



Common Vision Workshop on Small Aircraft Transport (SAT) Mode

Future Aircraft Concepts (Business, GA and Small Transport Aircraft)

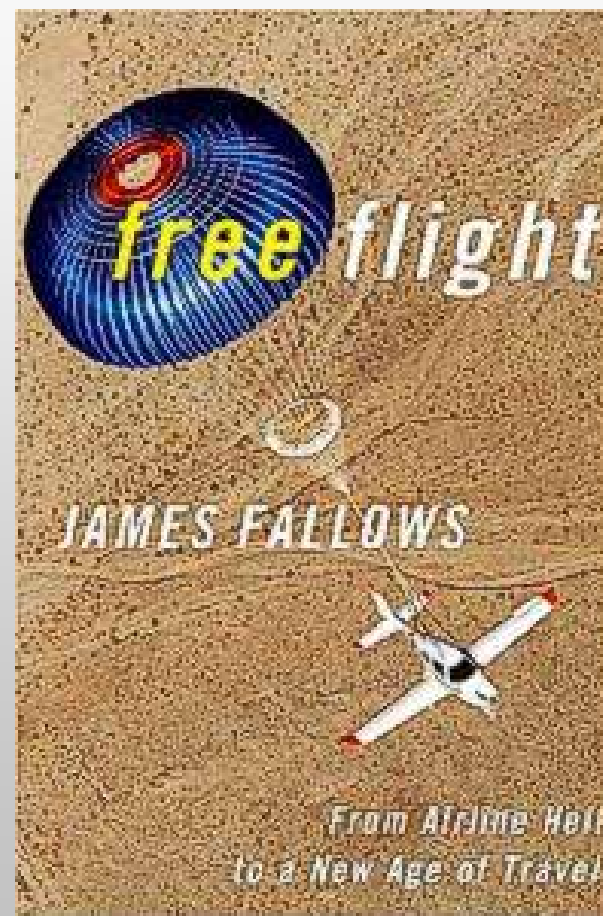
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Brussels, September 28, 2011



The GA enthusiasts

- Written in 2002 by aviation enthusiast it attempts to make a convincing arguments on GA efficient way for travel
- Fallows presents his case for how future GA planes could make point-to-point travel to smaller airports in the U.S
- Fallows describes two programs :
 - o New-generation light planes, the SR-20, by Cirrus Design Corporation
 - o The development of the revolutionary Eclipse Aviation light jet





Ten year later results: Cirrus Last Option

- Cirrus Aircraft has led sales of four-place light aircraft for nine consecutive years, delivering nearly 5,000 new piston-engine composite airplanes
- In February 2011, due to the little interest of American investors Cirrus was sold for US\$ 210M to China Aviation Industry General Aircraft (CAIGA), a subsidiary of Aviation Industry Corporation in order to finance production
- Without this sale, Cirrus was fundamentally bankrupt



Ten year later results: Eclipse Failure

- After a loss of well over \$1 billion on November 2008 the bankrupt of Eclipse Aviation was declared and only 260 aircraft were delivered
- A disaster of this size has many causes, but the most fundamental was a fantasy about the economics of designing, building and supporting airplanes.
- The failure of Eclipse has shown how much differences exist from a concept of way to travel to the real execution.



Free Flight Concept is still valid ?

- In today's hectic world, flexible transportation is ever more important and GA (from piston engine aircraft to sophisticated Business jet) offer the answer to the this request.
- This future is based on new technology and new rules that makes flying easier and more comfortable and more reliable and safer.
- So what are we doing in order to achieve these goals?



Technology

- Most of the avionic technology are available and it allow to delivery higher performance with reduced pilot workload:
 - GPS navigation
 - Display large screen man machine interface
 - Air traffic, weather condition , aerospace border easily displayed
 - Flight envelope protection
- But as in the past, today we are living in an engine-centric world so the economic performance of future GA product are depending on efficient less expensive aircraft power plant.



GA needs not only Technology (1)

- Analyzing the **effect of LSA regulation on sport aircraft** more than 30 new manufacturer entry in the market
 - The GA need a new **simplified CS/FAR23 rules for certification**
 - EASA raised the issue of a new concept for regulation of non complex aircraft, used in non- commercial activities
- **Liability insurance expense:** for general aviation is eight times greater per dollar of sales than for all other aviation markets despite the product liability is now limited to the first 18 years of an aircraft's or parts lifetime, the lawyers are finding ways to prosecute lawsuits anyway



GA needs not only Technology (2)

- **Pilot training:** The accident analysis suggests that the majority are caused by pilot error. This impose to look at how training is done and how it can be improved with may be increasing the number of flight hours
- **Airport & Aerospace accessibility:** Despite efforts, the number of public-use small airports continues to decline and the air traffic management is not getting benefit by the ADS-B technology due to its cost (still too expensive for GA application)



Future of GA aircraft products ***The Single Engine Jet***

- Many companies are attempted to develop Single Engine Jet GA aircraft for personal transportation (Cirrus, Diamond, Piper, etc.)
- Apart from the enthusiastic view of having an high performance a/c for GA, flying high altitude and high speed aircraft is posing a lot of challenges to the aircraft R&D and pilot training.





Future of GA aircraft products

The Single Engine Turboprop

- We will continue to see the dominance of single engine turboprop replacing the old twin piston engines aircraft. Currently the market is dominated by Pilatus, Cessna, Piper and Socata
- The market segment was challenged by many companies (Aero Vodochody IBIS, Comp Air 12, Vulcan Air etc) with low success.





Future of GA aircraft products

The Light Twin

- The light twin engine market seems to have a glimmer of life, but prices are still flat
- People that need a twin (flight schools) are driven by a low acquisition price





Future of GA aircraft products

The Very Light Twin Jet

- There were about 17 participants in various stages of development: currently only Embraer and Cessna brought new models to production and Honda is following (3rd Q 2012)
- The VLJ aircraft are filling the gap between market driven by owner pilot and professional business aviation



Future of GA aircraft products

The Ultra Long Range Business Jet

- The globalization of the economy is pushing up the market need for to business travels on long distances. This is well recognized by big Business jet players (Gulfstream, Bombardier, Dassault)





Future of GA aircraft products

The Small Aircraft Commercial Transport

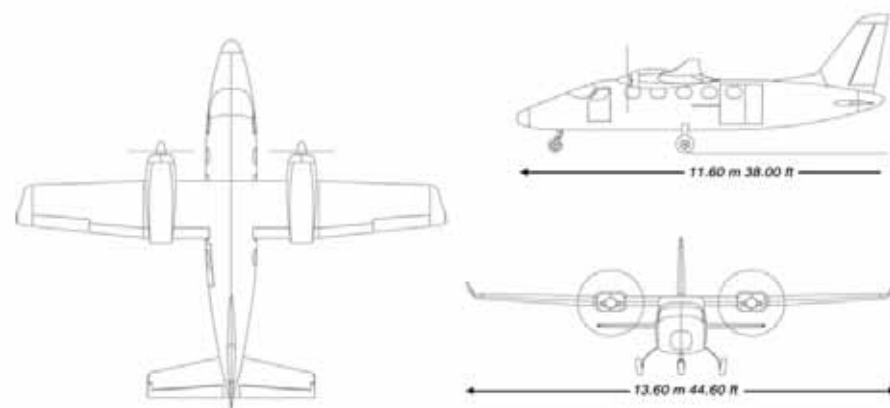
CapeAir Study Case

- Cape Air has served Island-markets with a focus on leisure travel since 1989 and is experienced with the unique transportation needs of Island communities
- With a fleet of two ATR-42s and sixty-two Cessna 402s, Cape Air flies more than 600,000 passengers annually with up to 600 non-stop flights per day and 130,000 flight operations each year
- In November 2010 Cape Air issued an RFP to replace the aged fleet of Cessna 402





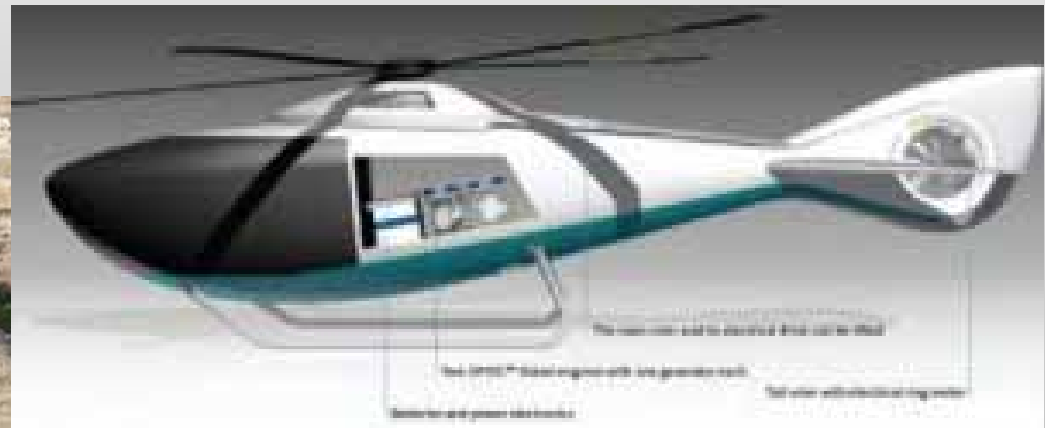
The Small Aircraft Transport ***The Tecnam Answer for CapeAir RFP***



- Designed to reduce the acquisition and operating cost with high level of reliability, this 9-10 seats a/c will use updated Lycoming 350Hp piston engines and fixed landing gear

Future of light Helicopters

- Innovation is the key to the helicopter industry's future health and small manufacturers of light helicopter need this more than the others
- Powered by new propulsion turbo-shaft or diesel engine this new products can be commercialized at very competitive prices





Conclusions

- GA aircraft is a transportation tool and, ranging from light single piston engine up to sophisticated business jet, have got the potential to service within a flexible transportation system (SATS) answering to medium and long term needs
- Technology has to be focused on reducing pilot workload and improve safety without increasing the acquisition cost
- New concept and new configuration are exotic but the real need are affordability and reliability of GA products.



END