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Space Communication Technology

Space communication technology was put into practical use in the mid-1960s. Japan participated in a space communication experiment conducted with global cooperation, developed an experimental space communication facility using purely domestic technology, and completed the Ibaraki Space Communication Laboratory. An experiment with the US using the Telstar satellite and the reception of TV signals by the relay satellite 1 were successful. Based on these results, new technologies such as band compression were developed, earth station equipment was built at the Kashima branch, and the TV broadcasting of the Tokyo Olympics using the Cincom satellite 3 was successful. In addition, Cassegrain antennas for space communications that have high gain, low noise, high tracking accuracy, and are economical have been put into practical use. These technological developments and communication experiments have greatly contributed to space development and the development of space communication technology in Japan.

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Telemeters for Observation Rockets

In 1964, the observation rocket Lambda was completed, making many successful space science observations. For the realization of telemeters for observation rockets, after developing electronic components, electron tubes, and telemeter transmitters for rockets that can withstand harsh space environments, an all-transistor crystal controlled phase modulation telemeter transmitter was successfully developed. Automatic tracking reception by rocket mounted beacon radio waves, VHF band parametric amplifiers and high-sensitivity telemeter receivers were also successfully developed and put into practical use. These technological developments have contributed to the development of telemetry technology for observation rockets and astrionics in Japan.

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Quasi-millimeter Wave Satellite Communication Technology

Propagation experiments were conducted in a wide frequency band including millimeter waves using the Engineering Test Satellite II (Kiku No. 2), and the characteristics of high elevation propagation in the millimeter wave band were clarified. Based on these results, various quasi-millimeter-wave earth station devices and satellite-borne equipment were

developed, and the world's first quasi-millimeter-wave domestic satellite communication using communication satellite 2 (Sakura 2) was put into practical use. Later, a satellite transit network system was devised, in which the demand-assigned satellite communication system was integrated and operated in conjunction with the terrestrial switching network, and new satellite switching technology, demand assignment control technology and earth station configuration technology, etc. have been developed and put into practical use with this system. These technological developments have greatly contributed to the development of satellite communication technology in Japan.