**X-Aircraft Stakeholder Goals**

*Updated August 31, 2015 by Retep Relief, X-Aircraft Product Manager.*

In August, we engaged in several interviews with stakeholders for the new aircraft we’ve been conceptualizing. I’d summarize their needs with three words: performance, agility, and costs.

**Section 1. Weight Class**

In our [interview with the airlines representatives](http://www.wikipedia.com), they repeatedly emphasized that the aircraft would need to be of a size and weight that could be accommodated at all major city airports—which limits its mass and size. In particular, we’re not talking about an Airbus 340 here or a Boeing 747—we’re still talking something in the [Large Jet weight class 41-255K lbs](http://aspmhelp.faa.gov/index.php/Weight_Class). With many airlines increasingly looking at point-to-point transportation, and given the long-term prospects for fuel supply to surely diminish, our company needs to consider lighter-weight solutions than, for example, the Dreamliner or Airbus 350, and thus we need to aim at the midpoint of this range (too much lower and we may not be able to design an aircraft to travel the long distances needed for point-to-point transportation. Recurring phrases were “agility” and “fuel efficient.”

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**Section 2. Long-Distance Flights**

Relative to agility, a main concern was ability to handle long-haul flights, allowing airlines to reach new destinations. While there was variation around what long-haul meant, the emerging need seems to be for an aircraft to be able to be flown for ranges of 10-[16,000 km non-stop at speeds of 1000 km/h](http://cdn.intechopen.com/pdfs-wm/28814.pdf).

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**Section 3. Electrical Power**

In our interviews, the Dreamliner was often mentioned by reference: the supposition being that todays’ airlines often prefer an all-electric power solution rather than the traditional pneumatics-based or mechanical-based power solutions (the former uses fixed-size bleed extraction ports to serve the maximum anticipated load, thus reducing fuel efficiency; and both lead to reduced aircraft availability and higher maintenance costs, or so the argument goes). However, the battery technology is still not quite there and might not be for the forseeable future. Also, an all-electrical power solution places a much heavier demand for the electrical power supply, creating a heavy reliance on batteries for auxiliary power. Assuming we continue with our mixed-electrical and pneumatics solution and retain our current [supplier for the main and auxiliary power systems](http://cdn.intechopen.com/pdfs-wm/28814.pdf) (including the AC-5 now in service; and AC-6 that will soon be entering production) we’re talking about electrical power systems that distribute about 24.0 K w power. We might want to see if our AC subsystem and subcontractor chief designers can collectively operate within that same power budget, while asking our power system supplier what alternatives they can provide for the X-Aircraft, which might require additional power to address the additional goals identified in our stakeholder interviews.

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**Section 8. Responsiveness**

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With regards to Flight Guidance, discussions with our pilot union representatives expressed general satisfaction with the [responsiveness of the flight surfaces to pilot commands initiated from the flight deck](http://www.boeing.com/commercial/787/#/design-highlights/visionary-design/aerodynamics/advanced-fly-by-wire/) for our AC product line (through AC-5), so if we can sustain the relatively low latencies that we’ve achieved in the past (Stick-to-Surface direct mode 0.15 ms; normal modes 25.0 ms), we may be well positioned to retain our lead against our main competitor in the big-jet point-to-point transportation market. Achieving such a latency could prove a challenge area for us given the need to adopt superior real-time analytics to dampen turbulence for improved passenger comfort, among other drivers for more functionality in real time.

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**Section 12. Computing Platform**

Our computing system supplier in the past (for the AC-5 and our soon-to-enter-production AC-6) has a processor card and network design that seems to provide sufficient computing capacity for the avionics and other subsystems that make up or support the IMA function. While the X-Aircraft will feature additional functionality, from our initial discussions with our supplier, they expect to be able to capitalize on faster processing, memory, and bandwidth over that used for the AC-5 and AC-6. Assuming the processing (processors and memory) and network (bus) configuration is largely unchanged from AC-5-6 (that featured 1.1 GIPS processing, 2.0/4.0 Gbyte RAM/ROM, and 1.0 Gbyte bandwidth capacity), we should be able to reuse the existing top-level software architecture and still allow for sufficient spare capacity to support growth in functionality in later years.