

QEX

QEX (ISSN: 0886-8093) is published bimonthly in January, March, May, July, September, and November by the American Radio Relay League, 225 Main St., Newington, CT 06111-1400. Periodicals postage paid at Hartford, CT and at additional mailing offices.

POSTMASTER: Send address changes to: QEX, 225 Main St., Newington, CT 06111-1400 Issue No. 349

Publisher
American Radio Relay League

Lori Weinberg, KB1EIB
Assistant Editor

Production Department
Becky R. Schoenfeld, W1BXY
Director of Publications and Editorial

Matt Ali
Layout & Production Specialist

David Pingree, N1NAS
Senior Technical Illustrator

Brian Washing
Technical Illustrator

Advertising Information
Janet L. Rocco, W1JLR
Business Services
860-594-0203 – Direct
800-243-7768 – ARRL
860-594-4285 – Fax

Circulation Department
Cathy Stepina
QEX Circulation

Offices
225 Main St., Newington, CT 06111-1400 USA
Telephone: 860-594-0200
Email: qex@arrl.org

Subscription rate for 6 print issues:
In the US: \$29

US by First Class Mail: \$40

International and Canada by Airmail: \$35

ARRL members receive the digital edition of QEX as a member benefit.

March/April 2025

About the Cover

Using a Raspberry Pi Zero Board and camera to demonstrate Gas Law. The aim of this project was to verify the law of perfect gases by estimating the volume of the balloon as a function of altitude. Anthony Le Cren, F4GOH/KF4GOH, explains in "Demonstrating the Idea of Gas Law Using a Balloon, SSTV, and LoRa."



In This Issue:

2 Perspectives

3 Extreme NVIS Antennas — How Big Can We Go? John Stanley, K4ERO

6 A Low-Cost Tunable RF Preselector Using a Varicap Diode Dr. George R. Steber, WB9LVI

11 Yaesu FT-891 Control Box Mario Lechasseur, VE2KEC

17 Demonstrating the Idea of Gas Law Using a Balloon, SSTV and LoRa Anthony Le Cren, F4GOH/KF4GOH

26 Self-Paced Essays — #27 Overkill Eric P. Nichols, KL7AJ

28 Upcoming Conferences

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 immediately. Thank you for your assistance.



Copyright © 2025 by the American Radio Relay League Inc. For permission to quote or reprint material from QEX or any ARRL publication, send a written request including the issue date (or book title), article title, page numbers, and a description of where and how you intend to use the reprinted material. Send the request to permission@arrl.org.

Index of Advertisers

DX Engineering: Cover III
ICOM America: Cover IV
Kenwood Communications: Cover II
Tucson Amateur Packet Radio: 10