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 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

Re-cycling Electronics

During my early days in amateur radio — in the mid 1960s — my main source of electrical and electronics components for homebrewing ham gear was a discarded television chassis. After dismantling and sorting the components, there was almost enough to recycle a vacuum tube television set into a low-power ham transmitter — along with a healthy handful of resistors, capacitors and potentiometers to replenish the 'junk' box for other projects. I needed just a few additional specialized parts like crystals for frequency control. That was then. Today's discarded television sets do not yield many ham-salvageable components, which begs the question: "What can today's home brewer recycle into a ham project?"

Some discarded consumer items can still be recycled into ham gear. For example, a magnetron-based microwave oven can source the parts for a several hundred watt high-voltage power supply to breathe life into a home brew vacuum tube linear amplifier. The magnetron also yields a hefty refrigerator magnet.

I'd like to revisit this concept and publish an account of what you, dear reader and experimenter, have recycled into ham projects?

In This Issue:

- Tim Czerwonka, WO9U, creates custom keyboards using qmk firmware.
- Lynn Hansen, KU7Q, describes automation options for the CTR2 HMI.
- Chuck MacCluer, W8MQW, describes sequencing of antenna change-over relays.
- Eric Nichols, KL7AJ, in his Essay Series, describes angular frequency.
- Philip Cassady, K7PEC, reveals the effects height and ground parameters on a dipole.
- John Stanley, K4ERO, shows that loss on a line with SWR can be lower than on a matched line.
- Peter DeNeef, AE7PD, estimates the field power density from a parabolic dish antenna.
- Alan Victor, W4AMV, investigates transformer coupled tuned impedance transforming circuits.

Writing for *QEX*

Please continue to send in full-length *QEX* articles, or share a **Technical Note** of several hundred words in length plus a figure or two. *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. All members can access digital editions of all four ARRL magazines: *QST*, *On the Air, QEX*, and *NCJ* as a member benefit. The *QEX printed edition* is available at an annual subscription rate (6 issues per year) for members and non-members, see **www.arrl.org/qex**.

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Very kindest regards,
Kazimierz "Kai" Siwiak, KE4PT
QEX Editor