



# In This Issue

February 2015

Volume 99 Number 2

**Harold Kramer, WJ1B**  
Publisher

**Steve Ford, WB8IMY**  
Editor

**Becky R. Schoenfeld, W1BXJ**  
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, N0AX**  
**Paul Wade, W1GHZ**  
**Jon Jones, N0JK**  
**Rick Palm, K1CE**  
**Joel R. Hallas, W1ZR**  
**Barry Shackelford, W6YE**  
**Kai Siwiak, KE4PT**  
Contributing Editors

**Michelle Bloom, WB1ENT**  
Production Supervisor

**Jodi Morin, KA1JPA**  
Asst Production Supervisor

**Maty Weinberg, KB1EIB**  
Production Coordinator

**Sue Fagan, KB1OKW**  
Graphic Design Supervisor

**David Pingree, N1NAS**  
Senior Technical Illustrator

**Jennifer Glifort**  
Copy Editor

**Debra Jahnke, K1DAJ**  
Business Services Manager  
*QST Advertising*

**Bob Inderbitzen, NQ1R**  
Marketing Manager

**Yvette Vinci, KC1A1M**  
Circulation Manager

**Diane Szlachetka, KB1OKV**  
Advertising Graphics Designer

## Technical

### Measure Your Receiver's Digital Noise Reduction 30

**Bob DePierre, K8KI**

Understand how your DNR improves the signal-to-noise ratio of noisy signals with this easy measurement.

### A Homebrewed Shock-Mounted Boom Microphone 33

**Geoff Haines, N1GY**

Creative parts-sourcing yields commercial audio quality from an inexpensive electret element mic, a PVC pipe coupling, and a repurposed swing-arm lamp.

### Free Maps for UView 36

**Chris van Gorp, PA7RHM**

A zero-cost mapping solution for the most widely used APRS *Windows* software.

### Make Homebrewed Look Factory Built 39

**William H. Ellis, KF7PB**

Readily available design software and build services lead the way to professional results — for a price.

### Test Setup for Measuring Traps 43

**Lucio Attolini, IW2FND**

Find the resonance and Q of antenna traps using this method.

## News and Features

### It Seems to Us 9

**David Sumner, K1ZZ**

Great Centennial. What's Next?

### Inside HQ 13

**Harold Kramer, WJ1B**

ARRL Update

### A Seven Seas Shack 73

**Jeremy Allen, N1ZZZ**

A freighter captain shares some practical advice for hamming on the high seas.

### On the Air with Single Sideband 76

**By Goodman, W1DX**

Our series of articles reprinted from vintage issues of *QST* continues, this time with a selection from the February 1953 issue.

### A Ham Radio Makerspace 78

**Dino Papas, KL0S**

Build a workspace and the builders will come.

### Hunting Down RF Noises 45

**Michael Foerster, W0IH**

Find noise sources both outside and inside your home with a systematic approach.

### A Direct-Reading Milliwatt Power Sensor for Your Digital Wattmeter 47

**Phil Salas, AD5X**

Build a plug-compatible detector with a 1/1000 scale factor to read directly in mW.

### A Prototyping Technique 51

**Edward Ringel, AA1WZ**

Ground-plane PC boards custom designed for specific packaging technologies and etched at home.

### Product Review 56

**Mark Wilson, K1RO**

Icom ID-5100A Dual Band VHF/UHF FM Transceiver, YouKits TJ2B Handheld HF Transceiver, Heil HM-12 Base Station Microphone, RigExpert WTI-1 Wireless Transceiver Interface.



### Discone DXpedition 80

**Ron Parks, WB5DYG**

An Arizona club keeps a piece of Cold War communications history on the air.

### Analog FM Repeaters — an Overview 82

**Steve Sant Andrea, AG1YK**

Why your local voice repeater acts the way it does, and how to get along with it.

### Philip J. McGan Memorial Silver Antenna Award 84

**Sean Kutzko, KX9X**

Honor a ham's public relations efforts in the non-amateur community.

### Happenings 85

**Rick Lindquist, WW1ME**

New Atlantic Division Director, new Vice Directors and Section Managers; call for ARRL award nominees; Amateur Radio figures into the Department of Homeland Security's emergency communications plan; more.

**Our Cover**

The first winner of the QST Centennial Photo Contest is Lester Hudgins Jr, N3LH, of New Market, Maryland, whose station photo dominates this month's cover. In addition to his impressive station photograph, Lester sent along other images that illustrate his passion for homebrewing. In the upper portion of the cover you'll find his HF/VHF/UHF software defined receiver. At center left you'll see his recent Raspberry Pi microcomputer project. All photos were taken by N3LH. If you have a photo that you think might belong on a QST cover, send it to [upfront@arrl.org](mailto:upfront@arrl.org).



**February 2015**

Volume 99 Number 2

QST (ISSN:0033-4812) is published monthly as its official journal by the American Radio Relay League, Inc, 225 Main Street, 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 #90-0901437. 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 \$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.

**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, \$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 1-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 © 2015 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 Emergency 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/](http://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](mailto:circulation@arrl.org) or 860-594-0200 immediately. Thank you for your assistance.

Reprints and permissions: [permission@arrl.org](mailto:permission@arrl.org)

Details of our Online Privacy Policy can be found at [www.arrl.org/online-privacy-policy](http://www.arrl.org/online-privacy-policy). Telephone: 860-594-0200 Fax: 860-594-0259

# Radiosport

## Contest Corral 91

H. Ward Silver, N0AX

## 2014 ARRL 10 GHz and Up Contest Results 92

Bruce Richardson, W9FZ

Rain can be a good thing — when it brings rain scatter!



Page 92



Page 78

# Columns

Amateur Radio World.....	101
Correspondence .....	24
The Doctor is In .....	66
Eclectic Technology.....	55
Hands-On Radio .....	68
Hints & Kinks .....	70
How's DX? .....	93
Public Service.....	89
Up Front.....	20
Vintage Radio.....	99
The World Above 50 MHz .....	95
75/50/25 Years Ago.....	104

# Departments

ARRL Member Services .....	14
ARRL Section Managers.....	16
Convention and Hamfest Calendar .....	102
Feedback .....	46
Field Organization Reports.....	104
Ham Ads.....	154, 155
Index of Advertisers.....	156, 157
New Books .....	103
New Products .....	32, 35, 46, 97
Officers, Division Directors, and Staff .....	15
QuickStats.....	138
Silent Keys .....	105
Special Event Stations.....	98
Strays .....	38, 90
W1AW Qualifying Runs .....	98

## Digital and Mobile Editions

ARRL members can access the digital edition via a link at [www.arrl.org/qst](http://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](http://www.arrl.org/qst-author-guide)  
e-mail: [qst@arrl.org](mailto:qst@arrl.org)