## KEN STOUT

An Intermediate competitor, he flies an 8KCAB or 180 HP Super Decathlon that's basically factory stock. Any alterations have been STC'd ones so that the aircraft could remain in the certified category. Although he has opted to add spades as a purely competitive-edge type of mod, he has primarily enhanced his aircraft, its equipment and his preflight inspections to give him an edge in the area of safety.

For instance he removed the rear stick. Some Decathlon front seat backs have broken and fallen back against the rear stick, jamming it into a fixed position. Occasionally belts or other items may entangle it as well. A side benefit in competition is the stick removal helps lighten up the controls, just a little bit he feels. "And in a Decathlon, everyone knows that anything we can do in that area is a plus," he commented.

Not satisfied with the factory installed harness system, he decided to go with one from Hooker Custom Harness complete with a ratchet tightening device. He was concerned about problems other IAC members had encountered with their factory installed seat belts and harnesses in their Decathlons and Citabrias. These included rear stick entanglement, failure of seat belt attach fittings, inadvertent release of the belt buckles, and loosening up of the belts and harness while flying, particularly during aerobatics.

Another of his concerns centered on the factory harness' single attach point to the seat. Hooker's setup has separate attach points for the main and secondary seat belts, a requirement of IAC contest rules. The main belt is attached to the same tab to which the rear legs of the seat are fastened and the secondary, to a cross member between the two lower longerons beneath the floor boards. In addition the primary and secondary belts are parallel to each other as opposed to one being on top of the other. This aids the comfort factor as the load is then spread over a large section of the pilot's hips and legs.

Since the fasteners/buckles for the Hooker primary and secondary belts face in opposite directions, this prevents accidental release of both belts by a shirt or jacket sleeve catching on a buckle. Shoulder straps are attached to a cross member between the two upper longerons or basically the rear spar carry-through and to the bottom of the seat where there is a yoke to keep everything pulled down to the proper restraint angles — again providing for more comfort.

It also delivers a more effective shoulder strap angle, getting away from the typical automobile type setup which also on occasion got hung up in the wires of his helmet/headset. "My old strap was just in the way," said Stout.

He swears his Hooker Harness is stronger and keeps him more securely in place. "I used to be floatin' all around the cockpit thanks to the belts loosening up and the automobile-like, across-the-shoulder bit," he stated. Now if a little more give develops than he wants while performing maneuvers, he can reach down without letting go of the stick, give the ratchet a quick click and be instantly snug again in his seat. This produces another fringe competition benefit in that firm, secure bodily restraint aids one in flying maneuvers better.

However, he didn't entirely discard his original harness system either. He simply installed it in the back seat.

# SAFETY
## One Man's Style

**Text & Photos**
**By Editor Jean Sorg**

Like all pilots, fire worries him. Hence he started wearing a Nomex flight suit which he puts on just prior to any aerobatic flight, practice or contest situation. He admitted it can be hot. "But at the same time it's not really that bad," he maintained. "You know you're not going on a long cross country with it. And it gives you a few seconds of fire protection."

That could spell the difference in a safe evacuation on the ground or in the air. He indicated that some day he'd even like to acquire a heavier, automobile racing quality Nomex suit along with the fire retardant underwear. He already has the Nomex gloves.

Originally intending to only wear leather ones for better grip on the stick and some possible fire protection, he learned from conversations with other contestants that the leather "will shrink in a fire and you won't be able to move your hands. So I went to the regular stock military Nomex gloves which are very comfortable and pliable," he noted. "You can still pick up things easily and they keep your hands from slipping off the stick. Sweat is just absorbed. In addition the military style grip is a lot better than the old rubber bicycle grip."

Another safety feature this aerobatic competition pilot and judge incorporated is a custom fitted helmet. "One year at Oshkosh (the annual EAA Fly-In convention) I went to the Flight Suits Limited booth and had myself measured for a mold to make me a custom fitted Kevlar helmet," he stated. "It's the stock military high G helmet. Kevlar is an option that adds lightweight strength. A composite, it's the state of the art in space age lightweight, real strong material."

He also arranged for his Dave Clark headset to be installed in this helmet. He explained his rationale here, "First of all you need to wear some type of a headset anyway because it's just too noisy. It's hard on your hearing if you don't wear one or ear plugs for noise attentuation. And a headset tends to just fly off; so you need a leather or cloth helmet to hold it on. They don't provide much protection however in a severe crash or from an accidental bump in an emergency exit of the aircraft."

The use of a helmet made a lot of sense to him which was reaffirmed when "a couple of guys on the circuit started showing up with them. I know," he conceded, "some guys may think it's not very macho to wear all this stuff. But when I'm up there I'm not really trying to impress people that way. The helmet is phenomenally comfortable and easy to wear and only took me about one hour to get used to it. In fact I wear it on cross countries and everywhere now."

He claims it's not as hot as wearing a leather headgear which can actually absorb heat coming through a windshield or canopy. In addition, his Nomex skull cap helps absorb any moisture and has a cooling effect he says.

An image of Darth Vadar from Star Wars pops into mind as one glances at him in his helmet with the darkened visor over his face. He noted the visor is an option that most order. He has a gradient shaded one which gets darker at the top. This feature allows one to look into the cockpit and read gages while the darker area at the top keeps the sun out of the eyes. Both it and his eyeglasses are shatterproof. It also lends a little bit of reflective heat protection. In his experience as a volunteer fireman while wearing plastic face shields, he finds the visor

would also reflect heat away.

In another trip to Oshkosh he ran across the booth operated by International Safety Systems, Inc., a Georgia firm. What attracted him was not just their small Halon fire extinguishers for aircraft use, but their complete Halon fire extinguisher SYSTEM for aircraft. With it the entire cabin and engine compartment are flooded, which is certainly more effective than a directional handheld extinguisher that is even useless under the cowling while airborne. Then, too, the system delivers considerably more punch in quantity than the small handheld bottle. In addition, the system affords faster access and release. There's no fumbling around to reach and operate it like there can be with the handheld.

With the system in his Decathlon, one nozzle is pointed right at the header tank which is "right there almost in your lap." The other points downward at both sides of the engine and its cylinders via tubing from the top. The theory behind this is the natural airflow will suck the Halon down and around the engine very rapidly. Of course, no one has actually set a Decathlon on fire to test it, but Stout has confidence in the premise. At any rate he contends that if worse comes to worse and any fire isn't completely and/or permanently extinguished in either area, the system should make it possible for one to safely vacate the airplane.

What he identified as a large panic button (actually about a two-inch red one that reads, "PUSH, FIRE,") releases the Halon. Once released, the system stays on. There's no shutting it off. What about accidental release? Or what about some youngster coming up and crying, "Hey, Mom, what's this?" A safety pin fills the bill here and it's easily pulled before striking the button.

Halon is not supposed to harm any of the aircraft's components, including electrical. Its common use is in computer rooms. Although it's not wise to breathe one hundred percent of it in high concentrations as it may replace your oxygen, it's doubtful this would occur in a Decathlon he believes. As he points out, there's a window vent up by one's head and if nothing else, "you could stick your nose in the vent to breathe outside air. So I don't think that would be a problem. I think you'd have more problem keeping the Halon in there than out."

He still carries his handheld bottle as an emergency backup. "It's always nice to have a second option, you know," he concluded. And he definitely prefers Halon over any dry chemical or $CO_2$. He's flown with the full system for more than 15 acro hours now and says the installation shows no signs of being in the way or loosening up. It's mounted on the firewall right behind the header tank.

Realizing that some pilots might be concerned about the added weight all these safety enhancements might entail, he scoffed at such concern. "Safety equipment is a lot better than worrying about weight," he pointed out. "And if you're that worried about weight, then quit crying about it and just go on a diet. Most of the guys who do worry about weight are carrying a lot of extra pounds themselves." He estimates the Halon system's weight at about seven pounds.

As to expense, well it all adds up. But what's more important — your neck or dollars? In his opinion the most expensive item is the custom made helmet which might run about $600 to $800 depending on make, model and degree of fanciness. Flight suits don't come cheap either, anywhere from $85 to roughly $200 unless you're lucky enough to find one second hand or like he did in a tradeoff situation. His Hooker setup ran about $200 and the Halon system, about another $200 or so. He reminds us that a regular harness checks in at about $100 anyway and the stick removal is definitely inexpensive.

But the biggest safety precautions gained are even the least costly he quickly stresses. Falling under this category are such things as preventive maintenance, thorough knowledge of one's aircraft and very thorough preflight and technical inspections.

"Now most who fly aerobatics know this, but someone new to the sport might not," he began. Then he continued, "A lot of things tend to end up in the tail assembly. You wouldn't believe some of the things that drift back there from pockets or whatever — like keys, coins, screwdrivers, pens, glasses, anything. So before every flight you want to take off the inspection plate under the horizontal stabilizer and check visually and by feel."

He acknowledges it might be a bit

**Some lap section of Ken Stout's Hooker Harness is visible in foreground above. Centered under the instrument panel and ahead of the control stick is the header tank with its fuel lines. Below it and mounted on the firewall between the rudder pedals is a Halon bottle for the fire extinguisher system. A round release button is above it to right of tank and just under panel. The photo on page 13 shows Stout in his cockpit wearing his Hooker Custom Harness, parachute, custom fitted helmet and Nomex flight suit and gloves.**

dirty in there and sometimes it might be inconvenient to do it, but taking the time and trouble is far better than the alternative — an object caught in an elevator cable. Landings alone can sometimes be tricky enough even with fully operational elevators and rudder.

About every ten hours he also carefully scrutinizes the interior of his wings. Nails working up or out is one item he's looking for here. If one is working out, he simply taps it back in. He has inspection plates that he pulls for the task.

Jim Batterman of Milwaukee, a long-time and active IACer who instructs in Decathlons and frequently serves as the chief technical monitor at contests including Fond du Lac, recommends more than just tapping. He suggests the use of a hypodermic syringe or any device one can use to syringe epoxy glue in around the nail before tapping back into place. Otherwise it'll just work out again. The best and recommended/required fix per an AD is to cut open the wings and redo the nails with ringed ones and epoxy glue. He said some install inspection covers between each rib and then install nails through them. "But that's a lot of covers per wing," he commented.

Stout also recommends checking routinely to see that the battery is still securely in place. And he encourages waxing the airplane regularly. The safety element derived from that he explained is, "It forces you to go over every inch of the airplane and look at it. You'd be surprised what little nicks and dings you'll find by going over the whole airplane just an inch at a time. Then you can stop problems before they start. If you do find something starting to fray or come off, you just put a little fix to it." Or, in other words, an ounce of prevention is invaluable.

Header tanks have their own unique set of problems he indicated. Its aluminum tubes are very brittle he says and tend to develop cracks from vibration or metal fatigue. "You may not notice it until all of a sudden you see a little stain on them," he said. "The cracks may not be big enough — just hairline — to actually allow any dripping, but some seeping may occur and then if you bump them or try to tighten them you could break the whole tube. Then you'd be running around with coffee cans trying to catch 40 gallons of gas before it goes all through your airplane — or worse."

Normally the big tip-off that all is not well is the smell of gas or one might see a little "gooey" green stain down around a fitting. At the first sign of either, Stout strongly urges the drainage of the tanks and replacement of the tubes. He's had to replace all three of his tubes which broke within about five hours of each other right after the five hundred mark on his airplane.

He doesn't think there's any magic number regarding time. "I would be simply suspect of aluminum fuel lines at any fitting because that is where vibration and wear seems to take place," he declared. "You just have to be careful with them because they won't take much stretching and bending. From experience just trying to tighten them up doesn't work. All you'll do is break them then . . . I think what happened to mine was the nuts on the ferrels were over-tightened at the factory causing the tubes to be crushed, binded or kinked . . . It's not that they're a very big problem from what I understand from other pilots, it's just that you do have to be careful and do thorough inspections."

**"big tip-off . . . smell of gas or . . . a little 'gooey' green stain"**

He mentioned he'd like to be able to install some fuel shutoffs in the wing root where somehow a person could just reach up and close the fuel source. That would eliminate the hassle of having to drain fuel to replace the lines and/or much of the mess if a line from the header tank does happen to break. But he's not sure what the FAA stance would be for an STC for such an alteration even though one would be doing it for the ultimate purpose of safety in his opinion.

"Although we're only required to do annuals, actually what we're doing in our 100-hour inspections are full annuals and that entails some expense if you fly a lot," he admitted. "But again it's just part of the safety system. You just can't inspect the aircraft too much. It's mechanical. There's going to be wear and tear. And you never know when someone is going to back into it or a kid is going to poke his finger through something."

He strongly advocates practicing fast emergency exit of one's aircraft while on the ground. Being prepared is good policy. Additionally he firmly believes in buying and frequently reviewing the information in the TECH TIPS I and II manuals. "Every so often I get those books out and just remind myself of some of the things to look at all over the aircraft," he said. "And another thing, I talk to other Decathlon owners a lot to find out what they have had problems with and what breaks on their airplanes and why.

"Also I never take offense with the thorough inspections by the technical monitors at contests. It may be a pain and disappointment if your aircraft gets rejected for anything. It may be hot on the ramp and upsetting with some of them acting like little old ladies poking all over your airplane, but they're trying to do their job to protect you and our sport. After all if you've been practicing a good inspection maintenance system you won't be finding out at a contest something you should have done back home.

"And besides in the 20 contests I've been in during the last two years I've always picked up something from somebody on what to look at or how to look at the aircraft, not to mention general tips for flying maneuvers." You can learn a lot by observing and listening.

One of the tips he picked up was actually more beneficial from a flying standpoint than a direct safety measure he indicated. It involves the taping of all tail surfaces to gap seal them. "It gives you much better performance," he claimed, "and you don't have to load up the airplane as much G-wise to get the same maneuver. I figure I save almost a G on a maneuver by having my gaps sealed and I can use the same amount of muscle pull as before to produce an extra G if it's needed without straining to get it.

"The side benefit here, I feel, from a safety standpoint is the aircraft is much more controllable with the gap seals. It really makes a difference in the elevator and rudder handling performance. It won't hold knife edge without the tape and does quite nicely with it."

By the way the tape is cheap. He uses 3M book binding tape for about a buck fifty. It does get yellow and old and eventually peels off. Then one simply replaces it.

"Now if only I could fly the figures better," he jokingly moaned. Yes, it still takes plain old practice and skill for that, plus a little expert critiquing from fellow competitors or judges.