

QEX

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 239

Harold Kramer, WJ1B
Publisher

Doug Smith, KF6DX
Editor

Larry Wolfgang, WR1B
Managing Editor

Lori Weinberg, KB1EIB
Assistant Editor

L. B. Cebik, W4RNL
Zack Lau, W1VT
Ray Mack, WD5IFS
Contributing Editors

Production Department

Steve Ford, WB8IMY
Publications Manager

Michelle Bloom, WB1ENT
Production Supervisor

Sue Fagan
Graphic Design Supervisor

Devon Neal, KB1NSR
Technical Illustrator

Joe Shea
Production Assistant

Advertising Information Contact:

Janet L. Rocco, W1JLR
Business Services
860-594-0203 direct
860-594-0200 ARRL
860-594-0303 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

Subscription rate for 6 issues:

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

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

Elsewhere by Surface Mail (4-8 week delivery):
ARRL member \$31, nonmember \$43;

Canada by Airmail: ARRL member \$40,
nonmember \$52;

Elsewhere by Airmail: ARRL member \$59,
nonmember \$71.

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 ©2006 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).



About the Cover

Paul Wade, W1GHZ, shows us how to design waveguide to coaxial cable transition blocks. The cover photos show a waveguide slotted line, which Paul uses to measure the complex impedance inside the waveguide, along with some resulting transitions.



Features

- 3 Measurement of Soil Electrical Parameters at HF**
By Rudy Severns, N6LF
- 10 Rectangular Waveguide to Coax Transition Design**
By Paul Wade, W1GHZ
- 18 IMD in Digital Receivers**
By Leif Åsbrink, SM5BSZ
- 23 In Search of New Receiver-Performance Paradigms, Part 1**
By Doug Smith, KF6DX
- 31 Seventh-Order Unequal-Ripple Low-Pass Filter Design**
By Dave Gordon-Smith, G3UUR
- 35 A High-Efficiency Filament Regulator for Power Tubes**
By Eric von Valtier, K8LV
- 40 Command and Control: Talk to Your Radio and Your Radio May Talk Back**
By Steve Gradijan, WB5KIA

Columns

- 49 Tech Notes**
By Robert P. Haviland, W4MB
- 50 Next Issue in QEX**
- 51 Antenna Options**
By L. B. Cebik, W4RNL
- 59 Out of the Box**
By Raymond Mack, W5IFS
- 60 Letters**
- 63 2006 Index**

Nov/Dec 2006 QEX Advertising Index

American Radio Relay League: Cov II, 30, Cov III, Cov IV
ARA West: 48
Atomic Time: 39
Down East Microwave, Inc.: 64
Elkins Marine Training International: 48
International Crystal Manufacturing: 50

National RF: 59
Nemal Electronics International, Inc.: 64
Real Nerds: 17
RF Parts: 39
Teri Software: 64
Timewave Technology, Inc.: 22
Tucson Amateur Packet Radio Corp.: 30