

## 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/](http://www.arrl.org/qex/) or by e-mail to [qex@arrl.org](mailto:qex@arrl.org).

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Kazimierz “Kai” Siwiak, KE4PT

## Perspectives

### New Rules on RF Exposure Compliance

A lengthy 2019 *RF Report and Order* that went into effect on May 3, 2021 details rule changes governing RF exposure standards. The new rules do not change existing RF exposure limits but do require that stations, including amateur radio stations, be evaluated against existing limits, unless they are exempted. The 2019 *Report and Order* changes the methods that parties use to determine and achieve compliance with FCC limits on human exposure to RF electromagnetic fields.

One of the consequences is that the new rules no longer necessarily exempt handheld transceivers used by hams from certification that their use will comply with a specific absorption rate (SAR) limit. This is new to the amateur radio community, but has historically always been a requirement for commercial handheld transceivers — those used outside the amateur radio service.

The ARRL RF Safety Committee, chaired by Dr. Gregory Lapin, N9GL, is monitoring the new regulatory requirements and working to develop appropriate methods to help hams in their compliance efforts. Simultaneously, a small group of UK amateurs in the Radio Society of Great Britain (RSGB) along with the ARRL in the US have been convening since mid-2020 to collaboratively attack the issues regarding proposed new RF rules to be administered by Ofcom in the UK, and how the new changes in the FCC rules are being applied to hams in the US. Stay tuned!

### In This Issue

- Ric Tell, K5UJU, recounts how new FCC rules might now require RF exposure compliance using specific absorption rate (SAR) limits.
- Alan Victor, W4AMV, applies a systematic design flow for Class C RF power amplifiers.
- Tony Brock-Fisher, K1KP, describes a fixture for measuring Q of inductors.
- Jacek Pawlowski, SP3L, investigates the design of antennas considering common mode currents on the transmission line.
- Dan Koellen, AI6XG, uses *Telegram* to remotely command and monitor his ham station.
- John Stanley, K4ERO, matches twinlead or ladder line feeders with a sleeve implementation of a series-section transformer.

### 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. **QEX** is edited by Kazimierz “Kai” Siwiak, KE4PT, ([kswiak@arrl.org](mailto:kswiak@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](http://www.arrl.org/qex).

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Very kindest regards,  
Kazimierz “Kai” Siwiak, KE4PT  
**QEX** Editor