ABSTRACT

A Thirty-Two Channel Integrated Voice and Data Multiplexer

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Over the past half century, telecommunications, digital, microelectronics and computer technologies have evolved, converged and interpenetrated. The resulting dialectic of dominant and niche technologies has led to the emergent dominance of the CCITT-sponsored ISDN, but it is appreciated that significant niche technologies will coexist and compete with ISDN.

This project explores one such potential niche: a low-cost voice-frequency (sampling frequency 6.250 kHz) multiplexing switched digital communications network based on a novel transmission protocol using the 6402 UART. The switch processor is based on the 6809 microprocessor, and the system was developed with purpose-built low-cost two-port memory development tools based on an EMMA II/VISA II eight-bit microcomputer, which served as Host System.

The network multiplexes thirty-two user channels, establishing up to sixteen simultaneous full-duplex 62.50 kbaud links (2.000 Mbaud through the switch) between user channels, and is proof of concept for a practical system for up to two hundred and fifty subscribers with integrated voice, data and possibly (compressed) video services.