

David A. Minster, NA2AA
Publisher

Becky R. Schoenfeld, W1BXY
Editorial Director

Jen Glifort, KC1KNL
Senior Editor

Caroline Kenney
Leanna Zwiebel
Assistant Editors

Bart Jahnke, W9JJ
Radiosport & Field Services
Manager

Rick Lindquist, WW1ME
Happenings

Bob Allison, WB1GCM
Product Review Lab Testing

Steve Ford, WB8IMY
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
Bruce Draper, AA5B
Phil Salas, AD5X
John Stanley, K4ERO
Contributing Editors

Michelle Bloom, WB1ENT
Production Supervisor

Jodi Morin, KA1JPA
Assistant Production Supervisor

Maty Weinberg, KB1EIB
Production Coordinator

David Pingree, N1NAS
Senior Technical Illustrator

Janet Rocco, W1JLR
Advertising Sales Manager

Bob Inderbitzen, NQ1R
Product Development Manager

Yvette Vinci, KC1AIM
Marketing and Sales Manager

Steve Ewald, WV1X
Field Organization Supervisor

9 Second Century

The Idea Behind *Ideation*

30 Solar Cycle 25 Is Finally Here

Carl Luetzelschwab, K9LA

34 The W7SX (Zavrel) Array

Robert J. Zavrel, W7SX

37 Product Review

Mark Wilson, K1RO

Yaesu FTM-300DR Dual-Band FM/Digital Mobile Transceiver; SharkRF openSPOT3 Multimode Digital Hotspot; Etón Elite 750 Portable Receiver



57 Welcome to Cycle 25

Steve Ford, WB8IMY

61 Homebrewed Baluns: A Radio Club Project

Dave LeVasseur, N0DL, and Gary "Joe" Mayfield, KK0SD

64 Down-to-Earth Crank-Up Tower

Wayne L. Hester, NK4T

65 ARRL Board Considers Plan to Cover New FCC Fee for Young Members

Rick Lindquist, WW1ME

76 2020 September VHF Contest Results

Ralph "Gator" Bowen, N5RZ

79 2021 Straight Key Night Results

Paul Bourque, N1SFE

80 April 2021 Frequency Measuring Test

88 A Look Back — June 1971

Columns

Amateur Radio World	71
Celebrating Our Legacy.....	91
Classic Radio.....	92
Contest Corral	75
Correspondence.....	24
The Doctor is In	50
Eclectic Technology	56
Happenings	68
Hints & Hacks	52
How's DX?	82
Member Spotlight	13
Microwavelengths	54
Public Service.....	72
The World Above 50 MHz.....	84
Up Front.....	20
100, 50, and 25 Years Ago.....	94

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
Certificate of Code Proficiency Recipients	81
Convention and Hamfest Calendar.....	87
Feedback.....	55
Field Organization Reports.....	73
Guide to ARRL Member Benefits	14
Ham Ads.....	124
Index of Advertisers.....	126, 227
New Products	64
Officers, Division Directors, and Staff.....	15
QST Cover Plaque Award.....	63
Silent Keys.....	95
Special Event Stations.....	86
Strays.....	80, 86
This Month in QEX	33
W1AW Qualifying Runs	81
W1AW Schedule.....	74
W1AW's QSL File	28

Write for QST

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



Our Cover

Solar Cycle 25 has officially begun — here comes the sun! It will take a few years for the cycle to hit its peak, but the excitement starts now, with QST content that will help you plan for what's ahead. Beginning with this issue, look for the Cycle 25 logo that calls out special content related to the solar cycle.



Look for this logo on content that pertains to the new Solar Cycle 25



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. Periodicals postage paid at Hartford, CT, USA and at additional mailing offices.

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 IMEX Global Solutions, 1501 Morse Ave., Elk Grove Village, IL 60007.

US & Possessions: Membership in 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.

International

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

Canada: Membership in ARRL, including a 1-year subscription to QST, \$62, payable in US funds. Life Membership, including a subscription to QST is available at \$1,550.* Libraries and institutions, \$62 per year.

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

Copyright © 2021 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.

*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**