Adaptive filters, 279
  for channel equalization, 283
  for noise cancellation, 281
  for prediction, 280
  for sinusoidal noise cancellation, 291
  for system ID of FIR filter, 296
  for system ID of IIR filter, 301
  for system ID of moving average filter, 131
AIC3106 codec, 1, 39
  ADC gain, 44
  DAC attenuation, 44
def-phasis, 78
  format of data, to and from, 43
  identification of bandwidth of, 78, 89
  impulse response of, 77
  programmable digital effects filter, 83, 96
  sampling frequency, 46
  Step response, 85
Aliasing, 39, 73, 89
  in impulse invariance method, 178
Amplitude modulation (AM), 98
Analog-to-digital converter (ADC), 38
Antialiasing filter, 39, 88
ARM processor, 1
Bilinear transformation (BLT), 167
design procedure using, 169
frequency warping in, 169, 183
Bit reversed addressing, 220
Blackman window function, 115
Board support library (BSL), 5
Boot mode, 8
Breakpoints, 28
Butterfly structure, 217
C6748 processor, 1
Cascade IIR filter structure, 164
Code Composer Studio (CCS), 5, 6
  Build Properties, 20
  Debug window, 7
  installation and support, 7
  launching, 8
  Memory window, 25
  perspectives, 7
  Project View window, 7
  Watch window, 28
Codec, 38
Compiler Optimization Level, 31
Control status register (CSR), 49
Convolution, 104, 258
Decimation-in-frequency (DIF) algorithm, 214
Decimation-in-time (DIT) algorithm, 218
Difference equations, 111
  DTMF tone generation using, 206
  sine generation using, 203
  swept sinusoid generation using, 208
Digital-to-analog converter (DAC), 38
DIP switch
  Boot mode configuration, 8
  User, 71
Direct form I IIR filter structure, 160
Direct form II IIR filter structure, 161
Direct form II transpose IIR filter structure, 162
Direct memory access (DMA), 41, 50, 152, 236
Discrete Fourier transform (DFT), 212
  of real-number sequence, 223
  of real-time signal, 248
Discrete-time Fourier Transform (DTFT), 112, 212
DSP/BIOS
configuration tool, 308
hardware interrupt threads (HWI), 308, 310
idle function threads (IDL), 308, 322
periodic threads (PRD), 308, 327
software interrupt threads (SWI), 308, 320
task threads (TSK), 308, 322
threads, 307
DTMF generation
using difference equations, 206
using lookup tables, 73
EDMA3, 50, 236
Architecture, 236
Events, 48
Event-triggered transfers, 237
Manually-triggered transfers, 237
Parameter linking, 241
Parameter RAM (PaRAM), 239
Fast convolution, 258
real-time, 270
demonstration, 261
Fast Fourier transform (FFT), 212
bit reversed addressing, 220
butterfly structure, 217
decimation-in-frequency algorithm
for, 214
decimation-in-time algorithm for, 218
radix-2, 213
radix-4, 221
of real-time input, 255
of a real-time input signal using an FFT
function in C, 255
of a real-time input signal using DSPLIB
radix-2 function, 257
of a sinusoidal signal, 258
fdatool filter design and analysis
tool, 136, 185
Finite impulse response (FIR)
filters, 103
with internally generated pseudorandom
noise,
window design method, 113
Fourier series (FS), 212
Fourier transform (FT), 212
Frame-based processing, 233
Frequency inversion, scrambling by, 150
Frequency warping, 169, 183
Goldwave, 5
Graphic equalizer, 276
Graph Plotting
in CCS, 22
in MATLAB, 24
Hamming window function, 114, 254
Hanning window function, 114
HWI (DSP/BIOS Hardware interrupt thread), 308, 310
IDL (DSP/BIOS Idle thread), 308, 322
Impulse invariance method, 166, 171
Infinite impulse response (IIR) filters, 159
second order sections, 172
I/O
DMA-based, 50
interrupt-based, 46
polling-based, 42
Interrupt clear register (ICR), 49
Interrupt enable register (IER), 49
Interrupt selector (IS), 48
Interrupts, 48
Interrupt service fetch packet (IFP), 49
Interrupt service table pointer (ISTP), 49
Inverse fast Fourier transform (IFFT), 223
JTAG, 7
Kaiser window function, 115
L138_adaptc project, 288
L138_adaptIDFIR_init_intr project, 299
L138_adaptIDFIR_intr project, 296
L138_adaptnoise_intr project, 291
L138_adaptnoise2IN_intr project, 294
L138_aic3106_init.c file, 18, 31
L138_aic3106_init.h file, 18, 32
L138_aliassing_intr project, 89
L138_am_poll project, 98
L138_average_intr project, 123
L138_average_prn_intr project, 126
L138_bios_firprn_intr_SWI project, 320
LED

Index

339

L138_bios_LED_PRD project, 327
L138_bios_sine48_intr_HWI project, 310
L138_bios_sysid_edma_IDL project, 325
L138_bios_sysid_edma_TSK project, 322
L138_delay_intr project, 53
L138_dft project, 223
L138_dft128_edma project, 248
L138_dimpulse_intr project, 77
L138_dotp4 project, 26
L138_echo_intr project, 55
L138_fastconv_demo project, 261
L138_fastconv_edma project, 270
L138_fft_sinetable_edma project, 258
L138_fft128_dsplibr2_edma project, 257
L138_fft128_edma project, 255
L138_fir_dsplib_edma project, 153
L138_fir_edma project, 152
L138_fir_intr project, 134
L138_fir3lp_intr project, 144
L138_fir4types_intr project, 147
L138_FLRcasm_intr project, 155
L138_firprn_intr project, 138
L138_firprnbuf_intr project, 141
L138_firprnbuf_intr project, 141
L138_flanger_intr project, 56
L138_graphicEQ_DSPLIB_edma project, 276
L138_iir_intr project, 195
L138_iir_intr project, 192
L138_iirso_s_intr project, 172
L138_iirso_sadapts_intr project, 301
L138_iirso_sdelta_intr project, 177
L138_iirso_sprn_intr project, 175
L138_iirso_sstr_intr project, 175
L138_loop_buf_intr project, 62
L138_loop_edma project, 50
L138_loop_intr project, 46
L138_loop_poll project, 42
L138_mem_edma project, 241
L138_notch2_intr project, 148
L138_prandom_intr project, 85
L138_prbs_intr project, 78
L138_ramp_intr project, 97
L138_record_poll project, 101
L138_scrambler_intr project, 150
L138_sine_DIP_intr project, 70
L138_sine_intr project, 69
L138_sine48_buf_intr project, 14
L138_sine48_intr project, 65
L138_sine48_loop_intr project, 88
L138_sineDTMF_intr project, 73
L138_sinegen_casm_intr project, 210
L138_sinegenDE_intr project, 203
L138_sinegenDTMF_intr project, 206
L138_squarewave_intr project, 75
L138_sweep_poll project, 70
L138_sweepDE_intr, 208
L138_sysid_average_intr project, 131
L138_sysid_biquad_intr project, 196
L138_sysid_DSPLIB_edma project, 305
L138_sysid_intr project, 89, 128, 302
Least mean squares (LMS) algorithm, 287
sign-data algorithm, 288
sign-error algorithm, 288
sign-sign algorithm, 288
LED, 6
linker_dsp.cmd linker command file, 18
Lookup table
DTMF generation with, 73
impulse generation with, 77
sine wave generation with, 14, 65
square-wave generation with, 75
swept sine wave generation with, 71
Memory data, viewing and saving, 25
Moving average filter, 123
Multichannel audio serial port (McASP), 38
Noise cancellation, 281
Nonmaskable interrupt (NMI), 48
Notch filters, to recover corrupted input
voice, 148
Overlap-add, 261
Parallel form IIR filter structure, 165
Parks-Miller algorithm, 85
Performance function, 283
Ping-pong buffers, 50
Platform support package (PSP), 5, 329
Pragma directive, 102
PRBS, 78
PRD (DSP/BIOS Periodic thread), 308, 327
Profile clock, 31
Project view window 16
Pseudorandom noise, 85
as input to FIR filter, 138
as input to IIR filter, 175
as input to moving average filter, 126
Radix-2 decimation-in-frequency FFT algorithm, 214
Radix-2 decimation-in-time FFT algorithm, 218
Radix-2 fast Fourier transform, 213
Radix-4 fast Fourier transform, 221
Reconstruction filter, 39, 75
sine wave generation
using difference equation, 203
using lookup table, 14, 65
using \sin() function call, 69
with DIP switch control, 70
Sinusoidal noise cancellation, adaptive filter for, 291
Spectral leakage, 253
Square wave generation, 75
Steepest descent algorithm, 285
Support files, 31
l138_aic3106_init.c, 18, 31
l138_aic3106_init.h, 18, 32
linker_dsp.cmd, 18, 34
vectors_intr.asm, 18, 32
vectors_poll.asm, 32
SWI (DSP/BIOS Software interrupt thread), 308, 320
system identification, 281
of codec antialiasing and reconstruction filters, 89
of FIR filter, 296
of IIR filter, 301
of moving average filter, 131
Target configuration file, 10
TSK (DSP/BIOS Task thread), 308, 322
Threads in DSP/BIOS, 307
Twiddle factors, 213, 229
vectors_intr.asm file, 18, 32
vectors_poll.asm file, 32
Very-long-instruction-word (VLIW) architecture, 6
Voice recording, using external memory, 101
Voice scrambling, using filtering and modulation, 150
Watch window, monitoring, 28
Window functions, 114
Blackman, 115
Kaiser, 115
Hamming, 114
Hanning, 114
rectangular, 114
XDS100, 7
z-transform (ZT), 105
zero padding, 261