Southwest Soaring
Quarterly Newsletter of the U.S. Southwest Soaring Museum

June 2014

Rolladen-Schneider LS-3a
A museum lives and dies by its volunteers and this museum is no exception. Fortunately, we have some of the best. This month we feature Jimmie Akins, docent extraordinaire. Jimmie recently investigated our communications services and costs and came up with a package that gives us much faster internet service with lower monthly fees. We retain our old telephone number and the change is transparent to the users.

Jimmie began volunteering for the museum in March 2011 and he has been regularly opening the museum every Tuesday. He is an electrical engineer, retired from Sandia National Laboratories in Albuquerque. He built an RV-9 airplane and is a designated aircraft inspector for EAA homebuilt projects. Jimmie prepared the drawings and cost estimates for our Education Center. He has also provided drawings and sound advice for other projects. Some specific improvements he’s made:

- Installed Raven, our wireless access antenna;
- Contracted with ITP, internet phone service;
- Installed Mozilla Thunderbird, for e-mail and ITP voicemail services.
- Installed Office Pro 2013;
- Purchased Norton Internet security at a very low non-profits price.
- Updated Windows Pro 7 for 3 computers;
- Added additional memory and other updates.

Jimmie’s fertile mind is always finding ways to help the museum. He recently updated the museum brochure, adding a map and updating older information. There is no telling what the museum can accomplish with such talented volunteers.
This month we feature the **LS-3a**, a 15-meter single-seat glider produced by Rolladen-Schneider from 1976 to 1983.

### Development and Design
The LS-3 was developed as Rolladen-Schneider's first entry to the new 15-meter competition class created in 1974 by the International Gliding Commission of the Fédération Aéronautique Internationale. Building upon previous experience with the LS-1 and LS-2, chief designer Wolf Lemke developed a new fuselage with a larger cockpit and more generous horizontal and vertical stabilizers.

Lemke elected a relatively thick profile developed in 1967 by University of Stuttgart Professor Franz Xavier Wortmann, the FX 67-K-170, which offered the structural economy made possible by a tall spar - an important consideration as glass fiber was still the only affordable reinforcement material - as well as good performance for the time.

This profile and its sister profile FX 67-K-150 are among the most prolific in the history of gliding, as they were employed also in the Nimbus-2, Mini-Nimbus, DG-200 and DG-400, PIK-20 and PIK-30, Kestrel, Mosquito, Vega, Jantar and LAK-12 among other types.

The LS-3 wings are single-tapered, entailing a slight aerodynamic loss. On the other hand, this geometry complemented the straight axis for the full-span flaperons which gave the LS-3 good handling and roll rate characteristics. The control system was rigged to reduce the available control stick throw with negative flap settings, therefore giving a measure of built-in protection against over stressing at high speeds.

The flaperon drives are located at the wing roots, an elegant solution that required a large amount of lead for mass balancing the control surfaces to preclude any risk of flutter. This makes the LS-3 wings heavy, about 85 kg (187 lb) each half-span (thus the nickname LS-Blei, a pun exploiting the phonetic similarity in the German language between 'three' and 'lead').

In spite of its weight the LS-3 is a nimble climber. It is also less sensitive to rain or dirt than other types with the same profile. Its thicker wing takes its toll at higher speeds, where it could not keep up with the contemporary ASW 20.

A variant with separate flaps and ailerons and a slightly taller tail, the LS-3a, was introduced in 1978. This version did away with the flaperon mass balancing, making each wing about 10 kg lighter. A span extension to 17 meters was later developed for this version. Although not very successful due to speed and ballasting limitations, these extensions pioneered a trend that has become extremely popular. Today most new standard and 15-meter class gliders offer tip extensions as an option.

The LS-3 was superseded in 1983 by the LS-6. Its production run reached 429 of which two-thirds are of the “a” version. It remains a popular glider in the second-hand market, with a well-deserved reputation for its pleasant handling characteristics.

### General Description
- Wings, flaperons and horizontal stabilizer: spar and shell of glass fiber reinforced plastic/foam sandwich
- Elevator and fuselage: glass fiber reinforced plastic
- Automatic connections for flaperons, airbrakes, elevator and water ballast valves (except the ailerons in the LS-3a)
- Water ballast system: unvented ballast bags in the wings

### Variants
- **LS-3** - original production version (155 built)
- **LS-3a** - improved version with separate flaps and ailerons and a slightly taller tail (208 built)
- LS-3/17 - version with tip extensions for 17 meter span; no ballast provision (66 built)

**SPECIFICATIONS (LS-3a)**

**General characteristics**
- Crew: One pilot
- Capacity: 150 kg (330 lb) water ballast
- Length: 6.86 m (22 ft 6 in)
- Wingspan: 15.00 m (49 ft 3 in)
- Height: 1.32 m (4 ft 4 in)
- Wing area: 10.5 m² (113 ft²)
- Empty weight: ca. 243 kg (535 lb)
- Gross weight: 472 kg (1,038 lb)

**Performance**
- Maximum speed: 270 km/h (170 mph)
- Maximum glide ratio: approx. 40.7
- Rate of sink: 0.62 m/s (122 ft/min)

The LS-3a received US Type Certificate G37EU in 1980.

**The Designer**

Wolf Lemke is a sailplane designer who worked for Rolladen-Schneider and after it was taken over in 2003, for DG Flugzeugbau GmbH.

He was one of the student members of the Akaflieg Darmstadt who designed the revolutionary D-36 "Circe". This team also included Heiko Fries, Klaus Holighaus and Gerhard Waibel.

After leaving the Akaflieg, Lemke built a second D36 in his cellar. He almost killed himself in it when he took a winch launch with a disconnected elevator but he parachuted to safety and glider was repairable. Lemke joined Walter Schneider, a well-known sailplane pilot, and his brother Willi, in the firm Rolladen-Schneider at Egelsbach near Frankfurt.

His most significant design was the LS-1 which he first flew in May 1967. It was built by Walter Schneider, at first under the name Segelflugzeugbau Schneider OHG, but later as Rolladen-Schneider Flugzeugbau GmbH. The LS-1 conformed to the Standard Class rules then in force, having a non-retracting undercarriage and no flaps or provision for water ballast. The wing was mounted shoulder high on the fuselage and the tailplane was of the all-moving type, with sweep back. Trailing edge air brakes were mounted just inboard of the ailerons.

Two LS-1 prototypes flew in the German Championships in 1968: Helmut Reichmann and Walter Schneider placed first and second out of 44 competitors in the Standard Class.

**The Company**

Rollanden-Schneider Segelflugzeugbau GmbH was a major glider manufacturer.

Rollanden-Schneider was originally a business in Egelsbach near Frankfurt, Germany, that originally made rolling doors and shutters. It was run by Willi and Walter Schneider. Walter was an enthusiastic sailplane pilot who, with fellow club members, had built some wooden sailplanes. He recruited Wolf Lemke as sailplane designer and the company built its first glider in 1967.

The company produced the following gliders:
- LS-1 (Standard Class)
- LS-D Ornith (two seater prototype)
- LS-2 (15 meter Class, though before the present classes existed)
- LS-3 (15 meter Class)
- LS-4 (Standard Class)
- LS-5 (22 meter prototype only)
- LS-6 (15 meter Class with optional tips to give 17.5 meters or 18 meter spans)
- LS-7 (Standard Class)
- LS-8 (Standard Class with optional tips to give 18 meter span)
- LS-9 (18 meter self launching glider - 10 built)
- LS-10 (15 meter Class and 18 meters Class)
- LS-11 (Two Seater Class) - prototype in development by Akaflieg Köln

Because of difficult economic times following the US World Trade Center attacks, the company went into receivership in 2001. In 2003 DG Flugzeugbau GmbH took over the assets of the company including the LS brand name and designs. DG currently manufactures the DG-808C, DG-1001, LS-8, and LS-10. The LS-4 and LS-6 are currently produced by AMS Flight.

**AMS Flight**

AMS Flight Ltd. is a worldwide operating and EASA authority certified composite aircraft manufacturer and design organization.

The company was established in 1999 to continue the existing aircraft development and production they had performed since 1978 in the Elan facility. They took over the entire ELAN Flight factory division of Elan. The company’s manufacturing facilities were located at Begunje (inside the Elan
In 2010 AMS Flight reorganized and moved their office to the local sport airfield Lesce-Bled, and opened their production facility in the Zapuze industrial park.

In 2001, AMS took over from Technoflug GmbH the production of the Carat motorglider. The Carat is a single-seat, powered glider with the engine in the nose.

The AMS product range expanded in 2003 with the acquisition of the Apis ULA / Sport Class motorglider program of the Slovenian company Albastar. Manufacturing of the Apis continued at AMS until 2007 when production of the Apis was transferred to Pipistrel.

In 2005-2006 AMS took over responsibility for the LS-4 and LS-6 sailplanes.

The AMS Flight factory's expertise in advanced composite technology is also being used to develop products for 15 kW and 40 kW wind electric generators.

**History of the Museum’s Glider**

The museum’s LS-3a, N153MW, serial #3227, was manufactured in December 1978. It was first flown as HB-1462 in Switzerland by the Segelfluggruppe Knonaueramt flying club of Rifferswil.

We do not have the first logbook but the second logbook begins in 1998 with 595 flights and 1950 hours. The second owner was Georg Jakl of Göppingen, Baden-Württemberg, Germany, where the glider was registered as D-4849.

It was imported into the U.S. by Michael Wegner of Buford, Georgia, in 2002, with 2086 hours in the logbook.

The glider was purchased subsequently by Bob von Hellens of Phoenix, Arizona, who donated the glider to the museum in 2013 with a total of 2401 hours on the airframe.

The museum has many of the original inspection and maintenance records for this aircraft (mostly in German), including the record of the factory test flight that was conducted and signed by Wolf Lemke. We also have English-language flight and maintenance manuals.

This aircraft is now for sale by the museum including its well-built European trailer. Proceeds of the sale will go to the SW Soaring Museum Foundation to create an endowment for future support of the museum. Contact Gene Tieman at the museum 505-670-9631 or ussouthwestsoaringmuseum@gmail.com.
Acknowledgements: The preceding account includes information from the museum’s file of documents and logbooks for this glider. We also synthesize information from the Soaring Society of America’s “Sailplane Directory 1997,” Martin Simon’s “Sailplanes 1965-2000,” the online Wikipedia, and various issues of Soaring magazine.

Directions to the Museum
Approximately 35 miles east of Albuquerque on Interstate 40, take Exit 197 onto Old Highway 66 in Moriarty, NM. The museum is the big building on your left.

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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.

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P.O. Box 3626
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