

Turboprop orders reached a high of 151 in 2005, following a low of just 18 in 2002. Two reasons for this resurgence are an ageing fleet and low availability of used aircraft. Long-term projections are for a global market of 60 aircraft sales per year.

# Turboprop orders bounce back

**N**o industry observer can have failed to notice that the turboprop market has recovered over the last couple of years, but by how much and why?

Turboprop firm orders won since 2000 are analysed here to determine: the increase in the number of turboprops ordered each year; the most successful manufacturer; the most important seat category; and where the largest turboprop orders have come from.

Have orders increased because of operators' dissatisfaction with regional jets (RJs), a surge in passenger demand or new route development, or because there is simply a need to replace older fleets? This analysis will attempt to establish the main reasons for the resurgence of turboprop orders in order to predict their future levels.

## Orders

The orders for all turboprops from 2000 to 2005 averaged 42 aircraft a year, with a high of 61 in 2000 and a low of 18 in 2002. Orders surged in 2005 when 151 aircraft were ordered, thereby increasing the average annual order rate to 60.

ATR won 46% and Bombardier 54% of the 361 orders for ATR and Bombardier turboprops placed over this six-year period: the ATR 42-500 won 11%; the ATR 72-500 35%; the Q200 just 3%; the Q300 20%; and the Q400 20%.

Bombardier has consistently held the advantage over ATR, which only outsold Bombardier in 2002 when it sold 11 aircraft against Bombardier's seven. This changed in 2005, however, when out of

the order total of 151 aircraft, 90 were ATRs and 61 were Bombardier Q family aircraft.

The most successful turboprops are clearly the 70-seaters, which account for 66% of the total: the ATR 72-500 and Bombardier Q400. The 50-seater ATR 42-500 and Q300 only account for 31%. Not so far behind the ATR 72 and Q400 in overall numbers sold is the 50-seat Q300, which has outsold the competing ATR 42-500, over the six-year period, by nearly 2:1. This is despite the Q300's reduced commonality with the Q400, which compares with nearly 100% commonality between the two ATR variants. The smallest current turboprop, the 37- to 39-seat Q200, is only being maintained in production on the back of orders from the US Department of Homeland Security.

## ATR

ATR has achieved great success on the Indian sub-continent with orders for 30 ATR 72s from Air Deccan, 20 ATR 72s from Kingfisher and seven ATR 42s from Pakistan International Airlines, totalling 57 aircraft. ATR has won four out of six significant contests over the past two years (for five aircraft or more) that did not involve repeat orders or a strong existing relationship with the manufacturer (that is, excluding Air Deccan/ATR and QANTAS/Bombardier).

*The turboprop market is now left to ATR and Bombardier. The market has been split almost equally between the two over the past five years, but ATR has achieved high success on the Indian sub-continent.*



Aside from the Indian sub-continent, ATR's other principal success has been its ability to sell new production aircraft to existing operators of earlier generation ATRs. Air Caraibes, Air Tahiti, Binter Canarias and CCM Airlines are recent examples. Aside from maintaining production of the current family, this has generated substantial business for ATR Asset Management as these earlier aircraft have been taken back in trade. In turn this has, on occasion, resulted in these aircraft being replaced or complemented by new-production aircraft. For example, Air Deccan began operations with four used ATR 42-320s, but subsequently placed an order for 30 new-production ATR 72-500s.

## Bombardier

In general Bombardier has been more successful at placing its aircraft with large fleet operators, such as All Nippon Airways (ANA), Flybe, Horizon Air, Japan Air Commuter and Qantas. It has also consistently succeeded in placing Q family aircraft for special mission applications. In 2005, however, ATR made a significant inroad into this market with an order from the Turkish Navy for 10 ATR 72-500s.

With the decline in regional jet (RJ) orders, the importance of the turboprop to Bombardier has increased dramatically. The table below shows the company's end-of-year backlog for turboprops versus RJs for the past six years. Turboprops now account for nearly half of Bombardier's backlog.

Dec 31st	T/prop	RJ	T/prop %
2000	90	487	16%
2001	48	569	8%
2002	29	423	6%
2003	34	274	11%
2004	47	233	17%
2005	80	107	43%

Turboprop sales have totalled 361, and Europe has accounted for the largest share of 138 aircraft (38%). Asia is the second largest with 106 (29%) and Australasia 58 (16%).

It is significant that, with the exception of Bombardier's success at Horizon Airlines, neither manufacturer has sold a single aircraft to a US airline in the past six years. Since the US has historically accounted for 70% of the world market for regional aircraft, it is difficult to see how production will revert to previous levels without the return of US demand.

In addition to the orders for ATR and Bombardier, the 2000-2005 period also saw the delivery of a few additional aircraft. Fairchild Dornier received orders for a number of aircraft, two of which were eventually delivered, one each to

## TURBOPROP FLEET

Age (years)	30-seats	50-seats	70-seats	Total
Less than 5 years	13	75	144	232
5 to 10 years	232	178	115	616
10 to 15 years	452	312	162	926
15 to 20 years	484	260	45	789
20-25 years	46			46
Total	1,318	825	466	2,609

Shell Canada and Welcome Air of Austria. Embraer placed its last four EMB-120 Brasilia turboprops with orders for two from Avior Express of Venezuela and the Angolan People's Air Force. The only other turboprop orders were for the smaller 19-seat Beech 1900D.

## Why the resurgence?

It would be easy to attribute the surge in turboprop orders to the rise in fuel prices. Although this undoubtedly does no harm to turboprop sales, it is doubtful if many of these orders would have gone to RJs even if fuel had continued to be cheap. The two issues which will increasingly drive operators to acquire new turboprop aircraft are the ageing of their existing turboprop fleets and the poor availability of good used aircraft.

## Ageing and new versus used

One indisputable fact is that the existing turboprop fleet is ageing. The majority of the current fleet of 30- to 70-seat designs were launched in the early 1980s, and production ceased during the mid- to late 1990s. The breakdown of the fleet into seat size categories and age groups is illustrated (*see table, this page*). This clearly shows that out of the 2,600 turboprops in service, 835 (32%) are older than 15 years. Further analysis reveals that out of the two most important size groups of 50- and 70-seat aircraft totalling 1,291, more than 779 (60%) are older than 15 years.

Three of the six significant orders listed earlier were from operators looking to replace elderly fleets: Air New Zealand (ANZ), Finncomm and Pakistan International Airlines.

Finncomm wanted to replace the 1980s-built Saab 340s and 1990s-built Saab 2000s that it wet-leased from Golden Air of Sweden. Pakistan International Airlines desperately needed

to replace its even more elderly fleet of F.27s built in the late 1950s and early 1960s. Most interesting of all was ANZ's need to replace the fleet of Saab 340As at its subsidiary Air Nelson. It finally selected the Q300 after evaluating new production ATR 42-500s and Q300s, and used equipment: the Saab 340B from American Eagle and Saab 340 Bplus from Saab Aircraft Leasing.

The Saab 340B/Bplus option provided commonality with the existing fleet of Saab 340As, and would have involved far less cost and disruption in the short term. On the downside swapping the 1980s-built Saab 340A with the 1990s-built 340B/Bplus could have been just a short-term solution that offered no increase in capacity. The requirement for higher-capacity aircraft within the group could have been met with ATR 42-500s providing commonality with the ATR 72-500s of Mount Cook, ANZ's other wholly-owned subsidiary. The latter has been a long-standing ATR 72 operator having originally taken delivery of seven ATR 42-212s aircraft back in 1995. These were returned to ATR in exchange for seven new -500s aircraft in 1999 and subsequent single aircraft orders have raised the current fleet to 11 ATR 72-500s. The only apparent advantage of the Q300 was its commonality with the large-scale Dash 8 operator QANTAS, with whom ANZ is developing an ever closer relationship. In a double blow to ATR, ANZ not only ordered 17 50-seat aircraft from Bombardier, but also placed options on 13 Q300s, just enough for the longer-term replacement of Mount Cook's ATR 72-500 fleet.

## Availability

Unlike the inevitability of ageing, availability is subject to the variability of market forces. Lease rates and pricing for all the popular turboprop types (ATR 42, ATR 72, DHC Q200, Q300, Fokker 50



50-seat turboprops now account for a smaller share of turboprop sales compared to their historical sales level. The Q300 has outsold the ATR 42-500 over the past six years by nearly 2:1.

and Saab 340B) are increasing as availability falls and demand rises. Increasingly, good examples of the less popular types, like the Embraer EMB-120, Saab 340A and Saab 2000 have also become scarce and therefore expensive.

Availability is particularly limited in the 70-seat category with only four ATR 72s and two Q400s on the advertised market. The only sizeable ATR 72 fleet to recently come on the open market (as opposed to being traded back to ATR) came in 2005 when Lufthansa placed its fleet of 10 on the market. Demand was such that eight were quickly sold to FedEx for conversion to freighters and one to Avanti Air of Germany, leaving only one aircraft currently available. The only Q400 aircraft that have entered the used market are four returned by SAS to the manufacturer and two currently in operation with Changan Airlines that are being offered for sale. This is out of a total of 163 orders and 106 deliveries. The four ex-SAS aircraft have now been placed, with two going to Securite Civile of France for fire-fighting conversion, and two to Royal Jordanian Express.

## Will it continue?

It is impossible to predict exactly how long this trend of larger order volumes and stronger demand for turboprops will continue, but there are encouraging signs that suggest that there will be no immediate end. The Forum of European Aerospace Market Analysts (FEAMA), an industry forum with representatives from all the current manufacturers (including the non-Europeans Bombardier and Embraer) has forecast a demand for 600 new-production turboprops (15-89 seats) over the next 10 years. This average of 60

turboprops per year tallies almost exactly with the orders placed in 2000-2005.

The surge of orders in 2005 is symptomatic of a pent-up demand in earlier years. Order decisions have been deferred in many cases to await an upturn in overall market conditions. Several existing turboprop operators with specific requirements are evaluating the replacement of their existing fleets. Aer Arann, Eastern Airways and VLM Airlines are three independent operators that have grown their fleets around the availability of used equipment. Air Canada Jazz, Malaysian Airlines and Olympic Airlines are flag carriers, which have generally acquired their aircraft new from the factory.

- Aer Arann (Ireland) has been steadily expanding its fleet to its current level of five ATR 42-300s and eight ATR 72-200s. Over the next three years it sees further expansion to a fleet of 20 aircraft, primarily ATR 72s. The airline is believed to be in advanced negotiations with both ATR and Bombardier for six to 10 aircraft with the ATR 72-500 as the clear favourite.

- Air Canada Jazz has recently taken over Air Canada's fleet of 25 CRJ100s and has publicly stated that it would be very interested in an opportunity to trade in some of these RJs for larger CRJ705 or Q400 aircraft. As the world's largest Dash 8 operator, with 42 -100s and 26 -300s, the Q400 would be an obvious fit for the airline.

- Eastern Airways (UK) has steadily built up a fleet of used turboprops, initially 19-seat BAE Jetstream 31/32s,

and then 29-seat BAE Jetstream 41s. After a brief experiment with Embraer ERJ-135s/145s, the airline added a fleet of four Saab 2000s. ATR is known to be pushing the ATR 42-500 as a replacement for the Saab 2000s.

- Malaysian Airlines has had a long-standing requirement to replace its fleet of 10 Fokker 50s with newer-generation equipment. Although originally open to both jets and turboprops, the options have now been reduced to either the ATR 72 or Q400. A final decision is expected in the first quarter of 2006.

- Olympic Airways (Greece) has been an ATR operator since 1990 and has a current fleet of six ATR 42-320s and seven ATR 72-202s. In 2003 four used Dash 8-100s were leased from Bombardier to replace 19-seat Dornier 228s flying to the smaller Greek islands. Although under discussion for some time, the renewal of the turboprop fleet, like that of the mainline jets, awaits a decision on the privatisation of the airline.

- VLM (Belgium) has been a Fokker 50 operator from its inception, acquiring its current fleet of 14 on the used market. Any replacement must be able to operate at London City Airport and, even more importantly, offer higher capacity to increase the number of passengers achievable from each movement at this heavily slot-constrained airport. Either the ATR 72-500 or the Q400 could meet these requirements, but since VLM's sister company, Denim Air (Netherlands), is already a Q300 operator, with five operated alongside 14 more Fokker 50s, the Q400 is favourite.

Flag carriers are unlikely to take used equipment, but in an environment where the future availability of good used aircraft is hard to predict, even some independent operators will be attracted by the benefits of new production aircraft: warranty benefits; maintenance cost savings; improved reliability; reduced downtime; and operational commonality.

If these can be provided at equivalent overall direct operating costs to the older aircraft then the only disadvantage of the new aircraft is the loss of flexibility. Will

A peak of Turboprop orders was witnessed in 2005, with a total of 151 orders won. Forecasts predict a long-term annual average of 60 aircraft sales per year.

smaller independent operators want to give up their flexibility by committing to the long-term financing associated with new-production aircraft?

### Lead-times and production

The lead-time on new-production aircraft from the manufacturers is increasingly becoming an obstacle to their continued success. Both ATR and Bombardier face the problem of fulfilling large-scale orders with low production rates that cannot be ramped up overnight. One European operator was recently told that aircraft would not be available until the second half of 2007. Unless ATR and Bombardier have the confidence to increase their production rates to match demand they will be unable to meet new customers' requirements. Increasingly, orders may go to the manufacturer that has availability.

ATR has taken the initiative, by announcing two production rate increases during the past year. It is even considering a third which would see annual production increase to over 40.

### ATR's commonality

The two ATR family aircraft have an undisputed commonality advantage over the Bombardier Q family. Nevertheless, it is arguably less important to operators given the focus on 70-seaters. A good example of this is at Air New Zealand, where, although commonality favoured the ATR 42 and Saab 340B options, the Q300 was ultimately selected. The ATR 42-500 provided commonality with the ATR 72-500s of sister company Mount Cook, but would it have been in Air Nelson's own interests to select a common type? Internal politics can be a factor in the selection process.

The ANZ order was particularly important to Bombardier, since without it the backlog for the Q200/Q300 would have been in single figures. Given the lack of commonality between the Q200/Q300 and the Q400, the smaller members of the family could well face cancellation once the backlog is exhausted. In contrast, the high level of production commonality between the ATR 42-500 and the ATR 72-500 allows ATR to maintain production of both aircraft, regardless of how low the firm order backlog goes for either model.



### Future markets

#### 30-seat market

Only Bombardier's Q200 remains available for the 30-seat market, with just nine orders over the past six years. With many of the more popular 30-seaters in short supply on the used market, it is possible that there will be future demand for new-production aircraft. When considering the cost of financing a new Q200, however, it is possible that used equipment leased at \$25,000-30,000 per month is preferable to similar-capacity equipment leased at \$75,000-90,000 per month. The only option for these operators may be to continue operating used equipment, to grow the route, or to reduce the frequency to allow the economic acquisition of 50-seaters.

#### 50-seat market

The same scenario is true of the 50-seat market, and may explain the emphasis on 70-seaters. The replacement of used 50-seaters with new aircraft only makes sense if it leads to increased capacity and revenue earning potential.

A further threat to the continued large-scale production of 50-seat turboprops is the availability of 50-seat RJs. While lease rates for the latter were in excess of \$100,000 per month, the likelihood of their replacing the earlier generation of turboprops was minimal. In future, operators may be given the opportunity to replace their old ATR 42-300s, Dash 8s, Fokker 50s and Saab 340s with Canadair RJs at lease rates nearer

\$50,000 per month versus new-production ATR 42-500s financed over long terms at rates around \$100,000.

#### 70-seat market

Excluding the BAE ATP which has never gained widespread market acceptance, the availability of used 70-seat ATR 72s has never attained the worrying levels of used 30- to 50-seat turboprops. ATR 72 lease rates and values have been maintained at high levels, which in turn has allowed new aircraft to be an affordable option.

### Conclusions

After a fairly stable period from 2000 to 2004 when turboprop orders averaged 42 a year, there was an order surge in 2005 with 151 placed. ATR had the advantage over Bombardier in several significant sales campaigns during 2005.

The 70-seat market accounts for some 66% of the total market for turboprops. The 50-seat market has only 31% of the total. While Europe and Asia are the principal markets for turboprops, the US market is noticeably quiet.

The overall conclusion of this analysis is therefore that the recent success of turboprops should not lead to expectations of an explosion in demand, as happened with RJs in the 1990s. In the absence of a US market, without a significant increase in production rates and with the threat posed by surplus 50-seat jets, it is hard to see how long-term order rates for turboprops will be much greater than the 40-60 a year that they have been averaging since 2000. **AC**