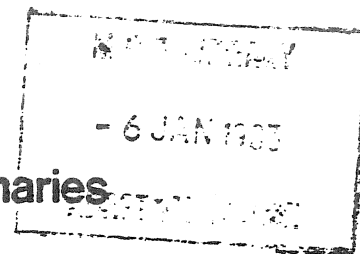


# MINISTRY OF DEFENCE

## Military Aircraft Accident Summaries



ADASTRA	MAAS 1/83
CLASS	5/76787
AUTH	GB MOD.PR
DATE	Date: 4/3/83

MAAS 1/83  
5 January 1983

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE PHANTOM FG1 XT 866

9 July 1981

Present Airfield: Royal Air Force Leuchars, Fife  
Place of Accident: Leuchars Airfield  
Crew: Two  
Casualties: Two Major Injuries

### CIRCUMSTANCES

1. XT 866 was one of a pair of Phantoms programmed to carry out routine night intercept training. The night was dark but with good visibility beneath a 5,000 ft cloudbase. Shortly after midnight the aircraft took off singly. Whilst carrying out his after take off checks, the pilot of XT 866 noticed that his Attitude Direction Indicator (ADI) was giving false indications of turning to the left and climbing steeply. He maintained control by use of his Back-up Attitude Indicator (BAI) and selected the standby reference gyro mode for the ADI. However, this had also failed. Shortly afterwards the crew noticed random fluctuations in the readings of the pressure sensitive flight instruments which they attributed to a fault in the aircraft's Air Data Computer. Deselecting this stabilised the pressure instrument readings but introduced known significant pressure errors. Later, whilst joining up with the other Phantom, it became obvious that the compass had desynchronised. These unrelated failures caused the crew to doubt the integrity of XT 866's electrical system; consequently they decided that it would be prudent to terminate the exercise, burn off fuel and return to base. In view of the flight instrument failures, they elected to take the added precaution of flying in close formation with the other Phantom.

2. The pilots carried out a radar approach to the main runway at RAF Leuchars. There was a light wind but the reported 3 kt crosswind component from the left was thought to be insignificant and the pilot of XT 866 flew in close echelon starboard for the recovery. The lead Phantom continued to descend to about 100 ft and then climbed away leaving XT 866 well placed to land. Just prior to touchdown at an estimated 50 ft, XT 866 rolled quickly but smoothly to the left. The pilot used full control deflections and applied power in an attempt to right the aircraft but only succeeded in stopping the gyration before the left wing tip touched the ground.

is was followed by the left underwing fuel tank and the left mainwheel striking the ground. The impact caused a crack to appear in the left wing and there were signs of an associated fire. Seeing this, the pilot ejected and was quickly followed by his navigator. The aircraft bounced and veered to the left; the right wing tip dug in and the aircraft cartwheeled, caught fire and was destroyed. Both ejections were successful but the pilot suffered lacerations to his chin and the navigator facial burns from the rocket motor of the pilots seat; both sustained spinal compression fractures.

#### CAUSE

3. An exhaustive Inquiry was unable to relate the earlier instrument malfunctions experienced to the loss of control encountered on the final approach and an AIB investigation failed to find a technical explanation. A theoretical analysis of the wake turbulence generated by a Phantom FG1 overshooting in the approach configuration indicated that this phenomenon could have promoted the left roll and high sink rate experienced by the crew. This is considered to have been the most likely cause of the accident.

#### SUBSEQUENT ACTIONS

4. Over the years, various procedures to avoid wake turbulence have been formulated and these have stood the test of time. However, this accident has focussed attention on the need to review procedures for safe approaches in close formation where the lead aircraft carries out a low overshoot and the wingman continues to land - a not unusual occurrence when the latter is suffering an in-flight emergency requiring a 'shepherd' aircraft. Flight trials using instrumented test aircraft have been carried out to quantify the wake turbulence hazard, with the aim of verifying the theoretical analysis and providing a basis for assessing the adequacy of the additional criteria specified since the accident. Apart from procedural changes to reduce the risks, considerable publicity on the nature of the hazard has been aimed at increasing aircrew awareness of the conditions in which the phenomenon may be encountered, together with the methods necessary to avoid the effects.

Issued by - Public Relations (RAF)  
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01-218 3253/4