Payload-range
Min. fuel flight procedure

6 8 10 12 14 16 18 20 22

Range x 100n.m.

Payload-range
High speed flight procedure

16 18 20 22
Range x 100n.m.

certainly far more than required by safety regulations.
The F.27's cabin floor was made of a sandwich panel/metal honeycomb. The Fokker 50's floor has gone entirely composite, using carbonfibre.
Quietness is a commodity for which Fokker is even to sacrifice a little effi-ciency, and the propeller is the key to this aim. The chosen unit is a pure composite Dowty-Rotol six-blader. Peschier says that in tests "the. four-bladed version was actually more efficient, but the six-bladed was quieter". He put the efficiency loss at 0.5 per cent to 1 per cent, and noted that, of course, weight and complexity increases with the number of blades.

But it's worth it, says Peschier, to achieve a cabin noise maximum (between the props) of 79-80dBa, "which we will meet". Fokker measures this noise at ear level and averages it across all four seat positions, while the aircraft is at 20,000ft. The Fokker 50's Dowty prop is unique
in this market. The ATR42 sports a four-bladed composite Hamilton Standard propeller built on a metal spar; the ATP will fly with a six-blader which BAe designed in conjunction with Hamilton Standard, again composite on a metal spar. The Fokker 50's propeller is pure

composite.
The F.27 was always in something of a minority by virtue of the fact that its undercarriage, braking, and nosewheel steering systems are pneumatic, rather than hydraulic. Fokker chose pneumatics because "air is cheap, light, and non-corrosive".

But the company has gone for hydrau-lics on the Fokker 50. Why? The first reason is the scarcity of pneumatics in aeroplanes now. Next comes the fact that only hydraulics can handle today's more efficient anti-skid braking systems. Finally, the slight nosewheel steering time lag to which F.27 pilots become accus-tomed (caused by air's compressibility) can be eliminated.

The Fokker 50's hydraulics serve land-ing gear selection, normal and alternative brakes, nosewheel steering, and flap selec-tion. Backup for these systems is as follows: gear, free-fall; brakes, accumu-lators; steering, system accumulator or differential braking; flaps, electrical oper-ation.

Flying controls are similar to those of the F.27, being mechanically and manu-ally operated by a cable system. The elevator and rudder are cable-operated, with spring-loaded regulators maintaining

constant cable tension. The ailerons oper-ate via a torsion bar spring tab inboard and a balance tab outboard. In all planes the backup system is the trimmer.
The Fokker 50's electrical system (see Basic system detail box) differs from the F.27's primarily in that it is AC-fed, whereas the F.27's system uses DC gener-ators feeding through rotary inverters. The air conditioning and pressurisation system in the Fokker 50 is an improvement on the F.27's as far as passengers are concerned, but some Fokker engineers are obviously sad to see the old system go because it was so effi-cient in terms of power consumed. The F.27's cabin air comes in via its "ears", the small protruding intakes below the tail, and the air comes from a mechanical pump (a Roots blower) driven off the propeller gearbox. The Fokker 50 has no "ears", and the air supply is the rather more conventional compressor bleed. A compressor bleed system tends to cost some 3 to 4 per cent in fuel efficiency, where the F.27 blower only costs about 1 per cent. But the blower is heavy, needs maintaining, and takes up space. Also, when the last F.27 lands, so will aviation's last Roots blower.

The Fokker 50's flightdeck represents a distinct technological advance on the neat but traditional F.27 cockpit. The centre of each pilot's panel is dominated by a cath-ode ray tube (CRT) primary flight display (PFD) the updated electronic artificial horizon plus much additional data), with, below it, a CRT navigation display (ND, the electronic compass display or what-ever mode the pilot wishes to select). The other instruments in the conventional "T" flying-instrument layout are standard. The engine instruments are standard dials in conventional layout, except the two torque indicators, which are of tape format, with the central warning panel (central annunciator panel) on the captain's side of them.

Fokker has followed the "dark, quiet cockpit" philosophy, whereby the panels are dark when systems are operating normally, and only a malfunction (or temporary/sporadic systems operation) will illuminate a switch or annunciator.

Fokker says it is looking for an improvement in "qualitivity" on its prod-uction lines, and has been investing heav-ily over the last few years in computer-controlled production and testing systems. It has turned out F.27s at a maximum yearly rate of 36, and expects this to be the Fokker 50 maximum rate as well. Commitments on early sales dictate an annual rate of 24 aircraft.

Fokker will have flown two prototypes before the first line Fokker 50 gets airborne in September this year. In fact the first prototype, a Fokker 50 with an F.27 Mk500 centre fuselage, flew on December 28, 1985.

Certification of the first line production Fokker 50 is expected by the end of this year, and Ansett Airlines of Australia will take delivery of the new type before the
year is out. Ansett is just one of six airlines
in six nations around the world who have
so far placed 38 orders for and 12 options
on the Fokker 50, the replacement for the
legendary F.27. •

4 FLIGHT INTERNATIONAL, 22 March 1986 33