



Digital Extras

Access exclusive online features for articles accompanied by this icon.

- 10 Feedback
- 12-14 Second Take
- 16 Up Front
- 18 In Orbit
- 135 Classified
- 136 Contact Us
- 137 Aerospace Calendar

DEFENSE

- 20 **Sierra Nevada and TAI** team up to offer Freedom Trainer for U.S. Air Force T-X competition
- 24 **New Air Force One** cost is too high, says general who negotiated last contract in 1985

ON THE COVER

Change has always been part of life, but it seems to be even more so heading into 2017. Our annual Aerospace & Defense issue examines the industrial, political and economic forces at play. And we project their impact on defense, space and aviation. The cover features a “selfie” like none other: NASA astronaut Tracy Caldwell Dyson snapped a picture of herself in 2010 on the International Space Station as she observed Earth moving by from the orbital outpost’s cupola. Aviation Week publishes a digital edition every week. Read it at AviationWeek.com/awst and on our app.

- 26 **Pentagon pushes** hard for a long-range, stealthy UAV surveillance aircraft
- 28 **Japan’s proposed** indigenous combat aircraft is bigger than the Lockheed Martin F-22
- 30 **Australia’s dominance** of longest routes set to increase with 787-9 Perth-UK nonstop service
- 32 **U.S. airlines bet** new Cuba services will pay off but face obstacles to building demand
- 34 **Airbus’s A3 modular** cabin concept promises new experiences for passengers

COMMERCIAL AVIATION

- 29 **Growth limitations** are beginning to emerge for some of Asia’s expanding low-cost carriers



- 36 **Simplicity is vital** to keeping production of Boeing's 787-10 stretch variant on track
- 38 **South Carolina** propulsion facility puts Boeing back in the nacelle business with work for 737 MAX

AEROSPACE & DEFENSE 2017



42

- 40 **Unprecedented** upheaval could loom for an industry that is used to thinking long-term
- 42 **Twelve areas** to watch in aerospace in a new year of unparalleled uncertainty

DEFENSE & SECURITY

- 44 **World Conflict Map:** Politics, terrorism and refugee crises change the security outlook

DEFENSE PROFILES

- 48 **U.S. Congress** is prioritizing readiness, troop increases with few changes to defense budget
- 50 **Canada continues** to waver on plans to replace its outdated CF-18 Hornet combat aircraft
- 51 **Brazil's defense** spending is projected to rise, despite pledge to freeze it for 20 years
- 52 **Stronger European** defense relations are being forged in light of Russian aggression
- 54 **Post-Brexit Britain** is likely to face challenges to planned boost in defense spending
- 56 **France increases** defense budget in response to terror attacks at home and in the Middle East

- 57 **Operations costs** from Ukraine to Syria add up, as Russian defense budget declines from 2016 peak
- 58 **Germany will choose** new systems in 2017 and spend €10 billion more on defense by 2020
- 59 **Post-coup purges** have taken a toll on Turkey's military staffing and equipment modernization plans
- 60 **Israel invests in** future systems, beefing up its air force and electronic warfare prowess
- 61 **Despite oil price** slump and costly regional conflicts, Middle East is still an influential fighter market
- 62 **New Chinese** fighters, UAVs and missiles are likely to start ops in 2017, as defense spending pays off
- 63 **F-35As top Japan's** fiscal 2017 defense budget, which continues its upward trajectory
- 63 **South Korea** increases budget for air-to-surface missiles and F-16s but keeps F-35 funding flat
- 64 **Rafale fighters** and rising staff costs consume much of India's limited modernization funds
- 64 **Australia and Thailand** are buying new maritime patrol aircraft, helos and submarines

DEFENSE SYSTEMS

- 66 **Joint Strike Fighter** is becoming the most sought-after combat aircraft internationally
- 70 **Trainer programs** progress worldwide, notably for the U.S. Air Force T-X competition
- 72 **Boeing KC-46** on surer footing; Airbus, Embraer, Lockheed Martin offer competitive aircraft
- 75 **Worldwide missile** market on upward trajectory through 2021, led by air defense weaponry

TOP TECHNOLOGIES

- 78 **Surveillance, strike** and countermeasures technology will be significant in 2017
- 86 **From pizza delivery** to military concerns, UAV technology will continue to advance adaptability
- 98 **Smallsat development** and launches will be dominant technologies in the new year
- 108 **Safety and efficiency** remain key objectives in commercial sector, and extend to UAV growth

ALTERNATIVE FUELS

- 93 **Biofuel commercialization:** A look at six providers of bio-based jet fuel and their customers

AEROSPACE SYSTEMS

- 82 **Military unmanned** air system makers eye commercial markets as civil roles widen
- 88 **Rotorcraft sector** bolstered by military deals that help counter softening commercial market



98

- 90 **Powerplant deliveries** are set to surge as first flights and new civil and military engines emerge
- 94 **SpaceX and ULA** will square off for commercial and defense space launches in 2017
- 96 **Pentagon considers** commercial satellites for some missions so it can focus on space asset revamp



COMMERCIAL AVIATION

100 **Several new aircraft** models are set to begin flight tests or enter commercial service in 2017

110 **Airline data snapshot:** Slowing traffic growth, lower profits and huge aircraft-order backlog



127

BUSINESS AVIATION

104 **The search** continues for a business model that can help generate faltering demand

AIR TRAFFIC MANAGEMENT

106 **Growing numbers** of small UAVs are pushing the pace of evolution in managing airspace

AIR TRANSPORT PROFILES

- 112** **U.S. commercial** sector remains on an even keel following rocky years at the turn of the century
- 115** **European airlines** continue to face challenges from Brexit fallout, terrorism and overcapacity
- 117** **Revenue pressure** and infrastructure challenges hinder Asia-Pacific-region airlines
- 119** **Middle Eastern** carriers struggle with declining yields even as passenger traffic keeps growing
- 120** **New routes and** partnerships will boost Latin American and Caribbean air travel in new year

121 **Brazil's airlines** seek ways to access fresh capital or consolidate to stay aloft

122 **Air freight** operators look to e-commerce, pharmaceuticals as expansion opportunities

MAINTENANCE, REPAIR & OVERHAUL

124 **Global civil aviation** aftermarket is predicted to grow in 2017 by \$10 billion, to \$78.4 billion

124 **India and China** will lead the world in MRO growth in 2017-26, Aviation Week forecasts

126 **Top 10 new** directions for the aftermarket in 2017 include focus on predictive maintenance

127 **Boeing 737 and IAE V2500-A5** are expected to generate biggest MRO expenditures in new year

129 **Many general aviation** operators could miss the FAA deadline to equip with ADS-B avionics

131 **Aviation aftermarket** is on the cusp of a data renaissance with enhanced aircraft analytics

132 **Regulatory challenges** in 2017 include rules for maintenance technician schools, drug testing



138

133 **MRO industry** initiatives, products, services aim for eco-friendly aircraft maintenance

AN APPRECIATION

138 **John Glenn**, first American to orbit Earth, was both a straight arrow and a self-promoter