Contents
March 2018 • Volume 102 • Number 3

This Month in QST
Steve Ford, WB8IMY

9

A Delta Loop for 160 Meters
Ted Algren, KA6W
First-place winner in the 2017 QST Antenna Design Competition, 160 Meters and Lower Frequencies category.

30

A Three-Element Moxon-Style Vertical Yagi Antenna for the 75-Meter Band
Al Christman, K3LC, and Joe Johnson, K3RR
First-place winner in the 2017 QST Antenna Design Competition, 80 Through 10 Meters category.

33

A Durable, Low-Profile 2-Meter Mobile Antenna
John Fortune, W6NBC
First-place winner in the 2017 QST Antenna Design Competition, 6 Meters and Higher Frequencies category.

37

“Cat Whiskers,” The Broadband Multi-Loop Antenna
Jacek Pawlowski, SP3L
Second-place winner in the 2017 QST Antenna Design Competition, 80 Through 10 Meters category.

40

Vintage Projects: A Wide-Range Coupler for Balanced Transmission Lines

Product Review
Mark Wilson, K1RO
Yaesu FT-70DR Analog and System Fusion Dual-Band Handheld Transceiver; M² 6-Meter HO Loop Antennas; TelePost LP-500 Digital Station Monitor; QRPme PocketPAL Hamfest Component Tester Kit

47

Hanging a Treetop Antenna with a Drone
Michael Shanblatt, W3MAS, and Joseph Warwick, KB3ZED

ARRL International Grid Chase Update
Bart Jahnke, W9JJ

The Transformative Power of Activation
Tim Carter, W3ATB

RF Treatment Offers Hope for Alzheimer’s Patients
Rick Lindquist, WW1ME

From the Archives: Gotham Antennas

The 2017 IARU HF World Championship Results

The April 2018 ARRL Rookie Roundup — Phone

Digital and Mobile Editions
ARRL members can access the digital edition via a link at www.arrl.org/qst, download our iOS app from the iTunes Store, and download our Android app from the Google Play Store.

Interested in Writing for QST?
www.arrl.org/qst-author-guide
E-mail: qst@arrl.org

Barry J. Shelley, N1VXY
Publisher

Steve Ford, WB8IMY
Editor

Becky R. Schoenfeld, W1BXY
Managing Editor

Jen Gilfort
Caroline Kenney
Allison McLellan
Assistant Editors

Bart Jahnke, W9JJ
Contest Branch Manager

Rick Lindquist, WW1ME
Happenings

Bob Allison, WB1GCM
Product Review Lab Testing

Mark J. Wilson, K1RO
Al Brogdon, W1AB
Bernie McClenny, W3UR
H. Ward Silver, WBAX
Paul Wade, W1GHZ
Jon Jones, NOJK
Rick Palm, K1CE
Joel R. Hallas, W1ZR
Barry Shackleford, W6YE
Kai Siwiak, KE4PT
Bruce Draper, AA5B
Contributing Editors

Michelle Bloom, WB1ENT
Production Supervisor

Jodi Morin, KA1JPA
Assistant Production Supervisor

Maty Weinberg, KB1EIB
Production Coordinator

Sue Fagan, KB1OKW
Graphic Design Supervisor

David Pingree, M1NAS
Senior Technical Illustrator

Debra Jahnke, K1DAJ
Business Services Manager
QST Advertising

Bob Inderbitzen, NQ1R
Marketing Manager

Yvette Vinci, KC1AIM
Circulation Manager

Diane Szlachetka, KB1OKV
Advertising Graphics Designer

Steve Ewald, WV1X
Field Organization Supervisor

Gail Iannone
Convention Program Manager

March 2018 www.arrl.org
Our Cover
Seventeen-year-old Javier Lopez, EA6ALW, stands near the base of his station’s antenna system on Menorca Island, one of the islands in the Balearic Islands group. Javier inherited the well-equipped station from his grandfather, the late Juan Llambias, EA6LH.
[Henryk Kotowski, SM0JHF, photo]

International
To compensate for additional postage for mailing outside the US, the following rates apply:
Canada: Membership in the ARRL, including a 1-year subscription to QST, $62, payable in US funds. Life Membership, including a subscription to QST, is available at $1,325. Libraries and institutions, $62 per year.
All Other Countries: Membership in the ARRL, including a 1-year subscription to QST, $76, payable in US funds. Life Membership, including a subscription to QST, is available at $1,900. Libraries and institutions, $76 per year.
Membership without QST is available to the immediate family of a member living at the same address, and to anyone who is legally blind, for $10 per year.
Foreign remittances should be by international postal or express money order or bank draft negotiable in the US and for an equivalent amount in US funds.

Membership in the ARRL, including a 1-year subscription to Digital QST only, is available to Canadian and International members at $49.

*Payment arrangements available. Please write for details.
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 at circulation@arrl.org or 860-594-0200 immediately. Thank you for your assistance.
Reprints and permissions: permission@arrl.org Details of our Online Privacy Policy can be found at www.arrl.org/online-privacy-policy.
Telephone: 860-594-0200 Fax: 860-594-0259

QST (ISSN:0033-4812) is published monthly as its official journal by the American Radio Relay League, Inc., 225 Main St., Newington, CT 06111-1494, USA. Periodicals postage paid at Hartford, CT, USA and at additional mailing offices.

POSTMASTER: Send address changes to: QST, 225 Main St., Newington, CT 06111-1494, USA. Canada Post: Publications Mail Agreement #96-0901437. Canada returns to be sent to IMEX Global Solutions, 1501 Morse Ave., Elk Grove Village, IL 60007.

US & Possessions: Membership in the ARRL, including a 1-year subscription to QST, is available to individuals at $49. Licensed radio amateurs age 21 and under and the eldest licensee in the household may qualify for the rate of $25. Life Membership, including a subscription to QST, is available at $1,225. Membership includes $21 per year for subscription to QST; Membership and QST cannot be separated. Libraries and institutions, $49 per year.

Single copies $6.95.