TABLE OF CONTENTS

Page

ABSTRACT.....1

1. INTRODUCTION.....1

2. SURVEY OF PREVIOUS WORK.....2

2.1. Results of Measurement Programs.....3

2.2. Some Height Gain and Polarization Effects.....11

2.3. Attenuation by Trees.....14

2.4. Multipath Fading.....17

2.5. Diversity Techniques.....21

3. PROPAGATION MODELS FOR URBAN AREAS.....23

3.1 Existing Propagation Models.....23

3.2. A Computer Prediction Model.....30

4. SUMMARY AND CONCLUSIONS.....34

5. REFERENCES.....36

APPENDIX - 1977 Modification of the Longley-Rice Computer Model 43

LIST OF FIGURES

Figures		Page
1.	Prediction curve for basic median attenuation relative to free space in urban areas over quasi-smooth terrain, referred to h_{te}= 200 m, h_{re} = 3 m. From Okumura et al. (1968).	26
2.	Median value of environmental clutter effect as a function of angle of elevation. From Kinase (1969).	27
3.	Median value of clutter effect as a function of frequency. From Kinase (1969).	27
A-1	Field strength (for 1 kW ERP) as a function of distance over a smooth homogeneous earth. Frequency 100 MHz, ε = 10, σ = 10 mS/m, h_1 = 20 m, h_2 = 0 to 20,000 m.	46
A-2	Attenuation relative to free space as a function of distance over a smooth homogeneous earth. Frequency 100 MHz, ε = 15, σ = 5 mS/m, h_1 = 5 m, h_2 = 5 to 2000 m.	47
A-3	Attenuation relative to free space as a function of distance over a smooth homogeneous earth. Frequency 300 MHz, ε = 15, σ = 5 mS/m, h_1 = 5 m, h_2 = 5 to 2000 m.	48
A-4	Attenuation relative to free space as a function of distance over a smooth homogeneous earth. Frequency 1000 MHz, ε = 15, σ = 5 mS/m, h_1 = 20 m, h_2 = 5 to 2000 m.	49