

HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

MOBILE PHONE SYSTEMS

E. 1260

BY

MARIOS RASPOPOULOS

JUNE 2001

**HIGHER TECHNICAL INSTITUTE**  
**ELECTRICAL ENGINEERING DEPARTMENT**  
**DIPLOMA PROJECT**

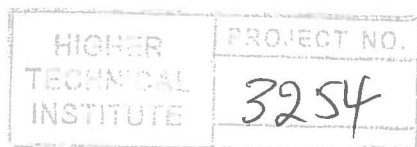
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**ELECTRICAL ENGINEERING DEPARTMENT**

**MOBILE PHONE SYSTEMS**

Project report submitted by

**MARIOS RASPOPOULOS**

In part satisfaction of the conditions  
for the award of diploma of technical engineer  
in Electrical engineering of the  
Higher Technical Institute

**JUNE 2001**

**HIGHER TECHNICAL INSTITUTE  
NICOSIA – CYPRUS**

**ELECTRICAL ENGINEERING DEPARTMENT**

**DIPLOMA PROJECT**

**Academic Year 2000/2001**

**Project Number: E.1260**

**Title: Mobile Phone Systems**

**Objectives:**

1. To study the various types of Mobile Phone Systems (systems, circuits, components etc).
2. Further study of the Mobile Phone Systems used by CYTA.
3. To investigate the use to different instruments used by CYTA including investigation of test results carried at CYTA and some companies.
4. To select, design, develop, construct, test and calibrate a Mobile Phone(s) and use it as a demonstration unit.

**Terms and Conditions**

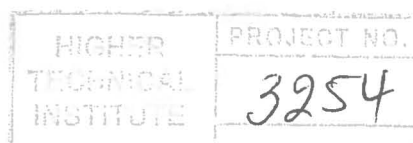
1. The demonstration unit should be compatible to CYTA Mobile Phone Standards.

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Supervisor : Mr D Lambrianides

External Assessor :

DL/ML



*Dedicated to my family and friends*

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## **SUMMARY**

This project deals with one of the fastest growing and most demanding telecommunications applications; The Cellular Mobile Communications. It begins with an introduction to Mobile Communications followed by a brief description of their main principles. Some of the most important cellular concepts are explained in chapter 3. Next, there is an overview of the four main systems used worldwide before the establishment of the GSM. In chapter 5 there is an analytical explanation of the Global System for Mobile Communications (GSM) and all of its parameters (architecture, functions, management etc.). Chapter 6 deals with Smart antennas, which are used in mobile communications. The next two chapters are mainly concerned with CyTA. There is an explanation of the Base Stations that are used by CyTA followed by some of the main tests, which are performed by the Authority on the system. As far as the handset is concerned, this project provides an analysis of the internal structure of the mobile phone, an analysis of the mobile phone signal as well as some tests, which are carried out on the mobile phone by some companies. The Wireless Application Protocol (WAP), which lets say, provides the Internet via a mobile phone is described in Chapter 12. The final chapter of this project deals with the passing to the third Generation of mobile communications (3G) and all the systems, which will be used in the near future.

This project would be suitable for use by a student of the HTI or the University in order to understand and get familiar with the mobile communication principles. CyTA can also use it as a training document for its new technicians.