

Aquila Fact Sheet

July 21, 2016

THE CHALLENGE

- Internet access can offer life-changing opportunities, information, and experiences, but there are still 4 billion people without it.
- 1.6 billion of these people live in remote locations that are not currently served by mobile broadband networks. The conventional approach to building networks — cell towers strung together by fiber — is too costly to make sense in these regions.
- Facebook's Connectivity Lab is developing new technologies, like Aquila, to address this challenge.

THE AIRPLANE

- Aquila is a high-altitude, long-endurance, unmanned solar-powered airplane.
- The wings are made from a cured carbon fiber that is stronger than steel for the same mass of material.
- Aquila has a wingspan bigger than a Boeing 737 airplane but weighs hundreds of times less (about a third of an electric car), because of its unique design and carbon-fiber frame.
- Aquila flies on solar power during the day and battery power at night. About half of Aquila's mass is devoted to batteries.
- At 60,000 feet, Aquila's efficient aerodynamics allow it to loiter using approximately 5,000 W of power, about as much as three hair dryers. The batteries must supply that load for a long winter night: up to 13 or 14 hours.

HOW IT WILL WORK

- When deployed, Aquila will be part of a fleet of airplanes beaming internet signal to people within a 60-mile communications diameter for up to 90 days at a time.
- It will fly at altitudes between 60,000 and 90,000 feet — above commercial air traffic and above the weather.
- It will use free space laser communications as a mechanism for communicating between aircraft in the fleet, and e-band technology to beam connectivity from the airplane to receivers on the ground.
- Our team designed and lab-tested a laser that can deliver data at 10s of Gbps — approximately 10x faster than the previous state-of-the-art — to a target the size of a dime from more than 10 miles away.

THE FIRST TEST FLIGHT

- Aquila's first full-scale functional check flight happened on June 28, 2016, at the Yuma Proving Ground (YPG) in Yuma, Arizona.
- We've been flying a 1/5th scale airplane for several months, and this was the first time we've flown the full-scale aircraft.
- During the low-altitude test flight, Aquila remained in the air for 96 minutes. The original mission was to fly for 30 minutes, but the flight was going so well we opted to extend it and Aquila stayed in the air for more than three times that long.
- At test flight cruise altitude of 2,150 feet about sea level, Aquila was consuming only 2,000 W of power.

OUR TEAM

- Aquila was built by a team of experts including aerospace, avionics, mechanical and software engineers, designers, technicians, operators and logistics specialists. Members of the team have previous experience at NASA, Boeing, DARPA, Northrop Grumman, and the British Royal Air Force, among other organizations.