



Contents

Preface	vi
Acknowledgements	viii

Chapter 1: Overcoming the limitations	1
Types of backyard locations	1
Planning permission	5
Operating times	6
Siting an antenna	7
HF propagation	9
References	13

Chapter 2: Centre-fed antennas for HF	14
The resonant dipole	14
The vertical dipole	16
The ground-plane antenna	16
Multi-band antennas	19
References	27

Chapter 3: End-fed and Marconi antennas for HF and LF ..	28
Matching the multi-band end-fed antenna	29
Obtaining a good RF earth	30
A remote-controlled ATU	33
Alternative end-fed antennas	35
Marconi antennas for LF	39
References	41

Chapter 4: Matching and tuning	42
The T-network antenna tuner	42
Balanced ATUs	51
Balanced tuner with plug-in coils	54
The Z-match	63
Components for ATUs	66
References	67

Chapter 5: Loops and slot antennas for HF	68
General comments on short loop antennas	68
A 14 to 29MHz loop	69
Wire loop antenna for the lower HF bands	77
Roof-space multi-band magnetic loop	83
Comments on small loop antennas	85
Multi-band delta loop antenna	85
Skeleton-slot antenna	86
References	89

Chapter 6: Small rotary beam antennas for HF	91
Two-element Yagi	91
The three-element Yagi	93
The cubical quad	95
Beams with bent elements	98
The gamma match	102
Commercial antennas	102
References	107

Chapter 7: VHF and UHF antennas	108
Omnidirectional antennas	108
Beam antennas	113
References	124

Chapter 8: Antenna materials, construction and supports	125
Introduction	125
Materials	125
Antenna construction	130
Antenna supports	132
Wind loading	142
References	144

Chapter 9: Transmission lines and baluns	145
The purpose of transmission line	145
Characteristic impedance	145
Transmission-line construction	146
Reflections and SWR	147
The transmission line as an impedance transformer	149
Losses in transmission line	150
Fitting coaxial connectors	151
Splicing coaxial cable	160
Balanced-to-unbalanced transformers (baluns)	161
Measuring resonant lengths of coaxial cable	172
References	173

Chapter 10: Estimating and measuring antenna performance 174

Antenna technical data 174
Checking the performance of your antenna 181
Test equipment 184
References 185

Glossary of terms 186

Abbreviations 191

Appendix 193

Resonant dipole lengths 193
Metric/imperial unit conversion factors 194
Power and voltage ratios in decibels 194
Wire gauges 196
Coil winding data 196
Antenna modelling programs 197
Antenna analysers 197
Antennas, antenna materials and tuners 197
Components 198
Antenna masts 198
Ionospheric propagation information 198

Index 199
