Index

asymptotic expansion elementary kernel 161	free oscillation 48 of a piston in a waveguide 256
Kirchhoff approximation 169 layer potentials 163 of integrals	Geometrical Theory of Diffraction 137 diffracted ray 140
stationary phase method 164	incident ray 138
steepest descent method 166 Watson's lemma 164	inhomogeneous medium 177
watson's lemma 104	ray method 176 reflected ray 139
Bessel equation 73	theoretical basis 174
Bessel function 73	Green's function
Padé approximants 125	free space 91
Boundary Integral Equations (B.I.E.) 86	of a duct 221
and Green's representation 110	Green's representation 81, 84, 86, 104
Boundary Element Method (B.E.M.), collocation equations 191	Boundary Integral Equation 112, 114, 132
Boundary Element Method (B.E.M.),	exterior problem 113
Galerkin equations 194	fluid-loaded baffled plate 283
fluid-loaded baffled plate 283	interior problem 112
ground effect problems 132	ground effect
polynomial approximation 284	homogeneous ground 122
P 1 1 1 P 2 61	inhomogeneous ground 132
cylindrical coordinates 71	Laplace type integral 125 surface wave 125
Dirichlet condition 43, 47	ground impedance
	measurement 128
eigenfrequency 47, 49	models 131
numerical approximation by B.E.M.	guided waves
195	infinite plane waveguide 214
eigenmodes 47, 49	W.K.B. approximation 209
of a fluid-loaded plate 274	II. about Consider 75
orthogonality 73, 274	Hankel function 75
series 54, 55, 60, 74	harmonics
fluid looded whee	cylindrical 95
fluid-loaded plate	spherical 95
coincidence frequency 267 critical frequency 262	Helmholtz equation 43
dispersion equation 262	inhomogeneous medium 149
eigenvalues and eigenmodes 273	Born and Rytov approximations 173
Green's representation of the solution	continuously varying index 151
281	Geometrical Theory of Diffraction 154,
non-dimensional equation 272	177
resonance frequencies and resonance	layered medium 150
modes 274	parabolic approximation 155, 179
forced regime 54, 55, 80	W.K.B. method 153, 171

INDEX 317

Laplace transform 59 reverberation time 67, 70 layer potential Robin condition 44, 47 discontinuities 99 Robin problem 52, 55, 78 double 85, 97 far-field asymptotic expansion 163 Sabine absorption coefficient 70 ground effect representation 124 Sabine formula 71 hybrid 107, 114 separation of variables 49, 52, 71, 75, 136 simple 85, 97 space Fourier Transform 123 specific normal impedance 44, 123, 131 light fluid approximation baffled plate 276 steepest descent method 166 infinite plate 264 limit absorption principle 103 thin plate limit amplitude principle 104 energy equation 258 partial differential equation 259 method of images 80, 174 thin screen 108 diffraction by a 143 Kirchhoff approximation 169 Neumann condition 42, 47 transient 58, 65 Neumann problem 49, 54, 71 parabolic approximation 179 wave equation 42 piston in a waveguide 224, 226 waveguide radiation of sound 250 circular duct 220 transmission of sound 253 cut-off frequency 219 Green's function 221 point source impulse response 228 isotropic 93 multipolar 94 rectangular duct 218 with absorbing walls 236 reflection coefficient 78, 126 Wiener-Hopf method 182 resonance frequency 52 example of application 135

resonance mode 52, 65