ROYAL AERONAUTICAL SOCIETY
Loughborough Branch

5 December 2017

Corporate Jet Cabin Evolution

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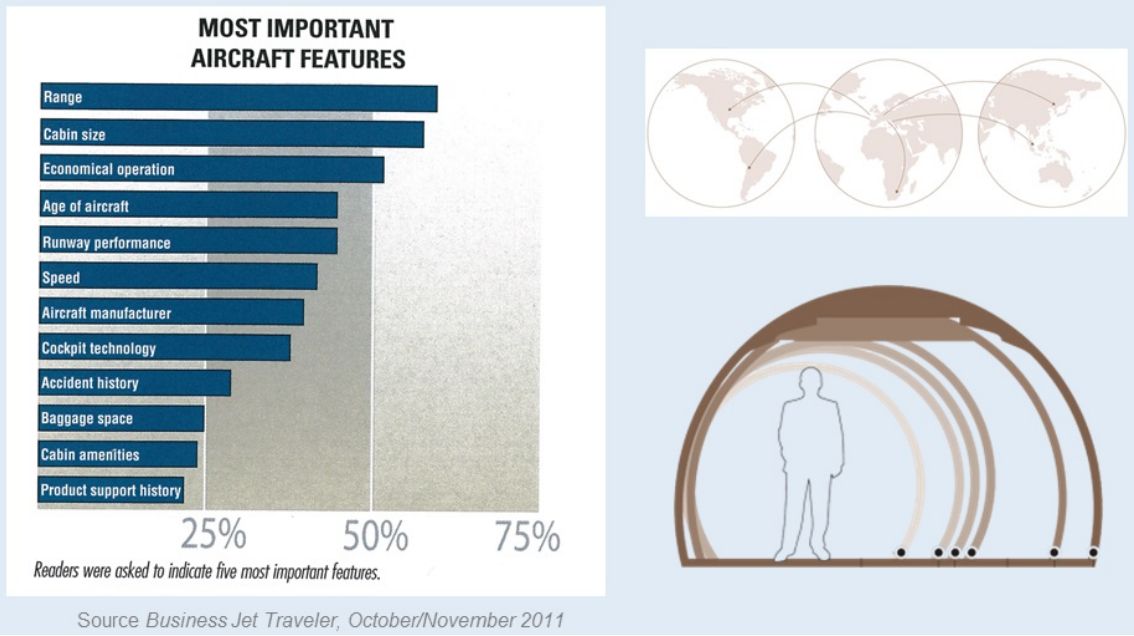
This was an introduction to a topic of which few, if any, attendees could claim any direct knowledge, and might concede that such an overall ignorance is always likely to be the case. The occasion therefore opened an opportunity to find out more than can be seen by just peeping into the cabin of the rare and valuable aircraft that appear on airports or as backdrops to film scenes and TV interviews.

The presentation set out to introduce what customers want, how cabins have evolved to meet needs, what the Airbus corporate jets offer, and looking ahead, the speaker took a look at what the cabins of the future might offer.

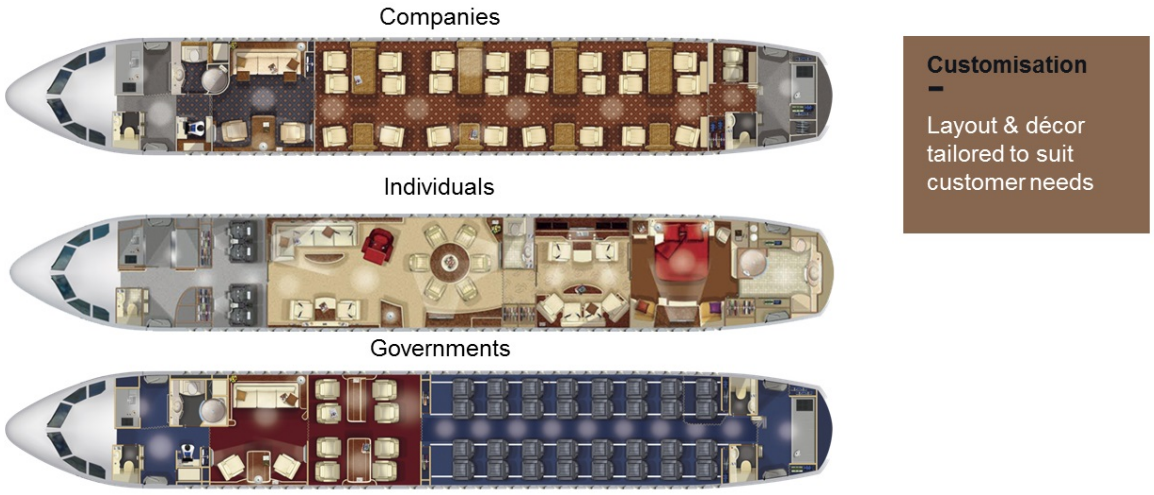
The Airbus airliner derivative corporate jets use standard airframes that are modified to fulfil customer needs. They offer the ability to 'buy' time, enable customised timetabling and the ability to conduct flight-time work in confidentially. The users are protected and travel more discreetly, they arrive ready for business, and in some cases a sizeable delegation can be carried, with their status and security assured. Financial benefits were accredited through analysis showing that the benefits stretch further, with considerable impact attributed to the profitability of large organisations.

The customers for the products can be wealthy individuals, or companies and governments. It was clear that the needs of these three types of users led to radical differences in the way that the internal volume of the cabin was used. There were also significant differences to technical aspects affecting performance which were dealt with separately, but largely these were related to extending aircraft range.



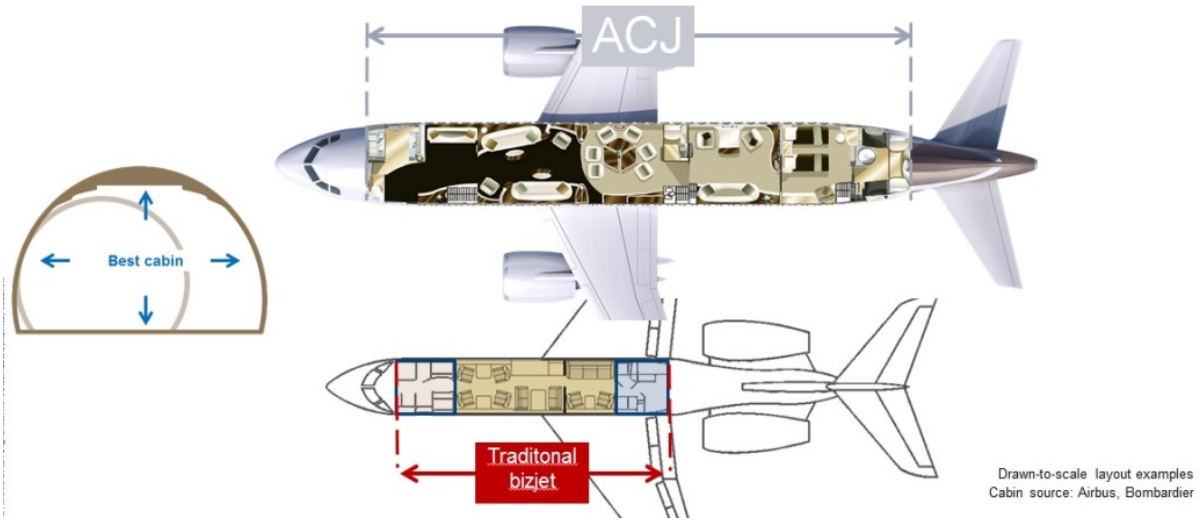
This survey of customer priorities shows preference for long-range and good cabin size

The five most important aspects of the cabin are not much different to the needs of the average traveller. It must support the ability to work, sleep, eat, relax and wash, but the expectations of course are for high, and in some cases the best possible, quality of experience. Three major categories of internal cabin plan that will support this are the basis on which a client's specification will be turned into a definitive cabin layout, as illustrated below.



These indicative cabin plans show the influence of the expectations of different users:
Companies have limited VIP accommodation
Individuals have the most spacious and lowest seat capacity cabins
Governments balance room for members of State, supporting staff and others

The speaker profiled a range of aircraft types from the 1930s DC-3 – which provided a cabin floor area similar to that of a mid-range business jet today – up to the ultimate possibility, the modern A380, which offers 551m²/5.930ft² floor space on two decks. Plans are perused, and no examples have been ordered as yet, but the range of options was clearly shown to become better to compromise function and expectations as an aircraft cabin gets larger. He concentrated his presentation on the cabins of the Airbus narrow-body family (ACJ318, ACJ319 and ACJ320), and cited the improvements on the basic airframes attained through using NEO (new engine options) and 'sharklets' (relatively-large winglets). The company has also supplied wide-body ACJs, with ACJ330 and ACJ340 aircraft in service.

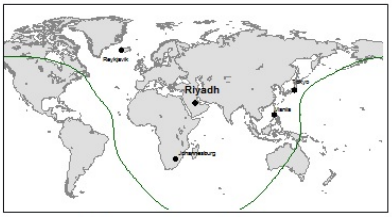


The small airliner and the larger types of business jets tend to need similar apron space (ICAO category C), and so provide more cabin space and accrue similar airport charges.

The quest for range does require more fuel volume than in the standard airliner and to fulfil the expectations Airbus offer additional centre tanks (ACTs), that occupy the lower fuselage and are easily fitted and removed via outward-opening doors. They are integrated into the fuel systems such that they do not create additional workload for the crew to monitor and manage. Each tank is a robust structure with an internal bladder, which ensures double-walled containment, and causes the tanks to empty by cabin air-pressure without adding complexity to the fuel system. The ACTs are designed and certificated by the company, and are integrated into the aircraft as a certified component that does not need additional maintenance or support from any third-party.

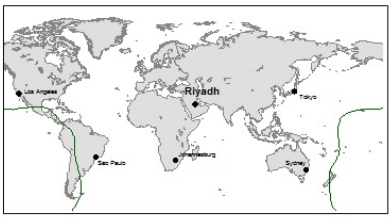
An additional benefit for autonomous operation as a private aircraft is the availability of 'airstairs,' that are stowed in the fuselage below the cabin floor. Using control either within or outside the aircraft the unit can extended/retracted whenever necessary.

ACJ320 Family



Intercontinental range

Airbus VIP widebody



"Nonstop to the world" range

This slide shows the payload-range capabilities over the range of aircraft available. The smaller aircraft have a range equivalent to the majority of large airliners with an economic payload, and the wide-body aircraft can offer almost non-stop capability world-wide.

The presentation touched on many more details aspects of the aircraft, and showed how the cabin designers were often customised to the requirements of cultures, with round tables preferred by private owners for family-style meetings, but square tables are preferred in cultures where there is a greater 'gaming' instinct. An example of a bespoke capability, but again more relevant to certain regions, was an area for karaoke performances.

In some concepts the standard cabin cross-section can be abandoned – there are no overhead luggage bins of course – and a more spacious feel created by having a ceiling contoured to the fuselage structure, creating a 'domed' roof line with exceptional headroom. Several examples of the latest in-home luxuries that private users will demand were quoted, and an example was the advent of curved-screen TVs. It was explained that these are not always so easy to integrate as one might imagine with safety regulations demanding sturdy attachments and in the example quoted additional screen protection to withstand impact conditions.

Airbus has around 10,000 airliners in service, and offers the 180 or so corporate jets already in service a comprehensive support organisation. Around 30-40 per cent of sales have been in the Middle East. A specialist team serves the corporate fleet with a view to offering fast and appropriate responses to requests, and will integrate demand with company-affiliated suppliers of maintenance

and servicing. The availability of crew training opportunities worldwide is also a significant advantage with the flight deck training options already serving other Airbus users worldwide.

Décor options, such as this spacious layout using sculptured panels, were illustrated

We were offered an insight into the future, with an overview of more radical cabin plans. Some are expected to use more sculptured spaces using carbon-fibre panels for style, and pragmatic integration of décor and evolving human-machine interaction capability where they will deliver benefits to users. The company can offer concepts under titles such as 'Elite, and 'Elegance,' and does not rule out a fully-customised design.

I have saved until last an example that was quoted early in the presentation, and that was the use of an ACJ319 by Daimler-Chrysler during the period when the German-US teams were closely associated. The aircraft has 48 seats – basically four-abreast and first-class in terms of dimension – and operated 4-5 rotations weekly between Pontiac in the US and Stuttgart in Germany, and with assured demand it was cost-effective, and brought the additional benefits of door-to-door service, high staff satisfaction, measurable productivity benefits, fast-response capability for managers and engineers, and so on. This is more 'extreme business class' than corporate, but is it a sign of things to come?

It was a very informative presentation that melded news, technology, lifestyle and economic elements with commentary and illustrations that were well appreciated by the 60 or so people present, and reflected in the questions and answers, and the vote of thanks.

Lecture notes by Mike Hirst