Rocket Report: Starship set for static fire test, meet “The Dorado” booster

Enlarge / The mighty Delta IV Heavy rocket takes to the skies.

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Welcome to Edition 2.42 of the Rocket Report! Our report this week is filled with news about the biggest of boosters, from flight hardware for Omega to ongoing development of Starship and the near readiness of China’s most powerful rocket for its next mission.

As always, we welcome reader submissions, and if you don’t want to miss an issue, please subscribe using the box below (the form will not appear on AMP-enabled versions of the site). Each report will include information on small-, medium-, and heavy-lift rockets as well as a quick look ahead at the next three launches on the calendar.

Rocket Lab rolls out Electron in Virginia. In preparation for a launch in the third quarter of this year, Rocket Lab has rolled out the first Electron rocket that will lift off from Launch Complex 2, NASASpaceflight.com reports. This is the company’s launch site at Virginia’s Mid-Atlantic Regional

Spaceport. Construction on the launch site began in earnest in February 2019.

Tracking a pandemic, hoping for the best … The first mission from LC-2 will be the STP-27RM mission for the US Air Force's Space Test Program. Previously, the mission was expected to launch in the second quarter of 2020. However, due to delays from COVID-19-related closures, launch has been pushed back to the third quarter. (submitted by Ken the Bin and platykurtic)

A Singapore-based company reveals "The Dorado" rocket. Equatorial Space, a Singapore-based space-tech startup, says it is preparing its new sounding rocket for a launch attempt above the Kármán line. The slender, 6.5m-long rocket will weigh approximately 370kg once ready for its first mission in the fourth quarter of 2020, SpaceWatch reports.

Well, we like the name … "The Dorado will be made available in two versions, a single-stage vehicle designed to reach an apogee of 105km, and a two-stage version capable of reaching altitudes above 200km," Simon Gwozdz, the company's CEO, said. "This will provide our clients with approximately 3 and 6 minutes of weightlessness respectively." An orbital launch attempt by the company is possible as early as 2022. We had never heard of The Dorado before today, but we hope it leads the company to gold. (submitted by Ken the Bin)

Arianespace to resume spaceport activities in May. As European governments begin to emerge from their COVID-19 lockdowns, Arianespace said this week that it will begin a "gradual" resumption of activity beginning on May 11 at its Guiana Space Center in French Guiana. These activities will be carried out "in strict compliance with the health rules" set up by local governments and the French space agency.

Summertime launches on tap … Arianespace also confirmed the first two missions it would begin work on. The first rideshare mission on the Vega rocket, which will also be the vehicle's return-to-flight mission after a failure last year, is now scheduled for mid-June. And a dual-payload mission on the Ariane 5 rocket, for Intelsat and B-SAT, is set for the end of July.

Sea Launch has no plans for imminent launches. The two vessels that serve as a floating launch platform and command ship for Sea Launch are now in a Russian port, but the company's owner says no launches are planned for the foreseeable future, SpaceNews reports. Vladislav Filev—who is chairman of the board of S7 Group, the Russian airline that owns Sea Launch—said there currently was no opportunity to do anything with the vessels, "so we have frozen the program until better times."

Seventy launches in 15 years? … The two vessels had been based in the Port of Long Beach, California, since Sea Launch started operations in the late 1990s. They were used for launches of the Zenit-3SL rocket, a medium-lift rocket, most recently in 2014. In 2016, S7 Group announced an agreement to purchase Sea Launch from RSC Energia, which had become the primary owner during a reorganization after it filed for Chapter 11 bankruptcy protection in 2009. Filev said S7 Group paid about $150 million for Sea Launch, and he envisioned conducting 70 launches over 15 years with the system. (submitted by platykurtic, JohnCarter17, and Ken the Bin)

The Rocket Report: An Ars newsletter

The easiest way to keep up with Eric Berger's space reporting is to sign up for his newsletter, we'll collect his stories in your inbox.

UAE Mars mission arrives at launch site. An Emirati-built Mars explorer, named Al Amal ("Hope" in English) and developed by engineers at the Mohammed bin Rashed Space Center, has been

shipped to the JAXA-run Tanegashima Space Center. Once there, it will undergo final checkouts and preparations ahead of its launch aboard a Japanese rocket, NASASpaceflight.com reports.

To the Red Planet from the Land of the Rising Sun … The launch window for this mission is currently scheduled to open July 14, with an arrival at the Red Planet set for early 2021. The vehicle arrived in Japan on April 24 and will fly on the experienced H2-A launch vehicle built by Mitsubishi Heavy Industries. (submitted by Ken the Bin)

Big rockets will play a big role in Artemis. NASA revealed its selections for a Human Landing System on Thursday, and the winners are Blue Origin's "National Team," a Dynetics-led team, and SpaceX. The agency's chief of human spaceflight, Doug Loverro, said a final architecture has not yet been chosen for the Artemis 3 mission planned in 2024, which will be the first human landing. That will depend on which landing system NASA chooses, Ars reports.

To SLS or not to SLS … However, the first mission will look something like this: for Blue Origin and Dynetics, the crew would launch in Orion on top of Block 1 of the Space Launch System rocket to high lunar orbit. Then, an integrated lander would meet them there, having launched on a commercial rocket. (New Glenn for Blue Origin; Vulcan for Dynetics). Starship would launch on Super Heavy with the crew inside.

SLS managers concerned about fuel leaks. Earlier this year, NASA moved the big rocket's core stage to a test site at Stennis Space Center in southern Mississippi. Before the COVID-19 pandemic temporarily halted work, NASA and Boeing teams were working toward a critical summer exercise. During this "green run" test, the clamped-down rocket will ignite its engines and burn for about eight minutes to simulate an ascent

into orbit, Ars explained.

The purpose of a fuel tank is to contain the fuel … The General Accounting Office's new "Assessments of Major NASA Projects" report raises the possibility of fuel leaks. "Program officials indicated that one of the top remaining technical risks to the green run test is that the core stage may develop leaks when it is filled with fuel," the report states on page 82. "According to these officials, they have conducted extensive scaled testing of the gaskets and seals used in the core stage; however, it is difficult to precisely predict how this large volume of liquid hydrogen will affect the stage." We hope so.

Starship passes a cryogenic test. Late on Sunday night, SpaceX completed a critical cryogenic test of a Starship prototype at its launch site in South Texas. During the successful test, chilled nitrogen was loaded into pressurized fuel tanks. The vehicle, dubbed SN4—which stands for Serial Number 4—was pressurized to 4.9 bar, or 4.9 times the atmospheric pressure at the surface of the Earth. This pressure is not as high as Starship's fuel tanks and plumbing system are designed to withstand, but it is enough for a basic flight, Ars reports.

Friday night lights … Since November 2019, the company has lost three full-scale Starship prototypes during cryogenic and pressure tests. The most recent failure came on April 3. This is the first time a vehicle has survived pressure testing to advance to further work. Such tests are designed to ensure the integrity of a rocket's fueling system prior to lighting an engine. Now, Musk said, SpaceX engineers will attach a single Raptor engine to this vehicle and conduct a static fire test. The company hopes to move forward with the test Friday night.

Long March 5B rolls out to the launch pad. China is readying its large Long March 5B launcher Wednesday for a mission to prove space station launch capabilities and test a new spacecraft for deep space human spaceflight. Images of the

Long March 5B shared on Chinese social media indicated that rollout at Wenchang Satellite Launch Center was completed early April 29, SpaceNews reports. Launch from the coastal Wenchang launch site can now be expected around May 5.

A high-profile mission … The payload for the test launch—a prototype new-generation crewed spacecraft—will be loaded with nearly 10 tons of propellant. This will both make the spacecraft analogous to a 20-ton-plus space station module and allow the prototype to reach higher orbits and test a high-speed reentry. The mission will resemble the 2014 Exploration Flight Test 1 of the Orion spacecraft. The new spacecraft is expected to reach an apogee of around 8,000km. (submitted by Ken the Bin, platykurtic, and JohnCarter17)

Northrop Grumman begins building Omega flight hardware. After reviewing the results of first and second stage tests of its Omega rocket, Northrop Grumman says the vehicle is ready to move forward to its next phase of preparation for a debut flight in 2021. The first and second stages of the Omega rocket, named C600 and C300 respectively, use a large diameter case known as the Common Boost Segment that the company developed with U.S. Air Force funding, SpaceNews reports.

Seeking Air Force contracts … Both static fires "as well as other subsystem testing, complete all Common Boost Segment motor testing prior to the first flight of the intermediate configuration of the Omega launch vehicle," Northrop Grumman said. Northrop Grumman is one of four companies competing for two contracts to be awarded later this year by the US Space Force to provide launch services for five years starting in 2022. (submitted by platykurtic, JohnCarter17, and Ken the Bin)

Falcon Heavy will attempt dual droneship landing. The next Falcon Heavy mission, due to fly no earlier than late 2020, will send a 3.7 metric ton satellite and an unknown number of secondary spacecraft directly to geostationary orbit,

Teslarati reports. This is the first time SpaceX has attempted an energy-intensive direct-to-GEO launch.

Let's hope they're not synchronized swimmers … For this mission the Falcon Heavy rocket will employ an expendable core stage and two side boosters that will attempt simultaneous sea-based landings on separate drone ships. The U.S. Space Force launch will be the Falcon Heavy's first "high-priority national security mission" for the military. Should be fun to watch. (submitted by Ken the Bin and DanNeely)

Next three launches

May 5: Long March 5B | Test flight of next-generation crew capsule | Wenchang Satellite Launch Center, China | TBD

May 7: Falcon 9 | Starlink-7 | Cape Canaveral, Fla.| 11:30 UTC

May 16: Atlas V | USSF 7 mission | Cape Canaveral, Fla. | TBD

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