

Safely Moving Satellites Before Liftoff

By John Massenborg, President and Chief Executive Officer, AeroGo

ViaSat-2, the second-generation commercial communications satellite, has been successfully providing high-capacity connectivity and broadband internet services since it went live in February 2018, eight months after its launch.

Between launch and “live,” the Boeing-built satellite underwent a series of diagnostic tests as it reached its orbital path. Yet the most important positioning movements for the \$600 million bird may well have been those that occurred on the ground prior to the launch.

The location was the cleanroom for the satellite’s assembly and testing where any source of friction or less than precise movements are carefully monitored by partners ViaSat and Boeing. NASA, satellite companies and partners such as Boeing require that any and all equipment used in the cleanroom be incapable of harming the satellite.

Even relocation from the shortest of distances leaves no margin for error. Any damage to ultra-sensitive equipment would likely run in the millions as would costs from the inevitable project delays.

Another issue to be resolved in the cleanroom was elimination of external forces, vibration in particular, which could possibly de-calibrate ViaSat-2 and its components.

Smooth and carefully controlled movements without friction or vibration were mandatory if assembly and testing were to be successful.

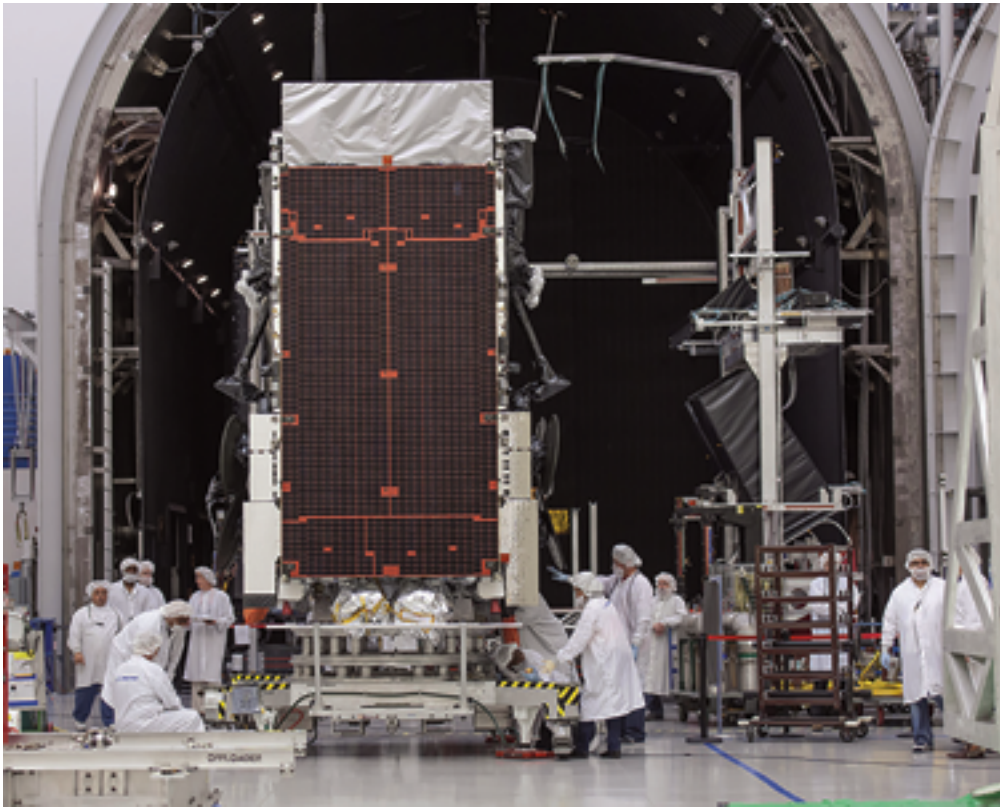
So much was at stake — ViaSat-2 is designed to bring “the fastest satellite speeds to some of the hardest-to-reach locations in North America... with seven times the broadband coverage over its predecessor ViaSat-1,” according to the company’s website.

The satellite delivers broadband speeds of 100 megabits/second with capacity of nearly 260 gigabits per second, which the company describes as “the highest capacity communications satellite globally.”

A number of aerospace and NASA contractors like Boeing have turned to the same solution — air bearings or air casters — as opposed to other load moving options to assure the safety of their invaluable products.



The world’s highest-capacity commercial communications satellite: ViaSat-2. Image is courtesy of Boeing



Air casters embedded in the structure move a satellite into a test chamber. Image is courtesy of Boeing.

This highly sophisticated satellite technology required very specialized equipment to move it in the cleanroom.

Boeing found its answer in the form of an air caster transport system. The transport system has load modules that are placed under each of the legs of the satellite mounting structure.

The system uses compressed air to inflate and float the load modules on a thin film of air. The inflated load module works similar to an air hockey puck in that it lifts and floats the satellite on an almost frictionless film of air.

This methodology lifts and moves all manner of structures and shapes in a precise, almost friction free manner while isolating the load from vibration.

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