HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

"STUDY OF AVAILABLE CYTA SYSTEMS OF ACCESS NETWORK ARCHITECTURES"

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Chapter 1 - Introduction

Digital transmission systems, is one of the most fascinating and rapidly expanded subjects of electronic engineering. In a great extent, humans vital needs depend on data processing systems. The most important factor is the data transfer speed, which could be further increased if the overall operation is well studied and understood.

The project deals with the discussion of the various existing CYTA systems of access network architectures and how the network can be used in order to satisfy the arising needs. The organization has developed through years a very sufficient network. The evaluation of the existing network is important in order to verify its reliability and how to accomplish the best possible results out of it. It can be said that, the oncoming technologies are in a way based on certain basic principles of the existing network. Under these conditions, cable architectures play without doubt a major role and are studied separately. High speed transmission over the copper network and especially ADSL technology is discussed thoroughly. A reference is also made on the practical aspects and applications associated with the implementation of the new techniques, as well as a comparison between the various technologies.

The experiments-tests performed are of similar importance, since they show the response of the different systems under real-world conditions. This section mainly involves ADSL performance and other pilot tests. The utilization of application software packages is indeed one of the major topics in telecommunications area. In fact, only a general overview is given about it.

Last but not least, the MATLAB Communications Toolbox used with Simulink offers an excellent collection of simulation blocks for research, development, system design, analysis, and simulation in the communications area. The extensive set of ready-to-use functions and blocks, which can be easily modified to implement certain schemes, provides a compact and easy way to learn in greater depth.

Chapter 2 – Distribution Network

2.1 Introduction

The Authority' s distribution network connects the clients premise' s with the telephone exchanges existing in the country. First and foremost goal of this network is the sufficient branching of wired or wireless mediums so that the supply of telecommunication services is possible in the whole region. Mostly, it must be well designed in order to provide flexibility concerning future needs and fast detection, repairing of faults. These are only possible if a min quality level, min possible cost of the given service is assumed. As an example, the ITU (International Telecommunications Union) indicates that the max acceptable attenuation level of a signal from the telephone exchange to the client is 10dB and the max loop resistance level for each line is 1700Ω, including the telephone device resistance.

2.2 Distribution Network Architectures - General

The Authority 's Outside Plant (OSP) Network is responsible for the distribution of the telephone lines from the MDF (Main Distribution Frame) to every direction. An overview of the external network architectures is always vital for the better understanding of the overall system behavior. The chapter describes copper network, fiber network and network infrastructure, and outlines important architectural principles, on the basis of which the network is built.

2.3 Copper Network

The copper network comprises mainly cables spread in local areas and flexibility equipment and it is mainly used to provide subscriber lines that connect the customer premises with telephone exchanges.

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