No: 8/86 Ref: 3

Aircraft type

and registration: Microlight/Lightning Phase II wing, Ultrasport Tripacer Trike

**G-MMCH** 

No & Type of engines: 1 Fuji Robin III two-stroke piston engine

Year of Manufacture: Not known

Date and time (UTC): 18 June 1986 at approximately 1930 hrs

**Location:** Martin Airfield, near Metheringham, Lincs

**Type of flight:** Private (pleasure)

**Persons on board:** Crew -1 Passengers - None

**Injuries**: Crew — 1 (fatal) Passengers — N/A

Nature of damage: Aircraft destroyed

Commander's Licence: Private Pilot's Licence — aeroplanes Group D (expired)

Commander's Age: 40 years

Commander's Total

Flying Experience: 130 hours (of which 52 were on type)

**Information Source:** AIB Field Investigation.

## **History of the Flight**

The aircraft had been rigged and flown for the first time that year from a field near Bardney, Lincs. It was flown to a private field used by a number of microlight operators on the north east corner of Martin Airfield (disused). A flight in the aircraft was then made by another pilot following which the owner again flew it himself. The other pilot made a second flight after which he was asked to leave the engine running. The owner then strapped himself in and took-off in a south westerly direction climbing into a left-hand circuit. During this flight while the aircraft was on a south westerly heading, either in a left turn or having just rolled out of a turn, a wire was seen to detach from the right wing area and the right wing folded upwards followed by the left wing. The aircraft struck the ground at a low forward speed and the pilot was killed instantly.

## **Examination of the wreckage**

Examination of the wreckage showed that the aircraft had fallen almost vertically onto its righthand side, breaking the right wing spar in three places. It was immediately apparent that both the flying wires (which react the lift loads of the wing) had failed. These wires run between the control frame and the wing leading edge and are constructed of stainless or galvanised steel cable terminating in a loop at each end. The loop is formed around a "thimble" and the free end swaged with two ferrules to the cable. The ferrules used on G-MMCH were made from copper material and had been formed into an extremely unconventional shape (see photograph). During the investigation it was discovered that this shape could be reproduced using hydraullic press dies having V shaped cut outs above and below the correct circular die shape (see drawing). When the ferrule and cable were inserted in and formed by the V shaped cut outs the swage resulted in the shape depicted in the photograph. This was undoubtedly the technique used by

the person forming the swages found on G-MMCH, and was clearly incorrect.

As stated previously, both flying cables were found to have failed, the left at the wing leading-edge end and the right at the control frame end. Both had failed in the middle of the malformed swages. Metallurgical examination showed that nearly 90% of the cable strands had failed or partially failed in shear — the remainder showing normal tensile failures. The process of forming, the swage, without control over the pressures exerted on the cable had therefore drastically degraded the strength of the cable even before it was fitted to the aircraft.

It has not proved possible to examine any technical records for the aircraft, and a check with the British Microlight Aircraft Association and the Civil Aviation Authority showed that the aircraft had not been submitted for its six-monthly inspections required to maintain its exemption from British Civil Airworthiness Requirements.