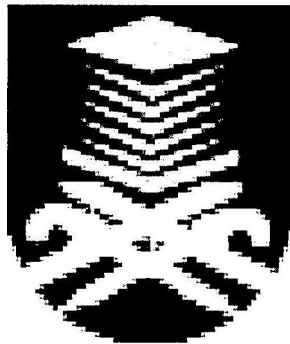


**SINGLE HAPS AIRSHIP INTERFERENCE TO FIXED WIRELESS
ACCESS STATION**

Project report is presented in partial fulfilment for the award of the
B. ENG. (HONS.) in ELECTRICAL ENGINEERING
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ABSTRACT

High Altitude Platform Station (HAPS) technology is a new technology that can perform the task currently handled terrestrial and satellite system. It is located at an altitude of 20 km to 25 km above the ground level to provide wireless access over a 400 km radius of footprint. The main objective of this paper is to study the interferences from the HAPS airship to the Fixed Wireless Access (FWA) station on the ground. Impact of using HAPS airship to the surrounding of FWA stations is analyzed. System performance is determined by the ratio of interfering powers to noise power, I/N ratio. All equations and methodologies used in interference and interference to noise ratio evaluation is done base on International Telecommunication Union Recommendation (ITU-R).

MATLAB software is used for simulation of the interference. The calculation is made for only the case of single entry and two under clear-sky condition. The minimum of interference to noise ratio, I/N of the downlink system in clear-sky has been obtained in order to determine the minimum interference level of HAPS downlink system.

Keywords- High Altitude Platform Station, Fixed Wireless Access, Interference.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

The increasing demand for broadband mobile communications has led to the successful and rapid deployment of both terrestrial and satellite wireless networks. In parallel to these two well-established ways for providing wireless communication services, in recent years another alternative has attracted the attention of telecommunication community and new technology utilizing high altitude platform station (HAPS) in the stratosphere is being developed. It is based on quasi-stationary aerial platforms operating in the altitude of 20-25 km above the earth surface [1-2]. HAPS technology is designed alternatively to perform the tasks currently handled by terrestrial and satellite systems including telecommunication, broadcasting services, surveillance of persons and goods, mapping, data collection and remote sensing [3].

QucompHaps is the sole telecommunication operator in Malaysia that provides the services using HAPS technology. They proposed to use a piloted M-55GN stratospheric aircraft as the height altitude platform station in Malaysia. It can fly up to five hours in a circular corridor at an altitude of approximately 20 km above ground level to provide wireless access over a 400 km radius of footprint. It has small latency and the bandwidth of HAPS is allocated to some other transmission technologies on the same platform [3].

High altitude platform network (HAPN) has a star configuration, with the platform serving as the main hub [4]. User terminals are portable devices that communicate with the payload directly and gateway stations are provided to allow user