SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Fixed and Broadcast Communications (4)

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HIGH-SPEED SATELLITE COMMUNICATIONS EXPERIMENTS FOR 622/1244 MBPS

Abstract

The National Institute of Information and Communications Technology (NICT) has developed a 622 Mbps and 1244 Mbps high-speed satellite communications network using the Wideband Internet Engineering Test and Demonstration Satellite (WINDS). The WINDS has two communication modes, namely, regenerative mode and bent-pipe-relay mode. High-speed satellite network are used in the bent-pipe-relay mode to realize the user data rates of 622 Mbps and 1244 Mbps. Satellite communication networks that operate in both modes are satellite-switched TDMA systems that enable an internet working IP connection. A high-speed burst modem was developed for installation in a terminal of the high-speed satellite network. We have developed a dual-rate burst modem prototype that operates at a user data rates of 622 Mbps and 1244 Mbps with a single carrier of QPSK modulation. We also developed a Large Earth Terminal (LET) of 4.8m diameter and a SDR-VSAT of 2.4m diameter for the high-speed satellite communications experiments. 622/1244 Mbps transmission test using the WINDS was conducted using this modems. The results showed that the Eb/No ratio required to achieve a BER at 10-10 with FEC was less than 10 dB and 13 dB for 622 Mbps and 1244 Mbps respectively. They also showed that the packet error rate test for WINDS satellite link as a TDMA satellite communications system and a three-dimensional 4K-HDTV transmission experiment were successfully completed.