Southwest Soaring
Quarterly Newsletter of the U.S. Southwest Soaring Museum
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An affiliate of the Soaring Society of America, Inc.

Fall 2008

The American Falcon (See article Page 4)
Editorial
by
Bob Alkov

This month we are privileged to have an article on the American Falcon contributed by the builder/donor Phil Bucher. As shown in the cover photo, the Falcon is a beautiful example of a homebuilt kit ship.

In pursuit of our goal of providing educational opportunities in the field of aviation technology, we applied for and received a grant from Lockheed-Martin that has a government grant to run the Sandia Lab. Accordingly, George Applebay and Deor Jenson contacted the local high school principal, Wayne Marshal, in Moriarty to present him with a check for $12,000 to fund a teacher and texts for a course to be taught in the fall session. A presentation ceremony with an oversized copy of the check will take place on the 19th of August at the Moriarty High School at 7 PM.

We would like to urge those of you who have not renewed their memberships to do so as soon as possible. Although we depend on the generosity of our members and contributors, we never seem to have enough money to continue day-to-day operations. Our docents volunteer to escort visitors around the museum during weekdays, but we need to keep taking in enough door contributions to pay the utility bills. With the higher price of gasoline there have not been many visitors this summer. We are attempting to advertise to attract more visitors. Several ideas have come up regarding attracting tourists passing by on the interstate. We are exploring putting a billboard message on I-40 approaching exit 197 from the East and from the West.

Another idea is to mount a sailplane on a pole out in front of the building so that it can be seen from the interstate highway. We have an extra all-metal ship that would be mounted on a swivel to act as a wind vane and as a sign.

Advertising in Soaring, or in the local newspapers or in the New Mexico magazine is expensive.

If you have any ideas, let us know.
Richard H. (Dick) Johnson

It is with great sadness we announce the passing of one of the Southwest Soaring Museum’s most faithful supporters and our friend, Richard H. (Dick) Johnson on Wednesday, July 23, 2008. Dick had just departed on tow to serve as the thermal sniffer for the US National PW-5 and I-26 contests to start at TSA’s home field near Midlothian, TX. He reported passing through 1800 feet, reaching for the tow release shortly thereafter, he was probably hit by a massive heart attack. His Ventus A was seen to drop off into a spiral dive, developing into a more nose down attitude as velocity rapidly increased before contacting the earth at high speed. Following loss of radio contact a search aircraft located the wreckage about 21/2 miles southeast of the airport in a wooded area.

A news helicopter broadcast a video of the crash site within 2 hours, while the emergency medical technicians were still searching the area. Wreckage was scattered over a 200 foot diameter circle.

This writer followed the early life of 16 year old Dick Johnson and his 17 year brother David from news articles in Air Trails magazine starting in 1940. The brothers showed up at the 1940 Soaring Nationals in Elmira, NY with a newly completed $385 kit built Baby Bowlus Albatross which was highly outclassed by the many imported and American home built ships such as the Minimoa, Rohnsberger, and the Ross Zanonia. Dick surprised everyone with a 130 mile flight early on and repeated good flights each contest day, finishing in third position at contests end.

His many accomplishments, learning to fly a Northrup Primary in 1938 at 14, starting a glider commercial operation at 17 with a Schweizer 2-8, instructing at the Army, 29 Palms, glider flight school, Co-pilot with PAN-AM, 1943 to 45, College, 46 to 52. Dick won his first Nationals flying out of Grand Prairie, TX in 1950 with the RJ-5.

When Dick gave up serious contest flying years later, he had won the Nationals eleven times. He wrote many articles for SOARING magazine. A program honoring Dick’s life will follow a dinner at the Southwest Soaring Museum, Saturday August 23, 08 at 6:00 PM. Dick will be missed.

George Applebay

Helen Montgomery – Prologue

by

Kathy Taylor

In the Summer 2008 issue of Southwest Soaring, we recounted a limited history of Helen from back issues of Soaring Magazine. We issued a challenge to our readers to provide details of Helen’s life after 1945.

Thanks to the efforts of Craig Angus of Aspen, Colorado, we are able to finish the story. Craig was able to locate her daughter Mary Ellen who was born June 23, 1938. A photo of Helen, L.D., and 2-month old daughter appears in the pages of “Soaring and Gliding the Sleeping Bear Dunes National Lakeshore Area,” by Jeffrey P Sandman and Peter R. Sandman, Arcadia Publishing, 2006. The Montgomery’s divorced shortly after the photo was taken.

Mary Helen pinned down her mother’s birth date. She was born July 4, 1911, as Helen Marie Davies. After the war Helen moved quite a bit, working as a school nurse, also doing some private practice nursing and teaching flying at the Auburn, Indiana Airport. She struggled to afford flying but partnered with a fellow Ninety Nine in a Cessna 172 that they planned to fly in the Powder Puff Derby. However, the plane and her partner disappeared over Lake Michigan and no trace of either has ever surfaced.

Helen eventually moved to California and died there at age 62. Her ashes were scattered over the Pacific Ocean from an airplane, as she had requested.

Helen made many contributions to early soaring and powered flight and her national feminine duration record of 7 hours 28 minutes stood until duration records were discontinued by the FAI. Helen and Alice Hammond (another Michigan Ninety-Niner) proposed the Amelia Earhart Memorial Scholarship in 1937. It is for women in aviation and continues through today via the National Office of the Ninety-Nines in Oklahoma City.
I developed an interest in flying as a small child. Living about 20 miles north of the Goodyear factory in Akron, OH, I saw the giant Navy blimps pass overhead several times a week. They trained over the open water of Lake Erie. And of course, like many small towns, we had a community airport with grass runways. When I was about 13, my dad helped me build a primitive R/C model airplane. It had just one channel and a funky arrangement to control both the elevator and rudder movements. The radio transmitter used vacuum tubes (!) that ran from 135 volt and 9 volt dry cell batteries.

When I turned 16, my mother helped me pay for flying lessons. I soloed in a J3 cub after 8 hours, and then moved up to a PA-18 Super Cub, and a PA-22 Colt before getting my Private license with just 36 hours of experience. Shortly I was working nights and weekends at the airport, running the fuel pumps, helping the mechanics re-build engines, recovering fabric planes and hand-proping the Cubs (and sometimes a Cessna, Tailorcraft or Stearman). When the sun set, and I was the only employee still working, I signed-out the last customers, pushed all the planes into the hanger and locked up. It was a lot of responsibility and a great experience for a 17 year-old kid.

A week after I graduated from high school in 1965, I bought my first plane; a 1960 7EC Champ with a 95 hp Continental. (Mom paid for it.) It had full electrical, landing lights, radio and a starter! I intended to build hours and get my commercial and instructor ratings, to help pay for my college costs. But after three years, I had only succeeded in passing the commercial written test and accumulating a couple of hundred hours. College and a girlfriend were just taking up way too much time. I sold the Champ and turned to another hobby, sailboat racing.

In 1985 I was in the middle of a great career selling business computers when a job transfer brought us to Colorado. It wasn't a serious place to race sailboats, so we sold them. Shortly after arriving, we were in

the stadium at Boulder watching CU play our alma mater, Ohio State. But I was having trouble concentrating on the action because of all the gliders flying overhead. This looked like fun. I could combine the best of sailing and flying by getting involved with gliders. I added a glider rating, and purchased a 1979 Slingsby Vega (British made 15 meter ship). It was a great glass glider with some clever innovations: retractable main & tail wheels, a flap that also acted as a huge trailing edge dive brake, and best of all, lots of ground clearance. I flew that glider for about 5 years until a job loss forced me to sell it (for almost twice what I paid!)

A couple of years later and with a new sales job, I spotted an advertisement in Soaring for a glass Standard-class glider kit called the American Spirit. Intrigued, I arranged to meet Tor Jensen, the owner of a small company in California called Advanced Soaring Concepts. He showed me the completed prototype and let me fly it. My initial reaction was only lukewarm. His prototype had some handling characteristics that I didn't like. The biggest flaw was a super-sensitive elevator. I talked a bit with Tor (he was a slick salesman) and he convinced me the issue could be corrected. Then he also mentioned that he was building a second variant of the kit, called the American Falcon, which would have flaps, inter-mixed with the ailerons. That hooked me. I sent him a deposit towards the $18,000 price and in January, 1994 I picked up my kit and got a week's worth of hands-on training in fiberglass aircraft construction.

I've always been pretty handy with tools and construction projects, and my degree in Mechanical Engineering gave me all the technical confidence I needed for the project. I moved the kit into our large, walk-out basement and opened my own airplane factory. I bought about $1000 of specialty tools which I didn't already own, and shortly I was cutting sheet aluminum for bell cranks, joining fiberglass panels and assembling pushrods. As the months went by, I worked almost every evening and every weekend. I was determined to finish the project in a reasonable time. (Most people who attempt to build a plane, car or boat never complete their projects.)

Since this was an amateur-built aircraft, I had the latitude to make design changes. The first change was to reduce the elevator sensitivity by changing
the stick’s fore-aft travel. Another innovation was the dipole radio antenna which I molded into the tail fin. I simply used two pieces of ¼” wide self-sticking copper foil tape purchased from a stained glass supply shop. Easy!

The most complicated part of the Falcon kit was the control “mixer” which Tor Jensen had designed. The purpose of the mixer is (a) to provide full-span proportional ailerons, with the inboard flap section deflecting about 40% of the outboard aileron’s movement, and (b) to provide full-span flaps, with both the aileron and flap moving up and down together equally. If you have an opportunity to look at my Falcon, watch the mixer while making these controls movements. The mixer works well, but does have as very small (acceptable) amount of “play” or looseness.

As designed by Tor, the Falcon flaps and spoilers were operated by separate control handles. But I wanted something better. My previous ship, the Slingsby Vega, had a clever single handle control for these two functions. So I designed and built my own version of it. Now a single handle on the left side of the Falcon cockpit is used for spoilers (fore-aft handle movement), and also for flaps (rolling the handle through 90 degrees from upright to horizontal). It works great and makes flying easier, while eliminating the possible safety hazard of “wrong handle.”

I designed and added other customizations included a gear warning system (linked to the gear and flap positions), and a set of double-locking quick-connectors for the control hook-ups. (The kit was designed to use bolt-on connections – a real chore for frequent rigging.) I also added an oxygen system since we do a lot of wave flying in Colorado. I built a small oxygen console on the right side of the cockpit. The console allows easy connection of either a mask or cannula and it has a small pressure gage and a refilling port. I added a 720 channel radio which connected to both a boom microphone or to the built-in mike in the oxygen mask.

Probably the trickiest part of construction was joining the top and bottom skins of the wings. First, I added all the internal hardware including spoiler box, access ports, hinge points and pushrods. The kit came with the carbon-fiber honeycomb spar pre-built into the top skin. The bottom skin had a full length channel to accept it. Both skins were molded with a 2” wide carbon fiber tape “cap”, so the completed assembly had an “I” shaped beam of carbon fiber as the main spar. The trick to this assembly process was to make sure both sections were perfectly straight and perfectly flat. Otherwise the wing would be cured with a permanent bend and/or twist. I got one wing pretty straight, but the other one has a slight twist.

One of the final construction steps was joining the canopy to the pre-molded canopy frame. Tor’s instructions called for drilling a dozen 1/8” holes and using Cleco fasteners to hold the assembly together until the special acrylic adhesive cured. In short order, I managed to crack the canopy, which was a pretty flimsy item. So I ordered a nice, high end canopy from Ray Poquette. I bought all the options – gray tint, UV protection, a sliding vent and extra thick plexiglass. That canopy set me back about $1500 and it was an excellent value!

A month in a friendly auto-body paint shop completed the construction. I performed the weight and balance analysis which showed it to be within the allowable CG aft limit, but pretty tail heavy. I installed placards, and took the plane to the A&E for inspection. Then on May 15, 1995, it was time to fly it.

The first flight was a bit sketchy. Despite my best efforts to set up the controls, the ship was out of trim. It was frankly a bit hard to control in both pitch and roll. The day was overcast and pretty calm, so there was no real opportunity to soar. That meant that I didn’t have a lot of time to experiment because my first (dreaded) landing was soon at hand. After about 25 minutes I got it down OK, and found I had no wheel brake. Fortunately Boulder has long runways.

I immediately proceeded to make a couple of changes. I re-rigged the ailerons, adjusted the brake and added a big chunk of lead ballast. The next flight was great. I flew to 16,000’ and spent over 2 hours playing above the foothills west of Boulder. I tested it at 120 mph, did steep turns and stalls. Much better! On my third flight, I performed a loop and climbed to 17,000 feet. I was still having problems with the wheel brake. So I contacted the wheel manufacturer and bought a new one with a much larger disc brake. Voila – now I could stop.
During the next winter, I decided to work a bit more on the trim issue. I put the ship back in the basement and installed the wings. (It is a big basement!) Then I proceeded to grind out the fiberglass around the box frame in the area of the left wing attachment point so I could raise the leading edge by 3/16". That improved the trim and no further changes were needed.

One other troublesome feature of this glider is that the wing angle of incidence, while sitting on the ground, is extremely low. In fact, if the flaps are “up” or “neutral” it is difficult or impossible to lower the tail enough to fly off the ground. The design would have been better with more incidence, or else a taller main gear. So a successful take-off requires flaps to be fully down. For the same reason, landings were always a little “hot” since I couldn’t lower the tail enough for a good stall landing. A low flare quickly produced tail contact, and then I was down. A higher flare meant dropping it in.

Another unique feature of the Falcon is the removable wing tips. I almost always flew with the 15 meter tips. But I also built a set of 18 meter tips which have a beautiful aft curve and upward swoop. (The Museum has them in storage.) I flew them a few times on weak days. I guess they helped somewhat. I never had a means to evaluate their performance. They flew nicely, except on tow when they produced a lot of adverse yaw. This manifested itself by making it difficult to make small turns and track the tow plane. So on tow, every turn and/or roll had to be accomplished by stomping on the rudder pedals. I learned to be happy with the 15 meter tips.

About three dozen Spirit kits were sold in 1993-1995 and approximately 10-12 of them were eventually finished and flown by their owners. Although this kit was #4 of the Falcon series, it may be the only completed Falcon, (other than the prototype). It has flown approximately 90 times and accumulated about 110 hours of flying time. The longest flight was more than four hours, and the highest flight was to 27,500 feet.

I mentioned earlier being too busy to fly while at Ohio State in the 1960’s. Well that girlfriend whom I met 45 years ago has been my steady companion and loving wife for almost 40 years. She was a temporary widow during the construction of the glider and was kind enough to put up with my time-consuming hobby. The name “Susan” on the nose of the Falcon is my dedication to her.

While I have had many enjoyable hours flying the Falcon, I think I enjoyed building it even more. I guess that is just the creative side of my personality.

Using his experience in design and glass/carbon fiber construction, Tor Jensen and his small company built a variety of unique aircraft and rocket parts for the large aerospace companies. (He also built a bunch of the fiberglass “Dumbo” rides for Disneyland.) Tor died in a motorcycle accident a few years ago. Advanced Soaring Concepts no longer exists.

As the official manufacturer of this airplane, Federal law say that I, Phil Bucher, am legally liable for design and construction defects for 18 years. When I decided to leave soaring in 2007, I first planned to sell the Falcon. I consulted with the EAA (Experimental Aircraft Association) which provided me with a sample “hold harmless” sales contract. But such a contract would not protect me from third party suits. If I were to sell the plane, I simply could not accept the possible liability for six more years. So in November, 2007 the glider was donated to the Museum, with the stipulation that it not be flown again.

Directions to the Museum

We are located at 918 East Old Highway 66 in Moriarty, New Mexico. Traveling East from Albuquerque on Interstate 40 take exit 197 3 miles from the city. Exit right onto Highway 66. We are the big building on the left before Lisa’s truck stop. Traveling West on Interstate 40 exit right at exit 197 and head West on Old Highway 66. We are the big building on your left.

Radio-Controlled Model Contest

A contest for radio-controlled gliders and sailplanes will be held at the museum all day on Saturday the 23rd and Sunday the 24th of August. Awards will be presented to the first, second and third winners in each of six categories. The models will be flown from the grassy area behind the museum.
Membership numbers and expiration dates are on your mailing labels.

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Traveling West on Interstate 40 exit right at exit 197, continue heading West on Old Route 66. We are the big building on your left. 10400 Walsworth Rd. 87035. Note: Deadline for Copy for the Fall Issue is August 15th.
USSSM Membership Application

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1. Free admission to museum facilities.
2. 10% discount on gift shop purchases.
3. Receive all USSSM mailings.
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Life members and major contributors and their minor children receive these benefits for life. Other members receive them for one year. Family, Supporting and Sustaining include minor children. Supporting and Sustaining accrue toward a Life membership.

Send check to: U.S. Southwest Soaring Museum
P.O. Box 3626
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