These Mathcad models have been constructed primarily to generate the various figures in the book Digital Waveform Generation and assume a basic level of Mathcad familiarity. They are intended to assist the reader in exploring the underlying concepts, experiment with 'what if' design scenarios and develop bespoke models to suit their own applications.

The models have been developed in Mathcad version 14.0 build M020 (i.e. .xmcd files).

Models saved in Mathcad version 11 are also included as .mcd files. However, their operation cannot be assured.

Chapter 1 - Waveform shape change with harmonic amplitude
Illustrates the small change in waveshape corresponding to a significant change in spectrum (e.g. harmonic amplitude).

Chapter 3 - Direct-form oscillator phase-continuous frequency transition
Illustrates behaviour of the direct-form recursive oscillator as discussed in Chapter 3.

Chapter 4 - Figs 4-5 4-6 4-7
Provides the models supporting figures 4.5, 4.6 and 4.7 in Chapter 4.

Chapter 4 - Figs 4-7 4-15 4-16
Provides the models supporting figures 4.7, 4.15 and 4.16 in Chapter 4.

Chapter 4 - Figs 4-17 4-18
Provides the models supporting figures 4.17 and 4.18 in Chapter 4.

Chapter 4 - Figs 4-21 4-24
Provides the models supporting figures 4.21 and 4.24 in Chapter 4.

Chapter 4 - Figs 4-25 4-26
Provides the models supporting figures 4.25 and 4.26 in Chapter 4.

Chapter 5 - Fig 5-7
Provides the model supporting figure 5.7 Chapter 5.

Chapter 5 - Fig 5-14
Provides the model supporting figure 5.14 Chapter 5.

Chapter 5 - Figs 5-11 5-12 5-15 5-16 5-19
Provides the models supporting figures 5.11, 5.12, 5.15, 5.16 and 5.19 in Chapter 5.

Chapter 5 - Figs 5-20 5-21 5-23
Provides the models supporting figures 5.20, 5.21 and 5.23 in Chapter 5.

Chapters 4-5 - Figs 4-19 4-27 5-13 5-17
Provides the models supporting figures 4.19, 4.27, 5.13 and 5.17 in Chapters 4 and 5.

Example of phase discontinuity
Illustrates examples of phase continuous and phase discontinuous frequency change.

Gibbs phenomenon reduction
Illustrates the use of the Lanczos sigma function to reduce Gibbs 'ringing' artefacts in harmonic waveform specifications.

Piecewise-linear test spectrum
Examples of simple piecewise-linear test spectra generation.

Time domain arb waveform definition by hybrid function

Specifying an arbitrary waveform in the time domain by a piecewise construction using hybrid functions.

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