

A Technological Perspective of Satellite Multiple-Access Arrangement in Relation to Wideband CDMA

Group Members:

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Description of DSPC Technology

Satellite communication consists of a microwave repeater in the sky that consists of a diverse combination of one or more of the following: receiver, transmitter, amplifier, regenerator, filter, on-board computer, multiplexer, de-multiplexer, antenna, wave-guide and about any other electronic device ever developed. Most of these devices use the knowledge of existing digital signal processing hypothesis especially the way in which these devices communicate with the earth stations.

DSPC Context

Satellite communication involves the usage of multiple access techniques. There are mainly three types of multiple-access method: TDMA, FDMA and CDMA. In this report, we will investigate these access mechanisms. In addition, we will focus on a special type of CDMA technology known as Wideband CDMA or WCDMA.

Technical Aspects

We will explore the following satellite communication system:

- Frequency Division Multiplexing Satellite Systems
- Single Channel per Carrier PCM multiple-access Demand Assignment Equipment (SPADE DAMA)
- Time-division multiplexing satellite systems
- Code-division multiplexing satellite systems
 - Direct Sequence
 - Frequency Hopping
- Wide-band CDMA transmission enhancement for satellite communication

Project Tasks

- Evolution of commercial satellite communication
- Brief Cost/Comparison of various satellite systems
- Description as well as application of current satellite communication techniques
- Focus on CDMA/WCDMA satellite communication technique
- Matlab/C/C++ based simulation of the satellite communication mechanism/technique (Optional)

Group Responsibilities

All project tasks have been equally divided among the group members.

Key Reference

- Electronic Communication Systems (Fundamentals through Advanced), 4th Edition, Wayne Tomasi, Prentice Hall International Inc, 2001