

Index

- acoustic impedance, 186
- acoustic intensity, 187
- acoustic isolation, 185
- adaptive algorithms, 108
- adaptive antenna array, 26
- adaptive sidelobe canceller, xxxiv
- adaptive signal processing, xxxiii
- amplitude weights, 44
- angular spread loss, 217
- antenna, 4
- antenna arrays, 21
- antenna impedance, 9
- antenna terminology, 7
- aperture antennas, 15
- auxiliary frequencies, 67
- azimuth, 5

- balanced, 15
- bandwidth, 12
- Bartlett window, 46
- beam cusp, 103
- beam cusp loss, 217
- beam efficiency, 212
- Blackman window, 47
- blind adaptive algorithms, 129
- blind downlink beamforming, 172
- bow-tie antenna, 19
- Butler matrix, 102

- calibration, 146
- calibration errors, 147
- Capon's minimum variance technique, 118
- cartwheel effect, 103
- channel modelling, 160
- charge density, 2
- circular arrays, 156
- circularly polarised, 7
- coherence bandwidth, 161
- complex array weights, 27
- conformal array, 24
- constant modulus algorithm, 132
- coordinate system, 5
- correlation, 28
- cost function, 226
- current density, 2
- cyclostationarity, 131

- Davies transformation, 159
- Decoupled Iterative Least Squares Finite
Alphabet Space-Time, 130
- digital down-conversion, 151
- direct matrix inversion, 113
- direction-of-arrival, 116
- directions of departure, 168
- directive gain, 12
- directivity, 14

- discrete Fourier transform, 68
- Dolph-Chebyshev window, 49
- doublets, 121
- downlink, 98
- downlink beamforming, 208
- downlink weight optimisation criteria, 179
- dynamic distortion, 148
- E-911, 220
- effective area, 11
- effective length, 10
- eigenvalues, 112
- eigenvectors, 112
- electric field, 3
- electric field intensity, 2
- electric flux density, 2
- element failure, 137
- element position uncertainty, 137
- elliptical, 7
- equivalent circuit, 10
- ESPRIT algorithm, 121
- far-field, 6
- feeder loss, 140
- finite impulse response (FIR), 90
- finite-length dipole, 15
- first null beamwidth (FNBW), 12
- Fourier method, 117
- fractional bandwidth, 56
- Fraunhofer region, 6
- free space permeability, 3
- free space permittivity, 3
- frequency division duplex, 161
- frequency response, 161
- ghosting, xxxiv
- grating lobes, 41, 59, 61, 94
- grid of beams, 102
- ground-plane, 17
- GSM, 198
- half-power beamwidth, 12
- Hamming window, 48
- Hanning window, 48
- Hertzian dipole, 5
- horizontal polarisation, 20
- Huygen's principle, 15
- hydrophone, 21
- hydrophones, 184
- ill-conditioning, 137
- impedance matching, 10
- impulse response, 163
- inter-element distance, 56
- inter-null beamwidth, 63
- interference reduction ratio, 214
- inverse-scattering problem, 193
- isotropic radiator, 12
- Kaiser window, 49
- Kalman filter, 202
- least-mean-squares, 113
- linear antenna array, 22
- linear polarisation, 7
- linear tilted polarisation, 7
- linearity, 146
- location-based services, 207, 220
- log-period dipole array, 19
- log-period toothed antenna, 19
- log-period trapezoidal wire antenna, 19
- LS-DRMTCMA, 133
- macro-cell, 138
- magnetic field, 3
- magnetic field intensity, 2
- magnetic flux density, 2
- main lobe, 11
- matrix inversion, 73
- maximal ratio combining, 197
- maximum likelihood, 124
- Maxwell Equations, 2
- medical imaging, 186
- method of steepest-descent, 111
- micro-cell, 138
- microwave imaging with space-time, 192
- microwave tomography, 193
- mono-pole, 17
- multiple antenna channel model, 162
- multiple beam antenna, 231
- multiple-beam array, 100
- MUSIC algorithm, 118
- mutual coupling, 27, 154
- narrowband, 12, 31
- narrowband calibration, 151
- noise figure, 142
- non-destructive testing transducers, 186
- null steering, 38
- number of signal sources, 127
- optimum combining, 197
- optimum weight vector, 111
- patch antennas, 17
- pattern factor, 16
- pencil beams, 24
- phase delay, 32
- phase error, 136
- phase taper, 35
- phase weights, 35
- phased antenna array, 26
- pico-cell, 138

- planar antenna array, 24
- plane wave, 6
- Pointing vector, 7
- polarisation, 7
- power azimuth spectrum, 168
- power density, 7, 8
- power gain, 14
- printed antennas, 17
- progressive phaseshift array, 22
- projector, 21, 184
- radar, 183
- radiated power, 9
- radiation efficiency, 14
- radiation intensity, 11
- radiation null, 11
- radiation pattern loss, 217
- radiation resistance, 9
- radiowave propagation, 160
- range extension, 194, 203
- received signal vector, 33
- rectangular window, 45
- recursive least squares, 115
- relative permeability, 3
- relative permittivity, 3
- Rotman lens, 102
- route mean squared angular spread, 166
- Rumsey's principle, 18
- satellite personal communications, 231
- scanning arrays, 101
- scatter map, 165
- sectorisation, 26
- sentinel function, 224
- side lobes, 11
- sidelobe level (SLL), 12
- signal processing constraints, 135
- single-ended feeder, 17
- sonar, 184
- sonar sensors, 21
- space division multiple access, 195
- space-time beamformer, 192
- spatial aliasing, 88
- spatial correlation, 162
- spatial covariance matrix, 98
- spatial diversity, 194
- spatial filtering, 25
- spatial filtering interference rejection, 195
- Spatial Multiplexing of Local Elements, 153
- spatial reference beamforming, 107
- spatial smoothing, 125
- spectral self-coherence restoral, 131
- static distortion, 148
- steering vector, 32, 34
- steering vector errors, 137
- sub-arrays, 121
- Switched beam, 101
- switched beam, 26
- temporal reference beamforming, 106
- time delay, 58
- time division duplex, 170
- transducer, 21
- transducers, 184
- transmit beamforming, 170
- triangular window, 47
- TSUNAMI, 196
- ultra wideband, 56, 192
- ultra-wideband, xxxvi
- uniform circular array, 23
- uniform linear array, 22
- unitary ESPRIT, 122
- Universal Mobile Telephone System, 207
- uplink, 98
- user location, 219
- user tracking, 198
- vertical polarisation, 20
- weight jitter, 138
- weight vector, 32
- wideband, 12, 18, 32
- wideband arrays, 56
- wideband calibration, 151
- wideband CDMA, 208
- wideband multiple antenna channel model, 164
- Wiener solution, 109, 111
- Wiener-Hopf equation, 110
- wind-loading, 140
- window functions, 44
- wire antennas, 15