

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:

ARRL
225 Main St.
Newington, CT 06111 USA
Telephone: 860-594-0200
FAX: 860-594-0259 (24-hour direct line)

Officers

President: Rick Roderick, K5UR
P.O. Box 1463, Little Rock, AR 72203

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 e-mail 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.

Kazimierz "Kai" Siwiak, KE4PT

Perspectives

An Expanded *QEX* Audience

We noted previously in this column that *QEX* Online edition is available to all ARRL members as a benefit. Members and non-members can still subscribe to the *printed* edition of *QEX* at the usual subscription rates. As a member benefit, the whole suite of ARRL online e-magazines is at your disposal. What this means for *QEX* is a potentially greatly expanded readership that includes all ARRL members plus the non-members who subscribe to the *QEX* printed edition. We recognize that the expanded membership profile boasts individuals from all walks of life and at all levels of technical expertise, not just engineers and technologists.

Keep the detailed and high technical level articles coming in, even though they may appear as '*mathematica obscurata*' to many of our new readers. To help transition those for whom engineering and technology are not their primary language, and as a hearty welcome to *QEX*, we shall embark on a self-paced series of essays in electrical engineering designed by Eric Nichols, KL7AJ. The essays will cover many of the fundamental topics that one would encounter in a university-level electrical engineering curriculum. We want this to be a highly interactive essay series, so we strongly encourage your feedback about the draft outline of the essays, and also about topics that you would want us to cover. We will do our best to accommodate you.

In This Issue

Steve Franke, K9AN; Bill Somerville, G4WJS; and Joe Taylor, K1JT, describe the FT4 and FT8 digital modes implemented in *WSJT-X*.

Gene Marcus, W3PM/GM4YRE, builds a project that includes a two-channel VFO, WSPR source, frequency counter, and a clock.

Eric Nichols, KL7AJ, presents Part 2 of his Double Balanced Mixer series.

Steve Stearns, K6OIK, explores general uniform transmission lines having complex characteristic impedance and propagation constant.

QEX introduces a self-paced essay series in electrical engineering designed by Eric Nichols, KL7AJ.

Writing for *QEX*

Please keep the full-length *QEX* articles flowing in, or share a **Technical Note** of several hundred words in length plus a figure or two. Let us know that your submission is intended as a **Note**. *QEX* is edited by Kazimierz "Kai" Siwiak, KE4PT, (ksiwia@arrl.org) and is published bimonthly. The content is driven by you, the reader and prospective author. *QEX* is a forum for the free exchange of ideas among communications experimenters. All ARRL members can enjoy the *QEX* Online edition as a member benefit. The printed edition annual subscription rate (six issues per year) for members and non-members is \$29 in the United States. First-Class mail delivery in the US is available at an annual rate of \$40. For international subscribers, including those in Canada and Mexico, *QEX* printed edition can be delivered by airmail for \$35 annually, see www.arrl.org/qex.

Would you like to write for *QEX*? We pay \$50 per published page for full articles and *QEX* Technical Notes. Get more information and an Author Guide at www.arrl.org/qex-author-guide. If you prefer postal mail, send a business-size self-addressed, stamped (US postage) envelope to: *QEX* Author Guide, c/o Maty Weinberg, ARRL, 225 Main St., Newington, CT 06111.

Very kindest regards,

Kazimierz "Kai" Siwiak, KE4PT

QEX Editor