FINAL REPORT

AAIU Synoptic Report No: 2004-015
AAIU File No: 2004/0020
Published: 13/09/04

In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 24/04/2004, appointed Frank Russell as the Investigator-in-Charge to carry out a Field Investigation into this occurrence and prepare a Synoptic Report.

Aircraft Type and Registration:	Stolp SA-300 Starduster TOO, G-KEEN
No. and Type of Engines:	1 x Lycoming 10-540-C4B5
Aircraft Serial Number:	800
Year of Manufacture:	1989
Date and Time (UTC):	24 April 2004 @ 12.20 hrs
Location:	Near Quigleys Point, Co. Donegal
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	Substantial, electric power line strike
Commander's Licence:	UK Private Pilots Licence
Commander's Details:	Male, aged 63 years
Commander's Flying Experience:	437 hours (of which 55 were on type)
Information Source:	Station Manager, ATC Shannon and AAIU Incident Report Form submitted by pilot. Additional AAIU enquiries.

SYNOPSIS

The pilot was operating his Starduster TOO, a two-seat aerobatic biplane, from Eglinton Airport, Derry. He flew the aircraft from the back seat while his passenger occupied the front seat. The purpose of the flight was to carry out some aerobatic training with specific emphasis on "rolls", in the east Donegal area of Lough Foyle. The first manoeuvre, a practice stall, was carried out successfully, and this was followed by a climb to regain lost height which was perhaps "too vertical", as the aircraft approached the stall. The pilot applied left rudder and left stick to exit this situation, not unlike a stall turn manoeuvre, he thought.

In this manoeuvre the aircraft inadvertently entered a spin, and recovery was effected only after serious height loss when the aircraft struck domestic electricity wires. The pilot cut short his flight and returned to Eglinton where he landed without further incident.

The Report makes no Safety Recommendation.

1. FACTUAL INFORMATION

1.1 History of the Flight.

The flight lasted approximately seventeen minutes, with take-off at 12.13 hrs and landing circa 12.30 hrs. Weather conditions were suitable for the flight, moderate SW winds, excellent visibility and broken cloud above three thousand feet. The passenger, also a qualified pilot, occupied the front seat. The pilot advised that he had previously undertaken a course in aerobatics with a UK based aerobatics champion. Neither he nor his passenger had instructor ratings. On this flight, he added, he wanted to "*sort out his rolls*", specifically.

The first manoeuvre was carried out as planned and the pilot's only recall of the second, climbing, manoeuvre, was that his effort to exit it became an "intended stall turn that converted into a spin". He recalls applying left rudder and stick, but was not sure when he applied the stick. The aircraft carried out four complete turns before control and airspeed was regained to effect recovery. He recalled having power on as he went through the electricity wires. He also recalled, given the broken cloud was above 3,000 feet, that he commenced his manoeuvres at about 3,000 feet. While the aircraft seats are fitted for parachutes, neither man wore a parachute that day. The pilot admitted that he was quite shaken by the event on his return to Eglinton, and for some time afterwards. It is not known how the passenger felt.

1.2 Stall Turn.

The stall turn is a manoeuvre where the aircraft changes direction from pointing vertically upwards to pointing vertically downwards at a speed below the normal 1g stall speed, by yawing over one wing tip. The normal entry is from straight and level flight, after pitching upwards towards the vertical, performing the stall turn and recovering from the vertical exit height is the same as at the entry and the heading is 180º from the entry heading. The aim of the manoeuvre is to initiate a yawing motion just before control effectiveness is lost which causes the inertia of the aircraft to keep it yawing through 180 degrees. The small remaining control effectiveness is used to prevent the aircraft from rolling or pitching.

1.3 Aircraft/Pilot Documentation.

The Stolp Starduster TOO SA 300, Registration G-KEEN, is operated under a Permit to Fly, issued by the UK CAA on 28 April 2003 and valid to 27 April 2004. The Permit contains an exemption and also eleven conditions under which the aircraft must be operated. One of the conditions (10.1) states: "aerobatic manoeuvres are permitted only when the upper tank is empty, and only when flown solo from the rear cockpit".

Also, the exemption requires when "flying within any other country (other than the UK) permission is obtained from the Airworthiness Authority of that country". The IAA has no record of such a request in respect of G-KEEN.

In addition, a review of the pilot's medical record certification showed that the pilot is a holder of a JAA Class 2 Medical, which expired on 14 March 2004. Thus, there was a break in the validity of his licence.

1.4 Aerobatics.

The UK CAA Safety Regulation Group publish General Aviation Safety Sense Leaflets, which are an important source of information and guidance to the general aviation pilot. Of particular interest to this Report is leaflet No.19 "Aerobatics", specifically Paragraph 8, Sub Para d, which states "*Height, depends on experience of pilot, but novices should commence at no less than 5,000 ft above ground level and all manoeuvres should be completed by 3,000 ft agl."*

In addition, Air Forces routinely set a Hard Deck of 3,000 feet for spinning, stalling and aerobatics during non-airshow training, this means that the aircraft must be in controlled flight by 3,000 feet.

1.5 Damage To Aircraft.

The wire strike caused substantial damage to the aircraft. The starboard wing strut fabric was torn, the port lower wing holed and leading edge damaged. The starboard upper wing leading edge was wrinkled, with a cut in the fabric and slight damage to the wingbrace/support. One propeller blade was nicked in four places, the nose spinner dented, and the fibreglass covering was cracked. Finally, the wheel spat on the port side was damaged.

1.6 Other Damage.

The Irish Electricity Supply Board (ESB) provided the following damage assessment to their line equipment. The incident on 24 April 2004 occurred in the townland of Drung, Quigleys Point, Co. Donegal. The three phase 10,000 volt overhead lines were in triangular construction, the lower two were 1500mm apart, the third was 1000mm above them. All three wires were broken and so badly damaged that 50 metres in each conductor had to be replaced. The aircraft struck the conductors approximately 3.5 metres from an ESB wood pole, the top of which was 9 metres above ground. 150 metres of 50 sq mm steel core aluminium (SCA) conductor was required to do the repair.

There were approximately 900 customers without supply for two hours, 340 of these were without supply for a further 3.5 hours. The incident occurred at approximately 12.30 p.m., supply was restored to all customers at about 18.00 hours.

2. CONCLUSIONS

2.1 There is no evidence of an aircraft technical malfunction or weather related factors that may have led to this serious incident. However, poor judgement on the pilot's part, in not planning to recover from the various aerobatic manoeuvres by at least 3,000 feet, is a significant causal factor.

2.2 The pilots own recall of events would suggest that he unwittingly applied pro-spin action, which led to the fully developed spin.

2.3 The aircraft was operated outside the exemption and a condition of its Permit to Fly, as issued by the UK CAA.

2.4 The Pilot's JAA Class 2 Medical was out of date.

2.5 It is purely fortuitous that there were no fatalities arising from this serious incident.

(Photo source: Janes All the World's Aircraft 1985-86)