



NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Aviation Safety
Western Pacific Region**

SITE and ON-SCENE INFORMATION (Rev B)

**NTSB Accident: WPR18FA143
Accident Date: May 19, 2018**

Examination Date: May 24, 2018

This document contains 28 embedded images

Photos Courtesy CCSC and NTSB

A. ACCIDENT

Location: Near Avenal, California
Date: May 19, 2018
Aircraft: ICA-Brasov IS-29D Lark, N38ES, Serial # 38
NTSB IIC: Michael Huhn

B. EXAMINATION PARTICIPANTS:

Michael Huhn
Air Safety Investigator
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C. SUMMARY

On May 19, 2018, at an unknown time, an ICA-Brasov IS-29D Lark glider, N38ES, was destroyed under unknown circumstances during a flight near Avenal, California. The co-owner/pilot received fatal injuries. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed.

The Romanian-manufactured 1974 glider was designed with removable wings and horizontal stabilizer to enable it to be stored and transported in a custom enclosed trailer. According to the other co-owner, he and the accident pilot had purchased the dis-assembled glider several months ago from the previous owner in Kansas. The co-owner reported that the glider had last been flown about 7 years prior. The glider was trailered to California, and eventually assembled by the co-owner and pilot. The accident occurred during the first flight after reassembly in California.

Examination of the accident site by Federal Aviation Administration (FAA) and NTSB personnel revealed that both wings had separated from the fuselage. The evidence was consistent with the fact that the pilot, who was wearing a parachute, had attempted to exit the glider. All primary components were identified on-scene. The wreckage was recovered to a secure facility for detailed examination.

D. RESPONSE and SITE LOCATION INFORMATION

1.0 Response

- The pilot was an active member of the Central California Soaring Club (CCSC)
- The glider separated from the launch tow plane about 1227 on May 19
- The pilot radioed in about 1 hour later, reported that all was normal, and that he planned to continue flying.
- That was the last communication from the glider.
- About 1830, two CCSC pilots departed CA69 (the launch airport) in a towplane to locate the pilot or glider
- They visually spotted two separate sections of wreckage about an hour later, in the mountains about 6 miles southwest of CA69
- Personnel from the Kings County Sheriff's Office accessed the wreckage about 2330, and determined that the pilot did not survive
- The pilot was recovered early in the morning of May 20
- A team of FAA, NTSB & CCSC personnel accessed the site about 1000 on May 24

2.0 Location & Site Condition Information

- The wreckage was situated in remote, rugged terrain
- The wreckage was determined to be in two primary locations
 - Most wreckage was loosely grouped in one location
 - The left wing was located about ¼ mile from the remainder of the wreckage
- The geographic coordinates of the major items were determined and recorded

ITEM	LATITUDE	LONGITUDE
Right Wing (Outboard)	35.93655	-120.21912
Canopy	35.93655	-120.21917
Right Wing (Inboard)	35.93685	-120.21833
Fuselage & Empennage	35.93755	-120.21865
Pilot	35.93770	-120.21907
Left Wing	35.93763	-120.21590



Figure 1 - Wreckage Overlaid on Google Earth View



Figure 2 - Left Wing (Aerial View)



Figure 3 - Main Wreckage Group

E. WING ATTACHMENT SCHEME

- Like many gliders, the design includes removable wings and other components to facilitate storage and transport
- The basic assembly consists of the 2 wings, each of which is fully intact/complete with flap, aileron, air brakes, and relevant control systems/links
- The flight control system/linkages are fully contained within each wing (no user installation required) and mate to their fuselage counterparts at the wing-fuselage juncture
- The main spar of each wing is fitted with upper and lower spar cap extensions on its inboard end to enable the attachment of the 2 wings to one another by means of 2 clevis/tang assemblies
- The clevis assemblies are referred to as the 'top' and 'bottom', corresponding to the upper and lower spar caps respectively
- The right wing clevis portions have a total of 4 legs (2 in the top clevis, and 2 in the bottom clevis)
 - The 2 legs of each top and bottom clevis are referred to as 'upper' and 'lower', referring to each leg's relative position in each clevis assembly

- The left wing has similar arrangement, with 2 single tangs, each of which is designed to insert between the 2 legs of each clevis of the right wing
- The 2 tangs and 4 legs all have approx. 3/4" diameter tapered holes machined into them, oriented vertically, so that when the wings are properly positioned into/onto the fuselage, the 6 holes are vertically aligned ('stacked')
 - The holes align at the airplane centerline
- A 'pin' and cone nut assembly is installed vertically through all 6 holes to attach the 2 wings to one another
- Two machined & formed plates bolted to the inboard end of the main spar of the right wing
 - These plates retained the pin assembly, and also served as alignment guides during wing installation.
 - These plates appeared essentially undamaged.
- The pin length is approximately the same as the distance between the bottom surface of the lower leg of the top clevis, and the top surface of the upper leg of the bottom clevis
- The pin is threaded on each end, and long tapered nuts (cone nuts) are installed on each end of the pin
- The pin has a hex socket to enable rotation with a hex ('allen') key, and the cone nuts have vertical slots that ride on vertical tabs on the wing structure to prevent them from rotating when the pin is rotated
- Thus, rotating the pin results in relative rotation between the pin and the cone nuts
 - The cone nuts travel up or down as a function of which nut and which direction the pin is rotated.
- Rotating the pin in one direction will sequentially drive the cone nuts through the leg, tang, and leg of each clevis
 - The top cone nut travels up and the bottom cone nut travels down to seat in their respective holes, securing the wings to one another
 - In some of this manufacturer's similar designs, but not this model, the allen key/wrench is designed/intended to be left in place after assembly, and has a capture/locking feature to prevent pin rotation (and cone travel) once the wing is assembled
- The wing structure also has 6 laterally-oriented pin-and-socket mechanisms to align the wings and to transfer loads between the fuselage and wings
 - Each wing root rib was equipped with a forward and aft socket which picked up a pin on the fuselage. These are the primary load-transfer mechanism between the wings and fuselage, and are sometimes referred to as 'lift pins'
 - The right wing main spar was equipped with 2 pins which mated to 2 sockets on the left wing spar

F. WRECKAGE INFORMATION

1.0 Left Wing

- The entire, all-aluminum wing was in 1 piece
- The wing was slightly buckled in the wingtip down direction near the 1/3 span point
 - This appeared consistent with ground impact damage

- The flap and aileron both remained fully attached to the wing, and appeared undamaged
- The 'air brakes' (1 panel each on the upper and lower wing surfaces) were intact and retracted
- The aileron, flap, and air brake control links appeared intact
- The 2 clevis tangs displayed minimal damage, primarily in the form of slight scoring, plus caked dirt from ground impact
- The machined holes in the tangs (to accept the cone nuts) were intact and essentially undamaged



Figure 4 - Left Wing as Found



Figure 5 - Left Wing Root



Figure 6 - Left Wing Clevis Tangs

2.0 Right Wing

- The all-aluminum wing was fractured/torn into 3 primary sections
 - Inboard wing section (approx. 15 ft, near the aileron-flap junction)
 - Outboard wing section (approx. 7 ft)
 - Inboard aileron section (approx. 4 ft)
- These 3 components were loosely grouped, and formed part of the primary wreckage group
- The flap remained fully attached to the wing, and appeared only slightly damaged
- The 'air brakes' (1 panel each on upper and lower wing surfaces) were intact and retracted
- The upper leg of the top clevis was fracture-separated, and not located
- The lower leg of the top clevis, and the 2 legs of the bottom clevis, were essentially undamaged
- The machined holes in the 3 remaining legs (to accept the cone nuts) were intact and essentially undamaged
- The 2 pin-capture/assembly guide plates were only slightly damaged
- The pin, with its 2 cone nuts were present and captive in the clevis assembly
 - The pin and cone nuts appeared undamaged
- The nuts were symmetrically positioned (up and down) along the pin
- The nuts were positioned so that their respective ends protruded only slightly (maximum ~1/8 inch) beyond the 'innermost' two (lower leg of top clevis, and upper leg of bottom clevis) clevis legs, so that they only minimally engaged the two tangs.
 - They did not at all engage the other two (upper leg of top clevis, lower leg of bottom clevis) clevis legs
- The hex/allen key assembly tool was not present in the pin, and was not located at the accident site
- An indexing/locking key for the air brake control linkage was partially displaced in the torque tube



Figure 7 - Right Aileron



Figure 8 - Right Wing Outboard Section



Figure 9 - Right Wing Root



Figure 10 - Right Wing Clevis and Pin Assembly



Figure 11 - Right Wing Clevis and Pin Assembly



Figure 12 - Right Wing Clevis and Pin Assembly



Figure 13 - Right Wing Clevis and Pin Assembly



Figure 14 - Upper Cone Nut (at rest)



Figure 15 - Upper Cone Nut (pushed up from below)



Figure 16 - Displaced Air Brake Control Indexing Key

3.0 Fuselage

- The all-aluminum fuselage, minus the empennage and most of the canopy, was located in the primary wreckage group
- The fuselage ground impact created a small crater about 1 ft deep, 3 ft wide, and about 5 feet long
- The empennage and some canopy and cockpit fragments were located in and around the crater
- The circular-cross section fuselage was found about 100 feet downhill from its initial impact point
- The fuselage was severely crushed in the aft direction, consistent with a nose-first ground impact
- The fuselage-wing attach structure and surrounding skin panels were significantly crushed or deformed
 - The crush damage extended to approximately the location of the wing trailing edge
- The cockpit was severely compromised
- The instrument panel was severely disrupted; Some intact instruments and some portions of instruments remained
 - Airspeed Indicator - intact, needle at 74 knots
 - Altimeter – hands missing
 - 'Whiskey' compass – destroyed

- Radio head – damaged, unreadable
- No other instruments identified
- A significant dent on right side of the fuselage was present just aft of the cockpit, and another one was present on the upper left side towards the aft end of the N-number
- The canopy was of the quick-release, jettisonable design
- The bulk of the canopy was found about 400 feet from the fuselage impact point, near the right wing fragments
- Portions of the canopy frame were found in or adjacent to the fuselage impact crater
- The pilot's cockpit restraint system was found unbuckled
- The pilot struck the ground about 200 ft from the fuselage
 - First responders reported that his parachute was partially deployed
- The pilot was reported to be wearing a memory-stick sized GPS position logging device
 - The device was recovered on scene and will be subjected to data download attempts



Figure 17 - Airplane Data Plate



Figure 18 - Fuselage as Found



Figure 19 - Fuselage as Found



Figure 20 - Fuselage Crush (resituated for examination)



Figure 21 - Instrument Panel



Figure 22 - Fuselage Dent



Figure 23 - Bulk of Canopy

4.0 Empennage

- The vertical stabilizer and T-tail horizontal stabilator were found adjacent to the fuselage impact crater
- The rudder remained attached to the vertical stabilizer
- The single-piece stabilator was fracture-separated from the vertical stabilizer
- The pitch tab (undetermined whether trim or servo) remained attached to the stabilizer
- The stabilator balance weight was found fracture-separated from its attach structure, but in the fuselage impact crater



Figure 24 - Empennage as Found



Figure 25 -Empennage as Found at Fuselage Crater



Figure 26 - Top of Vertical Stabilizer



Figure 27 - Fracture-Separated Stabilator Balance Weight



Figure 28 - Vertical Stabilizer and Rudder