



The  
**Wave Bender**

March 2018

AWARD WINNING NEWSLETTER



WRARC PREZ SEZ

Often times the public views Hams as from another era, frozen in time. But the Western Reserve Amateur Radio Club is an example of present day hams connecting to the modern world as their predecessors did in their time over 100 years ago. Our Club is active with over 42 members who enjoy everything from getting involved with community events, checking in on the net, attending Club meetings and much more.

In order to achieve what we have done in the past we will need more involvement from our membership because our Club is smaller than it has been previously. We want to do the best job at every event we attend and increase the traffic on the repeater. Our goal is to ask you in a positive way to be more involved. If you can't, we understand because Hams join the hobby for many reasons. But your help is needed now and you can make a big difference in the success of the Club.



Please feel free to let me know what ideas you think can make us a better Club. Thank you for your support. 🍀

73 Brian, AB8BL

Amateur Radio Operator "Amateur means we're simply professional volunteers" ARRL reflector



IN THIS ISSUE

**2018 Officers:**

- President:** Brian Lewis, AB8BL      ab8bl@wrarc.net
- VP:** Maureen Stein, KD8NXS      kd8nxs@wrarc.net
- Secretary:** Stan Adamski, KB3WPD kb3wpd@wrarc
- Treasurer:** Rose Marko, KD8TII      kd8tii@wrarc.net
- Past President:** Bob Mitzel, N8RCM n8rcm@wrarc.net
- Trustees:**
  - Darrin Cannon, N8DMC      n8dmc@wrarc.net
  - Roy Haren, KD8IJF      kd8ijf@wrarc.net
  - Steve Fabry, KC8SOY      kc8soy@wrarc.net

**Appointed Positions:**

- Social: Maureen Stein, KD8NXS  
kd8nxs@wrarc.net
- Publicity: Joe Wojtowicz, W0JO  
w0jo@wrarc.net
- Nets: Steve Fabry, KC8SOY  
kc8soy@wrarc.net
- Classes/Testing: Bob Mitzel, N8RCM  
n8rcm@wrarc.net
- Newsletter/Web: Jane Avnet K8JAA  
k8jaa@wrarc.net
- Historian: Rose Marko, KD8TII  
kd8tii@wrarc.net
- Badges: Dennis Marko, KD8DJM  
kd8djm@wrarc.net
- Facebook: This could be you

**Officer's Meeting:**

March, 13 2018, 7:00 P.M. At Eat 'n Park,  
Austintown, Eat 'n Park,  
5451 Mahoning Ave  
All members welcome

**Members Meeting:**

March 20, Davidson's  
3636 Canfield Rd., Cornersburgh

**Speaker:** It's a surprise

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**DST**  
**Sunday**  
**March 11**  
**2:00 A.M.**

**OTHER IMPORTANT WEB SITES**

**THE ARRL EXAM SEARCH PAGE**

<[HTTP://WWW.ARRL.ORG/FIND-AN-AMATEUR-RADIO-LICENSE-EXAM-SESSION](http://www.arrl.org/find-an-amateur-radio-license-exam-session)>

**OHIO SINGLE SIDEBAND NET**

<[HTTP://WWW.OSSBN.ORG/INDEX.HTML](http://www.ossbn.org/index.html)>

**ANTENNA HEIGHT ABOVE AVERAGE TERRAIN (HAAT) CALCULATOR**

[HTTPS://WWW.FCC.GOV/MEDIA/RADIO/HAAT-CALCULATOR](https://www.fcc.gov/media/radio/haat-calculator)



<http://www.wrarc.net/>



FROM OUR VP

Greetings all. We are still in the middle of winter with cold temperatures, wind, rain, snow, fog, and anything else Mother Nature wants to throw our way. But we are entering the month of March, so spring can't be too far away, right? With the coming of spring and the quick passage of time, we will be coming up on our first big public service event of the year, the Easter Seal walk/run at Boardman Park.



I don't have the date yet for this event as I write this article, but it is typically held in late March or early April. I will pass on the information as soon as I have it. I will likely send it out by e-mail as it should be available well before our March general meeting date. Please consider signing up for this event. It is a good way to "get back in the saddle again" after the long break from public service events over the cold winter. A little later in the spring (likely in May) will be our spring road cleanup. Again, the date for this is not set yet.

Please continue to keep in mind the dates for our other three major events - the Youngstown Marathon on Sun., June 3, the Panerathon on Sun., Aug. 26, and the Peace Race Sun. Oct.21. Stay warm and dry for the rest of the winter!

73, Maureen, KD8NXS  
VP/WRARC



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SOME THOUGHTS FROM OUR TREASURER

To All Members and Associate Members:

My article for the March Wave Bender is an email sent from our past vice-president, Joe, W0JO, from last September, 2017. It talks about the speaker we listened to at the September General Meeting, Tom Sly. He talked about different ways to keep our club successful. Our President, Brian, mentioned some of these factors at our board meeting and I thought they would be interesting to read again for those of you who couldn't or didn't come to that meeting, .reprinted here :



Photo by KA8DJM

*"To those of you who couldn't make it to our last club meeting, you missed a really good guest speaker who talked about various factors that are crucial to the success of good amateur radio clubs.*

*Our guest speaker was Tom Sly, WB8CLD, who, (is a member of WRARC) has been a licensed Amateur Radio Operator since his youth and was the first President of the Portage County Amateur Radio Service, [www.portcars.org](http://www.portcars.org). and still active, which is a very successful Amateur Radio Club.*

*One of the "key" factors he spoke about was an effort for a little more "participation" by ALL members and associate members. Does this mean that a member or associate members has to do everything the club does every time? No, that's not what that means. We know our members and associate members may get sick, have to work or have family obligations which always come first. But, what it does mean is that as a member can you:*

1. *Try to attend as many monthly club meetings as you can?*
2. *Try to be on as many weekly nets as you can?*
3. *Try your hand at net control for some of those weekly nets?*
4. *Try writing an article for one or more of our monthly newsletters?*
5. *Try helping at one or more of our community service events?*
6. *Try volunteering for one of our open club officer positions?*

*If all of our members would just do a few of the above or a little more, overall it would make a significant impact on the success of WRARC. Tom also spoke about how appreciative charitable community fund-raising event organizers are of our club and our volunteer services. I know many of you probably don't see these, so I have attached some recent ones and will quote them below to show you just how much they appreciate* **Continued page 7**

WHAT'S COMING UP?

- March 03 YL Breakfast  
Participate in the WRARC Anniversary Net
- March 11 DST - lose an hour of sleep
- March 13 Board Meeting - Austintown Eat 'n Park  
open to all interested members.  
Ham Community Breakfast - Boardman Eat 'n Park
- March 14 National  $\pi$  Day
- March 20 Members meeting
- March 27 Ham Community Breakfast - Boardman Eat 'n Park
- March 28 Mahoning County Skywarn Training
  
- April 25 Columbiana County Skywarn Training



There is nothing amateur about Amateur Radio

SKYWARN SPOTTER TRAINING

March 28, 2018 6:30 PM Basic  
Lisbon, OH CCCTC  
9364 State Route 45

April 25, 2018 6:00 PM Basic  
Austintown Fitch High School Auditorium  
4560 Falcon Drive



CONTACT WRARC ELMERS WITH YOUR QUESTIONS - [QUESTIONS@WRARC.NET](mailto:QUESTIONS@WRARC.NET)

Beatty, Dave KC8WY  
Fabry, Steve KC8SOY  
Haren, Roy KD8IJF  
Williams, Russ NR8W  
Wojtowicz, Joe W0JO

anything  
Yaesu FT8900, FT8800, Mobile  
???  
Electrician, tele-data, Amateur Extra  
ICOM radios, D-Star

kc8wy@zoominternet.net  
kc8soy@yahoo.com  
harens@juno.com  
rwiliams@neo.rr.com  
w0jo@arrl.net



Used with permission

He who is afraid of asking, is afraid of learning

Articles from members for the Wave Bender are encouraged. They must be received by the editor on the 20th each month. Please send your articles to: [k8jaa@arrl.net](mailto:k8jaa@arrl.net), and put WRARC on the subject line of your email. You may also send your articles to the editor: Jane Avnet, 2050 E. South Range Rd., New Springfield, OH 44443

Join us for the WRARC Friday night Net 9:00 P.M.

KD8DWV - 145.270, PL -110.9

Upcoming Net Control Operators

March 02	Jane, K8JAA
March 03	Anniversary Net
March 09	Rose, KD8TII
March 16	Roy, KD8IJE
March 23	Dennis, KA8DJM
March 30	Maureen, KD8NXS

April 6, 13, 20 This could be you

April 27 Rose, KD8TII

If your name has never been on this list  
Contact Steve, KC8SOY to take a turn at Net Control  
330-774-6346



WRARC Simplex Frequency 146.565

### Mahoning County ARES® Nets

1st Monday 8.40 PM ET W8QLY Repeater - 146.745 (PL 110.9)

&

3rd Monday 8.40 PM ET W8QLY Repeater - 146.745 (PL 110.9)

ARES thanks MVARA for the use of their repeater

W8SGT is facilitating The Ohio HF net every Tuesday - 7:00 PM

The net is run from the State of Ohio EOC on the

Ohio ARES Admin frequency 3875 kHz LSB

moves to 7240 Khz after 20-min.

All are welcome to check in.



The Ohio ARES/OES Digital Emergency Net held every Tuesday at 8:00PM.  
held on 3585 kHz USB.

Please note all digital communications are Upper Side Band.

<http://www.http://ohden.org/> for net details. Net Manager Gary NJ8BB

### COLUMBIANA COUNTY DIGITAL NET

Wednesdays 8:30 pm - 9:30 pm

145.510 MHZ SIMPLEX

First Wednesday of the Month Mahoning County Skywarn Net  
is held on the W8QLY repeater 146.745 (-) at 8:30P.M.

Thanks & 73

All of our members (and others) look forward (hopefully) to getting this newsletter every month, so keep sending those articles, jokes, and suggestions!

Thanks goes out to this month's contributors; N8SY, KB8Y, W5YI, the ARRL and the World-Wide Web.

2017 TOWER PROJECT

I guess we'll start at the beginning, which is a great place to start. When the need arises, you do what you have to do after a lightning strike on my old tower and antenna system. The need defiantly arose. Five years ago a medium sized strike hit my neighbor's tree. That little event caused approximately \$10,000 worth of damage to my electronics equipment including but not limited to Ham Radio, TV, VCR, Computer, rotor and controller, a ringo ranger, a vertical antenna, and last but not least a tower leg. The search didn't begin immediately, but after going through the insurance company to settle on replacement costs (and they did replace everything except the tower). I started pricing all of the new equipment and \$10,000 is a lot of money - but, not enough to replace the tower.



I went on line to price a new tower. Fold overs, crank ups, wire guyed, and free standing towers, I checked them all. I settled on the crank up style because of its ease of service and its fold over base. Now the question was price. Should I go new or used, short or tall, steel or aluminum. It seemed like the longer I pondered, the harder it got. An old acquaintance of mine, who was moving out of state wanted to sell his steel 52 ft. crank up tower with a fold over base, problem solved. All I had to do was try to negotiate a fair price. Well the long and the short of the story is, we settled on a price that was amicable to both of us.

The tower was located some miles away and was in use. I took the hour drive with a Ham buddy of mine Russ, NR8W, to go look at the tower and was very pleased with what we saw. The seller agreed to disconnect and take down the tower and two tri-bander antennas and deliver them to my home.

On the day Al, AB8AA and his XYL Jane, K8JAA, arrived with the tower and antennas. We also had my XYL Vivian, KB8CLH, Roy, KD8IJF, his XYL Donna, Russ NR8W, and his son Don there to help. Russ brought his big tractor with a front end loader on it to help take the tower off the trailer. We set the whole thing aside to wait for the hole and trenches to be dug. Almost two months later the contractor finished digging. So now we were ready for the base and conduit to be placed. The control cable, coax, and miscellaneous pull strings were pulled into the conduits.

Bob, WB8KLC, and I reassembled the two tri-bander antennas in preparation for the tower to be erected. All the little details of assembly that you sometimes forget were accomplished without incident. The number of wonderful friends, neighbors and Hams that gathered to accomplish my tower job was over whelming. Two of my Radio Clubs put out QST announcements for help on the day we put the tower up. We had lots of hands involved. Too many to mention all of them, but everyone's help was very much appreciated. We got the tower in the air and the weather, for the most part, cooperated. A little cold, a little rain, all in all not bad.

We raised the tower by hand from about 30 degrees. The rope we tied on for safety the last few feet is still on the tower. We tested the controller in both directions with no problems. I would like to thank Russ, NR8W, Al, AB8AA, Jane, K8JAA, Roy KD8IJ F, Donna, Donny, Bob, WB8KLC, Terry, KB8AMZ, Mike, KB8TUV, neighbors and friends. Hopefully I didn't forget anybody. I am still testing with a QSO here and there but, propagation being what it is we'll see. 🍀

Thanks to all Dave Desimio, WA8GCF

MAYBE THIS IS YOU?

Could YOU be the one I'm looking for? This is the editor of YOUR Newsletter. We have plenty of room for YOUR article(s)! If something is of interest to you, odds are that we all will enjoy your thoughts and activities! Have a favorite radio? Have some reminiscing to do? maybe you have a question for one of our Elmers. OR, a Tip or Trick you learned that would help one of YOUR WRARC friends. You are warmly invited to contribute! Don't worry about writing or formality - we can help you with that. Your article could go in this spot, or one larger, next month!!



TREASURER - CONTINUED FROM PAGE 3

our club, its members and what we do. We should all be proud of our club and the unique services we provide to our communities and this also gets our club name out in front of more people who know who we are and what we do:

This is a Thank You card from Ashlee Mauti, Director of Marketing for Covelli Enterprises, Inc. and who runs the Annual Panerathon for our third year participation. . .It starts”

Thank you for all your help with this year’s Panerathon. Its such a pleasure working with you and your team. We are not able to pull off an event of this size without your help.

Thank you, Ashlee

An email from Carol Vigorito, Executive Director of Mill Creek Park and their annual Green Cathedral fundraiser for our first-year participation . . . Many thanks to you and your group for all of the assistance with the Green Cathedral! I hope we can work together again next year.

An email from Alex George, who is one of the people running the Annual Youngstown Peace Race in response to my email asking if they wanted us back again for our second-year participation . . . Yes absolutely! I was going to contact you soon to discuss. The date is 10/22. You guys are great. YPD likes having you on the course too.

So attached, as you can see, the people we serve with what we do really appreciate us and what we do. If we all tried just a little more, we can accomplish a lot. Can we count on you to try a little more?”

73, Joe, W0JO  
VP/WRARC

When this email came out, I hard-copied it and then read it again. This is what our President hopes to accomplish with our club this year and next year. Please read this and think about what you can do to make WRARC a big success. 🍀

73  
Rose, KD8TII  
WRARC/Treasurer

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SWAP'N SHOP



**DO YOU HAVE ITEMS FOR SWAP & SHOP? CONTACT THE EDITOR TO POST YOUR ITEMS HERE.**

**<K8JAA@ARRL.NET>**

2	Hy-Gain Ham IV rotor and controller	\$300 ea
1	Hy-Gain T2X Tailtwister Rotor and DCU-3 Controller	\$450
3	Rohn 25 Tower Sections	\$ 75

Will accept all reasonable offers.  
Al, AB8AA, 330-207-3296 or ab8aa@arrl.net

1/28/18

What divides us cannot compete with what unites us

## FIELD DAY 2018

Hi to all Ham Radio operators,

It is Time for the WRARC Anniversary Net on two meters 145.270, KD8DWV repeater. Mark your calendars for March 3, 2018. Starting time 10:00 A.M. Saturday morning. There will be a sign up sheet for net control operators at our next WRARC meeting for our Friday night net. Steve KC8SOY will be signing operators for these nets.

KC8SOY will start the Anniversary Net at 10:00 a.m. operators can sign up for a 30 minute net segment or as many times as you want from 10:30 A.M. until 6:00 P.M.

Suggested Net Control Script, and some ideas for topics to talk about during your segment of the net:

"This is the Western Reserve Amateur Radio club 8th Anniversary Net. (Give your call sign, name, and location as a Net Control Operator.) We thank Liz and Dave for allowing us to use their repeater. Ask is there any emergency traffic please come now (pause). If there is emergency traffic. (Please ask Dave, KC8WY, to take the traffic. If he is not available, ask one of our Elmers to take the traffic.) This net will be taking check-ins 'till 6:00 P.M. today." Give your call sign name and location when you are finished with your segment(s) of the nets.

As you take check-ins, thank each operator for their check-in and ask how they are doing. Ask how did they become interested in Ham Radio and how long they have been a Ham Operator.

In other words, make small talk with each of the check-ins. Please invite visiting check-ins to our events, web site, Facebook page, and our meetings. Between check-ins, you might talk about WRARC, and the events that we participate in as a Special Service Club here in the Mahoning Valley. Also talk about Field Day, where and when it is held, Elser Airport in North Lima, June 23-24, and how much fun we have doing Field Day. For Information about WRARC please visit our web page, visit <http://www.wrarc.net/>, or our Facebook page, WRARC. Please make this an enjoyable day for everyone and your self. 🍀

## UPDATE ON FIELD DAY

We are into February and the snow is gone again. We hope we've seen it for the last time this year. I stopped at the Youngstown Elser Metro Airport today and dropped off our new flyer for, (yes) 2018 WRARC Field Day. The owner of the airport welcomes us with open arms to use his location for our Field Day site every year.

We all hope this year will be even better than last year. At the airport there is a lot of room for us to have fun. WRARC has all ways been about learning and teaching of Ham Radio. This year our Elmers are waiting for you to step up and ask for help in learning how to operate your radios, get on the air, and talking to people of your hobby. We can't make you ask for help. It is up to you to ask the Elmers, whether it is on HF, or your two meter radios.

We need to get everyone talking on two meters and using the repeaters. Because if we don't use them, they will go away. The repeater owners cover the cost to keep the repeaters on the air. They want YOU, a licensed Amateur Radio Operator, to use them. Whose fault is it when a repeater goes off the air? The people not using them, and not talking to other Hams. That is what the Service/Hobby is all about.

Field Day weekend, and WRARC, are all about you, our club members, and having fun. This is the largest event that we have every year, so mark your calendars - JUNE 23 and 24.

As in the past years, we will start setting up our Field Day site on Thursday, June 21. The WRARC Field Day site is and always is open for everyone to come out and camp with us. Again, we have more than enough space for everyone, including your friends and neighbors. So ask a friend to come to our site and see what your hobby is all about. 🍀

KC8SOY, Steve  
WRARC Trustee/Field Day Captain  
KC8SOY @ yahoo.com  
330.774.6346





**New to Field Day?**

Field Day is Ham Radio's open house. Every June, more than 40,000 hams throughout North America set up temporary transmitting stations in public places to Demonstrate Ham Radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day has been an annual event since 1933, and remains the most popular event in Ham Radio.

**Objective-** To work as many stations as possible on any and all amateur bands (excluding the 60, 30, 17, and 12-meter bands) and to learn to operate in abnormal situations in less than optimal conditions. Field Day is open to all amateurs in the areas covered by the ARRL/RAC Field Organizations and countries within IARU Region 2. DX stations residing in other regions may be contacted for credit, but are not eligible to submit entries, But above all HAVE FUN!

**WRARC ANNIVERSARY NET - MARCH 3 2018**

**KD8DWV - 145.270, PL -110.9**

Support the members who have Already singed up to take a segment. This will be a good time to get to know your fellow members. Ask them how they got interested in Amateur Radio, or what radios they have in their Shack, or you think up something to ask them while they are on for their segment of the net. Start a conversation with one or all of them

10;00 A.M.	STEVE	KC8SOY
10;30	DARRIN	N8DMC
11;00	ROCKY	W8RKY
11;30	ROY	KD8MO
12;00 P.M.	RUSS	NR8W
12;30	JOE	W0JO
1;00	MAUREEN	KD8NXS
1;30	KEVIN	KD8NXR
2;00	DENNIS	KA8DJM
2;30	ROSE	KD8TII
3;00	RUSS	NR8W
3;30	JANE	K8JAA
4;00	ROY	KD8IJF
4;30	AL	AB8AA
5;00	STAN	KB8WPD
5;30	DAVE	KE8ALR
6;00	RUSS	NR8W



*Brr... It's Cold*

**THE WRARC NETS NEED YOUR SUPPORT....**

9:00 P.M. Friday evenings: 145.270 Mhz (minus offset), PL 110.9  
 You can advertise your Swap 'n Shop. You can ask our Elmers anything -  
 No Question too big or too small!  
 You can even take a turn running the Net  
 The only dumb question is one you don't ask Hope to hear you on the net.  
 You can even take a turn running the Net  
 It's warm in your shack!





Thsnkd to KD8TII & KA8DJM FOR THE PHOTOS

FEBRUARY YL BREAKFAST

Our February YL breakfast was a great success. Those YL's who came out to enjoy the camaraderie were Janet Egan, Maureen, KD8NXS, Jane, K8JAA, Liz, KD8DWV, and Rose, KD8TII. We had fun joking and listening to our 'stories.'

The food there is always good, not sure when we all decided to leave, as we were having too much fun chatting. If you would like to join us next month, just send Rose an email. You don't have to be a WRARC member or a Ham to attend. Heck, if you can't drive, have your OM bring you. Some of our husbands (our drivers) stayed that morning at Thano's, sitting at their own table because they had their own 'stories' to tell. They were Dennis, KA8DJM, Roy Haren, KD8IJF, Bill Egan, KD8HCQ, and Al Avnet, AB8AA. Another member of WRARC, Ted Filmer, KD8IJE, was there with another group. So it seemed like half our club members were having breakfast there.

Our next Saturday morning YL breakfast is set for Saturday, March 3, at 9:00 A.M. at Perkins Restaurant on Route 224 in Boardman. Please let Rose know if you plan to join us, so she can let the restaurant know how many will be there. We look forward to seeing you there. Anyone who does'nt know or have Roses email, it is: kd8tii@zoominternet.net.



BIRTHDAYS THIS MONTH

- KD8SNV Devon Wilms
- KB8VRF Jack Twaddle
- WB8LCD Tom Sly
- KD8NFD Carol Gottesman



To see your Birthday posted make sure I have your special month.



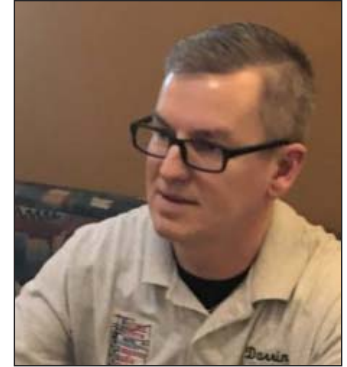
Electrical Teaser

Does resistance in series decrease or increase the current? Think about it for a bit.

If you just can't figure out the answer to this teaser with a pictorial appears on page 18.

A NOTE FROM OUR TRUSTEE - DARRIN

First things first . . . I wanted to thank Al and Jane Avnet both for everything they have done, to including starting our wonderful Western Reserve Amateur Radio Club! And of course, Jane for her expert newsletter that we have the pleasure of reading every month. Jane also has led many, many, many (Police academy movie humor . . . ha!) special event nets for us in the past. Al has taught many of you how to become Hams even! I know . . . because I attended his classes to advance my privileges to Extra!! Thank you! I could go on and on about all the wonderful things these two have brought to our club and to the hobby. I consider both as great friends and I'm sure that I will not be the only one who's going to miss them being around. Ohh yah . . . and that honeybee honey that they had!! Holy Cow is it delicious!!! From the bottom of my heart, Al and Jane . . . THANK YOU!



Let's not forget our Anniversary Net is coming up in March!!! (See Steve Fabry KC8SOY's article to sign up for a 30 minute segment and for more details)

Did you know that the club has equipment for our members to utilize? Please visit our website: [www.wrarc.net](http://www.wrarc.net) under "members only" to print out a form and check out a hand held or a mobile radio device. You certainly may contact me at [N8DMC@WRARC.NET](mailto:N8DMC@WRARC.NET) to learn more.

On a final note . . . I would like to ask those who are out there just listening to the repeaters to KEY UP that microphone and talk to one another. We have a great two-meter repeater in our area to communicate on, provided to you by KD8DWV, Liz Beatty, and KC8WY, Dave Beatty's 442.750 repeater. I'm sure you've heard me, or others state "If we don't use it, we will lose it" many times before. I'm here today to tell you, that is not a joke. If you need help programming your handheld or mobile device, please feel free to bring in your hand held, with your manual, for an Elmer to help you get it programmed at one of our meetings. Jane has also placed a section within our newsletter of several Elmers out there willing to help you. 🍀

73 for now  
Darrin Cannon – N8DMC

WHAT IS AN **Elmer** 

What's an Elmer? An Elmer is an experienced Ham who mentors beginners, would-be Hams, or the less experienced, advancing their knowledge in a personal way, usually with much hands-on radio operation and oversight. Finding a good Elmer can be a huge advantage for rapidly moving ahead with your Amateur Radio.

In short, almost everyone that is a HAM (Amateur Radio Operator) is an "Elmer." Because, we are all friends, and we help each other. Some Hams know more than others. The term Elmer first appeared in the March 1971 issue of QST magazine. In that issue, Rod Newkirk, W9BRD, called them "the unsung fathers of Amateur Radio." . . . There are lots of websites and mailing lists that are geared towards helping people become better amateur radio operators, and There is a list of knowledgeable WRARC Elmers, on page 4 of this newsletter, waiting to answer your questions. Remember, "**the only dumb question, is the one you don't ask.**" 🍀

very funny video about electricity, maybe for the wave bender, 73, Mike, KC8UNR

[https://www.youtube.com/watch?v=XDf2nhfxVzg&feature=em-share\\_video\\_in\\_list\\_user&list=PL0791FAF7707EA827](https://www.youtube.com/watch?v=XDf2nhfxVzg&feature=em-share_video_in_list_user&list=PL0791FAF7707EA827)

## SHACK SAFETY

I think it's time that we start talking about shack safety, and all the things that can go wrong when we least expect it. What does safety mean to you? I'm sure you've had your mom shout out to you "be careful," and we'd go off and do something dumb anyway. I know that I have done that more than I want to tell you about. Safety comes down to each person's knowledge, common sense, but most of all attitude. If you think about it, having a good attitude toward safety will make you think twice before picking up that hot soldering iron by the tip. You know it's gonna' hurt. So, having a good attitude means everything.



Now, what's a good attitude? It's keeping your mind focused on what you are doing right now! There are some really good books out there that will show you the right way to safety. The ARRL Handbook has tons of great ideas for keeping safe. Another really good book to have around is the Boy Scout Handbook. Yes, the Boy Scouts have a wonderful handbook that helps you learn, and keeps you safe in all sorts of ways that you probably never even thought of before.

You need to learn and refresh yourself about basic safety knowledge often. Some of the most common mistakes come from just forgetting some simple thing that you know, but just got in a hurry and didn't THINK it through. Like many things in our life, it pays to be informed, and safety begins with our attitude. Remember, attitude is keeping your mind focused on what you are doing NOW.

One very important aspect of safety is to keep your work area clean. We often joke about having the "messiest shack" in town. Heck, we've all seen pictures of junk piled up all over the place. I know from true experience that my operating position is often used for equipment repair and kit building, I have screwdrivers, pliers, test probes and so forth on my desk all the time. This can definitely be dangerous. Clean the work space/operating position often, and keep it clear of tools, sharp objects and especially spilled liquids (in my case coffee). Keep all of your tools in a toolbox or drawer so you can get to them but are still out of the way. Here is a list of some general safety rules to help you work safely around Amateur Radio equipment.

- Keep you work area clean and free of unnecessary materials
- Store sharp objects (screwdrivers etc.) with sharp points pointed away from you
- Wipe up all liquids immediately
- Remove rings and other jewelry when working on electronic equipment. Now, I will tell you that I've gotten shocked many times when my wedding ring touched something that it shouldn't have – take it off
- Keep a fire extinguisher in an accessible location. Most of us think that a fire will never happen in my shack since I have it protected with a circuit breaker that will shut everything down before it gets to be a fire.

WRONG!! Even though we may have the electrical circuit protected, what about the component parts that over heated before the breaker shut it down, they are red hot and are able to catch fire. That's when you quickly realize that you should have had a fire extinguisher in the shack! Fires in Amateur Radio equipment, and the shack, do happen. It is important that you are aware of the types of fire extinguishers available, and which type to use around electrical equipment. Quick action can make all the difference of a small fire, or the loss of your house, not to mention having to explain what went wrong to your spouse.

So, which fire extinguisher should you use? There are two types of fire extinguishers appropriate to use on electrical fires: The dry chemical or "ABC" type, and CO2 type. The ABC type extinguishers contain a solid powder that does not conduct electricity, and is safe for electrical equipment. They are the most common and the least expensive. CO2 type extinguishers use carbon dioxide to smother the fire. They also do not conduct electricity. CO2 types are heavy, and a little difficult to handle if you're not properly trained to use it. They also cost more than dry chemical extinguishers, but they don't expel any powders that will have to be cleaned up later either.

So, consider that when you go out to purchase an extinguisher. Oh, by the way, CO2 extinguishers are not rated for use on wood or paper fires. Now, one final thing that everyone needs to have in their shack, it's a good working smoke detector AND a good working CO detector. If your shack is like mine, it's in the basement, in fact, my shack is where the furnace is. So, as we all know, CO is the silent killer, and to protect ourselves we need to know quickly if there's a problem. 🍀

## FCC MAY NEED TO INTERVENE TO ENSURE EFFECTIVE ANTENNA RIGHTS

ARRL Suggests FCC May Need to Intervene to Ensure Effective Antenna Rights 02/01/2018



Commenting in response to an FCC Public Notice (DA 17-1180) released last month, ARRL addressed the extent of Amateur Radio's response to recent hurricane disasters and efforts needed to expand the use of Amateur Radio services when it comes to planning, testing, and providing emergency communication. The comments point out that Amateur Radio not only has been "far more than a hobby;" it is a ubiquitous, infrastructure-independent communication resource that's always ready to deploy effectively whenever and wherever needed. The League cited the remarks of former FEMA Administrator Craig Fugate, KK4INZ, that Amateur Radio "oftentimes is our last line of defense." ARRL raised three areas where action by the FCC could ensure and enhance the ability of radio amateurs to provide emergency communication, including the current Amateur Radio Parity Act of 2017 (S. 1534), now in the US Senate.

"HOAs can preclude amateur antennas in common areas. HOAs can enact reasonable written rules governing height, location, size and aesthetic impact of, and installation requirements for, outdoor antennas and support structures for amateur communications, but the effective outdoor antenna requirement is paramount," ARRL noted in its comments. "The bill is currently before the Senate Commerce Committee. If, however, Congress is unable, as has been rumored, to pass any telecommunications legislation this term, it will be incumbent on the Commission to take the action on its own initiative that would be called for by this legislation. The future of Amateur Radio emergency communications is dependent on it."

ARRL asserted that it "is critical to have stations located at one's residence in order to regularly participate in disaster preparedness training exercises and drills."

Another "noteworthy and urgent need" that might call for some regulatory involvement by the FCC, ARRL said, "relates to an outdated regulation that limits data rates in HF Amateur communications, precluding certain digital emissions that have recently proven extremely important in Amateur Radio hurricane relief efforts." ARRL noted that the FCC has yet to act on the League's Petition for Rule Making (RM-11708), filed in November of 2013, proposing to amend the Amateur Service rules to eliminate the symbol rate limit relative to data emissions in allocations below 29.7 MHz.

That Petition also called for establishing a 2.8-kHz maximum occupied bandwidth for data emissions in those bands. ARRL has argued that this deregulatory action is necessary to allow the use of PACTOR 4, an effective and efficient digital communication mode that has proven valuable in disaster-relief efforts. In July of 2016, the Commission released a Notice of Proposed Rule Making in WT Docket 16-239, proposing only to remove limitations on the symbol rate applicable to data emissions.

"Equipment dispatched with the 'Force of 50' [volunteers] to Puerto Rico included data transmission equipment capable of PACTOR 4 operation, but it could not be legally used in the Hurricane Maria disaster relief effort," ARRL noted. The League prevailed upon the FCC to grant a temporary waiver to permit use of PACTOR 4 by radio amateurs involved in the emergency response. "However, it should not have been necessary to wait more than 4 years for the underlying rulemaking proceeding to have been resolved, and it should not have been necessary to ask for a temporary waiver of a hopelessly outdated rule that limits data speeds for no useful reason," ARRL added in its comments.

The League also called on the FCC to "take the action requested in ARRL's January 2017 Petition for Rule Making (RM-11785), proposing to allocate the band 5351.5 to 5366.5 kHz to the Amateur Radio Service on a secondary basis, in accordance with the Final Acts of World Radiocommunication Conference 2015.

"A contiguous band in the vicinity of 5 MHz will assist in conducting emergency and disaster relief communications in the United States; with the Caribbean basin; with Alaska and with other parts of North, Central and South America," ARRL told the FCC. ARRL has asked the FCC to permit 100 W, as it does on the five existing 60-meter channels, and to retain the four channels that are not part of the requested contiguous frequency band. 🍀

*from the ARRL Web Site*

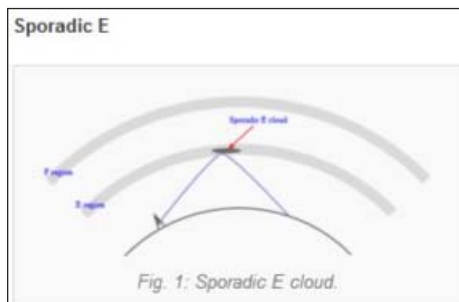
## Amateur Radio to Conduct Real Science

January 25th, 2018, by Hans van de Groenendaal. features editor, EngineerIT - US radio amateurs and scientist recently formed a new organisation called Ham Radio Science Citizen Investigation (HamSCI) with the aim of connecting professional ionospheric and atmospheric researchers with the worldwide amateur radio community. Members of the HamSCI have already carried out two studies, looking at Sporadic E communication and the effects of solar eclipses on propagation.

On 21 August 2017 the US experienced a total solar eclipse. HamSCI mobilised over 600 radio amateurs and a number of scientists from universities and research organisations to study the effects of solar eclipses on the ionosphere. The overwhelming information gathered is now being analysed and will soon be made available in various publications.

South Africa did some similar research but on a much smaller scale. During the solar eclipse on 4 December 2002, South African radio amateurs took part in an experiment conducted by Tony Voorveld who was working at the Department of Physics at the University of the Witwatersrand at the time. The objective was to show that solar eclipses do affect radio propagation. Radio amateurs were asked to tune to 1485 kHz, Radio Today – a low-powered AM station in Johannesburg.

Reports received indicated that under normal circumstances the station could not be heard during daylight hours. During the eclipse, as the moon was slowly moving in front of the sun, weak signals were monitored with signal strength slowly increasing and reaching the maximum level as the eclipse started to recede. The signal disappeared not long after the eclipse ended.



HamSCI member Joe Dzekevich (K1YOW) has a special interest in operating on 6 Metres (50 MHz) during the northern hemisphere summer months when the 6 metre band opens and makes long-distance contacts possible. Of particular interest to him was sporadic E propagation. But this interest also caused him a lot of frustration as he noticed that sporadic E communication in Europe was nearly a daily possibility while this was not the case in the USA. This led Dzekevich to do research on why. He engaged other scientist members of HamSCI to collaborate with his research.

Talking to Dzekevich during a Skype conversation, he explained that he first had to research the mechanics of sporadic E to get a better understanding of how sporadic E clouds are formed.

Sporadic E layers are a phenomena of the ionospheric E-region which occurs between 90 and 120 km in altitude and consists of enhanced electron density as compared to the background ionisation created every day by the sun's extreme ultraviolet rays. The E-layer virtually disappears at night as there is not enough solar radiation to sustain it. Sporadic E layers appear mainly during daytime in mid-latitudes and mostly in the summer hemisphere. The layers have a typically vertical thickness of between 500 m to 5 km and a horizontal spread of 10 to 1000 km.

Dzekevich said that it quickly became clear that a prime cause of sporadic E is related to winds in the upper level neutral atmosphere. As can be seen from many rocket flights, neutral winds around 100 km in altitude can have strong shears or changes in horizontal direction. Meteoric dust coming from tiny kilograms-sized or smaller micro meteoroids burning up at around 100 km altitude provide raw material, mainly iron, magnesium and potassium (Fe+, Mg+ and K+) for the formation sporadic E layers.

Dzekevich and his fellow scientists found some other interesting factors that influence sporadic E. Some of Dzekevich's findings include: Upper level low pressure systems with their strong possibility to affect high-level tidal winds shears via coupling to thunderstorms, hurricanes, strong fronts and lightning present a high degree of observational correlation to the appearance of mid-latitude sporadic E layers Low pressure systems that generate intense disruptions, including lightning and sprites could have extra potential to enhance the mid-latitude propagation up to 50 MHz.

A working hypothesis, requiring more research, is that sporadic E may be driven mostly by solar tidal wind shear in the E-layer ionisation field along with some form of horizontal Lorentz forcing from the Earth's magnetic field component.

Dzekevich says it is clear that we do not yet completely understand the mechanism behind sporadic E. Radio amateurs make sporadic E contacts in polar and equatorial regions even if the literature says that it is unlikely, if not impossible. Perhaps in the polar regions it is directly affected by the solar wind.

*Continued page 15*

REAL SCIENCE - CONTINUED FROM PAGE 14

South African radio amateurs are not new to sporadic E communication. Mike Bosch (ZS2FM) in Port Elizabeth – a prominent promoter of communication on the higher amateur frequency bands – says that sporadic E communication is something fascinating to experience.

Unexpectedly, a faint fluttery beacon signal would appear and slowly increase in strength, and after a few minutes would reach a signal strength of S9 plus with little fading (QSB). An opening could last half an hour or longer, before rapid QSB returns and the signal starts to fade out.

On 4 January 2018 there was an unexpected sporadic E opening across South Africa. It started with a report from the Eastern Cape at 15h42 that a beacon was heard, followed by several reports from KwaZulu-Natal and Western Cape. At 17h53 Pieter Jacobs (V51PJ) in Rosh Pinah in Southern Namibia made contact with stations in Gauteng. At 18h49 signals started to fade rapidly.

During the excitement little scientific data was recorded. It would have provided an ideal opportunity to shed more light on lower latitude sporadic E communication. It may, however, be possible to retrieve historical weather and space weather data to achieve some understanding of what lead to the development of this large sporadic E cloud.

Dr. Philip Erickson (W1PJE), assistant director at the MIT Haystack Radio telescope and Millstone Ionospheric Radars, said there are many opportunities for radio amateurs to observe and experiment and to become active citizen scientists in the area of radio propagation research. “There is a lack of information on how the ionosphere reacts in the Southern Hemisphere and particular in African regions. We believe it is very different and encourage radio amateurs on the African continent to become active citizen scientists. As South Africa has the largest concentration of radio amateurs in Africa, it would be good place to start.”

To heed Dr. Erickson’s call, South African scientist and interested radio amateurs should get talking. Perhaps a South African HamSCI group can be developed. There are already two South African Radio League projects that would benefit from this interaction: 5 MHz propagation research and RF noise level measurements.

Suggested by Ward Silver, N0AX, VIA pr.reflector.arrl.org

<http://www.ee.co.za/article/amateur-radio-conduct-real-science.html>

*Combines coverage of the Solar Eclipse QSO Party with K1YOW's interests in 6 meter Sporadic E propagation. Also mentions earlier South African experiments involving amateurs.*



WHAT IS HAM RADIO?

Amateur Radio (ham radio) is a popular hobby and service that brings people, electronics and communication together. People use ham radio to talk across town, around the world, or even into space, all without the Internet or cell phones. It's fun, social, educational, and can be a lifeline during times of need.

Although Amateur Radio operators get involved for many reasons, they all have in common a basic knowledge of radio technology and operating principles, and pass an examination for the FCC license to operate on radio frequencies known as the "Amateur Bands." These bands are radio frequencies allocated by the Federal Communications Commission (FCC) for use by ham radio operators.

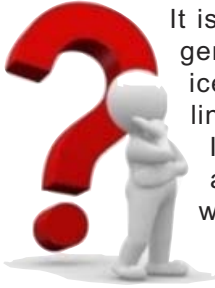
**Who is the Typical Ham?-**

Amateur Radio operators come from all walks of life -- doctors, students, kids, politicians, truck drivers, movie stars, missionaries and even your average neighbor next door. They are of all ages, sexes, income levels and nationalities. Whether through Morse Code on an old brass telegraph key, voice communication on a hand-held radio or computerized messages transmitted via satellite, all hams use radio to reach out to the world.

Find out what you can do with ham radio!<http://www.arrl.org/what-is-ham-radio>



JUST THINKING OUT LOUD (KINDA RANDOM)



It is often discussed what type of PR / Education can we do to get the youth and the public in general involved in the service/hobby. I will contend that most of us on this list got into the service/hobby long before there was the internet. I often hear people who say something along the lines "oh we need to get them into DMR etc etc etc" While I don't necessarily dislike the mode I do take exception that the way DMR mostly gets used and is nothing more than VOIP with a radio on each end instead of a phone. I'm seeing more and more "appliance operators" with no desire to learn anything more about the service/hobby than DMR or other digital modes. They seldom have any serious desire to get into any form of contesting, field day, public service etc etc etc.

This troubles me. Now I do understand that it's a big service/hobby and there is a lot of things for everyone to do but IMHO we are losing ground in the education department. Like many of us on this list we do a number of PR events where we're interfacing with the public at various levels. And I do listen to all of their comments. Soooo I've been thinking about this for some time and have some thoughts.

I personally don't think that most youth get all that much enthused that they can talk to anywhere in the world on a service that they recognize as not much different than any number of other services that do essentially the same thing with devices they already own and doesn't require a license. There is just no magic in DMR.

My question is could /should or would we be better off discussing how you can take this radio, gather these other parts, build their own antennas, assemble it together and get it working and on the air and talk to someone around the world who has done the very same and there is no additional layers of technology involved ... now that's what got me interested in the service/hobby A few youth / young adults I have already talked to and it really seems to grab them that we can do what all we can WITHOUT the internet. Now that seems magical. 🌱

Mike Urich, KA5CVH  
PIO Harris County, TX ARES  
<http://ka5cvh.com>  
From the ARRL PR reflector

We may be Volunteers, but we're professional.

SISTERHOOD OF AMATEUR RADIO SUPPORTS GIRL SCOUTS



Sisterhood of Amateur Radio Supports Girl Scouts in Obtaining Radio Wireless Patch - The Sisterhood of Amateur Radio (SOAR), in conjunction with the Girl Scout Council of Southern Nevada, hosted a Radio and Wireless Tech Field Day on February 3 in Las Vegas, Nevada, for more than 60 girls and their adult chaperones.

ARRL began offering its Radio and Wireless Technology Patch Program for Girl Scouts in 2016. The program defines the requirements for Girl Scouts to earn the patch at the Brownie, Junior, Cadette, Senior, and Ambassador levels and provides a platform for participants to learn about wireless technology, including Amateur Radio, and to inspire girls to learn the fundamentals of radio communication and wireless technology. It also prompts participants to take action in their communities to apply their newfound knowledge to connect people, provide safety, and to kindle an interest in science, technology, engineering, and math (STEM) subjects and careers.

In addition to hands-on activities, the Girl Scouts in Las Vegas also learned about emergency and public service communications, and explored ways wireless technology is used in everyday life and in the workplace. The SOAR participants enthusiastically shared what it means to be an Amateur Radio operator and demonstrated how they can communicate around the world via Amateur Radio.

"As a girl-led and girl-focused organization, Girl Scouts of Southern Nevada understands the importance of providing science and engineering educational programming to girls of all ages," said Linda Bridges, Chief of Communications for Girl Scouts of Southern Nevada. "By partnering with SOAR, we look forward to inspiring all Girl Scouts to pursue a lifelong love of communication and global goodwill."

*Continued page 17*



GIRL SCOUTS - CONTINUED FROM PAGE 16



Highlights of the event were spelling out their name in Morse code and hearing it via a code practice oscillator, learning about antenna directivity and participating in a foxhunt, and actually talking on the radio as well as using Voice over Internet Protocol (VoIP) modes.

Todd Wilson, WH6DWF, coordinated the \*ISLANDS\* Conference Server, IRLP 9256, the StarLink System Hub 357087, and DODROPIN 355800, and AllStar, illustrating how Amateur Radio can be used on a tablet or a smart phone, in addition to traditional radio equipment.

ARRL Nevada Section Manager John Bigley, N7UR, expressed appreciation for "the contribution of all the participants who took time out of their day to speak to the girls to demonstrate to these young girls what Amateur Radio can do to connect people around the world." -- Thanks to John Bigley, N7UR, and Nevada Section PIO Cathy Etheredge, N7HVN 🍀

ARRL RECEIVES BYRD ANTARCTIC EXPEDITION MORSE KEY



Historical Materials - ARRL has received from Lynn Burlingame, N7CFO, the donation of a Kilbourne & Clark Morse key that the late Howard Mason (11D, 7BU, and K7QB) used to let the world know that Rear Admiral Richard Byrd and his crew had overflown the South Pole for the first time during Byrd's 1928 - 1930 Antarctic expedition. Mason and his 80 colleagues were awarded Congressional Gold Medals for their efforts in establishing the Antarctic outpost "Little America," the first of a series of bases bearing that name.

Mason was a lifelong radio amateur from Seattle who was an active ARRL National Traffic System participant and manager. In 1923, he relocated to Connecticut to serve as an editor of the ARRL's journal, QST. Mason's first polar experience was as a radio operator with the Wilkins-Detroit News Arctic expedition that traversed the North Pole by air in 1928. This led to his selection by Byrd to be a radio engineer with his first Antarctic expedition. Mason was co-operator of Little America's base radio station, WFA, used to keep in contact with the rest of the world.

Mason continued to use the key in his ensuing and varied endeavors. Prior to his death in 1996, he gave the key to Burlingame of Bellevue, Howard Mason at WFA in Little America.

Washington, a collector and biographer who generously donated it to the ARRL Heritage Museum. The museum plans to display the key as part of an exhibition tentatively scheduled to open on April 15. The exhibition also will include a large wooden key, engraved with "WFA" and bearing the signatures of some expedition members.

Also on display will be a first edition of Admiral Byrd's book Little America: Aerial Exploration in the Antarctic, the Flight to the South Pole and an album of contemporary newspaper clippings, both part of the Burlingame donation. A complete narrative will be posted to the Heritage Museum Section of the ARRL website.

The key and the Little America radio operators can be seen in action in an original film available on YouTube, which offers a first look of the towers erected there (at the 15:00 mark). -- Thanks to Michael Marinaro, WN1M, ARRL Volunteer Staff Historian/Archivist 🍀



Howard Mason at WFA in Little America.

From The Ohio Section News Update 12 Feb- The PostScript is produced as a weekly supplement to the Ohio Section Journal (OSJ). I sincerely hope that you have enjoyed this edition of PostScript, and will encourage your friends to join with you in receiving the latest news and information about the Ohio Section, and from around the world!

Scott, N8SY  
ARRL Ohio SectionSection Manager  
n8sy@arrl.org

**Take time to laugh for it's the music of the soul** Author: --From an old English prayer

It's been snowing all night. So the morning goes like this;

- 8:00 I made a snowman.
- 8:10 A feminist passed by and asked me why I didn't make a snow woman.
- 8:15 So, I made a snow woman.
- 8:17 The nanny of the neighbors complained about the snow woman's voluptuous chest.
- 8:20 The gay couple living nearby grumbled that it could have been two snowmen instead
- 8:25 The vegans at No. 12 complained about the carrot nose, as veggies are food and not to decorate Snow figures with.
- 8:28 I am being called a racist because the snow couple is white.
- 8:31 The Muslim gent across the road wants the snow woman to wear a headscarf.
- 8:40 Someone calls the cops who show up to see what's going on.
- 8:42 I am told that the broomstick of the snowman needs to be removed because it could be used as a deadly weapon.
- 8:45 Local TV news crew shows up. I am asked if I know the difference between snowmen and snowwomen? I reply, "Snowballs" and am called a sexist.
- 8:52 My phone is seized and thoroughly checked while I am being blindfolded and flown to the police station in a helicopter.
- 9:00 I'm on the news as a suspected terrorist bent on stirring up trouble during this difficult weather.
- 9:10 I am asked if I have any accomplices.
- 9:29 A little known jihadist group has claimed it was their plot.

Moral: There is no moral to this story. It's just the America we live in today!



**My friend celebrated his birthday this year by buying an all-terrain 4-wheeler. this is a picture of him playing with it in his back yard.**

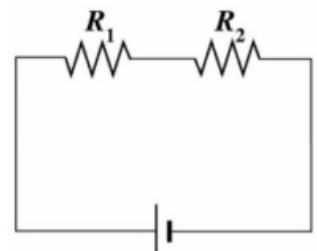
**I'm thinking about getting me one.**

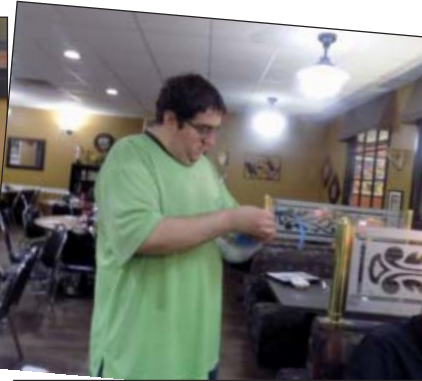
**Life is fleeting by, enjoy it while you can.**

**Getting old is easy - having fun at it is the real trick!**

**Answer to Electrical Teaser:**

Sometimes an extra resistor is added in series circuit in order to limit the current which is known as a current limiting resistor. Typically, the purpose of this resistor is to "Limit" or reduce the current in the circuit for certain applications. Here's the Ohm's Law equation for that:  $I = E/R$  - As the resistance goes up the current goes down. Try it out for yourself --- Use 12 volts for E and 10 ohms for the R and record your answer. Now change the 10 ohms to 20 ohms and see how your answer comes out.





# March 2018

PREPAREDNESS LEADS TO READINESS - MATT W8DEC



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 WRARC Net 9:00PM 145.270 Swap n' Shop Ask the Elmers	3
4	5 ARES Net 8:30 PM 146.745 PL 110.9	6	7	8	9 WRARC Net 9:00PM 145.270 Swap n' Shop Ask the Elmers	19
11 DST 2 A.M. 	12 Grilled Cheese Day	13 Ham Breakfast Eat'n Park Boardman 8:30 A.M.  Board Meeting Eat'n Park Auatintown 7:00 P.M.	14 PI DAY 	15	16 WRARC Net 9:00PM 145.270 Swap n' Shop Ask the Elmers	17 St. Patrick's Day 
18	19 ARES Net 8:30 PM 146.745 PL 110.9	20  WRARC Meeting 7:00 P.M. 	21	22	23 WRARC Net 9:00PM 145.270 Swap n' Shop Ask the Elmers	24
25	26	27 Eat'n Park Boardman 8:30 A.M. Ham Community Breakfast	28	29	30 Good Friday  WRARC Net 9:00PM 145.270	31 Passover (first day)