SGS 1-36 Briefing

The 1-36 SPRITE is an all-metal taildragger model. It has a glide ratio of 31:1, which is a big step up from the training gliders.

Since most of the really high-performance sailplanes are taildraggers, the 1-36 is an excellent way to build experience. The higher performance will allow you to move about the valley much easier than the 1-26 or 2-33, allowing you to make small cross-country-like tasks in the local area.

Checkout Requirements: 7 hrs. in 1-26's, flights in the 2-32 and/or Grob, and a ground check. Flights in the Grob with your instructor will help to ensure that your pitch control is smooth, especially during takeoff, steep turns, during spoiler deployment, and landing.

Limitations

N36148 has an empty weight of 483 lbs, and a maximum gross weight of 710 lbs, yielding a useful load of 227 lbs. A minimum weight of 125 lbs is required to bring the CG forward of the aft CG limit. The forward CG limit is not approached when within the allowable weight range.

Normal aerotow speed is 60-70 mph with a maximum aerotow limit of 98 mph.
The maximum cruising speed (V_C) is 108 mph and should only be flown in smooth air.
V_{NE} - Never Exceed speed (red line) 1s 121 mph.
Speed brakes may be used throughout the flight envelope up to V_{NE}.
Maximum demonstrated crosswind: 15 mph.

Arrangement

The 1-36 has a distinctive T-tail like many higher-performance gliders. It is of all-metal construction except for the fabric-covered elevators. The glider has a wingspan of about 46 feet (5 feet narrower than a 2-33 and 6 feet wider than a 1-26). This is also about twice as wide as most two-lane roads.

The pitot tube is located in the nose. A pitot cover is provided. Ensure that it is removed during preflight and replaced on postflight.

The static ports are two-small holes just aft of the nose below the midline. Contrary to the description in the Pilot Operating Manual our 1-36 does not have a static-line drain.

A total energy probe is provided for the variometer. While the vario will still have a lag it will be less susceptible to “stick thermals” and provide a better indication of climb rate during speed changes.

Ground Handling

Parking Location: The 1-36 is normally parked nose-in between the two 2-32s. They will each have to be partially untied to get the 1-36 in or out. Use extreme caution and obtain assistance to avoid hitting these other gliders.

The tail is heavy and you will not be able to lift it by pushing down on the nose. A rope handle is provided which can be looped around the aft fuselage to help turn the glider on the ground. DO NOT lift by the horizontal tail surface. Avoid pushing backward in soft dirt so the tailwheel doesn’t dig into the ground.

Do not hesitate to ask for assistance in ground maneuvering this glider.

When parked, a metal rudder lock is placed at the top of the rudder and the control stick is secured with the seat belt for the ailerons and elevator.

Cockpit Orientation

The 1-26 is very much a Schweizer glider and the cockpit will have a familiar feel for the 1-26 pilot. Like those gliders, the wheel brake is activated at the far aft spoiler handle position and the rudder pedals have a three-position adjustment on the rudder cables. The tow hook is identical to the other Schweizer gliders and the release is a familiar red ball on the forward panel.

The seat-back is adjustable with a locking pin on the right side. The pin adjusts a length of cable that supports the seat back. The farther back the pin, the farther *forward* the seat back is.

The pitch trim operates differently than other Sky Sailing gliders, and is set with a lever attached to the control stick. While holding the control stick in the desired position, pull and release the trim lever. This resets the trim spring. This system allows the trim to be reset quickly and accurately. Good use of the pitch trim will aid in flying the 1-36 smoothly and with a light touch.

The airspeed indicator has mph on the outer ring and knots on the inner.

The sunshade and tail rope can be stored behind the seat. The glider has no pouches or storage locations for personal items that can be reached in flight; big pockets or some other accommodation may be useful.

Takeoff

Unlike the 2-33, 1-26 and even the 2-32 the 1-36 does not sit on its nose after the pilot gets in.

Directional control will be reduced with the tail on the ground. Insure proper alignment before launch. Be ready to release early in the tow if directional control is a problem. Because of this, **do not fly this glider if taking off with a tailwind.**

The tail will remain on the ground until about 35-40 mph, which is near takeoff speed. Care must be taken to avoid kiting up behind the towplane when lifting off with a positive pitch-up attitude.

Its most significant handling characteristic is that the 1-36 is more pitch sensitive than the 1-26. The stick has a smaller range of movement and handling is very light. The trim should be set during your before-takeoff check with the stick in a mid position. Pilot-induced oscillations on takeoff are a common problem for those that do not take care to avoid reactionary movements on the control stick. Gentle inputs are the rule. Bracing your arm against your leg is a common technique to help make small and gentle control inputs.

Start the takeoff with a stick position that yields about 1” down on the elevator surface. The objective is to bring the tail up off the ground and obtain a level-flight attitude before liftoff. If the tail is left on the ground the glider is positioned with a high angle of attack and will climb quickly at liftoff.

In Flight

The 1-36 will be easier to speed up than the lower-performance gliders. Caution must be exercised with large or sudden control inputs above the maneuver speed of 65 mph.

Stall characteristics are typical but the aircraft will spin more readily than a 2-33 in a similar manner as the 2-32. As always maintain coordinated flight during all maneuvers except when slipping intentionally.

Due to the position of the spoilers, a pitch moment is induced when they are deployed. Smooth and deliberate spoiler control is essential. Overworking the spoilers may result in unwanted pitch oscillations.

Performance

Stall speed in wings-level flight is approximately 35 mph and 39 with dive brakes open. Stall speed increases with bank angle and increased load factor, like all other gliders by nearly 20% in a 45° bank.

The minimum sink speed at 0° is 42 mph (the same as the 2-33 with two occupants). Therefore, minimum sink in a 30° bank will be 45 mph and 50 mph in a 45° bank. Schweizer recommends thermalling between 43 and 46, which helps reduce the circle's radius when thermalling.

The 1-36 manual contains lists of recommended speeds in conditions of headwind and sink. The glide ratio may be as much as 31:1 at 53 mph in calm air, with a factory-new sink rate of about 150 ft/min. At 60 mph the glide ratio is about 30:1 with 180 ft/min sink, and at 70 mph the glider retains a 28:1 glide ratio at about 220 ft/min. It matches the 2-33 and 1-26 maximum glide ratio of 23:1 at about 84 mph thus providing a far superior ability to fly against headwinds than those gliders (the 1-26 would be 17:1 at that speed).

Schweizer recommends adding 9 mph additional speed for the first knot of sink with slightly less for each additional knot. That glide ratio degrades to 19:1 with as little as 100 ft/min (1 knot) of sink while flying the recommended 62 mph; and 14:1 (less than half optimum) when in just 2 knots of sink while flying at 68 mph. A conservative altitude safety margin must always be maintained. See the speed-to-fly section in the 1-36 Pilot's Operating Manual.

Schweizer's speed-to-fly with a headwind section recommends an additive just slightly more than ½ of the headwind. Recall that there is usually less performance penalty for going slightly too fast, than for going too slow.

Approach and Landing

For approach and landing, a no-wind approach speed of 55 mph is recommended by Schweizer with the standard increase in approach speed for wind (adding ½ the estimated wind value and additional speed if gusty or turbulent).

Avoid spoiler changes as you approach the flare as it will induce pitch changes and make control more difficult. Touchdown is ideal with ½ to ¾ spoilers.

Due to the aircraft's pitch sensitivity, ensure a smooth round-out and flare is used. Trying to flare at the last moment may easily result in ballooning and a difficult landing.

Land in a tail-low attitude touching down with the tail wheel touching down first. Landing with the tail up may result in repeated bounces. Directional control is limited so, good crosswind technique is essential, though it will weathervane. Make sure you are pointed in the direction you want to travel.

The rollout should be made with the stick all the way back.

There is no forward skid on the 1-36. Avoid hard braking which could cause the aircraft to pitch forward onto the nose, causing damage to the fuselage. The hydraulic disc brake may require "pumping."

History

The 1-36 has an interesting history. It was produced between 1979 (certified in 1980) and 1982. It was conceived as a replacement for the 1-26 when that model's production ended in 1979, but only 43 were built. The 1-36 was the last glider model to be built by Schweizer ending its 52-year glider manufacturing run.

The 1-36 "Sprite" was the only glider manufactured by Schweizer to be given a marketing name (Sprite).

Two models were produced the primary difference being the position of the main wheel. A forward-mounted wheel with spring tail wheel (i.e., tail dragger — like the one owned by Sky Sailing) was intended for private owners and a more aft placement along with a nose skid intended for purchase by schools and clubs.

The aircraft was reviewed by Dick Johnson as part of his series of glider evaluation articles that appeared in Soaring Magazine from 1977-2004. Hisflight test evaluation in the March 1982 issue concluded:

> "All considered, the new 1-36 sailplane appears to be an excellent intermediate-performance sailplane with markedly better performance than its 1-26 predecessor. Its robust and durable aluminum construction should make it an attractive sailplane for clubs, sport fliers, and one-design-class advocates"

Johnson's flight test evaluation indicated that the 1-36 out-performed the 1-26E (the models owned by Sky Sailing) by a margin of 45%

NASA Research Project

The Schweizer SGS 1-36 Sprite experimental prototype, registered N502NA, was acquired by NASA's Dryden Flight Research Center at Edwards, California and used for research into controlled, deep-stall conditions at an angle of attack of more than 30 degrees. The Sprite was used for the test program because of its slow speed and the simple aerodynamics of its long unswept wing.

Schweizer Aircraft modified the Sprite's horizontal stabilizer to allow it to produce an elevator angle of up to 70 degrees. NASA also modified the Sprite to permit better pilot entry and exit.

Radio-controlled-model, ground tests and simulator tests were conducted before manned flight.

During September and October 1983 NASA flew the test program with the SGS 1-36, to demonstrate whether a piloted aircraft could be controlled in flight at very high angles of attack. The 1-36 was usually aero-towed to 8,500 feet (2,600 m) to conduct these test flights.

The program results showed that the Sprite could be safely controlled at angles of attack of 30 to 72 degrees and at high rates of descent. That glider is now at the National Soaring Museum, in Elmira, New York.