

April 26

ARKANSAS DIAMOND RADIO CLUB NEWS LETTER

Volume 48

### *Local Nets:*

**Petit Jean Mountain**  
Monday Night  
7:30pm 146.685  
141.3 Tone

**ADARC Simplex**  
Thursday Night 8pm  
146.51 No tone no  
offset

**CAREN Statewide Net**  
Thursday Night 7pm  
146.940 - offset  
no tone

**FARC Conway**  
Thursday Night  
7:30 pm 146.970 pl  
114.5

### **Inside this issue:**

From the Prez **1**

Popiel Bio **3**

**5 Tools For**

**Every Ham-**

Quiz **6**

Quiz answers and **7**

Club Business

Organization **7**

## Next Meeting April 9th

North Fire Station

By the Hospital and Next to Colton's

5pm ish if you want to eat

6pm for the regular meeting

Glen Popiel will give a presentation on Arduino for Amateur Radio. He has written 3 books on the subject which can be purchased at the ARRL store.



From the PREZ!

### **ARRL Summer Field Day: Our Biggest Weekend of the Year**

Dear Arkansas Diamond Amateur Radio Club,

Every June, thousands of hams across the U.S. and Canada head outdoors, raise antennas, fire up generators, and put their skills to the test during **ARRL Summer Field Day**—the most popular on-the-air event in amateur radio. More than **31,000 operators** participate each year, turning parks, fields, and backyards into temporary communication hubs.

Field Day isn't just a contest—it's a **nationwide emergency-readiness exercise**, a public demonstration of our service, and a chance for clubs like ours to sharpen operating skills under real-world conditions. The 2026 event will be held **June 27–28**, aligning with this year's theme: "**Amateur Radio: A National Resource.**"

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#### **Club Assembly Location**

We will assemble at:

**Morrilton North Fire Station**  
**1700 E Harding St, Morrilton, Arkansas**

This location provides excellent access, visibility, and space for antennas, generators, and public outreach.

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## Why Field Day Matters

### Emergency Preparedness

We practice operating in “less than optimal conditions”—off-grid power, portable antennas, and rapid deployment. This is exactly the kind of readiness that makes amateur radio a critical resource during disasters.

### Community Outreach

Field Day is ham radio’s *open house*. It’s our chance to show the public what we do, invite newcomers to try the mic, and demonstrate the science and service behind our hobby.

### Technical Skill Building

From antenna design to logging software, Field Day pushes us to experiment, troubleshoot, and improve our station capabilities.

### Club Camaraderie

It’s also one of the best weekends of the year to enjoy fellowship, food, and fun with fellow operators.



## The Operating Objective

The goal is simple:

**Make as many contacts as possible** across the HF bands (160–10 meters) and all bands above 50 MHz. Whether you’re running CW, SSB, digital, or VHF/UHF, every QSO helps sharpen our skills and contributes to the club’s score.



## How Clubs Participate

Most clubs set up in camp style fashion with:

- Portable towers or wire antennas
- Battery, solar, or generator power
- Tents, trailers, or pavilions
- Public information tables
- GOTA (Get On The Air) stations for newcomers

This setup showcases our readiness and invites the community to learn more.



## Tools & Resources

ARRL provides a wealth of support, including:

- **Field Day Locator**
- **Rules & scoring guides**
- **Facebook Group** for sharing tips and photos

**America250 WAS Affiliated Club Endorsement**, where Field Day contacts count toward the award

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## A Call to the Arkansas Diamond ARC

Let's make this year's Field Day our strongest yet. Whether you're a seasoned operator or brand-new to the hobby, there's a role for everyone—logging, setup, operating, safety, hospitality, and more.

Bring your enthusiasm, your curiosity, and your willingness to learn. Field Day is where we shine as a club, as operators, and as ambassadors for amateur radio.

See you on the air—and at the Morrilton North Fire Station.

73,

The PREZ, W5WUP

## Our Program is to be Presented by Glen Popiel—Here is His Biography

### Glen Popiel

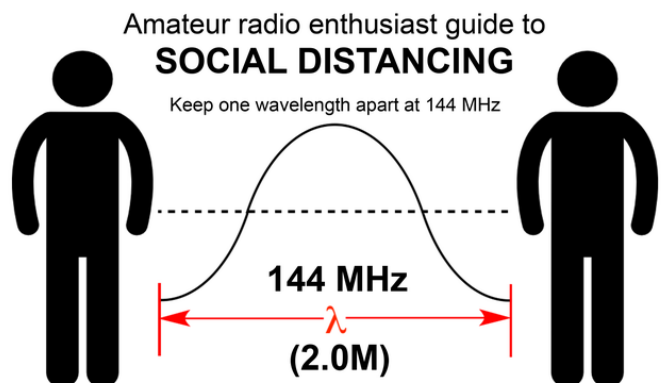
Glen Popiel is the author of ARRL's "Arduino for Ham Radio" series of books, along with ARRL's *High Speed Multimedia for Amateur Radio*. He is a retired network engineer and Technology Consultant for HTC Global Services. First published in *Kiloband Microcomputing* in 1979 for circuits he designed for the RCA 1802 microprocessor, he continues to work with microcontrollers and their uses in amateur radio and has written numerous articles on computers and amateur radio.

Always taking things apart (and sometimes even getting them to work again afterwards), he discovered electronics in high school and has never looked back. As a teenager, he had one of the first true home computers, a Digital Equipment (DEC) PDP-8 minicomputer (complete with state-of-the-art Model 35 Teletype) in his bedroom that he and his friends salvaged from the scrap heap. Over his 40+ year career, he has worked for various aerospace, computer manufacturers, and technology companies, including radio and military turbojet research data acquisition and control systems.

Since discovering the Arduino over ten years ago, he has developed a passion for this powerful, inexpensive microcontroller and has given a number of seminars and hamfest forums on the subject of the Arduino and Open Source. He is a member of the Olive QRP Amateur Radio Club International (QRP-ARCI), and the QRP Skunkworks, a design team of fellow hams and Arduino enthusiasts who have succeeded in getting the JT65 digital mode working natively on a CW-only (so they thought) QRP Transceiver.

Glen is also a former cat show judge and has exhibited Main Coon cats all over the country, with the highlight being a Best in Show at Madison Square Garden in 1989. He now lives in Conway, AR where he continues to create fun and exciting new Arduino projects for amateur radio with his two champion Main Coon show cats and lab companions, Angel and Shadow.

-----Taken from his book *Best of Arduino Projects for Ham Radio*.



# Top 5 Test Tools for YOUR Ham Shack!

Effective amateur radio operation depends on measurement. RF systems are governed by physical laws involving impedance, energy transfer, and electromagnetic radiation. Without measurement tools, operators often rely on guesswork when tuning antennas, diagnosing feed line problems, or evaluating transmitter behavior. This can lead to inefficient stations, unnecessary equipment adjustments, or even potential damage to transmitters and amplifiers.

Most station problems fall into three broad categories: antenna system issues, feed line or impedance matching problems and basic electrical faults. Each of these categories produces measurable symptoms. For example, an antenna that is electrically too long shifts its resonant frequency downward, while a poor connector may introduce feed line loss or reflected power. Identifying these symptoms requires appropriate instruments. In this article, I suggest five diagnostic tools that will help you solve the problems over your entire station.

## The Multimeter



Although amateur radio involves radio frequency engineering, many station problems originate from basic electrical issues rather than RF behavior. Power supplies may produce incorrect voltages. Cables may break internally, connectors may loosen, and grounding systems may fail. A multimeter is the primary instrument for diagnosing these fundamental electrical conditions. Modern digital multimeters measure voltage, current, and resistance with high accuracy. They often include additional features such as continuity testing, diode testing, capacitance measurements, and frequency counters. These capabilities allow operators to evaluate a wide range of electrical components and circuits within the station. In practical

troubleshooting, the multimeter is frequently the first and least expensive tool used. Before examining antennas or RF behavior, an operator may confirm the radio is receiving proper voltage, that fuses are intact, and the cables are electrically continuous. In many cases, a simple electrical measurement reveals the cause of a station problem within minutes.

Together, these instruments allow amateur operators to approach station setup and troubleshooting using the same measurement-driven methodology employed by RF engineers. Amateur radio stations are fundamentally RF systems governed by well understood electrical principles. Parameters such as impedance, standing wave ratio, resonance, and spectral purity determine how effectively a station converts electrical power into radiated electromagnetic energy. These parameters are not visible to the operator and cannot be accurately evaluated without instrumentation designed to measure them. When operators lack proper measurement tools, station adjustments often become trial and error processes. Antennas may be trimmed repeatedly. Tuners adjusted blindly and transmitter behavior inferred from incomplete indicators. This approach is inefficient and sometimes risky, particularly when high power transmitters or amplifiers are involved. Proper instrumentation allows the operator to isolate and analyze each subsystem independently. For example, a dummy load allows transmitter testing without involving the antenna, while an antenna analyzer reveals the impedance characteristics without transmitting RF. By measuring rather than guessing, operators gain the ability to not only troubleshoot problems, but to also optimize station performance for maximum efficiency and reliability.

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Continued from P4.

## Antenna Analyzer



An antenna analyzer is one of the most powerful diagnostic tools available to amateur radio operators because it reveals the electrical behavior of an antenna system without requiring transmission. The instrument injects a very small RF signal into the feed line and measures how the antenna responds across frequency. From this interaction, it derives critical parameters such as standing wave ratio, impedance, return loss, and resonant frequency. Modern analyzers, particularly vector network analyzer-based tools like the NanoVNA, provide graphical sweeps across the entire frequency ranges. These sweeps allow operators to see where resonance occurs and how impedance changes across a band and how wide the usable bandwidth of an antenna is instead of guessing where the antenna might be resonant. The analyzer shows us the answer immediately. The reactive component of impedance also provides insights into antenna length. If reactance is inductive, the antenna is electrically too long. If capacitive, it is too short. This information allows operators to adjust antenna elements or matching networks with precision. As a result, antenna analyzers dramatically reduce trial and error and transform antenna tuning into a predictable engineering process.

## Dummy Load



A dummy load is one of the simplest and yet most valuable pieces of test equipment in an amateur radio station. It provides a precisely known 50 ohm impedance that behaves like an ideal antenna from the transmitter's perspective. Instead of converting electrical energy into radiated electromagnetic waves, the dummy load dissipates that energy as heat within a resistor network designed specifically for RF operation. The primary advantage of a dummy load is that it isolates the transmitter from the antenna system. When a transmitter is connected to a properly designed dummy load, any unusual power or SWR readings can usually be attributed to the transmitter or measurement equipment rather than the antenna. This isolation is critical when diagnosing equipment faults or verifying transmitter performance. Dummy loads are also important for responsible operating practice. They allow operators to test transmitters, adjust audio levels, and evaluate amplifier performance without radiating signals that might cause interference. For this reason, nearly every well-equipped amateur radio station includes a high-quality dummy load rated for the transmitter's maximum power.

## SWR/Wattmeter



A power and SWR meter is one of the most widely used diagnostic tools in amateur radio because it directly measures how RF energy flows through the transmission line. By sampling the electromagnetic field within the co-axle line, the meter determines both forward power traveling towards the antenna and reflected power returning towards the transmitter. From these measurements, the instrument calculates the standing wave ratio, commonly known as SWR. SWR describes how well the impedance of the antenna system matches the transmitter and feed line. When the match is good, most of the transmitted power reaches the antenna and is radiated efficiently. When the match is poor, a significant portion of the energy reflects back towards the transmitter. External SWR and watt meters are often more accurate and flexible than internal meters built into many radios. They provide a clear view of transmitted output power and system efficiency, making them valuable for monitoring amplifiers, diagnosing feed line problems, and ensuring that RF energy is being delivered effectively to the antenna system.

A radio operator can read power out and SWR on his radio. I like an external meter because it is easier to read. One can even purchase a digital SWR/Wattmeter for easier reading. If you use an amplifier, having 2 meters can be helpful. Place one before the amplifier and one after so you can tell how many watts out of the radio will generate the watts your amplifier produces.

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## Spectrum Analyzer



A spectrum analyzer is one of the most powerful diagnostic tools available for understanding RF signals because it reveals how signal energy is distributed across frequency. Instead of showing voltage changes over time like an oscilloscope, the instrument displays signal amplitude as a function of frequency. This provides immediate insight into the spectral content of a transmitter or the RF environment surrounding a station.

One of the most important uses of a spectrum analyzer is detecting harmonics and spurious emissions. A transmitter operating on a given frequency should produce minimal energy at multiples of that frequency. If strong harmonics appear, it may indicate insufficient filtering, amplifier nonlinearities, or other technical issues that could lead to interference with other services. Spectrum analyzers are also extremely useful for evaluating filters and identifying noise sources in a station environment. Many modern amateur radio operators use compact instruments like the tiny SA or SDR based spectrum displays to track down interference generated by switching power supplies, consumer electronics, or digital devices. By visualizing the spectrum, operators gain a powerful method for diagnosing complex RF problems.

When viewed together, these five instruments form a complete diagnostic toolkit for an amateur radio station. Each device measures a different aspect of station performance, and together they've provided visibility into nearly every part of the RF system. Instead of guessing where problems might exist, operators can observe measurable evidence and narrow the cause quickly. Most station problems fall into three broad categories: antenna behavior, feed line or matching issues, and basic electrical faults. The antenna analyzer helps better understand resonance impedance. The dummy load allows safe transmission testing. The SWR and power meter measures how effectively energy is delivered to the antenna. The spectrum analyzer reveals signal purity and interference. And the multimeter checks fundamental electrical conditions. The most effective operators develop a habit of measuring before making adjustments. This mindset transforms amateur radio from a trial-and-error hobby into a practical application of RF engineering principles. With the right instruments and a methodical approach, diagnosing and optimization of a station becomes faster, safer, and far more reliable.

Just a note: Owning these tools alone will not optimize your station. I suggest that you learn as much as you can by reading the included manuals, exploring the internet, and watching YouTube videos.

This article was taken from the transcript of a YouTube video on TheSmokingApeHamRadio channel. <https://www.youtube.com/watch?v=G04fXOoAvPA&t=315s>

### General Exam Review Questions just for fun

**Which of the following is an effect of overmodulation?**

- A. Insufficient audio
- B. Insufficient bandwidth
- C. Frequency drift
- D. Excessive bandwidth

**What is another term for the mixing of two RF signals?**

- A. Heterodyning
- B. Synthesizing
- C. Frequency inversion
- D. Phase inversion

Answers found on Page 7

**Meeting April 9th:** Don't miss our meeting.

**Program:** Arduino Projects for Ham Radio - Glen Popiel

**Tech night:** February: Demonstration of Open Ham Clock online.

March: Discussed various subjects including the World Radio League online logging.

**Hamfests:** W5MAG Hamfest. Paris, AR. April 4th.

<https://w5str.org/>

Green Country Hamfest. Claremore, OK. April 10th & 11th

<https://sites.google.com/view/arv-hamfest/home?authuser=0>

Please comment or make suggestions concerning our newsletters. [kf5sde@gmail.com](mailto:kf5sde@gmail.com)

Answers from page : 6

D. Excessive bandwidth

A. Heterodyning

## Arkansas Diamond Amateur Radio Club

P.O. Box 1262  
Morrilton, AR 72110.

The Arkansas Diamond Radio Club (KE5FSY) of Morrilton News Letter This bulletin is published 4 times a year for the promotion of HAM radio. Ham radio is for enjoyment and is the emergency back bone of communication for the communities. When all else fails we will be there, we have in the past and will be in the future. Editors are KF5SDE Roger Alabach [kf5sde@gmail.com](mailto:kf5sde@gmail.com) All HAM related stories are welcome.

  
**Organization**

## Club Officers

David (W5WUP) is the Club President, Conway County ES Training & Resource Officer, County Emergency Coordinator for ARES/RACES/AUXCOM.

Roger (KF5SDE) is the Club Vice-President and the Deputy Communications Officer for Conway County ES/911. He is also in charge of the quarterly newsletter.

Steve Beavers (KF5DIF) is the Club Treasurer and Director of Conway County Office of Emergency Services/911

We are on the web

<https://arkansasdiamondarc.com/>

## Here are a few Special Event Stations that might be of interest.

- 04/03/2026 | Tater Day 2026 - Yam It Up
- **Apr 3-Apr 6, 0000Z-2359Z, KI4HUS**, Benton, KY. Marshall County ARA. 3.820 7.250 14.325 28.350. QSL. Steve French KM4JZJ, 3640 Olive Hamlett Rd., Benton, KY 42025.
- 04/11/2026 | Atlas Missile Silo, Oplin, TX
- **Apr 11-Apr 12, 1500Z-0100Z, KC5OLO**, Abilene, TX. Key City Amateur Radio Club. 28.400 21.300 14.250. QSL. KCARC Key City Amateur Radio Club, PO. 2722, Abilene, TX 79604. <https://keycityarc.org>
- 04/11/2026 | Shark's Tooth Festival
- **Apr 11-Apr 12, 1400Z-2200Z, W4AC**, Nokomis, FL. Tamiami Amateur Radio Club. 14.260 14.034 28.460 28.034. QSL. Tamiami ARC, PO Box 976, Nokomis, FL 34274. [tamiamiarc.org](http://tamiamiarc.org)
- 04/14/2026 | Sun & Fun Aerospace Exposition
- **Apr 14-Apr 19, 0817Z-0817Z, W4S**, Lakeland, FL. Lakeland Amateur Radio Club. 14.40 7.40 18.93 28.40. QSL. Lakeland Amateur Radio Club, P.O. Box 90853, Lakeland, FL 33804. [info@lakelandarc.com](mailto:info@lakelandarc.com)
- 04/17/2026 | Florida State Parks on the Air Contest
- **Apr 17-Apr 20, 1200Z-2359Z, W4AC**, Nokomis, FL. Tamiami Amateur Radio Club. 14.337. Certificate. Tamiami ARC, PO Box 976, Nokomis, FL 34274. [fspota.org](http://fspota.org)
- 04/23/2026 | Battle of Hobkirk's Hill
- **Apr 23-Apr 27, 0500Z-0500Z, K4H**, Camden, SC. Kershaw County Amateur Radio Club - KC4RC. 14.325 MHz 7.225 MHz 21.325 MHz 3.825 MHz. Certificate. No QSL cards, eCertificates only, request from [info@kc4rc.com](mailto:info@kc4rc.com), Camden. [info@kc4rc.com](mailto:info@kc4rc.com)
- 05/09/2026 | National Train Day
- **May 9, 1400Z-1900Z, W4LX**, Fort Myers, FL. Fort Myers ARC. 14.044 14.244 7.044 7.244. Certificate. Fort Myers ARC Train Day, P.O. Box 061183, Fort Myers, FL 33906-1183. [trainday@fmarc.net](mailto:trainday@fmarc.net)
- 05/14/2026 | Honoring the Serving Members and Veterans of our Armed Forces
- **May 14, 1400Z-1900Z, KA4TAL**, Conway, SC. Horry Post 111 The American Legion Amateur Radio Club. 14.255 7.264 14.275 7.185. Certificate & QSL. The American Legion Amateur Radio Club, Horry Post 111, 2830 Oak Street, Conway, SC 29526. [talarcpost111sc@gmail.com](mailto:talarcpost111sc@gmail.com)
- 05/30/2026 | Audie Murphy
- **May 30, 1400Z-1900Z, W2A**, CHRISTIANSBURG, VA. New River Valley Amateur Radio Club. 14.262. QSL. Danny Wylam, 710 McDaniel Drive Southeast, CHRISTIANSBURG, VA 24073-3848. [dannywylam@gmail.com](mailto:dannywylam@gmail.com)
- 06/01/2026 | W2W D-Day Commemoration
- **Jun 1-Jun 14, 1300Z-2200Z, K3NEM**, Middle River, MD. Amateur Radio Club of the National Electronics Museum. 14.244 14.044 7.244 7.044. Certificate & QSL. ARCNEEM, c/o Fred Heath AI3Z, 202 Baltimore-Annapolis Blvd., Severna Park, MD 21146-1368. [WW-2.us](http://WW-2.us)
- **06/06/2026 | Lewis and Clark Trail on the Air**
- **Jun 6-Jun 21, 0000Z-2359Z, W7AIA, Various Cities and States. Clark County Amateur Radio Club. 14.240. Certificate & QSL. Clark County Amateur Radio Club, PO Box 1424, Vancouver, WA 98661. <https://www.lctota.org>**
- 06/10/2026 | 190th Anniversary of Arkansas Statehood
- **Jun 10-Jun 15, 0000Z-2359Z, K5A**, Springdale, AR. Bella Vista Radio Club. 14.040 14.260 7.040 7.260. QSL. Don Banta, 3407 Diana Street, Springdale, AR 72764. [www.qrz.com/db/k5A](http://www.qrz.com/db/k5A) or <https://bellavistaradioclub.org>

For a more complete list of upcoming special event stations go to: <https://www.arrl.org/special-event-stations>

**Get on the Air!**