

DIGITAL TRANSMISSION SYSTEM IMPLEMENTATION FOR THE AMERICAN SATELLITE COMPANY

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ABSTRACT

Planning for the implementation of the digital transmission system began in 1975. Conceptual design was completed in late 1976 which consisted of three major elements; (1) analogged digital conversion equipment for the communication central offices, (2) time division multiple access system and earth station networking, and (3) digital microwave equipment for interconnecting the central offices to the earth station. Two approaches were considered for the voice analog to digital conversion equipment. These were CVSD (delta modulation technique) and specialized adaptive PCM technique. Contracts for the hardware were awarded in early 1978 for all the major elements. Installation was completed in mid-1980 and the system was made operational in August 1980.

Unique features of the system are: (1) 64 MBPS TDMA first rate transmission at a BER of the order of 10^{-8} , (2) digital microwave system incorporating state-of-the-art adapted equivilization for compensating multipath effects and hitless switching between the redundant equipment, and (3) voice digitizing equipment which multiplexes up to 44 voice channels intermixed with direct digital channels onto a T-1 (1,544 MBPS) Bell Tel. carriers as opposed to conventional PCM digitization of 24 voice channels per T-1 carrier. The digitization also allows virtually error-free transmission of in-band data of up to 4800 BPS. This paper reports on the details of the equipment and the measured performance thereof.