

No: 6/91

Ref: EW/C91/4/1

Category: 1c

Aircraft Type and Registration: Nieuport 24 replica, N153JS

No & Type of Engines: 1 Lycoming 320-E2D piston engine

Year of Manufacture: 1980

Date & Time (UTC): 11 April 1991 at 1714 hrs

Location: North Weald airfield, Essex

Type of Flight: Private (practice for air display)

Persons on Board: Crew - 1 Passengers - None

Injuries: Crew - Fatal Passengers - N/A

Nature of Damage: Aircraft destroyed

Commander's Licence: Private Pilot's Licence with a CAA Display Authorisation

Commander's Age: 47 years

Commander's Flying Experience: 855 hours (of which 5½ hours were on type)

Information Source: AAIB Field Investigation

The flying club had been formed at North Weald airfield, with the purpose of preserving and demonstrating various old and historic aircraft. To that end, the club owner also ran a display team comprising, amongst others, full scale replicas of the Fokker Triplane and the Nieuport biplane. These were displayed by pilots, appropriately experienced and holding a Display Authority, who had volunteered their services. The Nieuport, which was registered to an owner in the USA, held a valid FAA Special Certificate of Airworthiness in the Experimental category and had been granted an Exemption by the CAA for operation within the United Kingdom. Subsequent to the accident, calculations show that the aircraft's CG, assuming that there were 16 gall imp of fuel on board and that the pilot with accoutrements weighed 192 lb, was 27.52 inches aft of datum. This was within the (empirically evaluated) allowable range of 26.73 - 28.71 inches aft of datum.

The flight of the Nieuport, on the day of the accident, was to be conducted in the company of the Fokker Triplane, for the purpose of practising a display of the Nieuport 'ground strafing' and of both aircraft engaging in 'aerial combat'. The strafing run was to be carried out above 100 feet agl, in accordance with their CAA Exemption from Rule 5(1)(e) of 'Rules of the Air and Air Traffic Control

Regulations 1985', which also provides that aerobatic manoeuvres be completed at a minimum of 500 feet agl. Aerobatic manoeuvres are defined in Article 106(1) of the Air Navigation Order.

The wind was from 200° at about 10-15 kt and the two aircraft took off in formation from the grass strip alongside runway 20. As they climbed to about 100 feet, nearing the intersection with runway 13/31, the Nieuport levelled and turned to the right to carry out a simulated strafing run along the south side of runway 31. The Fokker continued to climb ahead to about 600 feet before turning right, inside the airfield boundary.

According to the detailed briefing carried out before the flight, during this turn the Fokker pilot would look for the Nieuport either turning, or having turned, to do another strafing run in the opposite direction. At the end of this run, the Fokker pilot would arrange his flightpath so as to position his aircraft behind the Nieuport as it turned right, upwind, just short of the runway intersection. The two aircraft would then engage in the aerial combat, in a right turn. The sequence was to be filmed by video camera.

However, at the end of the second strafing run, the pilot of the Nieuport, instead of turning right towards the Fokker, turned to the left, directly downwind, in a wing-over type manoeuvre. No evidence was found to explain this deviation from the planned flight. At the apex of the turn, the aircraft's angle of bank increased sharply as considerable aileron was applied in an effort to raise the left wing, and the nose of the aircraft dropped. During this manoeuvre there was no audible increase or decrease of engine power. The left roll continued as the flightpath became almost vertical and the aircraft struck the ground, causing fatal injuries to the pilot.

The club's emergency equipment was immediately deployed, providing hand-held fire extinguishers and their own fire appliance. The local Emergency Services were notified and the first police vehicle arrived at 1819 hrs followed, almost immediately, by the Fire and Ambulance Services.

The aircraft had struck the ground at a speed estimated to be in the region of 50 kt, in a pitch attitude about 20° from the vertical, and yawed about 30° to the right. There had been almost no movement across the ground from the first impact point. At impact the aircraft was complete, with all flying surfaces and control surfaces attached. Following the accident, the control runs and flying wires were inspected and judged to have been serviceable immediately before the impact. From the damage to the propeller it appears that the engine was running at impact and this was confirmed by the rpm gauge which had jammed, on impact, at 2250. These impact parameters were subsequently confirmed when the video recording was examined. Whilst the possibility of a control jam cannot be completely

discounted, there is no direct evidence to support this and there is clear evidence on the video recording of movement of ailerons, rudder and elevator in the final moments of flight.

The aircraft, known to have high drag characteristics, had a declared stalling speed of 40 kt and the video film suggests that the strafing run was carried out at about 68 kt ground speed, about 73 kt indicated airspeed in the quoted crosswind. The film also shows that the initial bank angle in the climbing turn was about 60° and the turn was downwind. A combination of the turn downwind and steep angle of bank with no increase of engine power caused the aircraft to enter an incipient spin at a height that was insufficient for a recovery to be made.