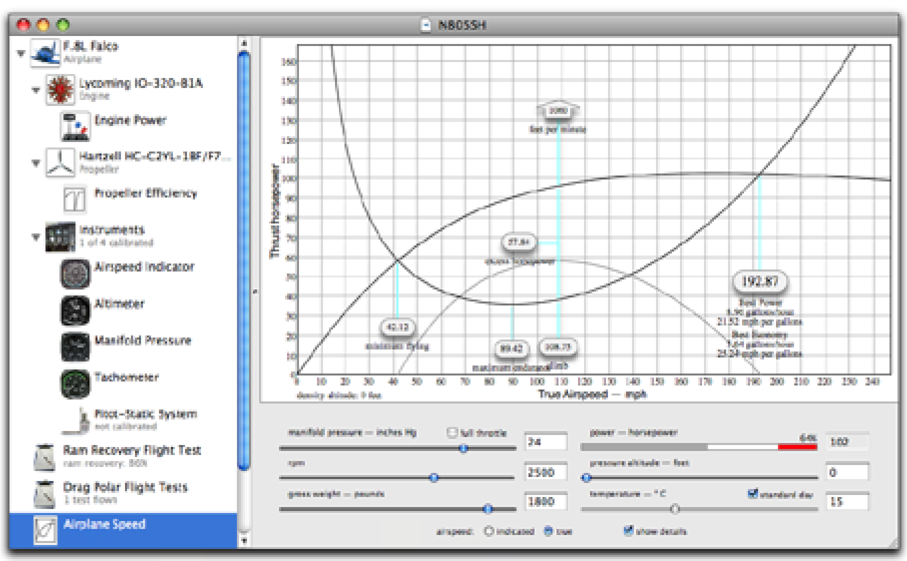
We have just released the program for open beta testing. It's a Mac-only program and you can find it on our website at

www.seqair.com/FlightTest/FlightTest.html

Download the version and try it out with Karl Hansen's Falco. Over time, we will be adding files for other engines and airplanes, and I have many ideas on how to improve the program.

The purpose of Benchmark is to produce performance charts for your own aircraft, not some factory-average machine. These go in the performance section of your flight manual.

My long-term goal is to create an iPhone version of Benchmark, so after you have modeled your airplane, you can export it and run it on an iPhone.—*Alfred Scott*



Top: Mike Schuler and Bob Trumbley's Falco is starting to look like an airplane. Center: Before the fall, this is one of the last photos Simon Paul took from his Falco before the crash into the water. This photo was recovered from the memory card of his camera after speeding several months under water. Above: Benchmark's airplane speed calculator.

Coast to Coast with Susan

The holiday season has come and gone here at Santa's Falco workshop. Hope you and everyone important to you had a joyful time. Part of the season's tradition is gift giving and gift receiving. The "getting" can be really terrific!

I have a reputation in my family of being the daring gift giver. Especially so for my husband on his birthdays. Vic knows to expect something really different at each celebrated decade.

On his 40th birthday, I surprised him with a ride in a hot air balloon. The balloon was a magnificent blue and gold tasseled replica of the Montgolfier brother's invention—the first hot air balloon to take flight (over Versailles on November 21st, 1783). I rode in the chase vehicle, with the guys who would eventually retrieve the balloon. It was a very exciting ride down country roads trying to keep an eye on the balloon and find it once it "landed". After a hard drop in a pasture there was a lot of applause, and we all had champagne.

Then came the challenge for his 50th birthday. Well, I drove him to another air field, but this time to go skydiving. He took it like a sport but insisted that if he had to jump out of a perfectly good airplane I was going to have to go with him. I guess you can say you have a good marriage if the two of you can fall to earth together, glide down toward the ground and walk away yelling "WOW!"

Do you know who is Richard Petty? In case not, he is a driver of legend within the NASCAR sport world. Since surviving and retiring, he now operates his own driving school for NASCAR driver "would bes". Yep, you have it. Took Vic on his 60th birthday to the Richmond International Speedway to learn to drive one of the Petty cars 100 mph around the track. Again, he told me that we would have to cheat death together once more. It is pretty tricky getting into one of those cars through the side window. I thought you could just open the door. I have a new found respect for the guys who do this thing for a living.

Naturally, I have had my thinking cap on for the next big birthday. I have considered a flight in a retired fighter jet. Better yet, why not a flight in a beautiful Falco? I may be asking some of you for input on that one. Would you believe my mother-in-law continues to ask me why I have to give her son such dangerous gifts? I swear

that the thought behind my gifts is for pure fun.

Back to business. The young man in the picture with me is part of our Falco staff, Shawn Winston. He has been my right hand in the warehouse for the past six months. Like most of us early in our lives, Shawn came to work needing a starting point, a place to learn and to develop skills. He jumped in with enthusiasm and commitment. No challenge has been too small or too big—he always smiles and says "Sure". He has diligently counted *every* item in the warehouse, made sure they were properly cataloged and expertly shipped your order to you. It was great to see him beam recently when a visiting vendor commented that he had never seen such an organized and clean warehouse. Thank you Shawn.

We have begun an exciting new and major project. We are creating a database that will store every Falco part, with full description, drawing location, warehouse location and even picture. All in an effort to be more efficient and to better support our builders.

While cleaning the warehouse this summer, I discovered a number of parts that we will present in a "dent & scratch" sale to you. Hope to have this out to you the first quarter of next year. Just never know what you may find when looking for something else!

Enclosed with this issue of the *Builders Letter* is a notice regarding subscription changes for some of you. There is no question that this publication is our main line of communication with our builders and supporters. We are committed to continuing to publishing quarterly and I hope you have all enjoyed the new look in color. However, the task of addressing the advancing production costs through the years and comparable subscription rates has long been overdue. I have worked at finding the least painful solution for everyone.

So, in order to keep us connected, we will be forwarding each edition to those of you who have signed up for the "electronic mailing". This will become our primary vehicle for receipt, so please do not forget to send me your e-mail address if you have not already. The entire *Falco Builders Letter* will also be posted on the website.

For those of you wishing to still receive the printed word, all subscriptions will become annual (January 1) at the rates stated on the notice. Printed subscribers will receive a timely advance renewal notice. Please let me know no later than Feb. 15th, 2008 how you wish to receive your next edition.

A special note to one of our new builders, Jerry Mulliken in Nickerson, Nebraska. Jerry ordered his first kits (Tail Groups) and thanks to him I finally had the opportunity to see Gonzales in action, discover the wonders of plywood by learning to build shipping crates, learn to use a power stapler and a power screwdriver. I went home proud of my splinters. I was really happy to hear that it all got to him intact, and he is underway with his project.

Time has not stood still. It is good to look back but there is still much to be done. There are still a lot of Falcos yet to be built and to fly! Looking forward to a terrific new year with all of you within the Falco family!—*Susan Arruda*

West Coast FlyIn

The 19th Annual West Coast Falco Flyin was held in Fredericksburg, TX on Sept 18, 19, and 20 Sept. The weather was as good as it gets in Texas at this time of the year, and the flying was especially good.

Most of the Falcophiles arrived on Thursday and checked into the Hangar Hotel (if you are ever in the area—check out this hotel—you will discover it is a rare treat).

On Friday we flew and drove to nearby Kerrville to tour the historic Mooney factory. Stanley, our tour guide has been employed by Mooney for 51 years, and he is number 2 on the seniority list—incredible in this day and time.

We had a two plus hour tour and viewed all aspects of the manufacture of the Mooney airplanes. 90 plus percent of the airframe is manufactured by the Mooney factory in-house, very little outsourced, and no offshore content.

Friday evening found the Falco gang at one of the local taverns, enjoying dinner and drink under the pleasant Texas skies at the Altdorf Bier Garten—a good time was had by all!

Saturday was another day to enjoy Falco flying and taking in the sights, sounds, and tastes of the Fredericksburg environment. Several of the gang visited the National Museum of the Pacific War, a museum dedicated to Admiral Nimitz and all who served in WWII.

Saturday evening found the Falco gang at one of the local award winning restaurants, enjoying another fine meal and Falco fellowship.

Sunday morning everyone began their return trip, again with good Texas flying weather. The 19th Annual West Coast Falco Fly-In came to a close, with all returning home in good shape, good spirits, and looking forward to next year's flyin.

—Jim Quinn

Top left: Falco gang at the Mooney factory. Left to right: Doug Henson, Ray Hecker, Jerry Mulliken, Jane Quinn, Karen Rives, Tamera Nason, Mark Wainwright, Stanley (tour guide), Ryan Vaughan, Dave Nason and Michael Stephan. Center: Surprise termite inspection by Falco Pest Management. All Falcos passed the inspection, except for Cecil Rives (overleaf), who doesn't want to talk about it.






Mailbox

Howdy, Dr. Engineer Scotti,

As you know there comes a time when a pilot has to hang up his scarf and goggles. I turned 79 this past August and in spite of the fact that I am one of the world's best pilots (second only to Bob Hoover) it may be my turn. I would appreciate any advice or sources of information you can provide me on how to minimize any liability I may be exposing myself to if I sell the Falco. I have considered placing it on static display in the front yard but Karen is somewhat reluctant to agree to that.

Over the years I have noted the expressions of gratitude that you have received for your producing the Falco in kit form and I would like to add my humble comments as well. I really am reluctant to have to say that the experience of building and flying the Falco for the past 15 years has been nothing short of grand for I am aware that it only adds to your somewhat inflated ego. But, so be it! For a relatively uneducated dirt farmer from Virginia to have conceived of a project such as this is symbolic of what makes America the greatest nation on earth!

Seriously, Alfred, it truly has been a wonderful experience! You are to be commended for your accomplishment.

Cecil Rives
Houston, Texas

P.S. I just bought two of your lousy sweatshirts so, hopefully, you can end this year in the black!

Dear Susan,

Unfortunately, I do not travel internationally any more, being retired and unable to take advantage of company-sponsored flights(!) so I doubt I will have the chance to meet you in person. Please accept my best wishes for Christmas and the New Year and do please pass on the same greetings to Alfred.

My Falco, ZU-BTT is flying very well but owing to house moving etc. the hours are still low at 50.

Brian Nelson
Potchefstroom, South Africa

A pilot on my airfield, a surgeon, once took a chair and sat down for 15 minutes just looking at the Falco. He said, "The airplane is such a pleasure to look at." I agree.

Cipriano Kritzinger
Abu Dhabi, U.A.E.

Top: Cecil Rives at Fredericksburg. Center: George Richards' Falco stops to smell the flowers. Above: This airplane, the F.30 was recently displayed in Italy. Reports are that it's a light plane that Mr. Frati has been working on for a couple of years and apparently meant to be a VLA certified airplane, which means it would have a maximum weight of 750 kg and a stall speed about 50 mph.