DORNIE R 228 LEADIN G DAT A

Length 49ft 3in (54ft 3in) Wingspan 55ft 7in Height 15ft 9in Win g area 344ft2

Aspec t ratio 9
Passenger capacit y (Two abreast, 30in pitch) 15 (19) Cabi n widt h 4ft 4in Cabin length 20ft 7in (23ft 2in) Cabin volum e 459ft3

(519ft3

) Fuel capacity 595 US gal (plus optional 1165 US gal)
Ma x cruising speed 233kt TA S at 10,000ft Take-off run (sea level, ISA, MTOW, 50ft obstacle) 1,720ft Rate of climb (sea level, ISA, MTOW) 2,050ft/min Max payload range 1,085 n.m. (620 n.m.) Service ceiling 29,600ft Max take-off weigh t 12,5701b Max landing weight 12,5701b Typica l empt y operating weight 7,0401b (7,3701b) Ma x payload 4,8701b (4,5401b) Powerplant Two Garrett TPE331-5 turboprops Take-off power 715 s.h.p. (flat-rated to ISA + 18°C at sea level) Pressure ratio 10-37: 1 Mass flow 7-75lb/sec Dry weigh t 3601b Take-off specific fuel consumption 0-57lb/hr/lb
Not e Where there is a difference between the 228-100 and 200, the -200 value is in parentheses.

DORNIE R COMMUTE R MILESTONE S

with an economy search speed of
104kt, can raise search time to 10-5hr
when 160 n.m. from base. Dornier is
shortly to deliver three maritime
patrol Do 128-6s to Cameroon.
Any discussion of the 228 must centre on its wing. In line with its normal policy. Dornier built a demon-strator aircraft, which made its maiden flight in June 1979. The demonstrator is essentially a 128 fuse-lage with a scaled-down version of the Tragilugel Neuer Technologic (TNT) wing. The aircraft is still flying, having verified the basic design con-cept, and Dornier plans a number of further experimental projects.

The TNT wing is made in three box sections—a straight centre-section, and two trapezioidal outer sections. The result is a wing whose leading-edge is straight between the engine nacelles, and swept back outboard. The wingtips are clipped. The overall shape is thus fairly close to an ellipse —the ideal for optimum lift/drag ratio. The Dornier A-5 wing section is similar to Nasa's Whitcomb super-critical wing, but with a deeper for-ward section. The idea of such aft-loaded aerofoils is to delay the drag-

rise which occurs with high subsonic Mach numbers, to above the cruising speed of the typical civil jet—around Mach 0-8. But this type of section also has benefits at lower speeds, and Dornier evolved this similar design on its own computers.
Important factors in the 228's low-speed performance are the large-span, single-slotted Fowler flaps and flap-erons—ailerons which droop in sym-pathy with the Haps. Dornier says that windtunnel tests and flights with the TNT demonstrator have demonstrated a performance improvement of more than 25 per cent over conventional wings. The benefits are felt particu-larly in take-off and climb.

Although the 228's fuselage uses conventional manufacturing tech-niques, the wing is claimed to save 15 per cent in weight through in-tegrally milled panels. There has been a transfer of production technology from the Alpha Jet in areas such as numerically controlled (NC) machine
tools, chemical-etching for skins,
anodic secondary-surface corrosion
protection, electron-beam welding,
cadmium plating, shot peening, and
the use of carbonfibre reinforced

Abov e Dornier makes the 228 wing in three box sections, along with two carbonfibre and Kevlar
end sections, or ribs. The use of integral milling saves almost 12,000 rivets. Belo w Dornier assembles the two 228 prototypes at Oberpfaffenhofen

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| June 1954

October 1956

Apri l 1959
February 1966
June 1979

Autum n 1979
November 1979
March 1980
Apri l 1980

December 1980

March 1981

May 1981

July 1981

December 1981
February 1982
February 1982

June 1982

1983

First flight of Do 25 (single-
engined liaison aircraft)
First flightof Do27A (single-
engined multipurpose air-
craft)
Do 28 flies
Do 28D Skyservant flies
Dornier TN T experimental
aircraft flies
128-6 development starts
228 go-ahead
128-6X prototype flies
128/228 announced: Do 28D
renamed 128-2
TN T Experimental aircraft
completes 200th flight
Rollout and first flight of
228-100 prototype
Rollout and first flight of
228-200 prototype
Delivery of first 128-6 to
Lesotho Airways
Certification of 228-100
Certification of 228-200
Delivery of first 228-100 to
Norving
Delivery of first 128-200 to
Jet Charters
Production rate of 228
reaches three a month
I

plastic (CFRP) in some areas.
The 228's wing skins are cut from 2in-thick aluminium sheets measuring 20ft X Zl

4ft. The skins are laid on a
milling machine, where more than 90 per cent of the material is removed to leave stringers, rib flanges, and front and rear spar flanges. Dornier then uses a special compression method to shape the skin according to the wing section, while hydraulic grippers compress the rib flanges simultaneously.

This integral machining replaces an estimated 10,000 rivets for the wing stringers, and 1,800 rivets for the ribs. As well as saving about 340 man hours of work in each aircraft the lack of protruding rivets improves the aero-dynamic cleanliness of the wing. Dornier also says that the local stress distribution can be controlled more effectively with its manufacturing technique.

Chemical milling

Dornier uses a chemically milled wing leading-edge, and parts of the flaps are chemically milled. The triangular wingtips are made of a glassfibre reinforced plastic sandwich, while the ailerons and the rib webs forming the ends of the wing centre-section are made of CFRP and Kevlar. The fuselage and tail are of conven-tional design, but with extensive use of chemical milling to save weight. Dornier has designed the aircraft for a life of 24.000hr.

Dornier has designed its own under-carriage for the 228, because it had difficulty obtaining one in time for the 228's speedy programme. The main landing gear retracts into underfuse-lage sponsons. The company also builds the undercarriage for the Pilatus PC.7 Turbo Trainer.
Garrett's TPE331-5 turboshaft rated at 715 s.h.p. is the standard engine on the 228. But Dornier has designed the engine mounting with the TPE331-

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