1 AUGUST 2021

THE FINAL FRONTIER FLASH

Developments & Analysis of the Space Domain

In This Issue

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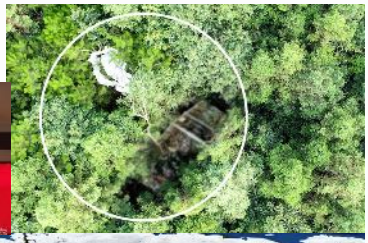
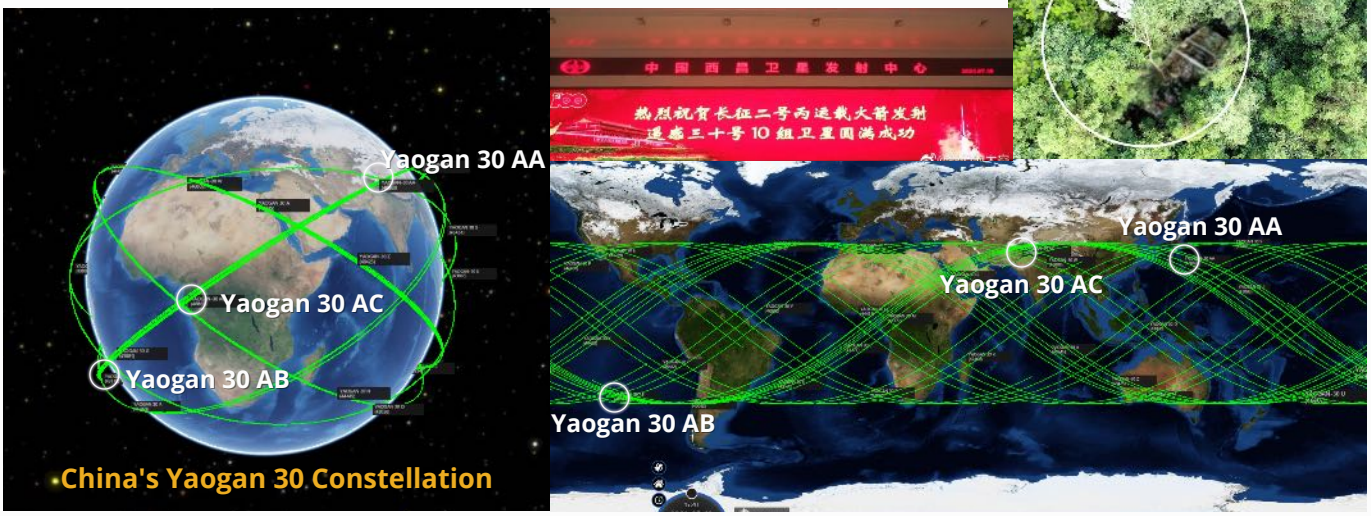
Rinse-Repeat: China Launches Another Yoagan-30 Trio

19 July 2021: China launched a Long March/Chang Zheng 2C rocket from the Xichang Satellite Launch Center. The launch carried three Yaogan-30 remote sensing satellites and the Tianqi-15 communications satellite. In addition to successfully delivering the satellites to orbit, the launch also included an experimental attempt to recover the rocket's payload fairings.

Launch VIDEO.



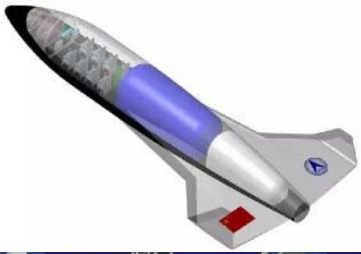
- Three Yaogan-30 satellites were flown on this mission, and were the tenth and final group of such satellites to be launched. With this launch, the Yaogan-30 satellite constellation now contains 27 active satellites. All are in a 600km orbit at 35° inclination.
- The Yaogan-30 satellites and constellation are suspected to support military intelligence like SIGINT, similar to the American Naval Ocean Surveillance System, known as NOSS, used by the U.S. Navy.
- Like the last launch in this constellation, Yaogan-30 Group 9, the mission carried a rideshare payload, the Tianqi-15 satellite. The Tianqi-15 satellite is an internet of things (IoT) data relay satellite.
- The Yaogan-30 constellation satellites are organized into 6 orbital planes. This latest batch of satellites joins 6 others to create the most populated orbital plane with 9 satellites. There is one other plane with 6 satellites, the remaining 4 planes have 3 satellites each.
- In order to support an experimental recovery attempt, the payload fairings for the mission were strengthened based on data from previous fairing recovery attempts. For the first time, these fairings were designed to open their parachutes at a high altitude. See Video.
- The fairings also had an improved electrical system for their parachute hardware. These recovery technologies on the fairings are being tested to improve control of debris landing inland on potentially populated areas.
- The fairings had a noticeable blue tarp during integration and appeared to have been removed just prior to launch.

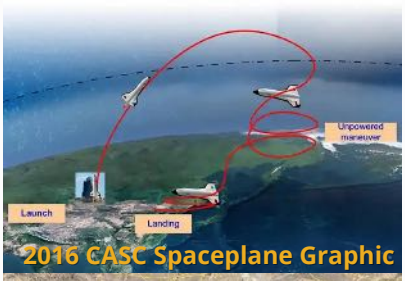


Open source reporting indicates this is the final launch of the Yaogan-30 constellation although future launches may occur to increase satellite density in the remaining 5 orbital planes. Open sources also report that some of the Yaogan-30 satellites may have Synthetic Aperture Radar (SAR) imaging capabilities. In the past 3 months China conducted 3 Yaogan-30 launches placing 9 satellites in orbit.

China Launches Secret Suborbital Vehicle

16 July 2021: China conducted a clandestine first test flight of a reusable suborbital vehicle as a part of development of a reusable space transportation system. The vehicle launched from the Jiuquan Satellite Launch Center and later landed at Alxa Right Banner Badanjilinan Airport, 220 km southeast of Jiuquan.





2016 CASC Spaceplane Graphic

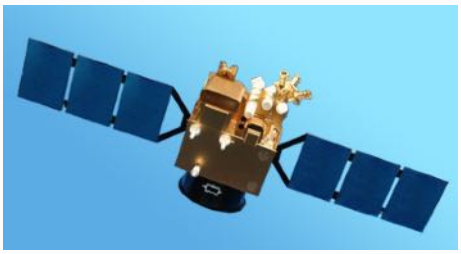

July 2021 Flight Path

- The CASC release stated the vehicle uses integrated aviation and space technologies, and indicated a vertical takeoff and horizontal landing (VTHL) profile. No images, footage, or further information such as altitude, flight duration or propulsion system was provided.
- China stated in 2017 it aimed to test a reusable spaceplane in 2020. A spaceplane project was included in a 2017 CASC 'space transportation roadmap'. The plans also included fully reusable launch vehicles and, around 2045, a nuclear-powered shuttle.
- Chen Hongbo, from CASC's China Academy of Launch Vehicle Technology (CALT), stated in 2017 that the reusable spacecraft would be capable of carrying both crew and payloads. Chen stated that some vehicles would have the characteristics of both aircraft and spacecraft. CALT was noted as the developer of Friday's suborbital reusable demonstration vehicle.
- In 2016 the projected design was described as an 11-ton vehicle with a wingspan of 21 feet capable of carrying five people.
- Chen stated the aim was full reusability, moving beyond partial reusability of Falcon 9-like launchers. The development and testing of the spaceplane is projected is by 2030 and should be capable of being reused more than 20 times. It will be oriented to orbital altitudes of between 300 to 500km, meet criteria of being "fast, reliable, and economical," satisfy the needs of military and civilian payloads, and be applicable for space tourism.
- The China Aerospace Science and Industry Corp. (CASIC), is working on its own spaceplane, named Tengyun. Demonstration and verification of the reusable two-stage-to-orbit Tengyun spacecraft is to be completed by 2025. Tengyun will be a horizontal takeoff, horizontal landing (HTHL) system.
- This latest test follows a September 2020 test flight of a "reusable experimental spacecraft". The spacecraft orbited for days, releasing a small transmitting payload and later deorbited and landed horizontally.

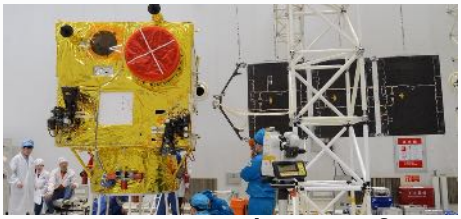
"The development of reusable space transportation technology is an important symbol of China's transition from "a 'big' space-faring nation to a 'powerful' space-faring one," CASC said in a statement about its spaceplane flight test. China's military will almost certainly operate reusable spacecraft in the future and has the same requirements as the US Air Force. They could use a spaceplane to get satellites into orbit, conduct reconnaissance missions, and perform other military tasks. The chief military advantage of spaceplanes is their payload bays, which enable them to launch and recover payloads, and then land on any sufficiently long runway in their path.

China launches Tianhui-1 (04)

29 Jul 2021: China launched Long March 2D rocket from the Jiuquan Satellite Launch Center carrying Tianhui 1-04, the fourth in China's series of Tianhui 1 Earth observation satellites. Launch VIDEO.

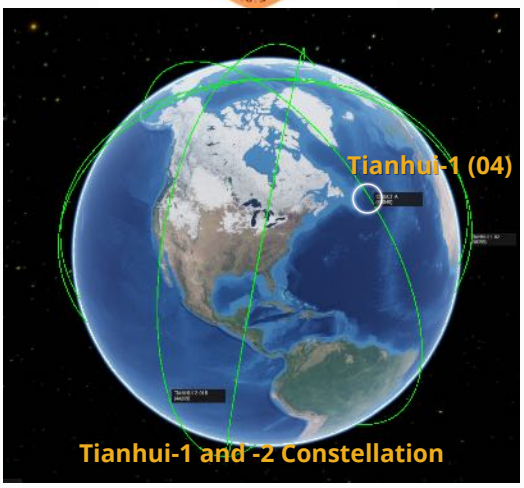


- The launched placed the approximately 1,000 kg satellite into a 97.3 degree inclined Sun-Synchronous Orbit, around 490 to 500 kilometers above the surface of the Earth.
- The Tianhui (or "sky drawing") constellation of satellites are Earth observation satellites built by Dong Feng Hong and operated by the People's Liberation Army.
- The Tianhui 1 series of satellites began launching in 2010 with the launch of Tianhui 1-01,
- Tianhui 1-02 and 1-03, the second and third spacecraft in the series, were launched in 2012 and 2015 respectively. The three previous Tianhui spacecraft, like 1-04, were also launched aboard Long March 2D vehicles.
- Each spacecraft is built off of the CSAT2000 spacecraft bus and is equipped with a number of electro-optical sensors.
- Like it's three predecessors, Tianhui 1-04 is equipped with three separate Earth observation cameras: a three-line array panchromatic camera with a spatial resolution of 5m, a panchromatic CCD camera with a spatial resolution of 2m, and a multi-spectral imager with a spatial resolution of 10m.
- There are also 2 Tianhui 2 satellites in orbit. Launched in 2019 they are believed to have a similar mission.



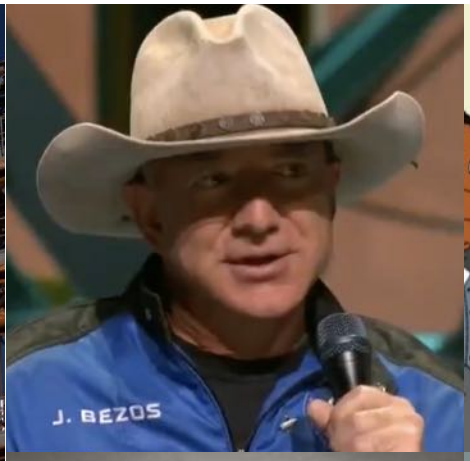
CSAT2000 Based Spacecraft

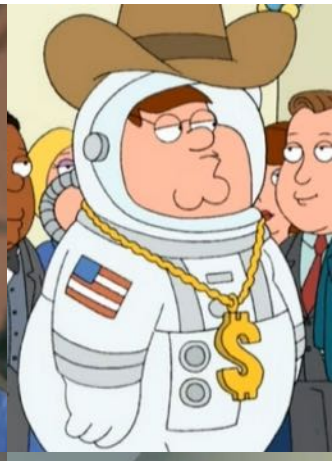
The Tianhui-1 satellites are part of the Ziyuan program that cover different civil and military earth observation as well as remote sensing programs. ***The Ziyuan-1 program is focused on Earth resources and looks to have two distinct military and civil branches. The Ziyuan-2 program is understood to be used for aerial surveillance, operated by Chinese People's Liberation Army (PLA), whereas the Ziyuan-3 series will be used for stereo imaging.***

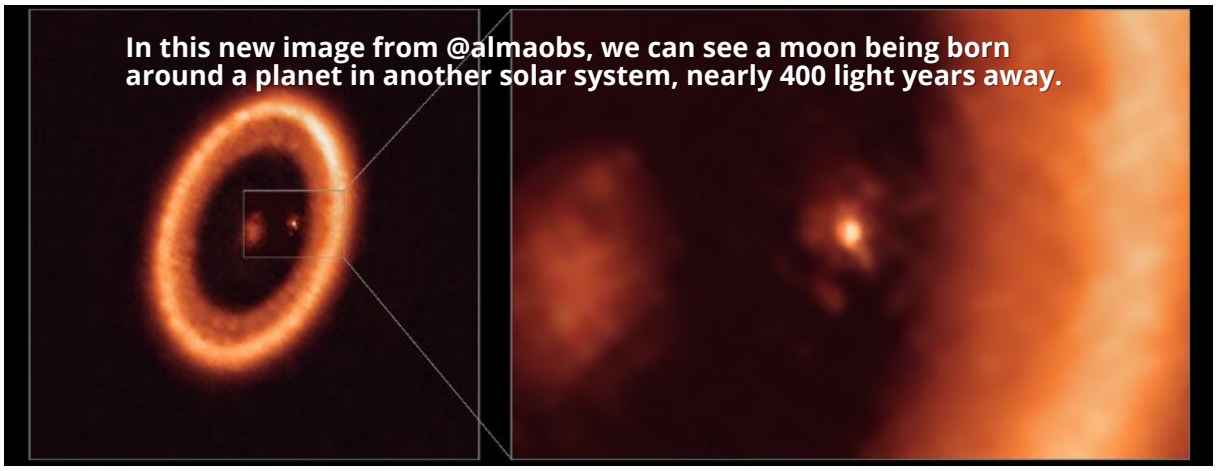


Tianhui-1 and -2 Constellation

Pics o' the week!







Electron Launch from New Zealand

First engineering prototype of the YF-90
2nd stage of the Long March 9

UK Establishes Space Command

Space exploration series blasts off at children's book expo

By Yang Yang | chinadaily.com.cn | Updated: 2021-07-29 15:11

Not space related at all...just amusing.