Our mission: To promote and advance the art, science and enjoyment of Amateur Radio.



In This Issue

Harold Kramer, WJ1B Publisher

Steve Ford, WB8IMY Editor

Becky R. Schoenfeld, W1BXY Managing Editor

Larry D. Wolfgang, WR1B Senior Assistant Technical Editor

Steve Sant Andrea, AG1YK Assistant Editor

Rick Lindquist, WW1ME Happenings

Bob Allison, WB1GCM Product Review Lab Testing

Paul L. Rinaldo, W4RI Mark J. Wilson, K1RO Al Brogdon, W1AB Bernie McClenny, W3UR H. Ward Silver, NØAX Paul Wade, W1GHZ Jon Jones, NØJK Rick Palm, K1CE Joel R. Hallas, W1ZR Barry Shackleford, W6YE Kai Siwiak, KE4PT Contributing Editors

Michelle Bloom, WB1ENT Production Supervisor

Jodi Morin, KA1JPA Assistant Production Supervisor

Maty Weinberg, KB1EIB Production Coordinator

Sue Fagan, KB10KW Graphic Design Supervisor

David Pingree, N1NAS Senior Technical Illustrator

> Kelsey E. Moore Copy Editor

Debra Jahnke, K1DAJ Business Services Manager QST Advertising

Bob Inderbitzen, NQ1R Marketing Manager

Yvette Vinci, KC1AIM Circulation Manager

Diane Szlachetka, KB1OKV Advertising Graphics Designer

April 2014

Volume 98 Number 4

Technical

D-Terminal: Arduino Meets D-STAR 30 L. Abraham Smith, N3BAH This mini data terminal lets you enjoy D-STAR data messaging without a computer.

A Tiny Python Panadapter 33 Martin Ewing, AA6E

Put one of the popular and inexpensive BeagleBone or Raspberry Pi microcomputers to work in your station.

A Series Resistance Meter Using Operational Amplifiers 39 David L. Chute, KG4BZW

Measure equivalent series resistance to find faulty electrolytic capacitors.

Crystal Phasing 42

Eric P. Nichols, KL7AJ Understand the XTAL PHASING selectivity control available in many vintage receivers.

A 10 Meter Moxon Antenna 44

Jay Slough, K4ZLE Build this compact and easy to construct twoelement directional antenna.

Windows XP[®] — Goodbye, Old Friend 46

Mike Carper, WA9PIE

Thirteen years after the release of *Windows XP*, Microsoft is ending support for the operating system on April 8. Here's how to keep things going in your shack.

Omnidirectional Hentenna 48 Paul Danzer, N1II

Prototype construction and field test pitfalls of the Hat Hentenna — an omnidirectional version of the Japanese Hentenna.

Product Review 51 Mark Wilson, K1RO

Wouxun KG-UV920P-A Dual Band FM Transceiver, Array Solutions AS-SAL-20 Shared Apex Loop Array Receiving Antenna





News and Features

It Seems to Us 9 David Sumner, K1ZZ

Our Gateway

Inside HQ 13

Harold Kramer, WJ1B Your Membership Benefits — More Than Just a Magazine

The 2 Meter Simplex Sprint – A Contest for Everyone 70 Paul Lusardi, NØVLR

Revitalize your club — and attract new members — with an event that's fun for operators of any skill level.

Extending the Limits 72

Michael Marinaro, WN1M

The decades surrounding World War I were a time of growth for Amateur Radio, and hams tested new technologies as well as their own increasing abilities in organized relays.

Log-less Logging 75 Steve Sant Andrea, AG1YK

Computer logging software provides many benefits besides saving trees.

Happenings 76

Rick Lindquist, WW1ME

FCC to review comments that could lead to changes in allocations, winners announced for Hamvention and League awards, new Vice Director appointed, and more.

Our Cover

The inexpensive BeagleBone Black and Raspberry Pi microcomputers are taking the hobbyist world by storm. In this issue Martin Ewing, AA6E, shows how you can use these devices to create a panadapter for any receiver or transceiver that provides In-phase and Quadrature (I/Q) signal outputs. Our cover shows both of these microcomputers, along with the equally innovative RTL-SDR "dongle," and an example of Martin's panadapter displaying the output of an Elecraft KX3 transceiver.

Radiosport

Contest Corral 82 H. Ward Silver, NØAX

2013 ARRL September VHF Contest 83

Jeff Klein, K1TEO Propagation forecasts were nothing special, but tropospheric ducting held some pleasant surprises for contesters.

The 2014 ARRL Rookie Roundup – Phone 86

2014 Straight Key Night Results 87 Sean Kutzko, KX9X

"A bout of larvngitis is no impediment on Straight Key Night!" - Jan, WB6VRN

Frequency Measuring Test — April 2014 88

Ward Silver, NØAX The ARRL Frequency Measuring Test transmissions





Columns

Correspondence	24
The Doctor is In	59
Eclectic Technology	64
Hands-On Radio	65
Hints & Kinks	67
How's DX?	89
Microwavelengths	62
Personal Visions	95
Public Service	80
Short Takes	61
Up Front	20
Vintage Radio	96
The World Above 50 MHz	91
75/50/25 Years Ago1	00

Interested in Writing for QST?

www.arrl.org/qst-author-guide e-mail: gst@arrl.org

Departments

Convention and Hamfest Calendar98
Feedback50
Field Organization Reports100
Guide to ARRL Member Services14
Ham Ads154, 155
Index of Advertisers156, 157
New Products
QuickStats140
Radio Tips74
Silent Keys101
Special Event Stations94
Strays 63, 88
W1AW Centennial Operations71
W1AW Qualifying Runs88

Digital and Mobile Editions

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



POSTMASTER: Send address changes to: *QST*, 225 Main St, Newington, CT 06111-1494, USA. Canada Post: Publications Mail Agreement #40612608. Canada returns to be sent to Bleuchip International, PO Box 25542, London, ON N6C 6B2.

additional mailing offices

US & Possessions: Membership in the ARRL, including a one year subscription to *QST*, is available to individuals at \$39. Licensed radio amateurs age 21 and under and the eldest licensee in the household may qualify for the rate of \$20. Life Membership, including a subscription to *QST* is available at \$975.* Membership includes \$15 per year for subscription to *QST*. Membership and QST cannot be separated. Libraries and institutions, \$39 per year. Single copies \$4.99.

April 2014 Volume 98 Number 4

Inc,

QST (ISSN:0033-4812) is published

monthly as its official journal by the

International

To compensate for additional postage for mailing outside the US, the following rates apply

Canada: Membership in the ARRL, andud. Wernbership in the ARAL, including a one year subscription to QST, \$49, payable in US funds. Life Membership, including a subscription to QST is available at \$1225.* Libraries and institutions, \$49 per year

All Other Countries: Membership in the ARRL, including a one year subscription to QST, \$62, payable in US funds. Life Membership, including a subscription to *QST* is available at \$1550.* Libraries and institutions, \$62 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 \$8 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

Copyright © 2014 by the American Radio Relay League Inc. Title registered at the US Patent Office. International copyright secured. All rights reserved. Quedan reservados todos los derechos. Printed in the USA

QST[®], DXCC[®], VUCC[®], DX Century Club[®], ARES[®], Amateur Radio Emer-gency Service[®] and ARRL, the national association for Amateur Radio[®] are registered trademarks of the American Radio Relay League, Inc.

The ARRL and QST in no way warrant the products described or reviewed herein.

QST is available to blind and physically handicapped individuals from the Library of Congress, National Library Service for the Blind and Physically Handicapped. Call 1-800-424-8567 or go to **www.loc.** gov/nls/

Indexed by Applied Science and Technology Index, Library of Congress Catalog Card No: 21-9421.

*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 ass tance

Reprints and permissions: permission@arrl.org Details of our Online Privacy Policy canbe found at www.arrl.org/onlineprivacy-policy. Telephone: 860-594-0200 Fax: 860-594-0259