



ARRL Midwest Division Newsletter December 2020



Dave Propper, K2DP Elected Vice-Director Midwest Division

by Rod Blocksome, K0DAS

Every three years an election is held in each ARRL division for the board of directors. Since there are 15 divisions, in any given year elections are held in five divisions. Thus my term as Director and Art's term as Vice-Director come to a close at the end of this year. Last July, I decided to not run for re-election and announced this to the division members. This allowed plenty of time for others to consider running for the office.

By the close of nominations, Art Zygielbaum, K0AIZ, was the only nomination received for Director and was therefore declared elected by the Ethics and Elections Committee. There were two candidates nominated for the Vice-Director position – Lloyd Colston, KC5FM and Dave Propper, K2DP resulting in a campaign period and balloting.

Midwest ARRL members can take pride in the fact that two well qualified individuals came forward to serve as Vice-Director. There were nearly 1,800 ballots cast out of 6,300+ members eligible to vote. This is a voter turnout percentage of nearly 29% - which is considered "quite good" for ARRL elections.

Election results were certified and published which declared Dave Propper, K2DP elected as the new Midwest Division Vice-Director. Art and Dave formally take office at Noon EST on January 1, 2021. In the meantime, a very orderly transition is taking place.

I've known both Art and Dave for a number of years and know them to be very capable and talented individuals both professionally and in amateur radio. So the phrase I've heard occasionally on TV comes to mind – "you're in good hands". I urge everyone to support these fellows (as you have Art and I in years past) as they tackle the many issues facing ARRL in the years to come. It's been an honor and a privilege to have represented you on the ARRL Board. So thanks, 73s, and I hope to work you on the air.

Merry Christmas and a Happy New Year,
de Rod, K0DAS



The following are power point presentations I've given at club meetings. They are brief and to the point but should help guide decisions as you experiment with antennas.

RF Power, Transmission Lines, & Miss-Matched Loads

by Rod Blocksome, K0DAS

RF Power

- $P = E^2/R$ or $P = I^2R$ (Ohm's Law)
- But RF loads may have a reactive component (Inductive or Capacitive)
- RF Load impedance: $Z = R + jX$
 - Sign of X is "-" if Capacitive
 - Sign of X is "+" if Inductive

Transmission Lines

- All have a "characteristic impedance"
- Consider only "real" impedances e.g. 50Ω or 75 Ω or 600Ω etc.
- Real world transmission lines all have some attenuation which depends upon:
 - Line construction and Length
 - Termination load (SWR on the line)

Typical Transmission Lines Matched Loss (dB/100-ft.)

Coax Type	1 MHz	10 MHz	100 MHz
RG-58	0.4	1.3	4.3
RG-213	0.2	0.6	2.1
RG-8	0.2	0.6	1.9
LMR-400	0.1	0.4	1.4
LMR-600	0.1	0.2	0.8
1/2" Heliac	0.02	0.2	0.6

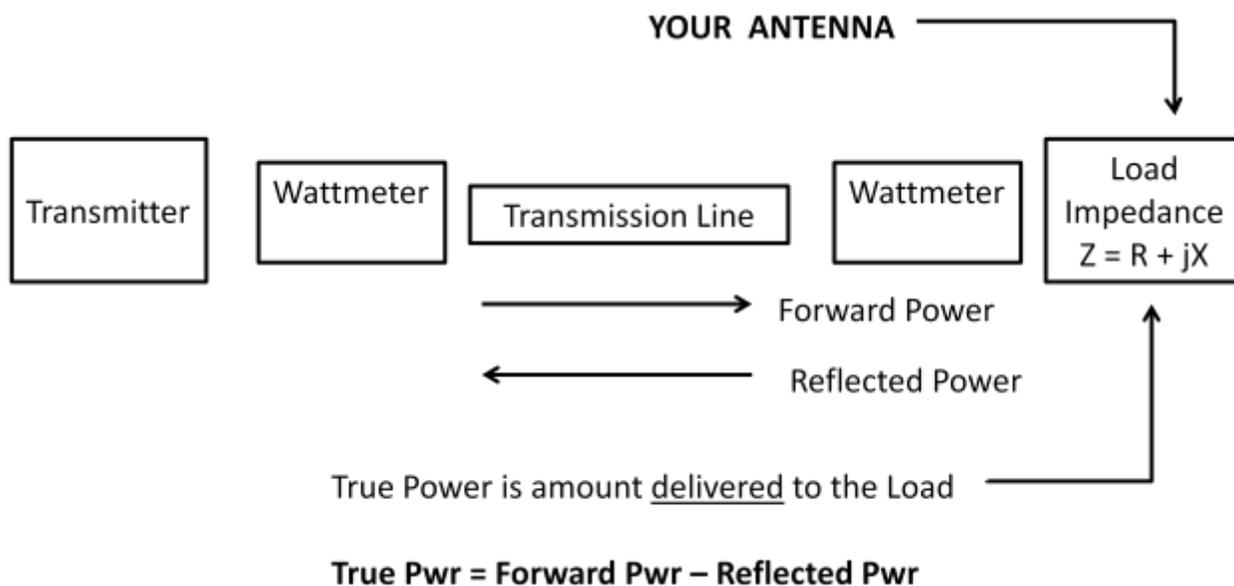
SWR and Miss-matched Loads

- When transmission line termination load is anything other than a resistance equal to its characteristic impedance – there will be an SWR on the line.
- Such a load is said to be "miss-matched"
- A miss-matched load will reflect a portion of the incident RF power and absorb the remainder.
- An SWR increases transmission line loss above its matched load loss value.



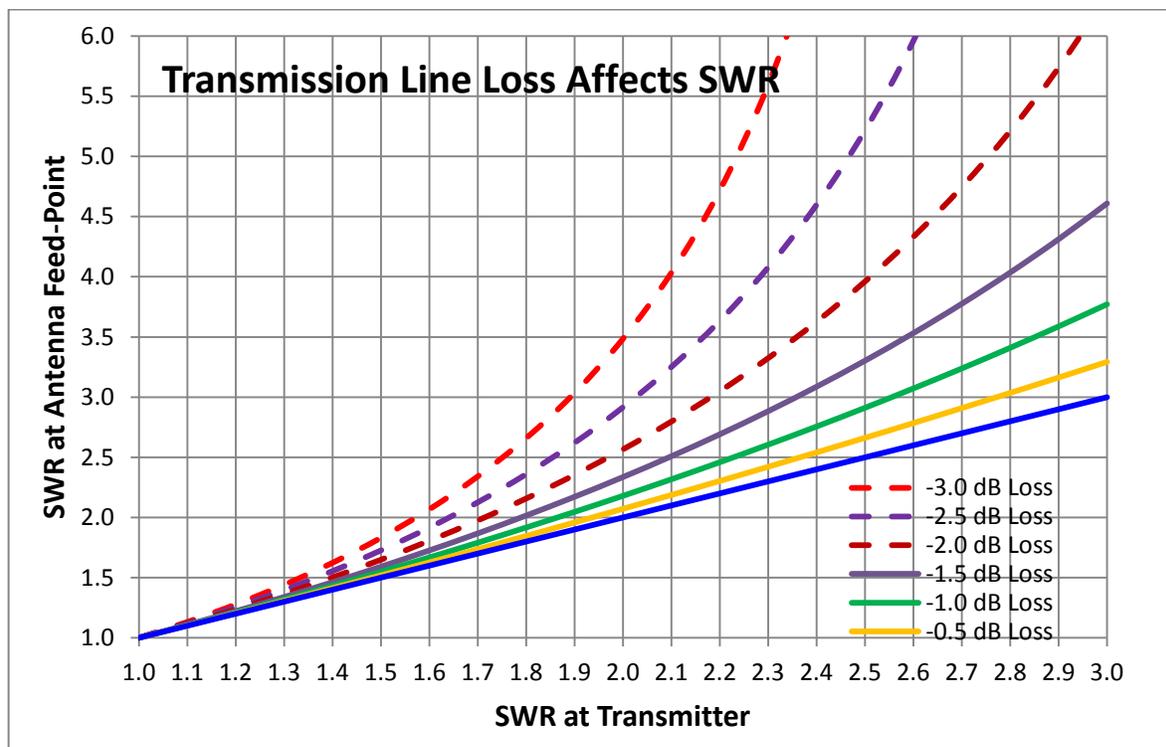
SWR

- A directional coupler wattmeter measures power in forward direction and in reverse direction.
- Forward Power wave propagates from source to load via transmission line and Reflected Power wave propagates in opposite direction
- The two waves set up an “interference” or Standing Wave pattern along the transmission line length
- $VSWR = E_{max}/E_{min}$ & $ISWR = I_{max}/I_{min}$ are same value, therefore we use “SWR”



Example for Transmission line with 1.0 dB Matched Loss

At The Transmitter			At The Antenna				
FOR PWR Watts P_F	REF PWR Watts P_R	SWR S	FOR PWR Watts P_F	REF PWR Watts P_R	TRUE PWR Watts P_T	SWR S	LOAD Z
100	0	1.0	79.4	0	79.4	1.0	50 Ω
100	12.5	2.1	70.8	17.7	53.1	3.0	150 Ω



Take-away Lesson:

- A low SWR at the transmitter does NOT mean you have an optimum antenna system.
- Knowledge of your transmission line loss enables calculation of antenna mismatch.
- Use low loss transmission line AND match your antenna impedance. (But you can trade one against the other e.g. open-wire line on non-resonant antenna)



Antenna Gain, Efficiency, and SWR

by Rod Blocksome, K0DAS

Resonant Dipole Antenna

- HF Wire Antenna: $L_{(ft.)} = 468/f_{(MHz)}$
- Feedpoint Impedance = 73Ω (in free space)
 - $SWR = 73/50 = 1.46$ (not bad)
- Feed point Impedance = 50Ω (0.18λ above ground)
 - $SWR = 50/50 = 1.0$ (excellent)
- Inverted “V” dipole – about 5% longer
 - $Z = 50+j0$ & $SWR = 50/50 = 1.0$

Antenna Gain

- A Point Source (isotropic antenna) in free space: Gain = 0 dBi
- A dipole in free space: Gain = 2.15 dBi = 0 dBd
- Beware of Antenna Ads claiming a gain figure but don't state the reference!
 - Example: “Whiz-Bang” 80m Antenna has 25 dB gain !
 - You should ask “relative to what?”
 - Answer: “My 8-ft CB antenna” – in fine print

Antenna Efficiency

- Assume a resonant antenna (no reactance)
- Input Resistance = Radiation Resistance + “Ohmic” Resistance
 - Radiation Resistance represents the RF power radiated into space
 - Ohmic Resistance includes resistance of antenna structure e.g. traps, conductors, connections, and dielectric losses
- Vertical Antennas susceptible a third loss – Ground loss
- Ohmic losses are insignificant if the Radiation Resistance is comparatively large
- Dipole example:
 - $R_{ant} = R_R + R_o = 49.5 + 0.5$
 - Antenna Radiation Efficiency = $49.5/50 = 99.0\%$
 - -0.04 dB due to ohmic losses (no big deal)
 - Miss-match loss = 0 dB (SWR=1:1)



- Trap Vertical over ground stake example:
 - $R_{\text{ant}} = R_R + R_o + R_{\text{gnd}} = 36.5 + 0.5 + 13$
 - Radiation Efficiency = $36.5/50 = 73\%$ (-1.4 dB loss)
 - Miss-match loss = 0 dB (SWR=1:1)

Quarter-wave Vertical

- Over “perfect ground” $R_{\text{ant}} = 73/2 = 36.5 \Omega$
 - SWR = $50/36.5 = 1.37$, but 0 ground loss!
 - Miss-match loss = -0.12 dB
- Over “lossy ground” (trap vertical example) $R_{\text{ant}} = 50 \Omega$
 - SWR = $50/50 = 1.0:1$, but -1.4 dB ground loss
 - Miss-match loss = 0 dB
- Over 120 buried radials or 4 elevated radials
 - SWR = $50/40 = 1.25$, but -0.4 dB ground loss
 - Miss-match loss = -0.05 dB
- Over 4 “drooping” elevated radials
 - SWR = $50/50 = 1.0$, but -0.4 dB ground loss
 - Miss-match loss = 0 dB

Electrically Short Antennas

- Radiation resistance decreases as electrical length decreases below resonance
- Matching circuits bring input impedance back to 50 ohms
- Now ohmic losses + matching circuit losses are a larger percentage of the Radiation resistance – thus efficiency (and gain) decrease

Short Vertical Antennas

- Example: 8-ft mobile whip on 40 meters
 - Radiation resistance = 1.5Ω
 - Ohmic loss = -13.9 dB
 - Tuner loss = -1.5 dB
 - Ground loss = - 2.0 dB
 - Mis-match loss = 0 dB
 - TOTAL loss = -17.4 dB



Achieving a Low SWR with a Resonant Antenna

- Cut the resonant antenna a little long
- Put it up and measure SWR across the band
- Plot SWR vs Frequency
- Adjust antenna length to put SWR minimum at desired frequency
- If minimum SWR too high, other adjustments are needed

Achieving a Low SWR with a Non-resonant Antenna

- Install as high and in the clear as possible
- Use a good antenna tuner to match to 50Ω
- Single-ended antenna needs a good ground (like a vertical antenna)
- Balanced feed antenna needs a good balun/antenna tuner

Broadband Antennas

- SWR limits define antenna bandwidth
- “Fat” antenna radiating elements e.g. Fan, Cage, Loops, etc.
- Log Periodic Structures
- Variable Length Antennas e.g. SteppIR Antennas
- Tuners, traps, matching networks - all narrow the SWR bandwidth

Practical Considerations

- Use low loss transmission line & connectors
- Use high dielectric insulators
- Pay attention to grounding for vertical antennas
- High and in the clear is better than low and near conductive/lossy structures

Balun Transformers

- Transforms unbalanced to balanced (to ground)
- Can also perform impedance transformation
- Examples:
 - 1:1 is 50Ω unbalanced (coax) to 50Ω balanced
 - 1:4 is 50Ω unbalanced (coax) to 200Ω balanced
 - 1:9 is 50Ω unbalanced (coax) to 450Ω balanced
- Two basic types of Broadband Baluns:
 - Conventional wire-wound RF Transformer (primary and secondary windings on ferrite core)
 - Transmission line Transformer (coax transmission line wound on ferrite core) Sometimes called a “choke balun” or “Current balun”
 - Transmission Line Transformers generally have lower loss and wider bandwidth than conventional wire-wound transformers



The Propagation Gods are Awakening!

by Kent Trimble, K9ZTV
MMARC Special Event Coordinator

The 2020 WØO Frankenstein Halloween FunXpedition from Frankenstein, Missouri, (the only Frankenstein in the United States) resulted in both the highest number of contacts in the last five years and the widest distribution of signals. All states but one (Hawaii) were worked, together with 20 Canadians and brief openings into Norway, Alaska, and Cuba.

Two full-size 80-10 meter off-center-fed dipoles were oriented north-south and end-to-end at 35-feet. Both CW and SSB positions operated 100-watt Elecraft K3s (plural, not K3S) and both rigs operated flawlessly. We encountered no equipment problems. Audio splitters and headphones at each station allowed up to 4 people to monitor each transceiver.

Antenna erection began at 9 a.m. CDT on Saturday, Halloween day, and WØO was on the air shortly after 11 a.m. The weather was beautiful -- windy, but in the high sixties. We ceased operating at 8:45 p.m. CDT when neither station received responses after 15 minutes of repeated CQs. After nine-hours of continuous operating, we did not want to face an hour-long drive home through dark and twisting deer-inhabited back-roads at midnight. Tear-down on Sunday was accomplished in an hour and we were all home by 10:30 a.m. CST. That extra hour of time-change-sleep was appreciated!

Our site was a small community structure in an abandoned rural field with an elevation of 850-feet. Considering Ozark geography, this was a fairly high perch. My QTH on a scenic ridge in Jefferson City overlooking the Missouri River is only 675 feet.

Warlock scientists haunting the derelict Frankenstein "castle" were Jim Branson, NØLBY; Curt Sanders, WØSN; Mike Schweiss, KDØCCI; Richard Manning, ACØSA; Karl Evans, ADØKH (who drove up from his new home in Arkansas); Mike Dolson, NØZH; Mitch Odneal, NWØM; and Kent Trimble, K9ZTV. Gary Zeilman, KØWYN, and Rich Glassner, NØEAX, helped with antennas.



TOTAL WØO CONTACTS:

2020: 495
2019: 232
2018: 306
2017: 353
2016: 344

Insufficient antenna separation caused the carrier-operated-relays on both K3s to trigger on 20 meters, so CW graciously forfeited that band to SSB for the duration. 20 meters accounted for 33% of all contacts made on both modes. SSB racked up 354 and CW 141. Clearly there are more phone ops than CW ops these days, but not having access to 20 meters kept the CW score artificially low. Nonetheless, 40 meters accounted for 64% of all CW contacts and 50% of all contacts made by both stations. After a full century of diverse band allocations, 40 meters continues to be Amateur Radio's HF workhorse.

11% of the contacts were with Texas, 8% with Missouri, 5% with Florida, and all the rest were in the 1-4% range. These uncanny percentages match almost exactly what club participants encountered during FOBB, Skeeter Hunt, and Winter/Summer Field Days.

We greatly appreciate all those who took the time to find us, spot us, and work us. The Frankenstein event has been a tradition with our club for over a quarter-century. If you worked us, a one-off-per-year QSL card is available by sending me your properly filled-out contact-information QSL card together with a No. 10 size SASE (self-addressed, *stamped* envelope) to the address below. A No. 10 envelope accommodates our QSL card without having to fold it.

A note on our unique QSL cards: For the last nine years the daughter (a Graphic Artist) of one of our Silent Keys has designed the WØO card in loving memory of her mother who especially enjoyed operating WØO. The QSL's graveyard always contains grave stones engraved with the name and call sign of club members who have become deceased since the previous Halloween. We are most grateful she wishes to continue this wonderful gift to us.

Finally, as we all know, nothing brings a club together quite like the camaraderie of a field event. The more we can do, the more signals there will be on the bands, and the stronger our clubs will be (pandemics notwithstanding).



Here and There

Virtual Ham Club Meetings: The Midwest Division has purchased a subscription to Zoom for use by ARRL clubs in the division to conduct virtual meetings and other related activities. It has been used extensively by the division clubs and on several occasions there have been two clubs who normally meet on the same night but our account can only accommodate one meeting at a time. Art is in process of getting a second account which should be available in mid December. Contact Director-Elect Art Zygielbaum, K0AIZ to schedule your use of the accounts. Please plan ahead as much as possible.

**Merry Christmas
and
Happy New Year**

to all Midwest Division Amateurs !



A Message from Art and Dave

A good friend once said at his retirement that he hated retirement speeches. He said that they always sounded like eulogies. Even so, as Rod, K0DAS, backs away from his long service as ARRL Midwest Division Director, I want to express my appreciation to him. From the ARRL's standpoint, Rod, has given amazing service to all the committees he has served on, Programs and Services, Historical, Administration and Finance, etc. His knowledge of ham radio, his special skills in VHF/UHF, radio propagation and electronics made him a valuable asset to the board and an invaluable source of information for me.

Over the years, Rod and his wife Elizabeth have become good friends. He is someone who cares about others and who dedicated himself to making sure ham radio stayed a vital hobby and a sustainable asset for our communities. I look forward to attending hamfests again where he played sensitive counselor on what I should buy and what I should avoid. On the other hand, he did cost me a lot of money by encouraging me to buy stuff that I think I really wanted.

Rod promised me that he would stay involved to support and provide counsel to Dave Propper, K2DP, our new Vice Director, and to me. I'll take him up on that promise. Rod, thank you for patiently teaching me about the ARRL Board, for listening to me when I had something to say, and for giving of yourself to the hobby.

Art Zygielbaum, K0AIZ
ARRL Midwest Division Vice Director
ARRL Midwest Division Director-elect

Adding to what Art has said, I too would like to thank Rod for his many contributions and service to the members of the ARRL Midwest Division / ARRL organization. I wish him the very best in his "second" retirement !

*Dave Propper, K2DP
ARRL Midwest Division Vice Director, Elect*

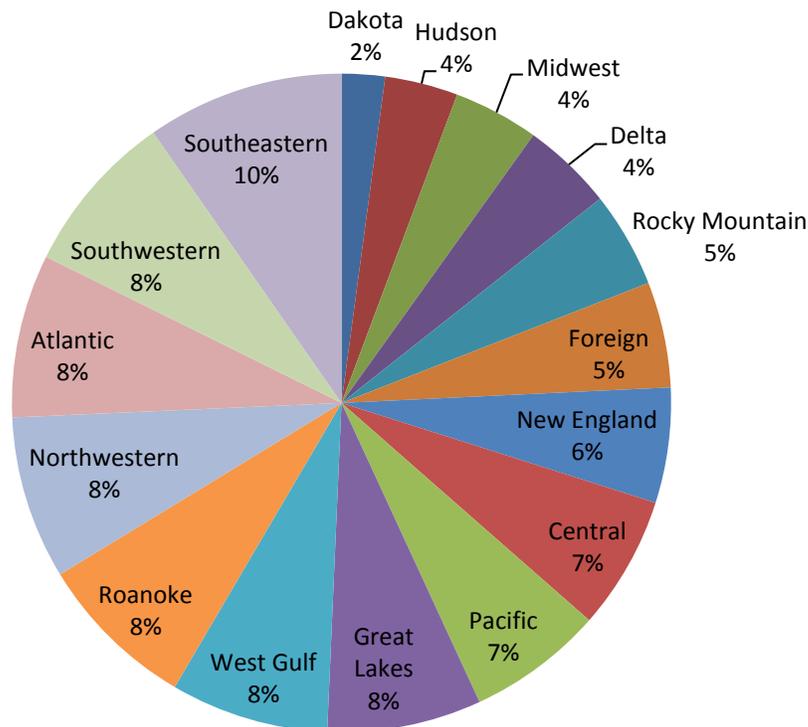


The 15 ARRL Divisions

As you are no doubt aware, the ARRL is composed of 15 divisions whose members are represented on the board of directors by an elected director and vice-director. Each division has one vote on matters that come before the board. The geographical boundaries of the divisions are established in the ARRL Bylaws and have been in place for many decades. Note: There are a number of foreign ARRL members who are represented on the board by the International Affairs Vice-President but without a vote.

Over the decades, ARRL membership in each division slowly changes as populations shift and other factors. I thought it interesting to compare the number of ARRL members in each division and so prepared the following pie chart to illustrate:

ARRL Membership per Division - Oct. 30, 2020

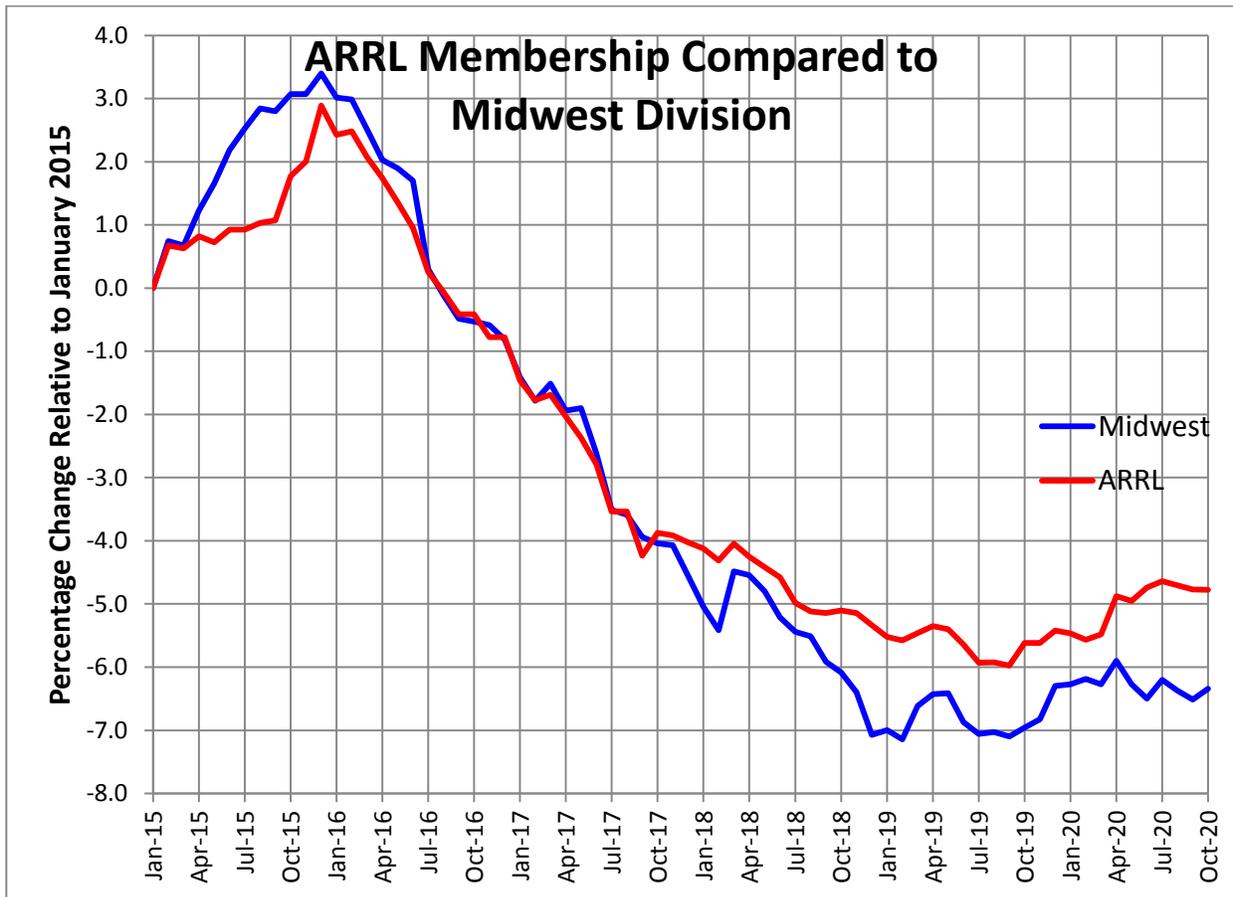




ARRL Membership Statistics Update

by Rod Blocksome, K0DAS

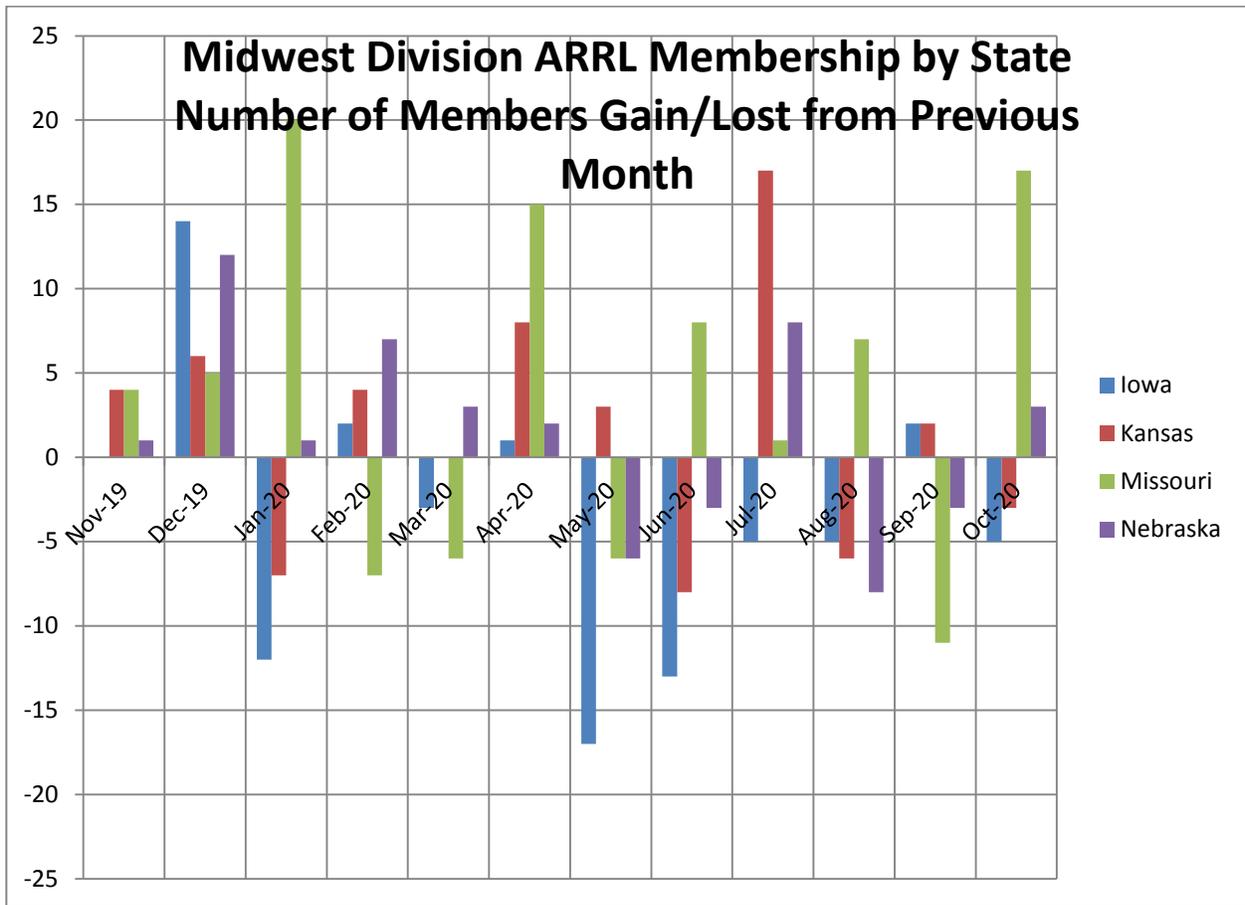
During the month of October, total ARRL membership remained flat while the Midwest Division had a slight increase. Below are the charts updated as of **October 30, 2020**. Let's get innovative and move this graph upwards. Invite a non-member ham to consider joining ARRL and explain to him/her the benefits of membership. ARRL is so much more than just a subscription to QST. Invite them to browse the ARRL web site at www.arrl.org





Included this month is a chart showing **section membership change from the previous month**. As you can see, the results are a “mixed bag” but in general we are seeing a slow trend over time of a decline in ARRL memberships. The COVID-19 restrictions and lack of hamfests have no doubt affected memberships.

Let’s all work hard to bring more hams into ARRL membership. It won’t be easy with all the hamfests canceled, but hopefully this will change in the future.





Midwest Division ARRL Hamfests & Conventions

**01/23/2021 - Winterfest, ARRL Midwest Division Convention – TO BE HELD
VIRTUALLY (See web site for details)**

Location: Collinsville, IL

Type: ARRL Convention

Sponsor: St. Louis Radio Club, Suburban Radio Club

Website: <http://winterfest.slsrc.org>

04/17/2021 - ARARAT HAMBASH 2021

Location: Kansas City, MO

Type: ARRL Hamfest

Sponsor: ARARAT RADIO CLUB

Website: <http://www.hambash.com>

06/05/2021 - Northland Radio Rendezvous

Location: Mason City, IA

Type: ARRL Hamfest

Sponsor: Northland Amateur Communications Group

Website: <http://www.ke0pou.com/nrr>

08/07/2021 - 08/08/2021

Cedar Valley ARC Techfest, ARRL Iowa State Convention

Location: Central City, IA

Type: ARRL Convention

Sponsor: Cedar Valley Amateur Radio Club, Collins Amateur Radio Club

Website: <https://w0qq.org/hamfest/>



Midwest Division Special Event Stations

01/01/2020 | Iowa State Parks On-the-Air Centennial Celebration

Jan 1-Dec 31, 0000Z-2359Z, various, Dubuque, IA. Great River Amateur Radio Club. All bands, all frequencies, as available. Certificate & QSL. IASPOTA-2020, c/o Great River Amateur Radio Club, P.O. Box 1384, Dubuque, IA 52004. Members will operate with their own call signs from state parks throughout Iowa. Operating as time permits, mostly weekends. QSL for contact; certificate for 5 parks. See website for complete information.

12/01/2020 | Best DAM Christmas

Dec 1-Dec 31, 0001Z-1159Z, KE0TGG, Edwards, MO. D.A.R.K. Dam Amateur Radio Klub. 28.440 14.240 7.240 3.840. Certificate & QSL. Roger Henley, 32018 Hwy 7, Edwards, MO 65326. <https://damark.org>

02/27/2021 | 17th Annual "Freeze Your Keys" Winter Operating Event

Feb 27, 1400Z-2200Z, W0EBB, Leavenworth, KS. Kickapoo QRP Amateur Radio Club. 14.058 7.035 14.325 7.240. QSL. Gary Auchard, 34058 167th Street, Leavenworth, KS 66048. SASE please for return QSL cards. w0mna74@gmail.com or www.qrz.com/db/w0ebb



ARRL CONTESTS – December & January

While we remain self-isolated to avoid COVID-19, we may find more time for operating on the air. If you've never considered yourself as a contester, there are several interesting contests in the next couple months that offer an opportunity to give it a try.

The current sunspot minimum coupled with the long nights (in the northern hemisphere) will make for some exciting long-distance contacts on 160 meters. Conversely, these two aspects will make the 10 meter contest a real challenge. But operating under less than ideal conditions coupled with the prospect of unexpected sporadic E propagation is what attracts many to this contest. If you've never tried it, a 10 meter dipole or vertical ground plane antenna is easy to put up – even in winter conditions.

Here is what the ARRL Contest Menu offers for the next two months:

December 4 – 6: 160 Meter Contest (get used to sleeping in the daytime)

December 12 – 13: 10 Meter Contest (propagation guaranteed due to ionization from all the transmitters' RF)

December 20: Rookie Roundup – CW (turn off the keyer and send like a code instructor)

January 1: Straight Key Night (not really a contest unless your key is bent)

January 2: Kid's Day (get on and make some kid's thrilled - and send them a QSL card)

January 2 – 3: RTTY Roundup (this includes all digital modes in addition to traditional RTTY)

January 16 – 18: January VHF Contest (one of my favorites for the added challenge of winter weather while Roving)

Details on these contests may be found on www.arrl.org/contests

ARRL Midwest Division Leadership



Director: Rod Blocksome K0DAS

k0das@arrl.org 319-393-8022

Vice Director: Art Zygielbaum K0AIZ

k0aiz@arrl.org 402-421-0839

Iowa Section Manager: Lelia Garner, WA0UIG

Kansas Section Manager: Ron Cowan, KB0DTI

Missouri Section Manager: Cecil Higgins, AC0HA

Nebraska Section Manager: Matt Anderson, KA0BOJ

DX Advisory Committee: John Yodis, K2VV (MO)

Contest Advisory Committee: Glenn Johnson, W0GJ (IA)

Midwest Division Volunteer Counsel: Craig Long, K0CSL (IA)

Division Legislative Action Chair: Mike Edwards, WB9M (MO)

Legislative Action Coordinators: Nick Critelli, K0PCG (IA); Bruce Frahm, K0BJ (KS & NE); Mike Edwards, WB9M (MO).

Assistant Directors (Missouri): Paul Haefner K0JPL, Dave Propper K2DP, Kent Trimble K9ZTV, Roger Volk K0GOB, Cecil Higgins AC0HA, John Frederick N8GOU, Eric Zust W0TT, Randy Schulze KD0HKD, and Ron Lowrance, K4SX.

Assistant Directors (Kansas): Mike Albers K0FJ, Jim Andera K0NK, Bill Henderson K0VBU, Charlie Hett K0THN, Richard Johnson K0RCJ, Rick Tucker W0RT, and Jon Jones N0JK.

Assistant Directors (Iowa): Tim Busch N0CKR, C.W. Pantel K0IIR, and Jim Spencer W0SR

Assistant Directors (Nebraska): Matt Anderson KA0BOJ, Joe Eisenberg K0NEB, Allen Harpham WD0DXD, and Todd LeMense KK0DX.

Midwest Division Webmaster: Steve Schmitz W0SJS email: w0sjs@arrl.net

Midwest Division's website: <http://www.arrlmidwest.org/>