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THE EFFECT OF RAINFALL ON 11.2 GHz
MICROWAVE LINK PERFORMANCE

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SUMMARY

Nowadays the development of digital radio relay systems are growing very rapidly. A knowledge of the rain attenuation at the frequency of operation is desirable in designing a reliable communication system at a particular location. The wave propagation at frequencies of 10 GHz can suffer from rain effects such as attenuation, scattering and depolarization. The magnitude of these effects depends on rain characteristics. Our objective was to find the rain effects on the microwave link performance at 11.2 GHz.

Continuous recording of signal level and rainfall has been carried out for four months. This paper presents results of the propagation experiments undertaken for the link between Bukit Gasing base station and Kelana Jaya base station.

The microwave attenuation was recorded using Yokogawa chart recorder at the AGC point of the receiver of DRS 140/11200 SEL microwave equipment. The rain measurement had been done at meteorological department located near Bukit Gasing. The line-of-sight distance between the two radio base stations is 6.51 Km.

From the observation, we can say that the links suffers

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CHAPTER 1

Introduction

1.1 Background

Communication has become more electronic since Samuel Morse sent the first public telegraph message in 1844. As the amount of the transmitted information increases, the bandwidth or frequency spectrum over which the information is transferred must increase.

Communication via radio or microwave began in 1895, when Guglielmo Marconi invented the wireless telegraphy. Radio communication uses large portion of the radio spectrum. As bandwidth requirements and the cost of laying coaxial cables rose in 1950s, many transmission links turned to microwaves. Today nearly every long distance telephone call, television program and data links involves a microwave link as a part of the system. Microwave frequency band can be defined as the frequency range from 1GHz to the frequencies where optical communications dominate (several gigahertz).

Microwave radio link must be along line of sight paths free of intervening obstructions between the transmitter