Left Dormer's TNT wing demonstrator is now free to conduct research into propellers, gust alleviation, and spoilers, having proved the TNT concept. The Dornier 228-100 (right) and -200 (below) have flown more than 275hr within nine months, and the third aircraft made its maiden flight recently. Note the difference in fuselage length between the two versions

10 (1,000 s.h.p.), Pratt & Whitney
PT6A-135 (750 s.h.p.), and PT6A-41
(850 s.h.p.) in mind. It lists an im-
pressive number of features for its
chosen engines, including design sim-
plicity, better installed performance, fuel economy, fast response, a long time between overhauls, and low noise and emissions. Flight understands that Far Eastern customers may find Pratt & Whitney's support superior, how-ever, so this may be a factor in offer-ing the PT6A in the future.

Two-pilot operation

Dornier has designed the 228 for two-pilot operation, but it should be possible to fly the aircraft with only one crewmernber. The IFR avionics fit includes the usual VOR/ILS, ADF, DME, transponder, and flight director. The first production aircraft had just had King avionics fitted when Flight visited Dornier at Oberpfaffenhofen. Weather radar, autopilot, and area navigatio n system are optional. Dornier is considering a digital test and maintenance system, headup dis-play, and navigation and performance computer.

The 228 currently has a Hartzell four-bladed metal propeller, selected after flight-tests of eight competing designs on the experimental aircraft. Dornier has since flight-tested a new commuter propeller on the TNT demonstrator, with a view to making it standard on the 228. The new pro-peller has an aerofoil broadly similar to the TNT wing's A-5, and prelimin-ary flight-tests indicated that it pro-vides 18 per cent more static thrust and 4-6 per cent more thrust in the climb—without affecting cruise per-formance. Dornier developed the pro-peller in collaboration with Hoffmann, the DFVLR research institute, and Stuttgart Technical University. It hints that it may use its experience with this propeller to design units for other aircraft,

Dornier will soon install and flight-test an open-loop, gust alleviation sys-tem on the TNT demonstrator. Inputs of aircraft angle of attack, pitch-rate,

and vertical acceleration will be used to simultaneously deploy the ailerons, alleviating the loads caused by gusts, for a better ride. The elevator will also be deployed to correct for the trim change caused by "flaperon" de-flection.

Dornier windtunnel tested the open-loop system in 1977, and concluded that the effect of gusts could be re-duced by up to 25 per cent. A closed-loop system which allows for dynamic effects is better, while a combined open and closed loop arrangement can remove up to 90 per cent of the gust effect, according to Dornier. The gust alleviation system will probably be offered as an option on the 228. It will be particularly valuable for aircraft of this class, since they have a low wing loading for short-field perform-ance, and typically fly at low altitudes where the turbulence is high.

Dornier also intends to flight-test CFRP in ailerons and other secondary structure, and a new spoiler system on the TNT demonstrator. The use of spoilers would allow full-span Fowler flaps to be incorporated. This would permit a reduction in wing area while retaining short-field performance, and allow higher cruising speeds.

Dornier says that the 228 and 128 cost DM50-60 million (£11 miUion-£14 million) to develop and test, but a lot of the TNT development money came from the German Federal Ministry of Research and Technology. The two aircraft are regarded as one pro-gramme, and Dornier hopes to be in profit by 1984-85. The company in-tends to deliver seven 228s and four 128s this year, and by next year the production rate should be four aircraft a month—three of which will be 228s. The most pessimistic Dornier target is 400 aircraft by the end of the decade, of which 300 would be 22%.

The basic price for the 228-100 is DM3-1 million (£725,000), while the 228-200 costs DM3-4 million (£785,000) in early 1981 prices. Dornier has based its design on familiar concepts where possible, but has not been afraid to develop new technology in the areas where it was needed—wing design and production techniques. It is cer-tainly unusual to see numerically con-trolled machines and chemical milling
used for aircraft of this sort. If the
aircraft's efficiency bears up to the
manufacturer's claims, the Dornier
228 should have a successful future. E

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