



June 25, 2025

To whom it may concern,

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**World's first<sup>(\*)</sup> high-speed data communication experiment using terahertz waves  
between aircraft and ground test stations**

**High-speed data communication experiment using terahertz waves between  
aircraft and ground experiment stations**

The Japan Aerospace Exploration Agency (hereinafter referred to as "JAXA") and Waseda University Educational Corporation ( Waseda University ) announced in a press release on May 30, 2025, the success of a high-speed data communication experiment between aircraft and ground stations using THz waves. We are pleased to announce that the THz frequency conversion equipment designed and manufactured by our subsidiary, Tamagawa Electronics Company Limited.

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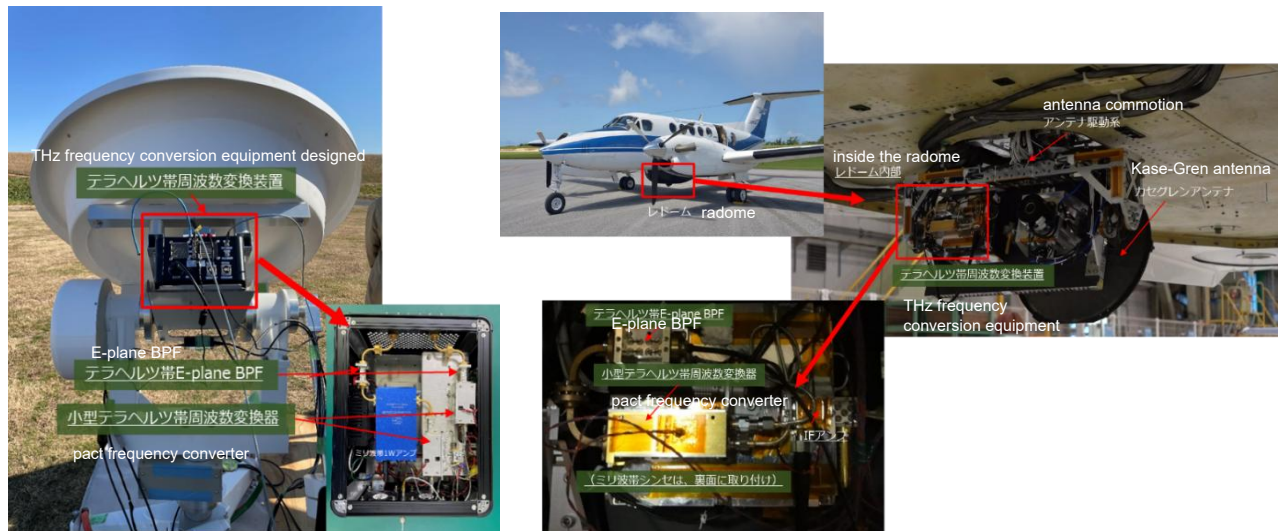
1. Outline

According to the Sensor Research Group of JAXA's Research and Development Directorate and the research group of Professor Tetsuya Kawanishi of the School of Science and Engineering, Waseda University, a compact and lightweight terahertz-band antenna subsystem (communication antenna and antenna tracking system) and receiver that can be installed on high-altitude platforms have been developed and will be installed on aircraft flying at an altitude of approximately 3 km. The antenna subsystem and receiver were mounted on an aircraft flying at an altitude of approximately 3 km, and high-speed, large-capacity communications (data transmission rate: 4 Gbps) between the ground and the upper space were demonstrated while the antenna was automatically tracked toward the ground. This is the first time in the world\* that high-speed, large-capacity communications using terahertz-band radio waves have been successfully achieved in data communications between an aircraft in high-speed flight and a ground experiment station.

Tamagawa Electronics designed, manufactured, and delivered to Waseda University a terahertz band frequency converter, one of the core technologies in the wireless communication system used in this experiment. The system consists of an "E-plane BPF" and a "compact frequency converter," and is used on both the ground station side and the aircraft side. The terahertz band design and ultra-wideband baseband design take communication quality into consideration and play an important function in terahertz band communications.

\*JAXA/Waseda University, May 30, 2025, "Development of a Compact and Lightweight Terahertz Band Antenna Subsystem for High-Speed Data Communications between Aircraft in Flight and Ground Test Stations

The antenna subsystem is designed to provide high-speed data communication between an aircraft in flight and a ground experiment station.



Designed terahertz band frequency converter for ground stations aircraft

Designed terahertz band frequency converter for

## 2. Future efforts

Tamagawa Electronics will continue to participate in research and development projects for next-generation mobile communications and develop products for the 6G era.

JAXA press release: [https://www.jaxa.jp/press/2025/05/20250530-1\\_j.html](https://www.jaxa.jp/press/2025/05/20250530-1_j.html)

Waseda University Press Release: <https://www.waseda.jp/inst/research/news/80951>

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