Background Information about the Dornier 17

1. More than **1,500** examples of the Dornier 17 medium bomber were built. The twin engine, twin fin configuration together with the narrow fuselage and shoulder-mounted engines gave the aircraft a distinctive silhouette and earned it the nickname ôThe Flying Pencilô The Goodwin Sands wreck is the only known surviving example.

2. The most numerous model was the Dornier 17 Z. Over **400** were employed by the Luftwaffe during the Battle of Britain, equipping at least 15 units on bombing and reconnaissance duties, predominantly Kampfgeschwader (KG ï Bomber Wing) 2, 3 and 76. Nearly 200 examples were destroyed (from various causes) during operations between August and November 1940. The Dornier 17 Z-2, powered by a pair of Bramo ôFafnirô323P air-cooled, 9 cylinder, radial engines each rated at 1,000hp, was flown by a crew of four and equipped with up to 7 x 7.92 mm MG 15 machine guns. The maximum bomb load was slightly over 2,000lbs.

IDENTIFICATION

3. Research by the Air Historical Branch and RAF Museum has identified the aircraft lying on the Goodwin Sands as probably being Dornier 17 Z-2 Ser No 1160 of 7 Staffel, III Gruppe/KG3 (7th Sqn of 3rd Group of Bomber Wing 3).
Coded **5K + AR,** this aircraft was lost on Monday 26 August 1940 when operating from St Trond in Belgium. The aircraft landed on Goodwin Sands at low tide (1340 hrs) after an attack by fighters that damaged the engines and left the crew wounded.

4. **5K + AR** was one of 7 carrying 16 x 50kg bombs tasked with bombing the Fighter Command airfields in the Medway area. Before reaching the target, when flying above clouds, the aircraft became separated from the rest of the formation and lost its bearings. It was then attacked by fighters (Boulton Paul Defiants from 264 Sqn based at Hornchurch in Essex). Both engines were hit as was the cockpit. With at least one of their engines stopped, a forced landing was made on the Goodwin Sands. The identity of the RAF fighter responsible for shooting it down has not been confirmed as it may have been shot down by the escorting German fighters from Jagdgeschwader 3 (Fighter Wing 3).

CREW DETAILS

5. The German crew details were as follows:

Pilot: Feldwebel (Flt Sgt) **Willi Effmert**, wounded (POW), age 24.
Observer: Unteroffizier (Sgt) **Herman Ritzel** (POW), age 21.
Wireless Operator: Unteroffizier (Sgt) **Helmut Reinhardt**, killed (buried Ysselsteyn, Holland - block BQ, row 6, plot 136), age 27.
Bombardier: Gefreiter (Cpl) **Heinz Huhn**, killed (buried Cannock Chase - block 1, row 1, plot 405), age 21.

SURVEY

6. Diving on the Goodwin Sands is not easy. Tides limit diving to 50-90 mins per day. Visibility is also problematical, although it can be as much as 5 m in the right conditions. Geophysical and visual surveys have confirmed that the structure is largely intact, with the bomb bay open and the undercarriage up. The wreckôs inverted position and bent propellers suggests that it óground loopedôon landing. The wreck lies largely proud of the seabed at a depth of some 16 m. (52ft). It is thought that it has only recently emerged from the sands (perhaps within the last 3 years). There are indications of a small debris field adjacent to the wreck, apparently comprising panels and lightweight structure, such as flaps and bomb bay doors, torn free in the landing.

STRUCTURE

7. The Dornier 17 Z had a wingspan of 59ft (18m), and a length of 52ft (15.8m). Its empty weight was approximately 5 tonnes. The aircraft was of all metal construction with a flush-riveted aluminium alloy skin over aluminium alloy ribs, stringers and semi-circular frames. The wings were built up on two open-section girder spars that ran through the fuselage. The spars and wing root fittings were of chromium-molybdenum steel while the flanges were made of light-alloy extrusions. Fuel and oil tanks were placed within the wings between the two spars. The fuselage was constructed in 3 sections: the cockpit; centre-section; and rear portion. Each part of the fuselage was joined to the next by about 25 bolts mounted through flanges. Flying controls comprised hollow steel tubes, rods and fittings. The rudders and other control surfaces were fabric covered - on an aluminium alloy frame. The undercarriage was constructed from alloy steel castings and steel stampings. The engines comprised aluminium alloy pressings, drop forged nickel chromium steel crankshafts, chromium steel cylinders and lead-bronze bearings. The complete

engine was mounted on a welded steel triangulated structure attached to the front spar.

MARKINGS

8. The aircraft would have been camouflaged green and dark green (in a splinter pattern) on the upper surfaces with pale blue under surfaces ï the junction being roughly along the fuselage midline. The wings bore black crosses (outlined in white) on their upper and lower surfaces and on the sides of the fuselage ï aft the wing roots. The unit code ó**5K + AR'** was carried either side of the fuselage crosses (reading left to right). The letters were in black, other than the aircraft identifier óAô which was in white or black-edged in white (white indicating that the aircraft came from the 7th Staffel, III Gruppe). This letter was probably repeated in white on the top surface of the wings (outboard of both crosses) and in black on the bottom surface. The propeller spinners would normally be coloured white, the Staffel colour.The Serial Number or Werke Number 1160 was the aircraftôs individual serial and would be found throughout the aircraft ï notably stencilled on the tail fin. Finally, black swastikas (outlined in white) featured on the outboard of both rudders. Aircraft from the 7th Staffel usually carried the ace of clubs playing card insignia, either on the nose or on the engine cowlings.

RECOVERY

9. The safe recovery (with minimal damage) of an aircraft that has rested underwater for nearly 70 years presents substantial challenges ï as does the subsequent conservation task. However, the RAF Museum has experience in stabilising and exhibiting aircraft immersed in water for an extended period (such as the Halifax Mk II recovered in 1973 from Lake Hoklingen in Norway and the Hurricane Mk I retrieved from the Thames Estuary in the same year). Conservation techniques have advanced greatly in the last 40 years. Similar restoration efforts undertaken in Norway and Australia in the past few years offer the prospect of less intrusive methods for stabilising and preserving aircraft structures immersed in salt or fresh water for extended periods. The conservation effort will be undertaken at the RAF Museumôs award-winning Michael Beetham Conservation Centre at Cosford where the Dornier will take its place alongside a RAF Vickers Wellington bomber currently undergoing an extensive restoration programme.

RAF Museum contact for further information, images and interviews on the Dornier project: 020 8358 4849 / dornier@rafmuseum.org