



Airbus Defense and Space Enabling Large LEO Constellations

AIRBUS DEFENSE AND SPACE, Inc.

Tim Deaver

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AIRBUS

Global Leader in Space Systems and Services



Telecommunication Satellites



Earth Observation Satellites



Space Equipment



Human Spaceflight



Space Exploration & Science



Navigation Satellites



On-Orbit Services



Ground Segments



Launchers

... and a complete range of **Space-based Services** in our “Communications, Intelligence and Security (CIS)” business line.

Enabling Low Earth Orbit Mega Constellations

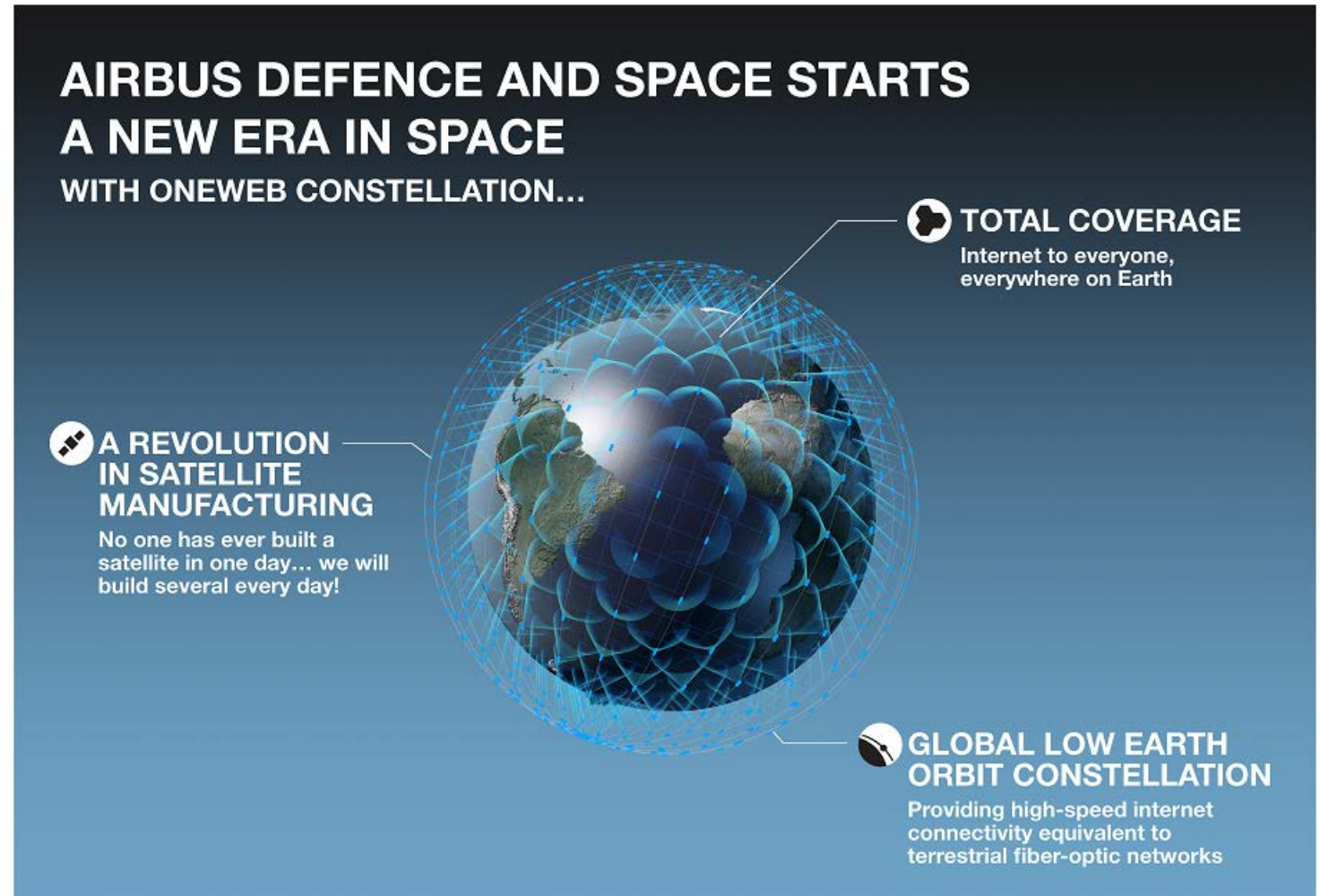
In 2018

Airbus delivered

- 24 satellites
- European Service Module 1
- 39 military planes
- 347 helicopters

This is our last year for double digit satellite deliveries. With the mass production of small, lower-cost satellites for OneWeb starting in 2019, *satellite deliveries will be in the triple digits.*

Tom Enders

An infographic titled "AIRBUS DEFENCE AND SPACE STARTS A NEW ERA IN SPACE WITH ONEWEB CONSTELLATION...". It features a central image of the Earth with a dense network of blue satellite orbits and satellite icons. Three callout boxes provide key information: 1. "A REVOLUTION IN SATELLITE MANUFACTURING" with the text "No one has ever built a satellite in one day... we will build several every day!". 2. "TOTAL COVERAGE" with the text "Internet to everyone, everywhere on Earth". 3. "GLOBAL LOW EARTH ORBIT CONSTELLATION" with the text "Providing high-speed internet connectivity equivalent to terrestrial fiber-optic networks".

**AIRBUS DEFENCE AND SPACE STARTS
A NEW ERA IN SPACE
WITH ONEWEB CONSTELLATION...**

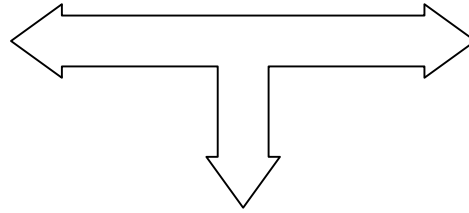
**A REVOLUTION
IN SATELLITE
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No one has ever built a
satellite in one day... we will
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TOTAL COVERAGE
Internet to everyone,
everywhere on Earth

**GLOBAL LOW EARTH
ORBIT CONSTELLATION**
Providing high-speed internet
connectivity equivalent to
terrestrial fiber-optic networks

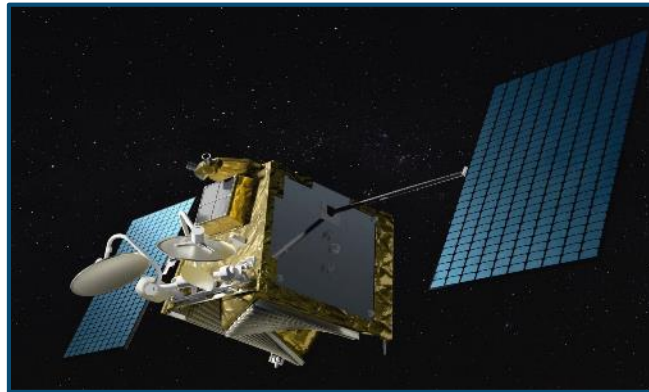
Airbus OneWeb Satellites Joint Venture

AIRBUS



OneWeb
Closing the Digital Divide

OneWeb  **Satellites**



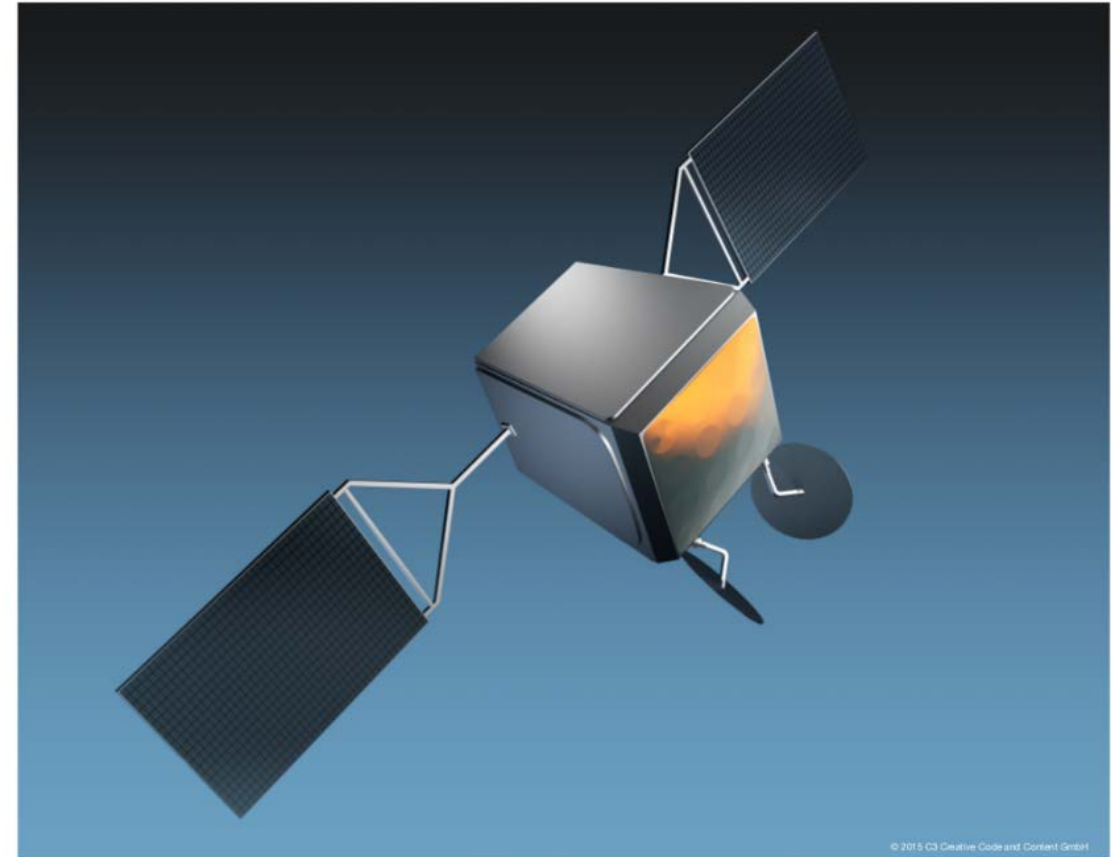
OneWeb satellite



Manufacturing facility in Florida

Revolutionizing Satellite Manufacturing

- Design for manufacturability
- Design for test
- Design for cost
- Supply chain management
- Flexible manufacturing facility to build other satellites



Facts & Figures



size



less than **150 kg**

weight



up to **4**

built every day

Florida Manufacturing Facility – Open for business

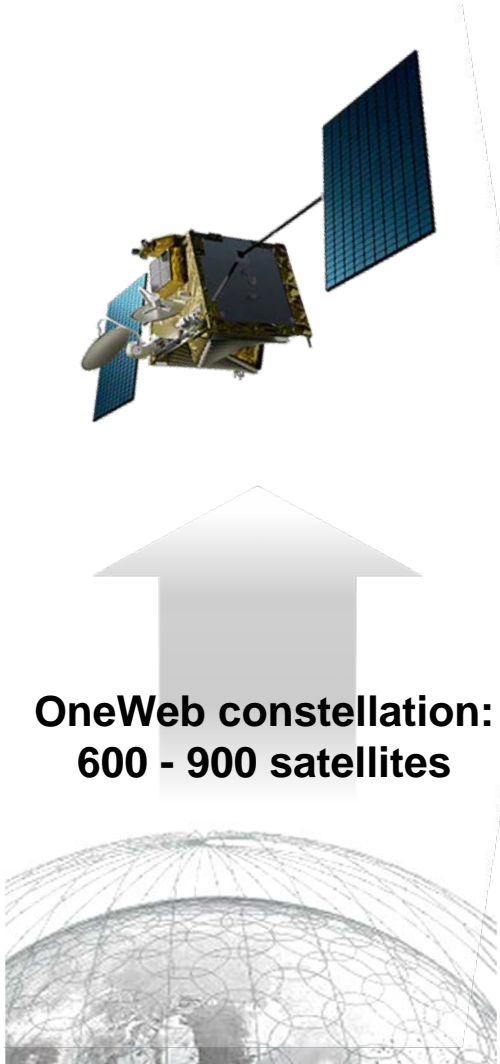
- Located near Kennedy Space Center
- Adds two manufacturing lines to the current line in Toulouse
- Ready for production in early 2019



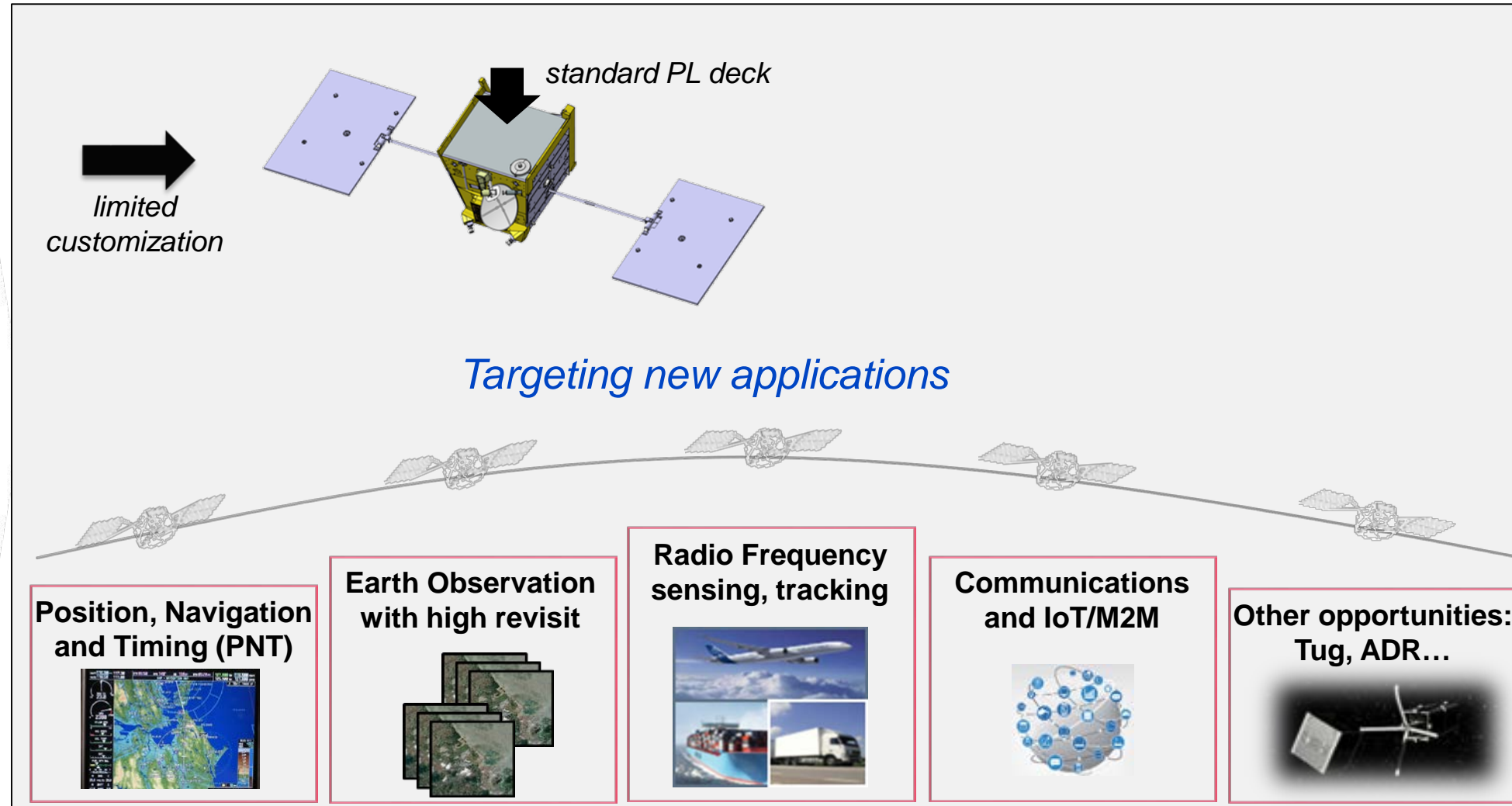
The machine that makes the machine



Enabling New Applications



**OneWeb constellation:
600 - 900 satellites**



PNT (Position, Navigation, and Timing) – GPS / Galileo augmentation or alternatives
Active Debris Removal (ADR)

Internet of Things (IoT)
Machine to Machine (M2M)

News Release: Airbus wins DARPA contract

- Defense Advanced Research Projects Agency (DARPA)
- Engineering work through Preliminary Design Review - \$2.894M
- Commercial satellite buses paired with military sensors and payloads
- Low-earth orbit constellations and mesh networks of lower size, weight and cost



AIRBUS



DEFENCE AND SPACE

Press Release

SPACE SYSTEMS

Airbus wins DARPA contract to develop small constellation satellite bus for Blackjack program

HERNDON, Va., USA, 14 January 2019 - Airbus Defense and Space Inc. has been awarded a contract from the Defense Advanced Research Projects Agency (DARPA) to develop a satellite bus in support of the Blackjack program.

DARPA describes the Blackjack program as an architecture demonstration intending to show the military utility of global low-earth orbit constellations and mesh networks of lower size, weight and cost. DARPA wants to buy commercial satellite buses and pair them with military sensors and payloads. The bus drives each satellite by generating power, controlling attitude, providing propulsion, transmitting spacecraft telemetry, and providing general payload accommodation including mounting locations for the military sensors.

Summary

- Airbus brings a large portfolio of satellites, space hardware and services to the global market place
- Airbus is developing a unique and proven satellite manufacturing capability for large low-Earth constellations in the US and is committed to additional growth in the US

Thank you

Tim Deaver
Director US Space Programs
Airbus Defense and Space, Inc.