

The Aerospace Update



Starman in a Red Roadster

Feb. 8, 2018

Video Credit: SpaceX

Falcon Heavy Nails Debut Test Flight

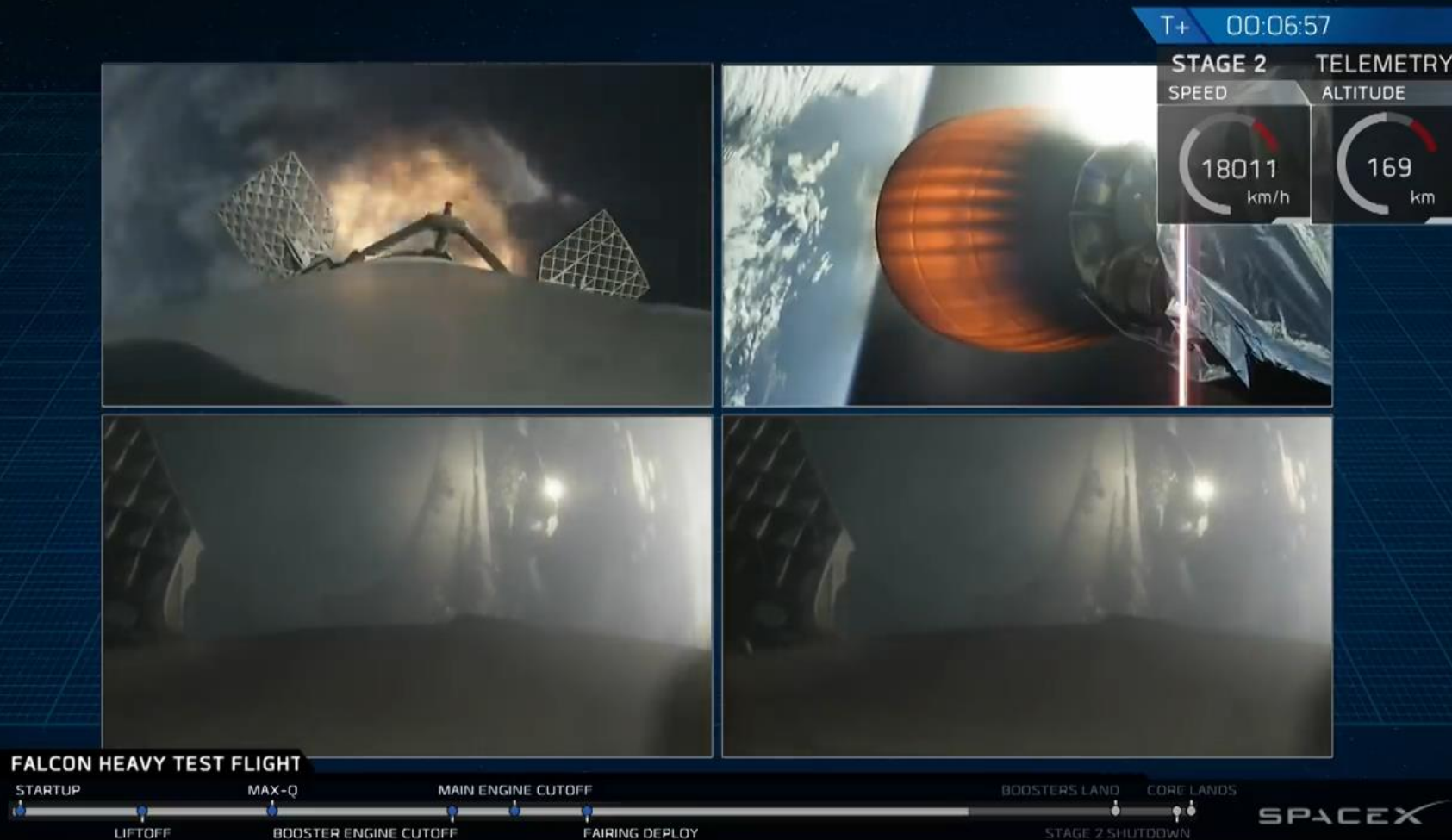


Video Credit: SpaceX

A SpaceX Falcon Heavy rocket blasted off from Kennedy Space Center's Launch Complex 39 on Feb. 6th for its long-awaited first test flight to validate the design of the triple-core first stage, side booster separations and an extended, six-hour coast of the second stage through the Van Allen radiation belts to deposit a simulated payload—Elon Musk's sports car—into a heliospheric orbit. The mission continued into the night, with the second stage completing a pair of engine burns and then coasting for six hours in a highly radioactive regime before restarting for a third time. The prolonged coast of the second stage was designed to dispatch Musk's red Tesla roadster on a whimsical voyage around the Sun that reaches as far as Mars, SpaceX's long-term goal.

Text Source: Irene Klotz @
Aerospace Daily & Defense Report

2 of the 3 Boosters Recovered



2 min. and 33 sec. after launch, the side boosters separated, leaving SpaceX mission control in much more familiar terrain, with a single-stick Falcon that burned for another 31 sec. “It becomes like a Falcon 9 at that point,” Musk said.

The side boosters, both of which had been used on previous Falcon 9 missions, flipped around and headed back to landing pads at Cape Canaveral Air Force Station, touching down in unison accompanied by a quartet of sonic booms. Meanwhile, the structurally reinforced center core separated from the upper stage and attempted to touch down on a drone ship floating about 300 mi. off of Florida’s east coast.

The booster ran short of propellant however and was unable to restart its engines for a braking burn in the lower atmosphere. Instead, it plowed into the ocean at a speed of 300 mph, narrowly missing the drone ship. The impact damaged two of the ship’s thrusters, Musk told reporters after the launch, adding that the company did not plan to reflly any of the Falcon Heavy cores.

'Starman' Puts Earth in the Rearview Mirror

Now in an elliptical orbit around the sun, the Tesla Roadster launched atop a SpaceX Falcon Heavy rocket Tuesday, Feb 6th, during the powerful booster's maiden flight, passed beyond the moon's orbit overnight Wednesday and will reach the orbit of Mars in July as it puts Earth in its rear view mirror, analysts said. About six hours after launch, the Falcon Heavy's upper stage engine ignited for a third time, boosting the Tesla's velocity high enough to carry it out of Earth's gravitational reach. Confirming the rocket firing, SpaceX released initial data indicating the Roadster was headed for an elliptical orbit around the sun with a high point, or aphelion, out in the asteroid belt, well beyond the orbit of Mars. However, an update on Wednesday clarified the trajectory showing the Tesla is, in fact, in a solar orbit with a high point just beyond Mars, as initially predicted by SpaceX, and not on a long drive deep into the asteroid belt.

Photo Credit: SpaceX

Text Source: William Harwood @ SpaceFlightNow.com

China Lofts Earthquake Research Craft with Cluster of Smaller Satellites

A Chinese Long March 2D rocket successfully delivered seven satellites into a 300-mile-high (500-kilometer) orbit Friday, Feb. 2nd boosting international missions to measure seismic signals that could help predict future earthquakes, take detailed imagery of planet Earth and test compact camera, propulsion and radio technology. The main payload carried aboard the two-stage Long March 2D rocket was Zhangheng 1, a Chinese-built satellite designed to sense precursor signals emitted before earthquakes, research that could eventually lead to quake predictions. Nine scientific instruments aboard the 1,600-pound (730-kilogram) Zhangheng 1 spacecraft will measure Earth's magnetic field, plasma and other particles to search for disturbances triggered in the early stages of underground seismic events.

Text Source: Stephen Clark @ SpaceFlightNow.com



Photo Credit: Xinhua/Wang Jiangbo

Souped-up Sounding Rocket Lifts Off from Japan with Tiny Satellite



A modified sounding rocket originally designed to loft science instruments on high-altitude suborbital arcs blasted off Saturday, Feb. 3rd from the Uchinoura Space Center in southern Japan and soared into orbit to become the world's smallest satellite launcher. The SS-520-5 rocket lifted off at 0503 GMT (12:03 a.m. EST; 2:03 p.m. Japan Standard Time), the opening of a 10-minute window. It released a CubeSat into orbit seven-and-a-half minutes later, according to the Japan Aerospace Exploration Agency, which declared the launch a success. Developed by the University of Tokyo, the TRICOM 1R CubeSat carries a store and forward communications radio and an Earth-imaging camera.

Video Credit: JAXA

Text Source: Stephen Clark @ SpaceFlightNow.com

Cosmonauts upgrade station high-gain antenna on record-breaking spacewalk



Russian cosmonauts Alexander Misurkin and Anton Shkaplerov floated outside the International Space Station on Friday and installed an upgraded electronics box on a high-gain communications antenna at the aft end of the Zvezda service module. Planned six-and-a-half hour excursion, the work took longer than expected, and Misurkin and Shkaplerov finally returned to the Pirs airlock closing out Friday's spacewalk at a duration of 8 hours, 13 minutes. The Lira antenna and its old electronics system launched with the Zvezda service module in July 2000. But Russia's Luch satellite fleet, similar to NASA's Tracking and Data Relay Satellite System, was in disrepair and unable to provide message relay services to the space station. Russia launched three new Luch satellites between 2011 and 2014 with S-band and Ku-band communications capability, but the electronics equipment on the station's Lira antenna was outdated and in need of an upgrade to be fully compatible with the Luch spacecraft.

Text Source: Stephen Clark @ SpaceFlightNow.com

Photo Credit: Roscosmos

Single-Person Spacecraft Design Passes Pool Test



Image Credit: Genesis Engineering Solutions

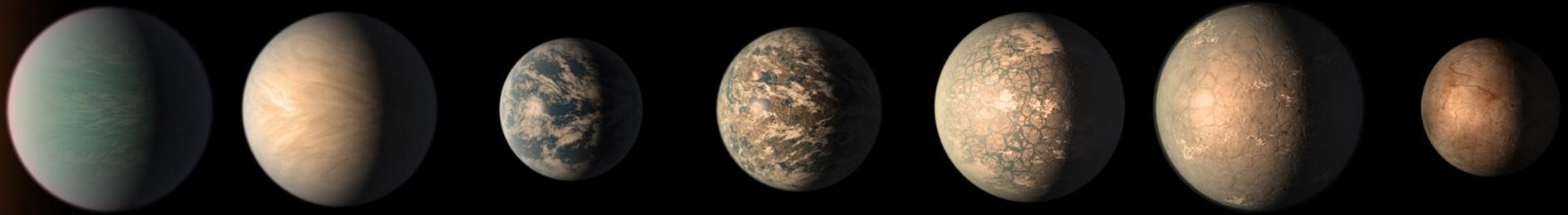
Putting on a spacesuit is one of the most dangerous activities for astronauts. During spacewalks, there is little protection against micrometeoroids, which can puncture the protective suits. Occasionally, the suits themselves suffer failures that can threaten the life of the astronaut.

To avoid this dangerous situation, what if astronauts could do activities that normally require a spacewalk with a maneuverable single-person spacecraft instead? That's the vision that the Maryland-based company Genesis Engineering Solutions suggests could work for future missions, including missions to NASA's proposed Deep Space Gateway near the moon.

In the company's proposed spacecraft design, the vehicle would be attached to the larger station or living space, and all an astronaut would need to do is shimmy through the bottom of the spacecraft to get inside it. It would be equipped with little robot arms to do repairs, and lots of fuel to zoom to even distant areas of the space station.

Text Source: Elizabeth Howell @ Space.com

New Clues to Compositions of TRAPPIST-1 Planets



The seven Earth-size planets of TRAPPIST-1 are all mostly made of rock, with some having the potential to hold more water than Earth, according to a new study published in the journal *Astronomy and Astrophysics*. The planets' densities, now known much more precisely than before, suggest that some planets could have up to 5 percent of their mass in water -- which is 250 times more than the oceans on Earth. The form that water would take on TRAPPIST-1 planets would depend on the amount of heat they receive from their star, which is a mere 9 percent as massive as our Sun. Planets closest to the star are more likely to host water in the form of atmospheric vapor, while those farther away may have water frozen on their surfaces as ice. TRAPPIST-1e is the rockiest planet of them all, but still is believed to have the potential to host some liquid water.

Text & Image Credits: NASA/JPL-Caltech

Combined Optics, Science Instruments of NASA's James Webb Space Telescope Arrive in California



Video Credit: NASA

The two halves of NASA's James Webb Space Telescope now reside at Northrop Grumman Aerospace Systems in Redondo Beach, California, where they will come together to form the complete observatory. Webb's optical telescope and integrated science instrument module (OTIS) arrived at Northrop Grumman Feb. 2, from NASA's Johnson Space Center in Houston, where it successfully completed cryogenic testing. During this summer, OTIS will be combined with the spacecraft element to form the complete Webb observatory. Once the telescope is fully integrated, the entire observatory will undergo more tests during what is called observatory-level testing. Webb is scheduled to launch from Kourou, French Guiana, in 2019.

Source: www.nasa.gov/webb

Airbus' Drone Taxi Takes To The Skies For The First Time



When Airbus first announced its plans to develop a self-flying taxi, it sounds like a fever drama of a sci-fi fan. Now, the aerospace giant has proven that it wasn't joking: Airbus' Vahanna team has successfully flown their autonomous air taxi dubbed "Alpha One" for the first time. Sure, it only reached an altitude of 16 feet and remained in the air for 53 seconds before descending, but it did so while fully self-piloted. The team conducted another test flight the same day and by the sounds of things, that one also went well.

Source: Mariella Moon @ msn.com

Photo Credit: Engadget

Boeing Unveils 737-7, Smallest MAX Variant



Boeing is preparing to begin flight tests of the third, and smallest member of the 737 MAX family, the 737-7, following the rollout of the first aircraft at its Renton factory in Washington on Feb 5. Boeing is scheduled to deliver the 737-7 in 2019 but hopes the positive news from upcoming flight tests will help stimulate further sales of the variant. While overall sales of the MAX have mushroomed to almost 4,100, the 737-7 has lagged behind. Despite a redesign of the -7 in 2016 to add range and increase passenger capacity by adding 12 seats, Boeing still has fewer than 70 acknowledged firm orders for the variant – compared to more than 2,100 for the -8 and around 274 for the stretched -10.

In The News



SpaceX No Longer Planning Crewed Missions on Falcon Heavy. SpaceX is backing away from one potential use of the vehicle, launching crewed missions beyond Earth orbit. SpaceX Chief Executive Elon Musk said the progress the company was making on an even larger vehicle made it unlikely that the Falcon Heavy will ever be used for launching crewed spacecraft. “What we decided internally is to focus our future development on BFR,” he said, referring to a fully-reusable launch vehicle formally known as Big Falcon Rocket. *(Jeff Foust @ SpaceNews.com)*



Detailed design starts on 737 Max 10. Boeing is on course to deliver the first 737 Max 10 in 2020 after the program passed the milestone of firm configuration, clearing the way for detailed design to begin. Launched at the Paris air show last year, the Max 10 is developed from the Max 9, incorporating a 1.68m (66in) stretch to increase seating to up to 230 passengers. It takes the CFM International Leap-1B powered 737 family into direct competition with the Airbus A321neo. *(Max Kingsley-Jones @ FlightGlobal.com)*



Sierra Nevada Gets Launch Window From NASA For Dream Chaser. Sierra Nevada Corporation (SNC) received NASA's Authority to Proceed for the Dream Chaser spacecraft's first mission, with a launch window for late 2020. The mission will provide cargo resupply to the International Space Station under the Commercial Resupply Services Contract 2 (CRS2). Dream Chaser will deliver up to 5,500 kg (12,125 lb) of pressurized and unpressurized supplies and scientific research payload to the ISS and return up to 2000kg of cargo via pinpoint landing at NASA Kennedy Space Center (KSC) Shuttle Landing Facility (SLF) for immediate post-landing handover to customer, maximizing the integrity of data collected on-orbit. *(SpaceRef.biz)*



Airbus To Offer A320neo To Military Customers. Airbus could begin competing head-to-head with the Boeing 737 in the large commercial derivatives market, offering the A320neo for roles such as armed maritime patrol and airborne early warning. The company announced at the Singapore Air Show on Feb. 7 that the A320neo (new engine option) is being considered for the global military aircraft market. *(James Drew @Aerospace Daily & Defense Report)*