## BOOKS
OP AMP APPLICATIONS
Edited by Walter G. Jung

He's done it again! Walt Jung, author of several generations of *IC Op-Amp Cookbook*, going back to 1974, has just completed an all-new op amp book. Together with Walt Kester and ADI's staff of Field Applications Engineers, he has assembled what may well be the ultimate op amp book, *Op Amp Applications*.[1] This 970-page volume is brimming with application circuits, handy design tips, historical perspectives, and in-depth looks at the latest techniques to simplify designs and improve their performance.

But this is more than just the last word on applications. In a brief but fascinating History section, he outlines the early development of the feedback amplifier, starting with H. S. Black's invention of seventy years ago—and provides priceless insights into the application needs, technological developments, and creative personalities that drove the many generations of op amp designs.

Following the history chapter, the book has seven sections with self-explanatory titles:

- **Op amp basics:** Topologies, structures, specifications, precision op amps, high-speed op amps

- **Specialty amplifiers:** Instrumentation, programmable gain, isolation

- **Using op amps with data converters:** ADC/DAC specifications, driving ADC inputs, driving ADC/DAC reference inputs, buffering DAC outputs

- **Sensor signal conditioning:** Bridge circuits, strain, force, pressure, and flow measurements, high-impedance sensors, temperature sensors

- **Analog filters:** Transfer functions, time-domain responses, standard responses, frequency transformations, filter realizations, practical implementation problems, design examples

- **Signal amplifiers:** Audio, buffers/driving capacitive loads, video, communications, amplifier ideas, composite amplifiers

- **Hardware and housekeeping techniques:** Passive components; PCB design issues; power-supply systems; protection; thermal considerations; EMI/RFI; simulation, breadboarding, and prototyping.
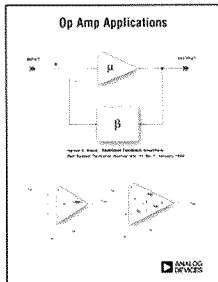
There are three indexes: a comprehensive subject index, an Analog Devices parts index, and a standard-device parts index. The book is in an 8.5 × 11-inch softcover format. Its price is $40.00. For copies, get in touch with Analog Devices Customer Service and request OP-AMP-APPLIC-BOOK. In North America, call toll-free 1-800-262-5643.

Walt Jung, who recently retired from ADI's Central Applications Group, is a well-known long-time electronics and audio experimenter and a prolific writer. A member of the IEEE and a Fellow of the Audio Engineering Society, he was inducted into *Electronic Design's* Hall of Fame in 2002. His books include three editions of the *IC Op-Amp Cookbook*, plus the *IC Timer Cookbook*, and the *IC Converter Cookbook*. A perennial resident of Maryland, he worked for a number of years as a design engineer, and for many years as a consultant and writer before joining ADI's Applications team in 1991.
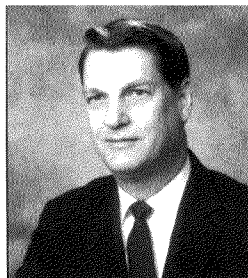
[1]Jung, Walter G., Op Amp Applications, Norwood, MA: Analog Devices, Inc., 2002. ISBN 0-916550-26-5.

[2]Kester, Walt, ed. Mixed-Signal and DSP Design Techniques, Boston, MA: Newnes, an Imprint of Elsevier Science, 2003. ISBN 0-7506-7611-6.

MIXED-SIGNAL AND DSP DESIGN TECHNIQUES

A set of ADI Seminar Notes, edited by Walt Kester, has been available in printed book form from ADI and free on our Website, *www.analog.com* (At left, under Technical Library, choose Technical Library Home; in the Master List, click on Seminar Materials for a list of free links to seminar books). It is now available in a new edition, with updated information—particularly in the digital signal-processing (DSP) area—published by Newnes (*http://www.bh.com/newnes*),[2] as the first volume in a new series.

Packed with design information from engineers with years of experience, and backed up by many references, this volume covers the details of both analog and digital signal-processing (DSP), as well as the requisite analog-digital interfacing. Chapter headings include:

- **Introduction:** About real-world signals and signal processing, with a practical example

- **Sampled data systems:** Discrete time sampling, static transfer functions and dc errors, ac errors in data converters, D/A converter dynamic performance

- **ADCs for DSP applications:** Successive-approximation, sigma-delta, flash, subranging (pipelined), bit-per-stage

- **DACs for DSP applications:** DAC structures, low-distortion architectures, logic, interpolating, sigma-delta, direct digital synthesis (DDS)

- **Fast Fourier transform (FFT):** Discrete Fourier transform (DFT), fast Fourier transform, FFT hardware and benchmarks, DSP requirements for real-time FFT, spectral leakage and windowing

- **Digital filters:** Finite impulse response (FIR), implementations in DSPs, circular buffering, FIR designing, infinite impulse response (IIR), design techniques for IIR, multirate, adaptive

- **DSP hardware:** Microcontrollers, microprocessors, and DSPs; DSP requirements; ADSP-21xx 16-bit fixed-point core; fixed-point vs. floating-point; SHARC DSPs; ADSP-2116x single-instruction, multiple-data (SIMD) core; TigerSHARC, static superscalar; DSP evaluation and CROSSCORE™ tools

- **Interfacing to DSPs:** Parallel interfacing, reading from memory-mapped peripheral ADCs; writing to memory-mapped DACs; serial interfacing; I/O ports, analog front ends, and codecs; high-speed interfacing; DSP system interface

- **DSP applications:** High performance modems for POTS; RAS modems; ADSL; digital cellular; GSM, SoftFone, Othello; analog cellular base stations; digital base stations; motor control, codecs and DSPs in voiceband and audio; sigma-delta ADC with programmable digital filter; applications summary

- **Hardware design techniques:** Low-voltage interfaces, grounding in mixed-signal systems, digital isolation techniques, power-supply noise reduction and filtering, dealing with high-speed logic.
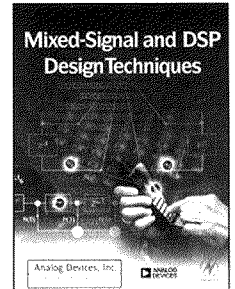
Priced at $59.99, it is available at technical book stores everywhere, including on-line.

Walt Kester is a Corporate Staff Applications Engineer. During more than 30 years at ADI, he has designed, developed, and given applications support for high-speed ADCs, DACs, sample-hold amplifiers, op amps, and multiplexers. Besides writing many papers and articles, he prepared and edited the *Notes* for High-speed, Mixed-signal, Advanced linear design, and other seminars. Walt has a BSEE from North Carolina State and an MSEE from Duke. He enjoys carpentry and travel.