



# Spark Gap

Vol. 34, Issue 2, February 2017 *MARC - Serving Central Indiana Communities for thirty-four years*

## *On Our MARC:*

Hope everyone is staying healthy these days. I'm surprised that more aren't sick with the hot cold weather we have been having. What does that Groundhog know?

With severe weather season just around the corner, I have heard that the Storm Spotter Training class will be March 20. I believe it will be from 6:30 to 9pm, and will be held at the new training center behind the EOC. I'm not sure as if we need to reserve a spot or not. I am hoping that Dave Daily, KB9LOT will have more information for us at the meeting.

If you know of anyone that is interested in taking the Tech exam but not sure they are ready, please remember that we will be holding a Tech Review Course April 8<sup>th</sup> at White River Fire Department Station 53. The class will start about 8 and go till noon. Testing will be after the review is done for those who are ready for testing. Class is free but there is a \$15.00 fee for taking the test.

On Monday January 23, 2017 the US House of Representatives suspended their rules and passed the Amateur Radio Parity Act of 2017 by unanimous consent. This action now sends the bill to the US Senate for its consideration. The wording of HR555 is identical to the language of HR 1301, which passed the US House of Representative by a unanimous consent vote September 2016 during the 114<sup>th</sup> Congress, which adjourned in Dec.

This month speaker will be Bruce Tisdale, K9ICP talking about Emergency Service Plan. See you Saturday and the coffee will be on.

Jacki-KI6QOG  
*President*

## **2017 Club Dues**

Please remember to renew your M.A.R.C. membership this month at the club meeting. The dues are still \$ 18.00 per year. See Marlys, KD9BHM at the Saturday club meeting and she can help you with renewing your membership or start your membership with the Mid-State Amateur Radio Club.

## 2017 Events Needing Ham Radio Support.

Mike Palmer, N9FEB is looking for some volunteers to help out this year for the following events. If you can help him out, please contact him at 317-849-3602 (home) or 317-753-8691 (cell). The dates and events are:

Sat May 6 - Mini Marathon

Sat May 27 - 500 Festival Parade

Sat Aug 5 - Indy Air Race (NOT the Red Bull)

Sat Oct 7 - American Diabetes Tour-de-Cure Bike Ride

Sat Oct 7 - Indianapolis Half Marathon in Lawrence

Sat Nov 4 - Monumental Marathon

Sat Oct 7 there are two events taking place; ADA Bike Ride and the Half Marathon in Lawrence. Mike is planning on working them both simultaneous however, if you sign up for that day, he will only be assigning you to one of them.

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*Birthdays for the month of February:*

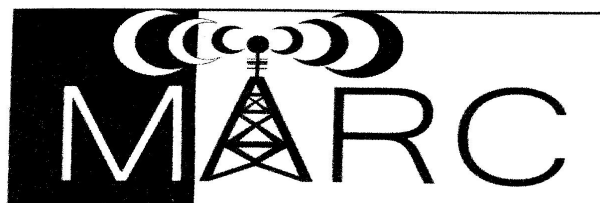
*NC9ULB -Jeff Allen*

*ND9C- Steve Curtis*

*N9SIU -Bob LaGrange*

*KC9ZMU- Fred Robertson*

*K9THR -Ron Schuetz*



## ***DIY: Packet in a Bucket***

As an ARES operator I frequently set up in the field taking along my trusted to-go box. Most recently it was put to use for the Trump/Clinton debate in Las Vegas, Nevada, and the Vigilant Guard Communications Exercise, in the County Mobile Communications unit. There, the mission was to provide voice and packet relay should the MACC (Multi-Agency Command Center) be unable to make contact with distant stations. After the Vigilant Guard Exercise, the local ARES District EC requested we bring our to-go boxes to an ARES training session as a show-and-tell for newer members to see what was possible. I needed a new one to show, after my box was broken. I headed to the nearest home supply store to see what was available for a replacement. Our ARES members have boxes that range from the higher-priced 19 inch rack models, to tackle boxes and ammo boxes. After checking out the plastic toolboxes as options, some with wheels, some having pull-handles and stackable accessories, I decided to go with the utmost in simple: The bucket!

I bought a food grade 5 gallon bucket, along with a screw-on top, purchased separately. The top is purchased with the screw-on rim that must be pushed onto the top of the bucket where it is held on by friction. Total cost for the three items: \$12.00.

Inside there are 2 shelves. The top shelf is wood. The bottom is steel. Prior to cutting the wood and metal it was necessary to create cardboard templates. These templates were placed inside the bucket at the same time to check for measurements to ensure the packet radio modem/TNC (Kantronics KPC-3+) would fit in the space on top of the wooden shelf while the radio was hung under it. The metal shelf was sized to allow an on/off switch box to be placed under it while allowing room for the power supply, radio and power distribution box on top. The Powerpole distribution box is placed between the power supply and the radio. The radio and TNC remain plugged into the distribution box. The red and black Powerpole connectors between the radio and power supply were set so that either the power supply or an alternate power source could be easily plugged in. This provides the input to the power pole distribution box.

The components are held in place with 1 inch Velcro strips cut to each unit's width. I placed the thin metal shelf under the power supply to mount it using the original screws that hold the feet onto the supply. Measuring and accurate drilling of 4 holes for the mounting screws made it an easy installation. Quarter round wooden stock was used to conform the shelves to the shape of the bucket. Shelves are screwed to the quarter round then inserted into the bucket and secured to the bucket with screws from the outside. I used a flashlight inside the bucket when screwing from the outside to create a shadow, so I didn't miss the quarter round. The bucket will be complete once I add the sound card interface and weather proof the 6 screws on the outside.

The on/off lighted switch box under the power supply is connected between the alternate power source and the powerpole distribution box. I used the lighted switch to indicate power was coming into the switch. This allows me to know when I've lost external power without having to dig my multi-meter out of my toolbox.



Also inside the bucket I store a magnetic mount antenna, dual band handheld, and the power cord to connect to an external source. I will be adding the West Mountain NOMIC sound card interface in the bucket to use with an HF system for sound card modes. It will mount on the side between the shelves.

The USB cable shown in the photo coming from the top shelf connects to the computer. There is also an adapter cable to connect between the radio and the antenna coax in the box, not shown.

..... ARRL, ARES NEWS ..... February 2017

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## CQ to introduce MF/LF column

As ham radio operators in the United States await final FCC action to open new amateur bands at 630 meters (472-479 kHz) and 2200 meters (135.7 kHz - 137.8 kHz), CQ magazine is getting a head-start by introducing a column that will help interested hams get ready to "hit the ground running" once the FCC issues its final rules.

The new column - to be titled "MF/LF Operating: Life Below the AM Broadcast Band" - will appear quarterly, starting in the April 2017 issue, and will be edited by John Langridge, KB5NJD/WG2XIQ.

Licensed as a high school student in 1989, John's interest in "life below the AM broadcast band" extends back even further, when, at age 11, he read an article in Radio-Electronics magazine about the unlicensed 1750-meter band (160-190 kHz).

He had to content himself with operating on 160 meters until the opportunity arose in 2012 to join the ranks of Part 5 experimental stations authorized by the FCC to conduct propagation research in preparation for the new medium frequency (MF) and low frequency (LF) bands at 630 and 2200 meters respectively.

He was granted a construction permit and station license for WG2XIQ and maintains a regular schedule of beacon transmissions and two-way contacts on 630 meters. He also shares tips and posts a "grabber," or bandscope view, of 472 kHz (which updates every 5 minutes) on his website at <http://njdtechnologies.net/>.

In his column, John says he plans to cover a variety of topics, including station building, propagation, news events affecting LF/MF, and operating strategies. "My goal," he says, "is to market the bands to people who know nothing about them." The title of his inaugural column in the April issue is "Ham Radio Below 500 kHz: What is All of This About and Where Should I Start?"

Professionally, John is a consultant in broadcast engineering and information technology, working for a variety of clients. He has a degree in physical chemistry and is currently working toward his Ph.D. in that field. John and his wife, Paula, KD5YHI, live with their pets in the Dallas, Texas, suburbs. John's column will appear in the January, April, July and October issues of CQ.

"We are looking forward to sharing John's knowledge and experience with our readers," says CQ Editor Rich Moseson, W2VU. "CQ has always been a leader in promoting new bands and modes, and in helping hams use and enjoy them. We are already seeing a growing interest in our soon-to-come MF and LF bands and John's column will be here to help our readers get active on them as soon as they become available for general use."

..... Southgate Amateur Radio News ..... February 2017

# Amateur Radio Emergency Service Posts its 2016 Annual Report

The Amateur Radio Emergency Service (ARES) has posted its 2016 annual report. The *2016 ARES Annual Report* focuses on documenting the value that ARES provides to the nation, states, and localities in collaboration with partners at all levels. The report features basic data drawn from Section Emergency Coordinators' reports, a breakdown of ARES figures by state and FEMA region, and a challenge for 2017. According to the report, ARES membership in 2016 was 27,754 — up from 17,756 in 2015 — and the Service was active in 42 states and US territories. ARES volunteers responded to 33,136 events last year.

“Sharing information about what ARES provides at all levels is critical to our work overall, as hard numbers provide better detail about our work,” ARRL Emergency Preparedness Manager Mike Corey, K11U, said. “We all need to pitch in to ensure that our contributions are counted, and here at HQ, we will be sure to do our part.”

ARES volunteers will see changes in some reporting forms in 2017; all forms, starting in January 2017, have been updated and renumbered. According to the report, 76% of ARRL sections filed reports for 2016, a significant improvement over past years. The report challenges ARRL Section Emergency Coordinators to raise that number to 85% in 2017.

In addition to the annual ARES report, ARRL Field Services staffers will produce their own monthly report, a link will appear in the *ARES E-Letter*, showing monthly data for ARES, as well as information about ARRL Headquarters emergency preparedness and Field Service activities.

..... *ARRL News* ..... *February 2017*

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## TECHNICIAN LICENSE REVIEW

The Mid-State Amateur Radio Club will be offering a one day review for the technician license, with a question and answer session. The review will be at White River Firehouse #53, 850 S. Mullinix Rd. Greenwood, Indiana.

The license review will be held on Saturday, April 8<sup>th</sup>, 2017 8am to 12pm

If you would like to attend please contact by email: [vicepresident@midstatehams.org](mailto:vicepresident@midstatehams.org)

There is no cost to attend this review session, it is FREE.

All students MUST PURCHASE AND STUDY the ARRL HAM RADIO LICENSE MANUAL 3<sup>rd</sup> Edition (ISBN: 978-1-62595-013-0) before attending the review session.

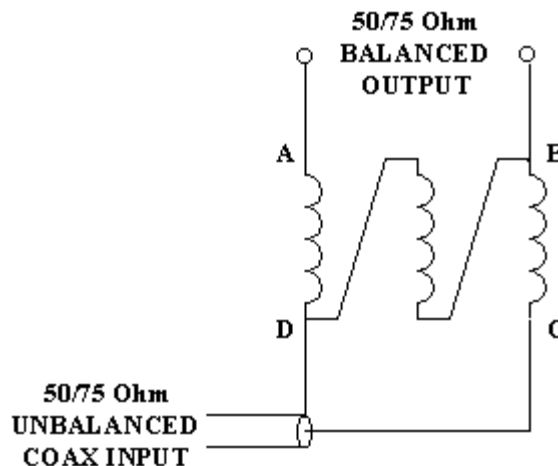
# Homemade HF Antenna Balun

Steve Yates - AA5TB

A balun is a device that is used at the feed point of a balanced antenna when an unbalanced feed line is desired to feed the antenna. Balun is a contraction for BALANCED to UNBALANCED. A common example of where a balun would be desired is at the feed point of a dipole antenna when a coaxial transmission line is used. If a balun is not used it is possible for common mode currents to be present on the feed line. The effect of this could be undesirable if the directional properties of the balanced antenna are to be maintained. Since the feed line usually leads into the shack RF could be present in the shack to create RFI as well as the possibility of receiving excessive amounts of RFI from indoor noise sources. It is often found that a balun is not necessary and everything works just fine feeding the balanced antenna directly with coax cable. When this is possible it may be found that the feed line is an odd multiple of  $1/4$  wavelength. In this case the transmitter end of the feed line is usually grounded and up from this point on the coax  $1/4$  wavelength or a multiple thereof will appear as a high impedance. When this high impedance point occurs at the feed point chances of common mode currents are low. Rather than take any chances it is often recommended to use a balun.

There are several different kinds of baluns. Some provide a 1:1 impedance ratio while others can provide 1:1.5, 1:4, and many other impedance ratios. A 1:4 ratio balun would come in handy if you were feeding a folded dipole (200 Ohms) with 50 Ohms coax. For a 1:1 ratio a balun can be constructed using the feed line itself by simply winding about five turns of the feed line around a 2" diameter piece of PVC. I preferred a 1:1 ratio balun that I could easily move from one antenna to another by simply unscrewing the coax.

My balun uses AWG 12 enameled wire trifilar wound on a 6" X  $1/2$ " piece of ferrite rod. 7 turns are tightly wound around the electrical tape covered rod. The free ends of the windings are connected as shown below in the schematic. The whole balun is installed in a 10" piece of 1- $1/2$ " schedule 40 PVC pipe. A SO-239 coaxial connector is installed in the bottom end cap with #4 stainless steel hardware. An eyebolt is installed in the top end cap. The antenna post consist of #10 stainless steel hardware mounted on opposite sides near the top of the PVC pipe.





First I drilled all of the necessary holes, including a drain hole in the bottom end cap, and then painted all of the PVC pieces with olive drab paint to protect from the elements. Next the balun was connected to the SO-239 connector and then the pipe was slid over the balun and cemented in place with PVC

cement. At this point the balun was connected to the antenna binding posts. Then the top end cap was installed with PVC cement. I tested the balun by attaching a 50 Ohms termination to the antenna posts and my MFJ-259B via coax to the coax connector on the bottom. The 50 Ohms resistive impedance was reflected back through the balun with little reactance throughout the HF spectrum. Since the design was based upon a tried and true design I am confident that it performs as expected as far as choking off currents.

I found this balun really easy to build and should easily handle a large amount of RF power as long as the SWR of the antenna remains low. A purchased balun may only cost a little more than my homemade version but I had the parts on hand and it was fun to build.



# UP – COMING ACTIVITIES AND HAMFESTS

**02/18/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**

**03/18/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**

**04/15/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**

**05/20/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**

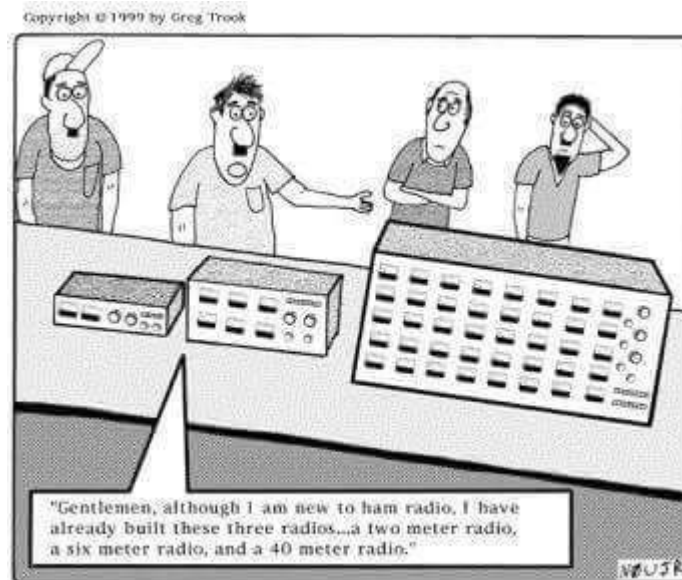
**05/19, 20 & 21/2017 – Dayton HAMVENTION new location  
Green County Fairgrounds and Expo Center, 120 Fairground Rd. Xenia, OH 45385**

**06/10/2017 – White River Fire Department Strawberry Festival TBA**

**06/17/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**

**06/24/2017 – ARRL Field Day, location TBA**

**07/15/2017 – 0800 - MARC Monthly club meeting at the New Location,  
Johnson County REMC 750 International Drive Franklin, IN 46131.**





# MID-STATE AMATEUR RADIO CLUB

The Mid-State Amateur Radio Club meets the **THIRD SATURDAY** of each month at the Johnson County REMC 750 International Drive Franklin, IN 46131.

See our website, [www.midstatehams.org](http://www.midstatehams.org), for maps on how to get to our meeting.

Everyone is welcome; you do not have to be a *HAM* to attend our meetings or a member of the club.

## WA9RDF Repeaters:

146.835/  
146.235 MHz  
(151.4 Hz PL Tone)

## WA9RDF Repeater:

443.525/  
448.525 MHz  
(151.4 Hz PL Tone)

Weekly Net: Sunday evening 7:00 PM ARES/RACES members and ALL RADIO AMATEURS  
146.835/146.235 MHz (151.4 Hz PL Tone)

## Club Officers:

President: Jacki Frederick – KI6QOG  
Vice President: Bruce Tisdale -- K9ICP  
Secretary: Rhonda Curtis – WS9H  
Treasurer: Marlys Barr – KD9BHM  
Repeater Trustee - Chris Frederick – KQ9Y

The Official Newsletter of the Mid-State Amateur Radio Club

P.O. Box 836  
Franklin, Indiana  
46131

Spark Gap Editor: Robert LaGrange N9SIU

*Please send your articles to my email: [n9siu@yahoo.com](mailto:n9siu@yahoo.com) no later than the 3rd of the month*



*Special thanks to Johnson County REMC for the use of their community room for meetings and testing.*