Contents

SECTION ONE	Introduction, 1
	1-1 Background material, 1 1-2 Why use microwaves, 3 1-3 Some basic considerations, 4
SECTION TWO	Microwave Transmission Theory, 7
	2-1 Transmission lines, 7 2-2 Waveguide, 19
SECTION THREE	Microwave Measurements, 23
	3-1 Microwave equipment, 23
	3-2 Frequency measurement, 24
	3-3 Attenuation measurement, 25
	3-4 Impedance measurement, 26
	3-5 Power measurement, 30
	3-6 Noise figure, 35
SECTION FOUR	Microwave Experiments, 41
	Equipment for experiments, 41
	Experimental data collection, 42
	RF power source, 42
	Safety precautions, 42
	Equipment handling, 42

EXPERIMENT

- 1. Reflex Klystron Characteristics, 45
- 2. Frequency Measurement, 57
- 3. Power Measurement, 69
- 4. Attenuation Measurement, 77
- 5. Measuring SWR, 85
- 6. Introduction to the Smith Chart, 93
- 7. More Characteristics of the Smith Chart, 117
- 8. Impedance Measurement Using the Smith Chart, 137
- 9. Bolometer Mounts for Microwave Measurements, 147
- 10. Power Bridges for Microwave Measurements, 155
- 11. Crystal Detectors, 165
- 12. Cable Measurements, 173
- 13. Mismatch Loss and Maximum Power Transfer, 183
- 14. Directional Couplers, 191
- 15. Microwave Transmission in Air, 199
- **APPENDIX A** Glossary of Microwave Terms, 213
- **APPENDIX B** Microwave Equipment Data Sheets, 219
- **APPENDIX C** Bibliography, 263