

Mayday! Mayday!

The prospects for Connexion-By-Boeing look grim

In March 2005, we analyzed the prospects for the Connexion-by-Boeing service¹, which Boeing has developed at a cost of more than a billion dollars to offer broadband Internet access on long haul aircraft around the world, and we predicted that even in the best case, it could take another four years before the service became profitable. A year later, Boeing has indicated that it is re-evaluating the business with a view to sale or closure, and has halted further sales while it considers the unit's viability.

Since our original article was published, additional information has emerged about the actual level of usage of the Connexion system, with Boeing stating in February 2006 that "over 1000" passengers used the service each day on "more than 110 flights"². Lufthansa also stated in June 2005 that they were seeing "about 10 users per flight" and in the long run they forecast this would grow to "20-30 users per flight"³. These levels are reasonably in line with Boeing's original projections that in the first year of service around 5% of passengers on each flight would use the service, if we assume an average of 200 passengers per flight. However, given that the service has now been available for almost two years, Boeing and the airlines would clearly have hoped for further growth beyond this level by now. Connexion reduced the price of its service by around 10% in January 2006, but if previous experiments in measuring demand elasticity for passenger communications services are anything to go by⁴, this may not have increased demand significantly.

At current usage levels, assuming 1.5 flights per aircraft per day, and 10 users per flight, then if 60% of users opted for unlimited service (at \$26.95) and 40% chose the one hour service option (at \$9.95), the gross revenues per aircraft would be around \$110,000 per year. Part of these revenues is payable to channel partners (such as ISPs who have signed roaming deals with Connexion) and if minimum revenue commitments made by airlines are exceeded (the exact level of which is unclear) we assume

¹ See our previous article at <http://www.tmfassociates.com/Connexion.pdf>

² Holger Ritter of Connexion-by-Boeing, quoted in Digital Ship magazine, April 2006, page 4 at <http://www.thedigitalship.com/DSmagazine/apr06gfd.pdf>

³ Bernhardt Seiter of Lufthansa, quoted in Space News, June 13, 2005

⁴ For example, Claircom (the main competitor to Verizon Airfone) conducted differential pricing experiments on its in-flight telephony service in 2001, but was unable to stimulate any significant traffic growth, and subsequently closed down the business

that the airlines may even share a part of the revenue stream. Thus it seems unlikely that Connexion will be able to realize more than \$80,000 to \$100,000 per aircraft per year from broadband connectivity at current usage levels. Future increases in usage may boost these revenues somewhat, but we believe that the realistic maximum level may be around \$120,000 per aircraft in net revenues to Connexion. In 2008 or thereabouts, cellphone service on aircraft may also be implemented, but even if Connexion received \$5 (net) in roaming charges from 10 passengers for use of their mobile phone on each Connexion-equipped flight (a fairly optimistic assumption), this would only provide an additional \$27,000 per aircraft per year, increasing Connexion's revenues to a maximum of perhaps \$150,000 per aircraft per year.

The only further upside would be if airlines made very aggressive minimum revenue commitments, beyond expected levels of passenger usage, or paid substantial additional sums for the in-flight live TV which Boeing now streams over its network. However, airlines already incur a significant penalty in fuel consumption when aircraft are equipped with the Connexion equipment, because the external VSAT antenna creates additional drag. We understand that the additional fuel consumption on each Connexion-equipped flight is equivalent to as many as five extra passengers, which may be difficult to justify if only ten passengers on each flight are using the service (even if the passengers using the service are flying in business class). As a result, we believe that any demand by Boeing for airlines to shoulder more of the burden of supporting Connexion in the future is unlikely to be well received.

At present, Boeing has equipped over 125 commercial aircraft, making over 180 flights per day, and also serves around 20 government and private jets. It has just started its maritime business and only installed the first commercial terminal in early 2006. If we assume that Boeing receives around \$80,000 per year from each commercial jet and perhaps \$50,000 per year from government and private jets (since its current user base is skewed towards large aircraft) then this would imply revenues of around \$11M per year. In terms of the costs of operating the Connexion business, the business unit employs some 646 people, which would imply staff costs of around \$100M per year⁵, while Connexion also has substantial capacity leases for worldwide coverage with SES Americom, Intelsat, Eutelsat, SCC, AsiaSat and Yamal. The most substantial of these leases is for the 20 transponder Ku-band payload on AMC-23, which was customized specifically for Connexion to provide trans-Pacific coverage. For technical reasons, the Connexion service requires a full

⁵ By way of comparison, Inmarsat's staff costs in 2005 were \$97.1M for a staff of less than 500 people

transponder to be allocated within each satellite beam, even if only 1 aircraft is using the service in that area, and thus the total amount of capacity leased by Connexion is quite sizeable. We estimate that the capacity lease and network operating costs for Connexion are at least \$50M per year, giving a total operating cost for the business of at least \$150M per year. Although a purchaser might well be able to cut staff costs significantly, unless Boeing were prepared to underwrite the costs of some of the capacity leases, it is unlikely that the operating costs could be reduced below \$100M per year while maintaining global coverage.

Even under our most optimistic revenue projections, with its current operating costs, Connexion would require a minimum of 1000 aircraft equipped with the service to breakeven. Before further installations were suspended, at most 100 aircraft were being fitted out each year, while Boeing claimed to have around 500 orders and options from airlines. The fitting-out process is quite time-consuming and therefore must be scheduled to occur during a multi-week maintenance period. As a result, it takes 2-3 years to completely equip an airline's fleet. Given these constraints, it is unlikely to be feasible to substantially accelerate installations and it would therefore a minimum of five years for Connexion to become profitable (at around 700 aircraft equipped), even if costs were cut, usage levels increased and any equipment subsidies were discontinued.

What is the outlook then? We predict that Connexion's commercial service will ultimately be closed down, probably at the end of this year. Options for a sale do not look positive, given the above analysis, and SES has a large measure of control over the future of the business, given the substantial termination charges presumably included in the AMC-23 lease contract. SES also has a relationship with Viasat (developer of the Connexion terminals) to develop Communications-On-The-Move terminals for the US DoD, which use a similar CDMA waveform. It is conceivable that the Connexion business could be folded into this effort in some shape or form, if SES decided to acquire the Connexion business from Boeing, but this would more likely to simply involve SES acquiring some of the Connexion assets, perhaps in lieu of a lease termination charge. In any case, it is hard to see how continued support of the commercial airline service can be justified.

However, this should not necessarily be a cause for celebration by Connexion's competitors. Connexion's service was well received by users, and feted by industry publications and analysts⁶, but

⁶ For example, as Connexion notes on its website, IDC wireless services analysts named Connexion-by-Boeing as one of the "Wireless Companies to Watch" in 2005

did not attract sufficient users. Connexion is one of a long line of unsuccessful business ventures providing aeronautical passenger communications, and we have just seen Verizon Airfone announcing its intention to shut down by the end of the year (its former competitor Claircom, ceased operations in 2002). Inmarsat satellite phones have been installed on thousands of long haul aircraft for more than a decade, but only attract less than five minutes a day of usage.

New ventures are now planning to launch cellular phone service on planes, using picocells and either Inmarsat satellite communications or (in the US) the recently auctioned air-to-ground radio frequencies for backhaul. Some of these operators also claim (as Boeing did three years ago) that there is a huge pent-up demand for onboard communications and that travelers respond very favorably to their service concept during market research. While undoubtedly these providers can rely to a large degree on existing infrastructure and so will not be saddled with the huge start-up costs incurred by Boeing, they still have to find a way of persuading enough customers to use their service, not least so that a critical mass of airlines will go to the trouble of installing the necessary equipment.

Perhaps we need to face the fact that while the benefits of being in touch are easy to describe, the challenges and limitations of aeronautical passenger communications services are less tangible. For example, if passengers have to switch their cellular phone off during take-off and put it away (probably in an overhead locker), how many of them are going to get up and switch their phone on so that it can receive calls during the flight? Are passengers' existing preconceptions that communicating by phone on a plane is expensive going to stop them from making a call, because they don't know how much it will cost them? Above all, is watching a movie or sleeping just a more appealing use of most people's time when they are on a plane? Only time will tell if these new operators can change the 100% failure rate for in-flight communications businesses, but we believe that investors will have to ask some hard questions and not just hope that everything will be different next time.

The above article was written in June 2006. Since then it has become clear that the running costs of Connexion were even higher than our conservative estimates, at over \$200M per year. In August 2006, Boeing announced that the Connexion service would be shutdown at the end of 2006. SES also revealed that Connexion was only using 8 of the 20 transponders on the AMC-23 satellite.

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*For details of our new report on “The Market for In-Flight Passenger Communications: Lessons from Connexion”, described by AirCell as “a thorough and one of the most thought provoking analyses of today’s in-flight communications market we’ve seen”, visit www.tmfassociates.com/aero
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