

Index

$(0, G/1)$ sequence, 83
 (dk) sequence, 52
 $(dklr)$ sequence, 106, 108
 (z) sequence, 200
 K th order zero-disparity, 253
 dk constraint, 52
 m -sequence, 260
 n -step transition matrix, 16
 z -constrained sequence, 200
a.c. coupling, 6
Abdel-Ghaffar, 313
Abdel-Khaffar, 109, 284
ACH algorithm, 160, 172, 284
adjacency matrix, 21, 60, 88, 120
Adler, 160, 170, 171, 191, 313
AES, 309
Aigrain, 138
Al-Bassam, 237
almost block-decodable code, 126
Alon, 237
alphabet of symbols, 9, 87
approximate eigenvector, 100, 170
Ashley 62, 63, 172, 192, 228, 313
asymmetrical constraints, 79
asymptotic information rate, 56
audio sample, 114
auto-correlation function, 30, 75, 244, 249
auto-covariance function, 30
automatic gain control(AGC), 273
autonomous machine, 37, 146
Aziz, 117, 314
Bahl, 52, 107, 138, 341
Baldwin, 181, 285, 314
bandwidth-limited system, 5, 51
baseline wander, 6
Beenker, 106, 315
Bennett, 32
Bergmann, 313
Berkoff, 52, 315
Bernoulli, 57
Berstel, 73
Bertram, 315
Bhargava, 319

Biglieri, 315
binary entropy function, 11
binary to decimal conversion, 137
bit stuffing, 163, 275
Blahut, 12, 315
Blake, 63, 109, 315
Blaum, 91, 315
Bliss, 154, 315
Bliss' scheme, 155
block code, 39, 95, 137
Bloomberg, 278
BluRay Disc, v, 4, 52, 289, 309
Bose, 237, 248, 336
Bosik, 32, 316
bounded-delay encodable code, 170
Bowers, 196, 257
Braat, 316
Braun, 283, 303, 316
Brayton, 313
Brickner, 79, 81
burst error, 2, 156
burst error correction, 155
Calderbank, 154, 319
Calkin, 91, 342
Campello, 120
capacity, 4, 10, 56, 201, 204
Capocelli, 237
Cariolaro, 29, 39, 40, 316
Carter, 196, 316
Cattermole, 32, 33, 36, 196, 252,
305, 317
CD-I, v
CD-ROM, v
CD-V, v
change-of-state encoder, 52, 122, 198
channel capacity, 2, 60, 100, 114, 160, 193, 229
channel code, v, 2
channel constraint, vi, 4
characteristic equation, 17, 56, 79, 204, 278, 279
characterizing function, 38, 181
Chien, 200, 229, 317
Cideciyan, 79, 244, 317
Cioffi, 336
Code
(0, G/I) code, 83
k-constraint, 115
(0,1) Code, 172
(0, 2) Code, 109
(0, 3) Code, 114
(0, 6) Code, 116
(1, 7) Code, 126, 171
(1, 7) parity preserve, 4
(1, 8) Code, 167
(1,8) block-decodable code, 126
(1, 8) parity preserve, 289

(2, 7) Code, 166
(2, 9) Code, 132
3PM, 53, 127, 191
8b10b, 231
Baldwin, 181, 187
Bi-phase, 53
bi-phase, 47, 49, 227, 279
Delay Modulation, 42
EFM 52, 114, 293, 296
EFMPlus, 52, 80, 286, 296
GCR, 109
Immink, 183
Manchester, 47
MFM, 42, 53, 98, 291
Miller, 42, 292
Miller-Miller, 292
Miller-Squared, 292, 295
Reed-Solomon, 2, 154, 296
Zero-Modulation, 291
code, 2
code efficiency, 96
code rate, 3, 10
codebook, 97, 252
codeword assignment, 97, 115
Coene, 287, 317
Cohn, 100
Compact Disc, v, 52, 114, 293, 309
compatible EFM, 295
concatenated scheme, 3
connection matrix, 21, 60, 88, 200
constrained channel, 9
constrained code, 2
constrained system, 18
Consumer Electronics, 309
Copeland, 258, 269
Coppersmith, 160, 287, 313
coupling components, 6, 195
Cover, 138, 318
crosstalk, 6, 31, 90, 232
cut-off frequency, 207, 243, 282
cyclo-stationary, 32, 239
D1 format, 305
Daniel, 115
DAT recorder, 4, 6, 232, 309
data detection, 83
Data Storage Institute, 309
data storage system, 3
Datta, 90, 140, 318
dc-balanced, 48
dc-balanced code, 47, 195
de-control, 285, 294, 298
dc-control bit, 285, 286
dc-free code, 4, 47, 48, 195
DCC, 4
DCRLL, 277

de-scrambler, 260
decimal representation, 96
decoder window, 292, 301
decomposition, 17
degenerate pattern, 163
Delay Modulation, 42
Deng, 259
Denissen, 259, 318
density ratio, 58
detection window, 58, 82, 129
deterministic constraint, 10
difference equation, 56, 202
digital audio recording, v
digital sum variation (DSV), 200, 281
digraph, 14
directed graph, 14
discrete components, 41
discrete noiseless channel, 20
disparity, 196
distribution vector, 16
Dolivo, 317
DSV (digital sum variation), 200, 281
DVC, 4, 309
DVD, v, 4, 284, 296, 309
ECC, 3, 154, 156
edge, 14
edge graph, 18, 174
EFM alternatives, 300
Eggenberger, 85, 167, 318
eigenvalue inequality, 100
eigenvector, 17
Eleftheriou, 244, 317
encoder efficiency, 230, 343
ensemble average, 30
entropy, 9, 11, 19, 201
entropy of Markov sources, 18
entropy of memoryless source, 10
enumerative encoding, 126, 129, 137
equilibrium distribution vector, 16
ergodic chain, 15, 34
error burst length, 152
error propagation, 95, 104, 133, 138, 152, 154, 159, 161, 167, 171, 270
Etzion, 91, 318
European Patent Office (EPO), 306
expectation, 30
Fair, 196, 247, 257, 318
Fan, 154, 157, 319
feedback register, 146
Feller, 73
Ferreira, 81, 191, 331
Fibonacci numbers, 54, 124
fingerprints, 195, 212
finite-state machine, 36, 60, 61, 200
Fisher, 119

Fitinghof, 154, 319
Fitzpatrick, 85, 119
floating point arithmetic, 144
251, 319
Franks, 32
Fredrickson, 320
Freiman, 52, 256
French, 192, 320
FSSM,36
Fuja, 111, 300, 321
Fukuda, 232, 344
fundamental theorem, 2
Funk, 81
future-dependent coding, 170
Gabor, 52, 169
Gallager, 12
Gallopoulos, 66, 280, 321
Gantmacher, 321
Geist, 66
generalized Fibonacci numbers, 55
generating function, 66, 107, 134, 147, 254
Georgiades, 90, 336
Gibbs' inequality, 12
Gilbert, 71
Gorog, 321
graph, 14
Greenstein, 219, 321
Gregory, 305
Griffiths, 196
Gu, 111,300
Guibas,73
Guida, 43
guided scrambling, 196, 257, 285
Hadamard matrix, 270
Hadamard Transform, 258, 259, 269
hard disk drive, 171
Hassner, 160, 171, 189, 313
Hayami, 301, 322
HDD, 115
Hecht, 43
Heegard, 66, 192, 280, 321
Henry, 198, 237, 322
Herro, 259, 318
high-rate code, 119
higher-order dc-constrained sequence, 253
higher-order edge graph, 174
higher-order null, 244
Hilden, 167, 323
Hodges, 167
Hoholdt, 198
Hollmann, 125, 126, 170, 193, 238, 323
holographic recording, 91
Horiguchi, 169
Howe, 167, 323
Howell, 64, 68, 166, 324

IEEE ISIT, vi
Immink, 106, 125, 233, 293, 305, 324
information content, 9
information rate, 3
information source, 9
Information Theory, 11, 309
Ino, 287
input set, 36
input-restricted, 9, 61
Institute for Experimental Mathematics, vi, 309
inter-track interference, 90
interleaving, 119
intersymbol interference, 5, 51
inverse rank, 142
irreducible chain, 15
Isailovic, 325
Isozaki, 292
Jacoby, 127, 171, 191, 326
Janssen A.J.E.M., 316
jitter, 51
Jorgensen, 326
Justesen, 208, 211, 225, 228, 319
Kahlman, 288, 289, 326
Kamabe, 41, 192, 326
Kanota, 259, 260
Karabed, 172, 244, 292, 314
Kashyap, 64, 327
Katayama, 80
Kato, 91
Kautz, 52, 138, 328
Kerpez, 163, 207, 280, 328
Kim, 127, 191
Kitchens, 287, 313, 318
Knudson, 85
Knuth, 198, 236, 237, 257, 328
Kobayashi, 169, 305, 328
Kost, 171
Kuki, 117
Kunisa, 259, 275, 329
label, 18
labelled directed graph, 27
Labin, 138
Lagrange multipliers, 22
land, vi
LaserVision, 309
lattice diagram, 14
Lee, 81, 191
Lempel, 100
lexicographical index, 139
lexicographical order, 138, 145
Li, 301
Lin, 284, 292, 295
Lind, 172
Lindholm, 43
line code, 3

Litsyn, 256
Liu, 284, 295
liu, 292
look-ahead de-control, 270
look-ahead encoding, 159, 170
look-ahead span, 170
look-up table, 106, 109, 121
low-disparity, 215
magnetic recording, 1
magnetization, 1, 5, 52
Mallinson, 292, 330
Mansuripur, 154, 319
Marcellin, 90, 333
Marcus, 83, 85, 111, 157, 172, 192,
305, 314, 331
Markov chain, 13, 64
Markov condition, 14, 345
Markov information source, 18, 21, 29
Markov model, 264
Markov process, 217
mass data storage, 4
matched-spectral-null code, 244
rmaxentropic sequence, 7, 22, 64, 198
maxentropic source, 22, 204, 277
maximum likelihood detection, 83
maximum runlength, 51
maximum transition run, 79
maximum-length sequence, 261
McClellan, 119, 331
McEwen, 119
Menyennett, 81
merging bit, 97, 106, 130, 284
merging rule, 97
merging word, 293
Milenkovic, 140
Miller, 332
Ming, 275
MImDisc, v
minimum runlength, 51
Modha, 317
modulation code, 2
MOLvre, 57
Monti, 244, 253
Moon, 79, 81, 332
Moore machine, 18, 37, 176, 201
Morita, 169
Moriyama, 287
Moussouris, 171, 313
MRDS, 264
MTR constraint, 81, 346
multi-level RLL sequences, 87
multi-mode code, 196, 258
multi-track (d, k)-constrained binary
codes, 90
multiple spacing, 81

multiple-spaced RLL sequence, 82
Murdock, 219, 333
Nagai, 259, 260
nat(ural unit), 11
National University of Singapore, 309
next-state function, 36, 181, 298
Nishiya, 81
Noda, 295
node, 14
noise, 51
noiseless capacity, 10, 152
noiseless channel, 10, 61
Norris, 278
notch width, 197, 207, 243
NRZ, 1, 53, 122
NRZI, 1, 53, 122, 232, 238, 291
Nyquist, 6, 333
O'Reilly, 33, 36, 317
Odaka, 287
Odlyzko, 73, 313
offspring state, 173
Ogawa, 293, 325
Orcutt, 91, 333
Ordentlich, 333
output function, 18, 36, 298
output set, 37
overwrite erasure, 232
packing density, 58
Papoulis, 29, 333
parity byte, 154
parity preserving word assignment, 52, 287
partial response, 83, 244
partition, 246, 254
Pascal's triangle, 139, 214
Patapoutian, 120, 333
Patel, 85, 115, 171, 287, 291, 305, 333
path, 14
Patrovics, 142, 257
PCM, v
peak detection, 53
Pelchat, 66
period, 32
Perrin, 73
Perron-Frobenius theorem, 22
phase average, 39, 40
phase-locked loop, 51
Phelps, 53
phrase, 25, 59, 65, 79, 93, 140
Pierobon, 29, 34, 200, 244, 315
pilot tone, 4, 195
pivot bit, 116, 128
Pohlman, 334
point-to-point communication link, 3
polarity bit, 196, 218, 257
Polya, 134

polynomial, 163, 201, 246
post-modulation, 154
power series, 134
power spectral density function, 31, 64, 66, 295
precoder, 52, 122, 234
prefix code, 164
prefix condition, 164
prefix-synchronized format, 71
principal state, 99, 164, 216
PRML, 80
probability density function, 30
pseudo random sequence, 5, 261
Pulse Code Modulation, v
random drawing algorithm, 269
random-walk, 200
rate, 3, 10
rate efficiency, 229
RDS, 198, 245, 247, 299
RDS-constrained sequence, 200
RDSS, 245, 247
read clock, 51
recording code, 2
recursive elimination technique, 99
redundancy, 2, 3, 10, 197, 213
Reeves, v
Reggiani, 334
regular chain, 15
Rensburg van, 191
repetitive-free, 71
Riordan, 134, 246, 335
RLL, vi, 4, 51
RLL sequence with multiple spacings, 82
RLL/MS constraint, 82
Robinson, 248
Roth, 91, 157, 192, 244, 251, 303, 305, 314, 335
Ruckenstein, 192
runlength, vi, 10, 51
runlength constraint, vi, 9, 51, 95, 137
runlength distribution, 65
running digital sum, 196, 198, 263, 277, 299
Saeki, 117
Saxena, 248
Schuetzenberger, 73
Scoopman, 4
scrambler, 5, 163, 260
scrambler polynomial, 163, 269
self clocking, 51
self synchronizing scrambler, 260
self-concatenable, 95
self-punctuating, 164
self-synchronizing scrambler, 260
semaphore codes, 73
sequence replacement technique, 118
set-concatenation, 111, 347
Shaft, 52, 335

Shannon, 2, 9, 11, 19, 61, 272, 335
Shannon capacity, 4, 10
shaping function, 34
shift register, 167, 173
Shim, 302
Shirota, 335
Siegel, 62-64, 66, 85, 91, 172, 228,
Skachek, 256, 336
sliding-block code, 95, 159
sliding-block compression, 157
sliding-block decoder, 161, 292
SMPTE, 309
Soljanin, 81, 90, 117, 233, 336
Sonntag, 119, 336
source alphabet, 18
source code, 12, 163
source data, 3
spectral lines, 41
spectral notch, 208, 243
spectral null, 195
spectral shaping, 4
spectrum, 29
splitting rule, 173
Stan, 336
state alphabet, 14
state diagram, 14, 103, 173
state merging, 172
state splitting, 155, 172, 176
state swapping, 299
state transition matrix, 16
state-transition diagram, 14, 15, 38, 65
stationary, 30
stationary state probability, 16
steady-state probability, 16
Stiffler, 71, 336
Stirling's approximation, 214, 348
stochastic matrix, 14
successor, 19, 176
sum variance, 197, 203, 209, 264, 266
surplus edges, 284
Swanson, 91, 171, 336
symbolic dynamics, 172
synchronization, 71, 115
synchronous variable length code, 164
systematic part of a codeword, 119
Tallini, 237, 248, 336
Talyansky, 91, 336
Tanaka, 127, 301
Tang, 52, 107, 138
Tartara, 334
Taylor series, 134
terminal state, 216
Tezcan, 258, 269
Tjalkens, 111, 337
Toeplitz matrix, 200

Tolhuizen, vii, 259, 318
tossing of a coin, 12
track, 1,90
track width, 6
tracking, 195
transition matrix, 16
transition probability matrix, 14
transition table, 38
trellis diagram, 14, 216
Tronca, 29, 316
Tsinghua University, vii
Turing Machines, 309
two-dimensional RLL constraints, 90
uncertainty, 11, 19
uncoded symbol, 119
unifilar source, 18, 176, 204
unique decodability, 104
US National Television Academy,
US Patent, vi
Vardy, 91, 244, 251, 337
variable-length symbol, 24
variable-length synchronous code, 162
Vasic, 91, 140, 299, 337
vertex, 14
video disc, 309
video recorder, 5
Von Mises, 73
Wang, 290
Watkinson, 338
waveform, 2, 9, 29, 43, 51
weak constraints, 85
weakly constrained code, 85, 259
Weathers, 171, 338
Weber, 90, 109, 284, 313
weight of a state, 173
weighting system, 137
Weldon, 334
Westby, 232
Wicker, 338
Widmer, 231, 233, 338
Wiener-Kintchine relation, 31
Wijngaarden, van, 81, 115, 118, 120, 325
Wilf, 91, 316
Wilson, 316
Winchester drive, 98
window size, 159, 161
Wolf, 64, 91, 171, 172, 192, 305,
worst case performance, 275
WRDS, 264
Wyner, 52, 320
Xie, 62
Xin, 247
Ytrehus, 323
Zeger, 91, 332
Zehavi, 64, 340

zero-disparity, 196, 247
Zook, 337, 349