**The American Radio Relay League**

The American Radio Relay League, Inc., is a noncommercial association of radio amateurs, organized for the promotion of interest in Amateur Radio communication and experimentation, for the establishment of networks to provide communications in the event of disasters or other emergencies, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

ARRL is an incorporated association without capital stock chartered under the laws of the state of Connecticut, and is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1986. Its affairs are governed by a Board of Directors, whose voting members are elected every three years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial, and no one who could gain financially from the shaping of its affairs is eligible for membership on its Board.

"Of, by, and for the radio amateur," ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

A *bona fide* interest in Amateur Radio is the only essential qualification of membership; an Amateur Radio license is not a prerequisite, although full voting membership is granted only to licensed amateurs in the US.

Membership inquiries and general correspondence should be addressed to the administrative headquarters:

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**The purpose of *QEX*** is to:

1) provide a medium for the exchange of ideas and information among Amateur Radio experimenters,

2) document advanced technical work in the Amateur Radio field, and

3) support efforts to advance the state of the Amateur Radio art.

All correspondence concerning *QEX* should be addressed to the American Radio Relay League, 225 Main St., Newington, CT 06111 USA. Envelopes containing manuscripts and letters for publication in *QEX* should be marked Editor, *QEX*.

Both theoretical and practical technical articles are welcomed. Manuscripts should be submitted in word-processor format, if possible. We can redraw any figures as long as their content is clear. Photos should be glossy, color or black-and-white prints of at least the size they are to appear in *QEX* or high-resolution digital images (300 dots per inch or higher at the printed size). Further information for authors can be found on the web at **www.arrl.org/qex** or by email to **qex@arrl.org**.

Any opinions expressed in *QEX* are those of the authors, not necessarily those of the Editor or the League. While we strive to ensure all material is technically correct, authors are expected to defend their own assertions. Products mentioned are included for your information only; no endorsement is implied. Readers are cautioned to verify the availability of products before sending money to vendors.

Ron Diehl, NQ8W

# Perspectives

Amateur radio is one of the modern era's most successful traditions of structured self-education. Long before formal electrical engineering programs and technical curricula were widely available, radio amateurs learned through independent study, experimentation, peer-to-peer exchange, and the discipline of making equipment work.

That tradition has continued through every technological transition — from vacuum tubes and analog circuitry to integrated transceivers, software-defined radio, embedded systems, digital signal processing, and now artificial intelligence. Modern amateurs may work with tools far removed from spark transmitters, but the underlying method stays unchanged: study independently, experiment freely, test claims against measurement, learn from others, and publish results so the community can advance together.

The right word for this self-educated practitioner is *autodidact*. Yet amateur self-education has never meant learning alone. It depended on mentors, license examinations, clubs, handbooks, journals, and an open culture of publishing circuits, measurements, mistakes, and improvements.

That tradition continues in this issue of *QEX*. Guenther Knebel, DK6ET, applies careful thermal design to water-cooled power amplifiers. Marilyn Wolf, W2MCW, tests AI tools and shows why expert verification is still essential. Robert Zavrel, W7SX, turns transmission-line loss into a practical calculation method. Alan Victor, W4AMV, reduces RF measurement to a simple resistor network and oscilloscope. Bob Fontana, AK3Y, combines embedded hardware, software, and Morse training in one compact project.

Different subjects, same model: study, build, measure, share, and improve. That is the enduring work of the radio autodidact.

## Writing for QEX

*QEX* welcomes practical and theoretical articles that advance amateur radio through experimentation, design, measurement, construction, software, and technical analysis. Articles are typically 2,500 to 4,000 words; contact the editor before preparing manuscripts much more than 5,000 words. Send manuscripts and inquiries to **qex@arrl.org**. Authors are paid $50 per published page or part thereof. Complete guidance is available at **www.arrl.org/qex-author-guide**.