

ACCIDENT REPORT

HCLJ530-000074 Aircraft Accident			
Aircraft:	Ventus 2CXT	Registration no:	OY-XXB
Engine:	Solo 2350	Flight:	Private flight, VFR
Crew:	1 – minor injury	Passengers:	None
Location:	Gliding Centre Arnborg	Date and time:	05.04.2009 at 1521 UTC

The Danish Accident Investigation Board was notified about the accident on 05.04 2009 at 1530 UTC by the Danish Gliding Union.

History of the flight

The accident occurred during a private VFR flight from Gliding Centre Arnborg.

After five hours flight, the pilot of the aircraft turned back towards Gliding Centre Arnborg with the intention of landing the aircraft. The pilot prepared for a long final approach to runway 27. Approximately five kilometres from the airfield, the aircraft was positioned for a long final approach to runway 27 at 1400 ft elevation. Approximately four kilometres from Gliding Centre Arnborg, the main wheel was extended at a speed of approximately 150 km/h and flaps were set to position -1. Flight speed was then increased by 30-50 km/h due to a surplus altitude of 100 metres.

One kilometre from Gliding Centre Arnborg, the glider was flying at 30-40 metres altitude, at which point flaps were set to neutral, confirmed by a green light. Approximately 400 metres before runway 27, the air brake was opened about 1/4 to 1/3, until speed had decreased to 150–160 km/h.

Upon crossing the beginning of runway 27 at 10-15 metres altitude, the air brake was fully opened. Shortly after – at 5-8 metres altitude – the pilot heard loud rattling noises, followed by a loud bang. The glider decelerated drastically as it hit the runway 27 without the pilot regaining control. The glider was substantially damaged.

The accident took place in daylight and under visual meteorological conditions (VMC).



The Pilot

The pilot was in possession of a valid glider pilot licence and had at the time of the accident 2257 hours of flight time, 375 hours of which had been on the glider type in question.

The pilot suffered minor injuries as a consequence of the accident.

Information about the aircraft

The glider is manufactured in Germany, and is marketed under the name Ventus 2CXT. The glider is constructed especially for high-speed flight. To further improve flight performance profile at high speed, flaps had been designed not only for downward deflection, as is the case with traditional flaps (positive flaps), but were also able to deflect upward (negative flaps). The flaps were operated by means of the flaps handle, positioned on the left hand side of the cockpit. Directly in front of the flaps handle was the air brake handle (fig. 1).

Please note: the following photos are from another aircraft of the same type as Ventus 2CXT.

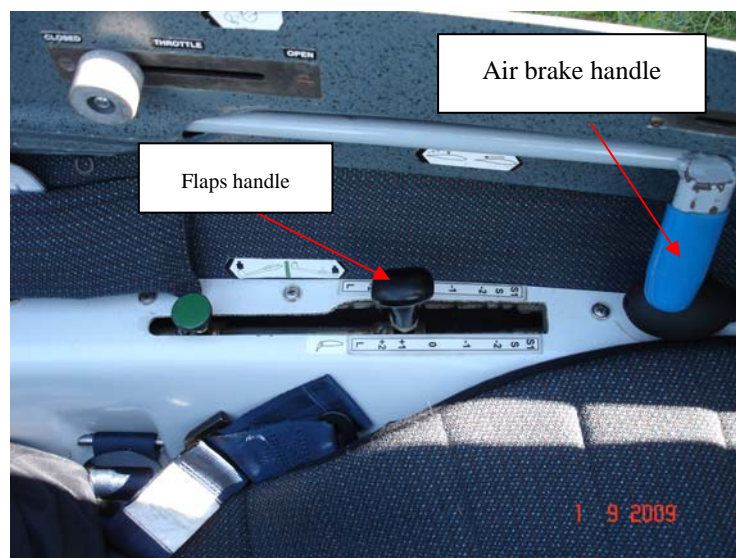


Fig. 1

In order to make it easier for pilots to respond to the greater air drag experienced at high-speed flight, the aircraft manufacturer had fitted this particular aircraft type with a spring-loaded handle for actuating negative flaps.

The flap handle - that was spring-loaded into the notch – had to be moved out of a notch on the locking device each time flaps position had to be changed. The handle had the following positions: L, +2, +1, 0, -1, -2, S and S1, 0 being neutral. L signifies low-speed flight (*German; langsam*) whilst S signifies high-speed flight (*German; schnell*).

The handle had to be moved from 0 towards L at decreased flight speed and towards S at increased flight speed (fig. 2). Figure 3 shows the handle in transit (unlocked) position.



Fig. 2

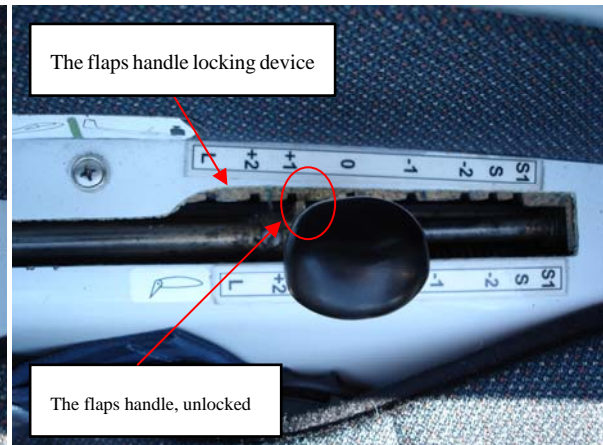


Fig. 3

According to the aircraft manufacturers Flight Manual, there was an increased risk of damage to the glider if flaps were deployed in reverse. That is to say, if flaps are set to minus at low-speed flight or flaps are set to plus at high-speed flight.

Investigation

Maintenance

The glider was maintained in accordance with the manufacturer's Maintenance Manual. No remarks were made concerning the locking device in the most recent mandatory annual inspection.

Centre of gravity

The glider's centre of gravity was within the tolerances stipulated in the Airplane Flight Manual.

The glider

No defects besides those related to the accident were identified on the glider and its systems.

Immediately after the accident, flaps were found to be set to minus and the flaps handle was set to position S1, which is the setting normally applied for flying at very high speed.

When operating the air brake, the handle initially had to be pulled towards the pilot's knee to release the over-centre mechanism. When the over-centre mechanism was released it gave a jolt in the handle, which was normal (fig. 4).

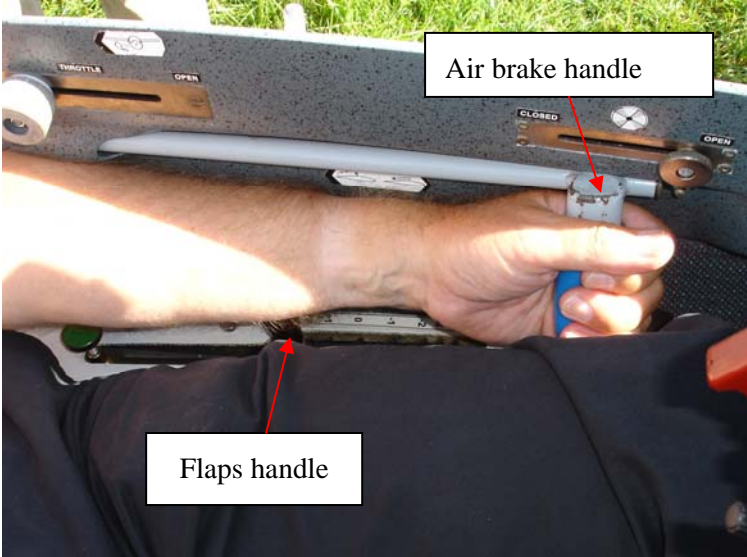


Fig. 4

The flaps handle casing, which allowed for adjusting the flaps into various positions, consisted of eight notches. As illustrated in fig. 5 below, these notches can be more or less worn, and consequently may not lock the handle into the correct position. In this particular aircraft the notches were worn. It consequently did not take much force for the handle to slide out of the locked position.

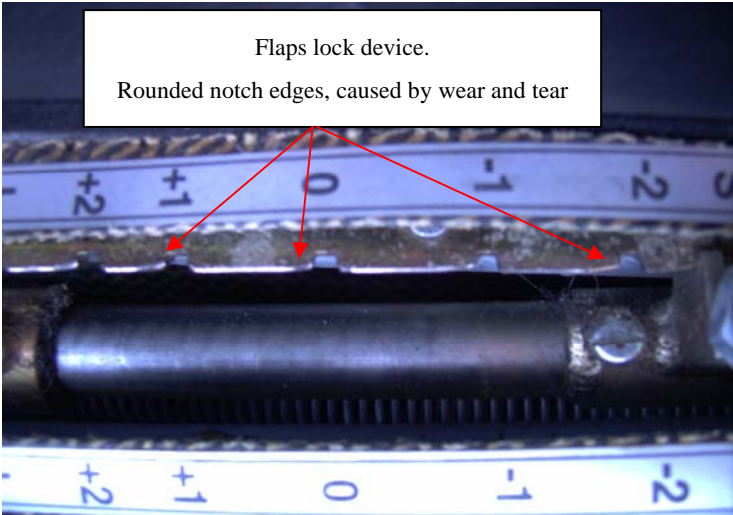


Fig. 5

Several pilots, who had previously operated this type of aircraft, have informed the Accident Investigation Board that it felt natural, either consciously or unconsciously, to use the flaps handle as an armrest when using the air brake (fig. 4).

As illustrated in the photo, there is not much space between the flaps handle and the air brake handle. In several on-the-ground tests of the air brake handle, it was found that unintentional release of the flaps handle was possible, partly because of the pull of the air brake handle when released from the over-centre mechanism combined with the pilot resting his/her arm on the flaps handle.

The manufacture had informed the Accident Investigation Board the following:

To hold the flap handle in place into the notches a spring was installed between the flap control rod and the gear box. The correct tension of this spring is very important. If the adjustment of the spring is incorrect, the spring tension in the flap handle is present only in a more or less unlocked position and disappears completely before the latch at the handle is engaged in the notch.

However, the manufacturer's Maintenance Manual did not include criteria for wear and tear on the locking device nor it is mentioned how to adjust the spring.

A replacement of the locking devices in this type of glider would only be carried out at the inspectors' recommendation.

Conclusion

Based on the results of its investigation, the Accident Investigation Board concludes that the flaps handle was most likely released from its neutral position - due to a combination of poor tension and worn notches not locking the flaps handle correctly into place - when the pilot at 5-8 metres altitude chose to fully open the air brakes. The flaps handle slid all the way down into setting S1 because of the spring-load mechanism.

As described in 'Information about the aircraft', it can damage the glider if minus flaps are deployed in connection with low-speed flight. In this instance, the aircraft lost its upward force on both wings. This happened at such low altitude that the pilot had no possibility of regaining control of the aircraft.

The maintenance Manual did not include criteria for wear and tear on the locking device nor it is mentioned how to adjust the spring between the flap control rod and the gear box.

Recommendation

The Accident Investigation Board recommends that,

- the European Aviation Safety Agency (EASA) evaluates the design, and/or possibly introduces a maintenance scheme including wear and tear limitations for the flaps locking device as well as an adjustment procedure for the handle spring, so that unintentional changing of the flaps position is not possible.

DENM-2010-004