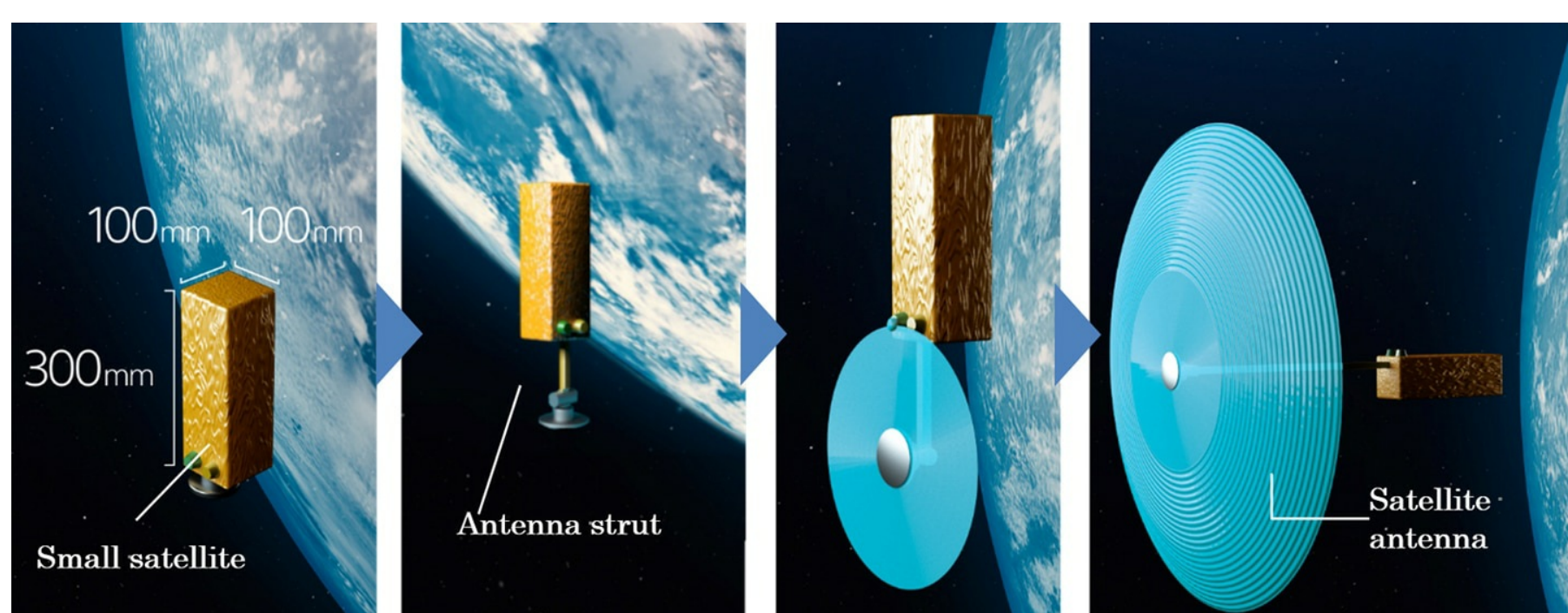


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On-orbit manufacturing and deployment of a satellite antenna in space (from left)

**TOKYO, May 17, 2022** - [Mitsubishi Electric Corporation](#) (TOKYO: 6503) announced today that the company has developed an on-orbit additive-manufacturing technology that uses photosensitive resin and solar ultraviolet light for the 3D printing of satellite antennas in the vacuum of outer space.

The novel technology makes use of a newly developed liquid resin that was custom formulated for stability in vacuum. The resin enables structures to be fabricated in space using a low-power process that utilizes the sun's ultraviolet rays for photopolymerization. The technology specifically addresses the challenge of equipping small, inexpensive spacecraft buses with large structures, such as high-gain antenna reflectors, and enables on-orbit fabrication of structures that greatly exceed the dimensions of launch vehicle fairings. Resin-based on-orbit manufacturing is expected to enable spacecraft structures to be made thinner and lighter than conventional designs, which must survive the stresses of launch and orbital insertion, thereby reducing both total satellite weight and launch costs.

Spacecraft antenna designs are challenging due to their conflicting requirements for high gain, wide bandwidth, and low weight. High gain and wide bandwidth necessarily require a large aperture, but economical orbital deployment conventionally dictates that designs be lightweight and small enough to fit or fold inside a launch vehicle or satellite deployment mechanism. Mitsubishi Electric's innovative approach—resin-based on-orbit manufacturing—efficiently realizes high-gain, wide-bandwidth, large-aperture antennas deployed from a lightweight, vibration-resistant launch package. By developing a 3D printer that extrudes a custom ultraviolet-curable resin formulated for vacuum, resin-based low-power freeform\* additive-manufacturing in space has now become possible.

\* Without requiring auxiliary support structures

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