

Index

Numerics

1/f noise 315

A

Accuracy 309
Analog output 293
Astronomy plots
 celestial map 59
 magnitude 58
Attenuator
 L 311
 T 310
AutoCAD DXF files 40

B

Bar charts
 nonuniform bins 73
Binary files
 export to 175
 reading from 45
 string export to 177
Byte order
 endian number attribute 47
 number export and 177

C

C strings
 export to binary files 177
Callbacks
 in MathLink 217
Catalog
 file content 28
Coloring function
 polar surface plot 72
Colors
 coloring schemes 54
Comments
 data files containing 23
Compiler
 number formats 46

Complex number plots 63
Compression
 entropy 190
 Huffman codes 196
 predictors 196
 run-length encoding 191
 shift codes 192
Context
 MathLink 209
Control structures
 loops 102
Cyclic errors 85

D

Design issues 184
 compression 189
 continuous acquisition 279
 data assessment 188
 drivers 264
 file types 199
 latency 265
 layer model 185
 layers 261
 looping 264
 MathLink 187
 polling 263
 safety 200
 synchronous function calls 263
 transmission time 189
DIF files 34
Digital-to-analog conversion 293
Directory
 file access 169
Disk partitions 14
DOS machines
 line termination character 35
DXF files, reading from 40

E

EISA 184
Endian issues 177

INDEX

Entropy 190
 Error handling
 in MathLink 219
 Exception handling
 in MathLink 223

F

Files
 ASCII 16, 169
 basic operations 169
 binary 16, 45
 binary, output to 175
 content cataloging 28
 default directory 14
 DIF 34
 directory specifiers 14
 DXF 40
 exporting strings 177
 extracting comments 23
 filename characters 14
 fixed-format 31
 free-format 19
 locating 13
 Mathematica format 40
 numbers, to binary 176
 Pascal-type string export 178
 path 15
 spreadsheet 34
 variably named 25
 Fitting functions
 complex data 118
 derivative estimation 129
 linear vs. nonlinear 110
 noise removal 137
 nudging 116
 traps 110
 Flicker noise 315
 Floating-point numbers
 IEEE format 46
 Formatted files 31
 Free-format files 19
 Functions
 addtwo example 205
 anonymous 324
 installable 204
 options 51
 pure 324
 statistical 97
 summary 323

G

Glitch removal 84
 Graphics
 array of plots 55
 function table 51
 labelling curves 106

overloaded functions 66
 polar surface plot 67
 primitives 66
 side-by-side plots 105

H

Haar filter 149
 Help
 Usage messages 25

I

IEEE standards
 for floating-point numbers 46
 IEEE-488 183
 RS-232 conversion 237
 speed 189
 Integer formats 46
 Interfacing
 with vendor library 273
 without driver 265

J

Johnson noise 314

L

Lanczos smoothing 142
 Level detection 317
 Library
 interface using 273
 Line termination character 35
 DOS machines 35
 Macintosh 35
 UNIX 35
 Lists
 in MathLink 211
 Loop control structures 102
 Loopbacks
 MathLink 232

M

Macintosh
 line termination character 35
 numerics environment 46
 serial port 238
 Macintosh Toolbox 263
 Manhattan plots
 nonuniform bins 73
 Mathematica
 reading files from 40
 MathLink
 abortable functions 234

addtwo example 205
 callbacks 217
 context setting 209
 debugging 228
 error handling 219
 evaluations from kernel 217
 exception handling 223
 expression passing 215
 list handling 211
 loopbacks 232
 memory allocation 215
 Numerical Recipes functions 221
 results of unknown length 232
 templates 206
 UNIX 206
 UNIX debugging 229
 Usage statements 208
 Memory allocation
 in MathLink 215
 MitlMain.tm 301
 MitlUtil.c 303

N
 Noise
 bandwidth effects 315
 color of 315
 flicker (1/f) 315
 generally 314
 Lanczos smoothing 142
 out-lying points 137
 reducing 316
 removal 137
 Schmitt trigger 317
 shot 315
 smoothing and filtering 142
 switch debounce 316
 thermal (Johnson) 314
 Number types 19
 Numbers
 binary file export 176
 byte order 177
 colored random 162
 compiler format settings 46
 complex 63
 endian attribute 47
 endian issues 177
 floating-point formats 46, 199
 IEEE floating-point 176
 integer formats 46
 listening to random 90
 Poissonian random 157
 random, colored 156
 random, white 154
 to strings 22
 Numerical Recipes
 MathLink calls 221

O

Operating system
 binary files 175
 directory specifiers 14
 disk partitions 14
 file locations 13
 file operations 169
 filename characters 14
 line-terminating characters 35
 Options
 polar surface plot 68
 Oscilloscope
 serial link checking 240
 trigger 273

P

Parallel link 183
 Pascal-type string export 178
 Path, for file searches 15
 PCI 184
 Periodic errors 85
 Phase data plots 64
 Poissonian random numbers 157
 Polar surface plot 67
 coloring function 72
 options 68
 Poles
 transfer function 118
 Programming language differences 103
 Programming styles
 procedural vs. functional 102

R

Random numbers
 colored 156
 customized colored 162
 Poissonian 157
 white 154
 Record, data 17
 Resolution 309
 Right Ascension/Declination plot 59
 RS-232
 IEEE-488 conversion 237
 link implementation 237
 parameters 241

S

Schmitt trigger 317
 Sensor matching 309
 Separating characters
 Record 19
 String 19
 Word 19

INDEX

- Serial link
 - ACIA 241
 - checking with oscilloscope 240
 - closing 248
 - connection checks 258
 - distance 237
 - echo 252
 - initialization 245
 - lost data 259
 - Macintosh port 238
 - parameters 241
 - read 247
 - receive buffer length 259
 - response timing problems 259
 - RS-232 183
 - speed 189
 - transmission speed 237
 - UART 241
 - write 247
 - Shot noise 315
 - Signal conditioning
 - differential amplifier 313
 - generally 313
 - inverting-summing amplifier 312
 - L attenuator 311
 - noise generally 314
 - T attenuator 310
 - Sounds
 - amplitude modulation 94
 - analytic functions 91
 - frequency modulation 94
 - random numbers 90
 - sampling rate 91
 - simple waveforms 90
 - Spreadsheet format files 34
 - Standard Apple Numerics Environment (SANE) 46
 - Statistical functions 97
 - Strings
 - C-type 177
 - export to binary files 177
 - Pascal-type export to binary files 178
 - to numbers 22
 - Structures, data 17
 - Switch debounce 316
- T**
- Thermal noise 314
 - Transfer function
 - poles and zeros 118
 - Types
 - numbers 19
- U**
- UNIX
 - line termination character 35
 - MathLink 206
 - Usage message 25
 - Usage statement
 - for Mathlink 208
 - Utility routines 301, 303
- V**
- VME 184
- W**
- Walsh filter 149
- Z**
- Zeros
 - transfer function 118