



QEX (ISSN: 0886-8093) is published bimonthly in January, March, May, July, September, and November by the American Radio Relay League, 225 Main Street, Newington, CT 06111-1494. Periodicals postage paid at Hartford, CT and at additional mailing offices.

POSTMASTER: Send address changes to: QEX, 225 Main St, Newington, CT 06111-1494 Issue No 255

Harold Kramer, WJ1B  
Publisher

Larry Wolfgang, WR1B  
Editor

Lori Weinberg, KB1EIB  
Assistant Editor

Zack Lau, W1VT  
Ray Mack, W5IFS  
Contributing Editors

**Production Department**

Steve Ford, WB8IMY  
Publications Manager

Michelle Bloom, WB1ENT  
Production Supervisor

Sue Fagan, KB1OKW  
Graphic Design Supervisor

David Pingree, N1NAS  
Senior Technical Illustrator

**Advertising Information Contact:**

Janet L. Rocco, W1JLR  
Business Services  
860-594-0203 – Direct  
800-243-7768 – ARRL  
860-594-4285 – Fax

**Circulation Department**

Cathy Stepina, QEX Circulation

**Offices**

225 Main St, Newington, CT 06111-1494 USA  
Telephone: 860-594-0200  
Fax: 860-594-0259 (24 hour direct line)  
e-mail: [qex@arrl.org](mailto:qex@arrl.org)

**Subscription rate for 6 issues:**

In the US: ARRL Member \$24,  
nonmember \$36;

US by First Class Mail:  
ARRL member \$37, nonmember \$49;

International and Canada by Airmail: ARRL member  
\$31, nonmember \$43;

Members are asked to include their membership control number or a label from their QST when applying.

In order to ensure prompt delivery, we ask that you periodically check the address information on your mailing label. If you find any inaccuracies, please contact the Circulation Department immediately. Thank you for your assistance.



Copyright © 2009 by the American Radio Relay League Inc. For permission to quote or reprint material from QEX or any ARRL publication, send a written request including the issue date (or book title), article, page numbers and a description of where you intend to use the reprinted material. Send the request to the office of the Publications Manager ([permission@arrl.org](mailto:permission@arrl.org)).

July/August 2009

**About the Cover**

AF8L describes an RF power meter that is part of his Cybernetic Sinusoidal Synthesizer. An AD8307 logarithmic amplifier board is isolated from the rest of the circuitry by using separate cast aluminum project cases.



**In This Issue**

**Features**

**3 A Cybernetic Sinusoidal Synthesizer: Part 3**  
By Gary Steinbaugh, PE, AF8L

**9 Splat!: An RF Signal Propagation, Loss and Terrain Analysis Tool**  
By John A. Magliacane, KD2BD and Bill Walker, W5GFE

**15 Experimental Determination of Ground System Performance for HF Verticals—Part 5**  
By Rudy Severns, N6LF

**18 The “Chicken Wire Wonder”—A Unique Broadband Vertical Antenna for the HF Bands**  
By Tom Warnagiris, K3GSY

**25 Alternatives to Octave**  
By Maynard Wright, W6PAP

**28 Maximizing Radiation Resistance in Vertical Antennas**  
By Robert J. Zavrel, Jr., W7SX

**Columns**

**24 In the Next Issue of QEX**

**34 Tech Notes**  
By John S. (Jack) Belrose,  
VE2CV, VY9CRC

**36 SDR: Simplified**  
By Ray Mack, W5IFS

**43 Letters to the Editor**

**47 Upcoming Conferences**

**Index of Advertisers**

American Radio Relay League: 48, Cover III  
Down East Microwave Inc: 47  
Hagerty Radio Company: 24  
hamcity.com: Cover IV  
Kenwood Communications: Cover II

National RF, Inc: 48  
Nemal Electronics International, Inc: 8  
RF Parts: 43, 45  
Teri Software: 8  
Tucson Amateur Packet Radio: 46