

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 280

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

Carol Michaud, KB1QAW
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

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.

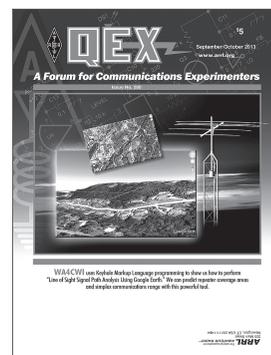


Copyright © 2013 by the American Radio Relay League Inc. For permission to quote or reprint material from QEX or any ARRL publication, send a written request including the issue date (or book title), article, page numbers and a description of where you intend to use the reprinted material. Send the request to the office of the Publications Manager (permission@arrl.org).

About the Cover

James McCullers, WA4CWI, uses Keyhole Markup Language (KML) programming to draw lines for “Line of Sight Signal Path Analysis Using Google Earth” images. He shows us how to predict repeater coverage areas and simplex communications range with this powerful tool. Google Earth 3D images clearly show mountains and terrain variations that can block line of sight signal paths.

In This Issue



Features

3 A 21 MHz Four Square Beam Antenna
Garth Swanson, G3NPC

13 Frequency Synthesis and Impacts on Receiver Performance — Reciprocal Mixing and Blocking Dynamic Range
Cornell Drentea, KW7CD

25 Frequency Dependence of Equivalent Series Resistance Measurement
Dr Sam Green, W0PCE

28 Line-of-Sight Signal Path Analysis Using Google Earth
Jim McCullers, WA4CWI

41 Blood Lead Levels in Australian Amateur Radio Operators—A Pilot Study
Dr. Erich Siegfried Heinzle, VK5HSE

44 A Model for Sporadic E: Meteors+Wind Shear +Lorentz Force
Flavio Egano, IK3XTV

Index of Advertisers

American Radio Relay League:.....	Cover III	Nemal Electronics International, Inc:.....	27
Array Solutions:	40	Quicksilver Radio Products.....	Cover IV
Down East Microwave Inc:.....	48	RF Parts:.....	43, 45
Kenwood Communications:	Cover II	Tucson Amateur Packet Radio:	27
National RF, Inc:	48		