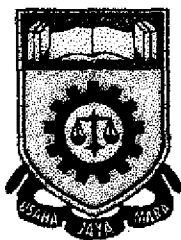


**A STUDY OF RADIO TRANSMISSION IN
CELLULAR TELEPHONE NETWORK**

**Project ilmiah presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Honours)
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Abstract

Wireless communications, particularly cellular communications seem to be moving forward at ferocious pace. Communications engineers are to come up with more innovative solutions to meet the demands of global communications and must therefore be aware of factors such as performance and coverage so that high grades of service can be maintained.

The Global System of Mobile Communications (GSM) was designed to be a global standard for digital cellular communications and for much of Asia and Europe at least, this aim has been met. Project work covered in this report brings together the results of detailed measurement and research work with the objective of comparison study of propagation loss versus distance between measured, predicted and drive test collected data in cellular telephone network environment.

Also comparison the signal strength between using the omnidirectional antenna and sectorised antenna. The comparison between has been made between Extended Total Access Communication System (ETACS) by using the Mobile Telephone Model SE 925 and calculated by Okumura-Hata's formula.

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CHAPTER 1

INTRODUCTION

1.1 GENERAL

The original idea of the project was based on the requirement by Cellular Network Service Providers and companies involved in Mobile Communications to assess current and future proposed coverage for cellular networks. This may be for the propose of monitoring network efficiency and the capacity of the signal strength versus distance based on measurement, prediction and drive test data. It is also benefit to those new coming students as to expose them with the equipment used in studying the transmission of radio signals between Radio Base Station (RBS) and mobile station (MS) using the Mobile Telephone Model SE 925 [1], which operates with Extended Total Access Communication System (ETACS) requirements.

Some network providers claim to give coverage to over 95% (*appendix 1*) of the Malaysia population with their current pattern of cell sites, but since the population is clearly not evenly distributed within the Malaysia land-mass, this figure tries to conceal the fact that as yet no cellular network can offer ubiquitous coverage. It therefore becomes of great value to network providers to have a means of identifying regions within catchment areas which do not offer consistently good call quality and where there is a greater probability of calls being lost; these area tend to where radio wave propagation is restricted by the terrain such as the presence of hills or mountains, deep valleys or signal paths which go through areas near very flat expanses. These all represent obstacles to transmit signals and will concern network planners since they can cause problems such as fading or poor speech quality on mobile hand-sets.