

David A. Minster, NA2AA
Publisher

Becky R. Schoenfeld, W1BXY
Editorial Director

Dana Kasowitz, KC1SEB
Managing Editor

Leanna Figlewski, KC1RMP
Sam Shaner, KE1SAM
Editors

Amanda Fahy
Assistant Editor

Paul Bourque, N1SFE
Contest Program Manager

Phil Salas, AD5X
John Stanley, K4ERO
Technical Editors

Dave Casler, KEØOG
Steve Ford, WB8IMY
Steve Goodgame, K5ATA
Sierra Harrop, W5DX
Jon Jones, NØJK
Bernie McClenny, W3UR
Rick Palm, K1CE
Pascal Villeneuve, VA2PV
Paul Wade, W1GHZ
Contributing Editors

Terese Newman
Assistant Production Supervisor

Matt Ali
Layout & Production Specialist

Maty Weinberg, KB1EIB
Production Coordinator

David Pingree, N1NAS
Senior Technical Illustrator

Janet Rocco, W1JLR
Advertising Relationship Manager

Bob Inderbitzen, NQ1R
Director of Marketing & Innovation

Steve Ewald, WV1X
Field Organization Supervisor

9 Second Century

My Friend Bob

30 A Portable 10-Meter Vertical Antenna

Ellwood Brem, K3YV

34 An Updated DC Power Polarity Checker

John Burnley, NUØV

36 Visualize Impedance with a Simple Graph

John Stanley, K4ERO

39 Product Review

Pascal Villeneuve, VA2PV

Pacific Antenna KD1JV Tri-Bander CW Transceiver;
DX Engineering RT4500HD Rotator;
The Flatlanders Mirrors End-Fed Half-Wave Antenna



55 NASA On the Air

David D. Lee, W5OC

58 The Newport Antenna Shootout

Jim Sammons, KA1ZOU, and Bob Beatty, WB4SON

61 POTA Italia

Bill Hatch, NL7P

64 The Transcontinental NBEMS Net

Don Rolph, AB1PH

67 The ARRL Ham Radio Equipment Insurance Plan

74 ARRL Field Day 2025

75 2024 ARRL November Sweepstakes — CW

Kelly Taylor, VE4XT

78 2024 ARRL International EME Contest

C. R. "Skip" Paulsen, W1PV

80 2025 ARRL International Digital Contest

80 June 2025 Kids Day

81 The 2025 ARRL June VHF Contest

 An icon next to an article means there's bonus content in the digital edition at www.arrl.org/qst.

Columns

Ask Dave	51
At the Foundation.....	90
Celebrating Our Legacy.....	97
Classic Radio.....	98
Club Station	82
Contest Corral.....	73
Correspondence	24
Ham Media Playlist.....	84
Happenings.....	68
Hints & Hacks	53
How's DX?.....	86
Member Spotlight.....	13
Public Service.....	71
The World Above 50 MHz.....	88
Up Front	20
100, 50, and 25 Years Ago	100

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.

Departments

ARRL Section Managers.....	16
ARRL Special Service Clubs.....	83
Certificate of Code Proficiency Recipients	94
Convention and Hamfest Calendar	92
Feedback	38
Field Organization Reports	95
Guide to ARRL Member Benefits.....	14
Ham Ads	124
Index of Advertisers	126, 127
New Books.....	96
Officers, Division Directors, and Staff.....	15
QST Cover Plaque Award	66
Silent Keys	101
Special Event Stations.....	91
Strays	95, 96
Volunteer Monitor Program Report.....	63
W1AW Qualifying Runs	94
W1AW Schedule.....	28

Write for QST

www.arrl.org/qst-author-guide
email: qst@arrl.org



Our Cover

Since 2018, the ham radio clubs of 12 NASA centers across the country have collaborated on NASA on the Air (NOTA), an operating program that celebrates the agency's major historical achievements. NOTA operations also share information about current and upcoming NASA projects, such as the use of the *Orion* spacecraft, shown on our cover, to carry humans beyond Earth's orbit. Learn more about NOTA's mission and the operations they have planned for 2025, in "NASA On the Air." [NASA photo]



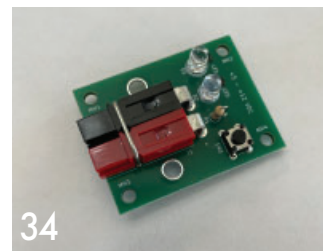
30



58



61



34

QST (ISSN:0033-4812) is published monthly as its official journal by the American Radio Relay League, Inc., 225 Main St., Newington, CT 06111-1400, USA. Canada Post: Publications Mail Agreement #90-0901437. Canada returns to be sent to The Mail Group, 1501 Morse Ave., Elk Grove Village, IL 60007.

POSTMASTER: Send address changes to: QST, 225 Main St., Newington, CT 06111-1400, USA. Canada Post: Publications Mail Agreement #90-0901437. Canada returns to be sent to The Mail Group, 1501 Morse Ave., Elk Grove Village, IL 60007.

ARRL Membership and QST cannot be separated. All ARRL members have digital, online access to QST. Print subscriptions are available and sold separately. For ARRL members in the US, a subscription to QST via mail is

\$25 per year. For libraries and institutions, a subscription to QST is available for \$84 per year; single copies \$7.

ARRL Membership is available to individuals at \$59 per year. A reduced rate is available for licensed radio amateurs under 26 years old, for \$30 per year. Membership is available to the immediate family of a member living at the same address, and to anyone who is legally blind, for \$12 per year. A complete list of dues rates is available at www.arrl.org/join. 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 © 2025 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®, Logbook of The World®, LoTW®, and ARRL The National Association for Amateur Radio® are registered trademarks of the American Radio Relay League, Inc.

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.

To ensure prompt delivery, we ask that you periodically check the address information on your mailing label. If you find any inaccuracies, please contact Member Services at circulation@arrl.org or 860-594-0200.

Reprints and permissions: permission@arrl.org

Online Privacy Policy: www.arrl.org/online-privacy-policy

Telephone: 860-594-0200