

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 Street, 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

Institutional Memory

Amateur Radio operators have accumulated a huge collective *institutional memory* of data, information, and knowledge about Amateur Radio techniques and technology. Although we strive to cover a wide range of current technologies and topics from that evolving *memory* in these pages, the typical article can span several pages and cover topics in extended depth. Full-length articles require much effort by our authors, and producing a long in-depth technical study might not be for everyone. Yet there are ideas out there, technical treasures, which might be described briefly. So how can we tap into this aspect of the *institutional memory*? How can we elicit *QEX*-level technical tidbits from our readers? Going forward a new **Technical Note** column debuts in *QEX*.

By all means, keep the full-length *QEX* articles flowing in, but let's also tap into our *institutional memory* and share a brief **Technical Note** that is perhaps several hundred words long plus a figure or two. Expand on another author's work and add to the Amateur Radio *institutional memory* with your technical observation. Let us know that your submission is intended as a **Note**.

In This Issue

Our authors improve on several instances of test equipment, rediscover old noise measurements, and beef up transmission line analysis.

Michael Knitter, DG5MK, describes a complex-impedance analyzer that uses a heterodyning technique and high resolution ADCs to get good accuracy at low cost.

Robert H. Sternowski, WB0LBI, uncovers old measurements, which show that vertically and horizontally polarized noise can differ by tens of decibels in the lower HF bands.

Paulo Renato F. Ferreira, PY3PR, updates the Octopus V/I curve trace by providing selectable scanning voltages for testing.

Maynard A. Wright, W6PAP, provides Octave software for computing the performance of transmission lines having a complex characteristic impedance.

QEX is edited by Kazimierz "Kai" Siwiak, KE4PT, (ksiwiak@arrl.org) and is published bimonthly. *QEX* is a forum for the free exchange of ideas among communications experimenters. The content is driven by you, the reader and prospective author. The subscription rate (6 issues per year in the United States is \$29. First Class delivery in the US is available at an annual rate of \$40. For international subscribers, including those in Canada and Mexico, *QEX* can be delivered by airmail for \$35 annually. Subscribe today at www.arrl.org/qex.

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73,

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