



Signals from SARA

WØJH	©2018 The Stillwater Amateur Radio Association An ARRL Affiliate & Special Service Club www.radioham.org	October 2018
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Program: Chris Petersen, K9EQ, Presents Overview of Yaesu System Fusion

Image: FTM-3200, courtesy Yaesu.
Chris will have this and several other radios on display.



Chris has been a Ham for a very, very long time. The spark of short wave listening as a child grew into a life-long interest in radio.

As a novice he was “forced” into learning the Morse code but quickly switched to FM after getting his Technician license. From there it was a quick jump to repeaters, remote bases, and remotely controlled radio equipment of various sorts.

Since then Chris moved from California (mountains) to Minnesota (not so much) and wandered through the Advanced to Extra license classes.

Chris enjoys the technical side of Amateur Radio and has been an early adopter of digital

Continued on next page

Proud affiliate of the **Courage Kenny Handiham Program**



Announcements

Monthly Meeting:
Oct. 13, 2018
Meeting: 09:00

[Boutwells Landing](#)
Auditorium A
Gables Wing

**Program: System
Fusion – Chris K9EQ**

Pre-meeting:
~07:30 - 08:45

Breakfast & Coffee
[Perkins Restaurant](#)
2050 Frontage Rd W
Stillwater, MN

SARA On the Air

SARA Phone Roundtables:

Daily @ 20:00 Local:
(*except* Tuesday & Thursday):
1.966 MHz LSB +/- QRM
(*alternates*: 3.803 MHz LSB or
21.316 MHz USB +/- QRM)

Monday @ 09:00 Local:
3.856 MHz LSB +/- QRM

Tuesday @ 19:00 Local:
3.803 MHz LSB +/- QRM

**SARA Repeater Weekly Net
Wednesday @ 21:00 Local:**
WØJH Repeater
147.060+ MHz (Positive offset)
DCS/DTCS 026(Normal)

Digital Net returns Oct. 21
Sunday @ 19:00 Local:
3.58415 MHz (500-1,000 Hz)
(mode announced Sunday via
email broadcast)

Can't Find Us On the Air?
... **Monitor SARA Repeater**

technologies (HF, D-Star, Fusion). He is a co-founder of the Bakken Amateur Radio Society (WØMDT.com) and the MNWis Fusion network (HamOperator.com).

Chris will give an overview of Yaesu Fusion including a brief technical description, features, and operation. He will have the FTM-3200, FTM-100, FTM-400, FT70D, FT2D, and FT-991A radios on display and will be happy to answer any questions you may have.

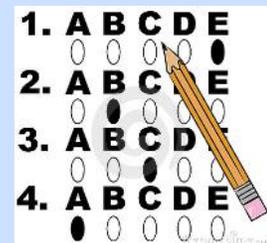
VE Session Set

The next SARA VE Session is scheduled to coincide with the conclusion of the upcoming General classes. The exam session is posted on the ARRL website, will be at **Boutwells Landing on November 8th with exams starting at 6pm.**

Exam sessions following our General classes usually have fewer examinees, so will likely need a smaller number of examiners for this session, than we had for the last exam. I currently have KCØOIO, NØDXH, WAØTDA, and myself on the list to work this exam session. I am likely not going to make it to the upcoming October monthly meeting, so If you are a member of the SARA VE Team and would like to work the November 8th exam session, drop me an email to let me know.

Shel NØDRX

Trustee@radioham.org



Bandwidth from the President

Greetings from my shack, de Joe KCØOIO.

It's October and we're into our full schedule of activities. We have the General License course and an Extra Class study group studying for their respective license upgrades. The Thursday



Eyeball Sessions continue at the same time, we're even adding some Tech Topics to them. The MAP team has been busy with antennas, radio programming, and all-around Elmering. And we have the Remembering the Edmund Fitzgerald Special Event coming up Nov 2-4. It's a great time for SARA.

The 2018 Remembering the Edmund Fitzgerald Special Event doesn't happen without a lot of planning and work to make it a success. Yes, this is the 14th year we're doing this, and yes, we have a lot of experience to draw upon. Yet, something changes every year and presents new challenges. We've added stations. We now have a trailer to transport equipment and serve as one of the operating stations. The antenna supports, aka trees, near the Trail Shelter are slowly dying off. The weather is always a big variable. Besides the operating that goes on, plans are made for group dinner and breakfasts (a fire at the restaurant we've had Friday's dinner at in the past has forced a change in venues this year). A lot of logistics goes into conducting an event like this. Dave WØOXB handles the majority of the background work (announcement in QST, confirming the motel is available, making dinner and breakfast reservations, promoting and recruiting...). Be sure to thank Dave for all he does to make this event a success. The 20 to 25-or-so people who make it up to Split Rock for the event sure do!

As we reach the solar minimum of cycle 24, making contacts on the HF Bands has been a challenge. Taking the challenge, we amateur radio operators continue to look to new modes and new technologies to continue the legacy of the hobby. We push our antenna and operating skills to exploit the capabilities of the low bands. Many are learning and practicing Morse Code and use CW to continue to make contacts. New modes that work well in poor conditions are being developed; used; and refined, such as FT-8. We take to the VHF/UHF and above bands while using analog and digital voice modes such as Fusion, DMR, and D-Star; all while sharpening our skills as radio technicians by gaining the knowledge and experience communicating by radio waves. We face many other challenges to our hobby: band allocations, demands for RF spectrum from commercial and governmental concerns, infamous operators, the "ham radio is still around" disbelief, the "I don't want the antenna in my back yard" and CC&R and HOA restrictions, and a rising noise floor due all the RF from unintentional radiators.

Yet we as amateur radio operators continue to be resilient; exploring ways to get the message through; to make that contact, DX or local; to continue pushing the bounda-

ries of radio as experimenters; to get a functional antenna up under challenging conditions. We are a diverse and talented bunch. In a digital universe, we continue to grow the hobby by applying all the tools available to us. Witness digital signal processing and the capabilities of software defined radio; the development of new battery technologies, and the developing portability of solar power systems. Amateur radio continues to be exciting and we must push ourselves to learn and push the limits of our interests in the hobby.

I was listening to one of the amateur radio podcasts recently, doesn't matter which one it was, and the speaker mentioned the origin of the word "amateur." Dating back to the late 18th century, the French word comes from the Italian word "amatore", which came from the Latin word "amator" (lover), which derives from the Latin word "amare" (to love). We all share that love for radio, no matter what our individual interests within this avocation we call amateur radio!

The SARA Digital Net will return for fall/winter 2018-2019 this month. As of this writing, the startup is planned for Sunday October 21st at 7:00 PM Central. We'll be back on 80 meters, usually around 3.582 MHz. The practice of sending a reminder e-mail the day of the net stating the mode and frequency selected for the session will continue.

I want to remind our members of the Joe Simonet WØTBC Memorial Award. This award recognizes the spirit and passion for SARA and amateur radio of Joe WØTBC as demonstrated by a current member of the Stillwater Amateur Radio Association. Nominations for this award are always open. Written nominations can be made at any time through contact with the club's president, vice president or past recipients. Nominations must be made in written form and forwarded via e-mail to any one of the selection committee. We have presented the Joe Simonet WØTBC Memorial Award just once since its inception, to Dave Glas WØOXB in June 2017. Nominations can be emailed to president @ radioham.org; vice president @ radioham.org; or w0oxb @ radioham.org. (Remove the spaces from the email address when entering it)

SARA's Board has developed a program schedule for our monthly through March. Joe KCØOIO will present a program on the FT-8 digital mode for the November meeting. John W9LHG will be our speaker at the December meeting, sharing his program on electronic keyers. January will see the return of the SARA White Elephant Exchange Party (SWEEP). We have a special operating roundtable planned for the February that will draw upon the group collective for the discussion. And Dave WØOXB has agreed to share insightful information on Baluns, Ununs, and Chocks for our March meeting.

Do you have a technical topic or skill development that you would like to learn more about during one of our Eyeball QSO sessions? Did something you read in QST, QEX, CQ Magazine, or any other ham radio or electronic publication pique your interest and you want to explore it more or understand it better? Did you hear something on an amateur radio podcast such as Ham Nation, Ham Radio Now, AmateurLogic, Solder

Smoke or any other podcast that has your attention and want to discuss it further? Did you read something in a blog posting, on Twitter, or other social media outlet that has you wondering? If you do, please send me an email explaining that interest, curiosity, or confusion and I'll see if we can work it into a Tech Topic or Skill Night. I am trying to have focus topics at once or twice a month during these weekly sessions. Your input and participation can make that happen a lot easier than one person trying to pick something. This has the potential to be quite fun and informative for all of us. The best way to contact me is again at my email: president @ radioham.org (remove the spaces).

For our October 6th meeting, Chris K9EQ will be our speaker with a program on System Fusion that will complement our recent repeater upgrade. Chris will present an introduction to the System Fusion, integration of Fusion into a club where everyone has FM, and a technology primer on Fusion. Chris is a big promoter of System Fusion in the Twin Cities, operates several Fusion repeaters, and maintains the website <https://www.hamoperator.com>. Don't forget the pre-meeting Breakfast will be at Perkins Restaurant 2050 W Frontage Rd (Hwy 36 & Washington) in Stillwater at 7:30 AM. The breakfast gang hopes to see you there!

73 es CUL,
de Joe (KCØOIO)



NEW Time: SARA-Sponsored Monday Morning 75m Round-Robin Rag Chew

It's already fall and time to alter the start of our Monday morning gatherings.
(You've probably noticed the sun is coming up later and the low frequency bands are staying "long" a little later in the morning.)

Want to work some DX and/or make distant state-side contacts (WAS award)?
----> Try the 160, 80 & 40m bands early in the morning!

Monday Mornings

:: 9:00 am Central Time

:: 3.856 MHz +/- QRM

(Please use that "big knob" on your radio to tune around and find us!)

Sleep in a little, grab your coffee and join us for some on-air fun!

*This is a facilitated, informal gathering; it is not a net!

*All are welcome to join us (SARA membership is not required).

73, Dave (WØOXB)

**“Remembering the Edmund Fitzgerald”
Split Rock Lighthouse
November 2-4**



SARA's big, annual Special Event is coming soon!

About 20 from the club will be operating as WØJH Special Event Station. This is the fourteenth consecutive year for our popular, transnational event. And, it marks 43 years since the fateful night of the sinking of the iron-ore carrier the Edmund Fitzgerald.

Come to learn and to have fun!

Besides phone stations at the trail center, we'll be operating a portable phone/digital station from our FB trailer. Many operating opportunities, learning experiences and quality after-hours networking sessions are guaranteed for all who attend.

If you're interested in attending for all or part of this event, don't wait; contact Dave (WØOXB).

HF 101: Making the most of the HF bands at solar minimum

Patrick Tice, wa0tda@gmail.com

Since we are teaching the General Class course right now, the anticipation is building for new General operators, and that means getting on the HF bands. Yes, one can make use of quite a few HF bands with the entry-level Technician Class license, but let's face it - most newbies buy VHF/UHF handheld radios or mobile rigs and pretty much stick to FM phone operation via repeaters. The General Class license opens up plenty of other real estate in the frequency spectrum and has for a long time been considered the real portal to HF operation.

So here we are, ready to help new HF operators open that door to all kinds of exciting shortwave contacts and the prospect of direct worldwide communication. The only problem is...

...the solar minimum.

As I write this in October 2018, we are at the point in the sun's average 11 year cycle of activity when the solar disc is mostly free of sunspots. More sunspot activity near solar maximum is associated with good HF band conditions for ham radio contacts across the globe. At maximum the ionosphere becomes more ionized and the maximum usable frequency (MUF) gets higher. For example, at solar minimum, the MUF may be disappointingly low, with the 14 MHz band (20 m) being barely usable and all the frequencies above that simply being closed to long distance contacts.

We typically talk about the HF bands using their approximate wavelength, so to avoid confusion let's recall that the longer the wavelength (higher number), the lower the frequency associated with that band. Here is how it works out:

Wavelength = Frequency

- 160 meter band = 1.8 to 2.0 MHz
- 80/75 meter band = 3.5 to 4.0 MHz
- 60 meter band = 5.X MHz (channelized)
- 40 meter band = 7.0 to 7.3 MHz
- 30 meter band = 10.1 to 10.15 MHz
- 20 meter band = 14.0 to 14.35 MHz
- 17 meter band = 18.068 to 18.168 MHz
- 15 meter band = 21.0 to 21.450 MHz
- 12 meter band = 24.89 to 24.99 MHz
- 10 meter band = 28.0 to 29.7 MHz

[A complete graphic chart is available at ARRL for download and printing.](#)



General Class licensees will have access to at least some portion of all of the above bands. Some, like 160 meters and 10 meters, allow Generals the same privileges as Extras! Others, like 20 meters, have specific segments devoted to license class. Let's take a look at the two bands that bookend our list: 160 and 10 meters.

Tuning across the 10 meter band at solar maximum can be a delight. The band is often open to worldwide communication, and because it is one of our most expansive bands, there is plenty of room to call CQ. At solar minimum that same band is pretty much dead from one end to the other, with a few exceptions when there are local communications via ground wave or when there is summer "sporadic-E" propagation, usually within 1,400 miles. But trust me on this - the 10 meter band isn't worth much during solar minimum, and even less in the non-summer months of solar minimum.



The 160 meter band is a different story. It's not that affected by the solar cycle and it is at its best in the winter, when the long nights tamp down thunderstorm interference and ionospheric (skip) propagation can allow for long distance contacts.

Sandwiched between the extremes of the 10 and 160 meter bands are the rest of the HF frequency segments on our list. As a rule of thumb, those closer to 160 meters are going to be more useful during times near solar minimum, while at solar maximum the bands closer to 10 meters will be the go-to places for worldwide communications. Bands in the middle, such as 20 and 30 meters, can be useful throughout a solar cycle but will definitely be better at solar max. The 40 meter band is generally open to somewhere 24 hours, but it is not a band with a huge spread of frequencies and it has traditionally been plagued with shortwave broadcast stations.

Let's cut to the chase. It's quite likely that a newcomer to HF will be disappointed with the static and noise across the spectrum. You need a strategy to get through solar minimum. Here's what I suggest:

If you don't hear anything but noise when tuning across various bands, don't assume that you are doing something wrong. Occasionally geomagnetic storms do engulf the Earth, even at solar minimum, and they can close all of the bands. Be patient and conditions will improve, usually in 12-24 hours.

Try the 160, 80/75, and 40 meter bands, especially when the popular 20 meter band seems dead. Be sure the antenna is tuned - a band can sound dead if the antenna is out of tune.

Certain bands, especially 160 and 80/75 meters, are best at night. Daytime (especially in the summer) is especially bad on these bands, but they do open up at night as the sun goes down. Plan to do more of your operating on them in the evening or early morning.

Even if you don't have an antenna that will tune for transmitting on 160 meters, you

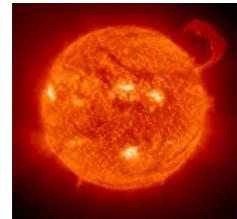
can still use whatever antenna you have to receive on that band. Tune across the band to find out if you can hear other stations. Use the same strategy for 80/75 meters and 40 meters.

Wire antennas are your friend at solar minimum. If you can put up a wire antenna that can be tuned to transmit in the 80/75 and 40 meter bands, you are almost guaranteed to make contacts. 160 meters is a bit tougher, since as the wavelength gets longer, so does the ideal length of the antenna. There are ways around this, like adding a coil of wire to increase the electrical length of a shorter wire antenna.

Vertical antennas can be base-loaded with a coil to increase their electrical length, allowing them to tune on 160, 80/75, and 40 meters. Almost any yard can accommodate a vertical antenna.

Consider using an HF remote station, using the free RCForb software from Remote-hams.com. Both stations W0EQO and W0ZSW, maintained by SARA volunteers, have wire antennas that can tune 160 through 6 meters. SARA members and Handiham members may request transmit access to these stations. [I also give remote transmit access to my own station, WA0TDA, to operators who have at least a General license and who request it.](#) Remote HF can be another useful tool in your ham radio toolbox, useful for bands where your own antenna won't tune or a way to get on the air when you are traveling.

Use the internet for information on space weather and band conditions. Two sites I recommend are Spaceweather.com and the NONBH Solar site. If you have an Amazon Echo, you can enable the propagation report skill via the Alexa app, then you will be able to get the NONBH report by saying, "Alexa, start propagation report". The NONBH solar report is also available on many ham radio websites, including QRZ.com.



Take advantage of club nets, on the air get-togethers, and special events on the air. There will be more stations on during these times, increasing your chances of making more contacts.

I hope these strategies are useful to you as you begin to explore the HF bands. This particular solar minimum (2017 through 2021) has so far been pretty hard on band conditions. Don't be discouraged, though - openings can happen anytime, and the more familiar you become with the various bands, the more contacts you will make.

Now, get out there and have fun on the air!



Marketplace - Buy, Sell, Trade

From KØBR:

ALL Prices Reflect the SARA Member Discount!

- Icom IC-746 (Non-Pro): **\$525**. Everything works and is in excellent condition. Original box and un-cut power cord with power poles.
- Heil ICM Mic, S2 Foot Switch & Mic Stand: **\$60**.
- Ameritron ATR-15 Antenna Tuner (Pre MFJ): **\$180**. Incandescent lamps replaced with blue LEDs. Very good condition.
- Timewave DSP-9 Digital Signal Processor: **\$50**.
- Kenwood SP-820 Speaker with Filters: **\$60**.

If someone wants to buy the complete station, I will include an older computer with the software to run the IC-746, communication cables including a Rascal for PSK31 and other digital modes, headphones, fused power distribution block for Anderson power poles, W9INN balun, and couple of OXB Specials antennas all for **\$825**. I probably have other stuff to throw in too. If anyone wants to operate the station before buying; they are more than welcome to arrange a time and operate the entire station from my QTH.

Rick Brennan (KØBR)

rbrennan221@gmail.com Phone: (612) 770-7407



From AGØH:

FOR SALE

Kenwood TS 590 HF All Mode Transceiver

Mint Condition—3 years old

\$750. Firm

Keith Miller (651) 777-0109

Grid Chase Update



2018 Grid Chase

#4

as of October 1

Chaser		Grid Score Mode				
		Total	Digital	Phone	CW	
ADØSN	Rich	<input type="checkbox"/>	423	423	0	0
KCØOIO	Joe	<input type="checkbox"/>	1401	1401	0	0
KDØIPI	Jim	<input type="checkbox"/>	47	0	47	0
KEØIYN	Collin		364	344	20	0
KEØLMX	Tim		321	321	0	0
KEØMUW	Joe	<input type="checkbox"/>	17	17	0	0
KEØN	Eliot	<input type="checkbox"/>	2343	2212	23	108
N9JNQ	Dave		976	907	65	4
NØCQ	Ken		1041	1041	0	0
NØODK	Mike		783	783	0	0
VE3MXJ	Brad	<input type="checkbox"/>	330	3	327	0
VE3XT	Bill		306			306
WBØMOA	Gary		142	0	142	0
WØFL	Brian		817	817	0	0

See a mistake, want to join the fun, let me know: KDØIPI@ARRL.net

Near disaster! My hard drive failed, but with some help from the pros we recovered. Here are the numbers as of October 1. Way to go. Never too late to join the fun this Fall. Let me know and I will add you to the list. Jim, KDØIPI

Remote Base Update

WØZSW and WØEQO are available for member use. Both stations may be accessed via the Remotehams.com software "RCForb", a free program. SARA & Handiham members please contact me for access to transmit capability.

The stations continue to be pretty darned reliable, but I've noticed an occasional glitch in the hosting software at WØEQO. The symptom is that you connect to the station but hear no audio. After going through the usual list of suspects (RF gain set too low, my own sound card muted, audio gain set to zero, and so on), I've concluded that something causes the audio server on the host to stop functioning. The only cure is for an admin to access the host PC, halt the RCForb host, then restart it. That fixes the problem, but of course we depend on users to report it to us. I check the stations daily, but if things get busy it is possible that the audio server might be down for an extended period - so please email me as soon as you notice a problem and that will help us to get things running again quickly.

There is preliminary evidence that the audio host glitch is not confined to just WØEQO, so if it appears on any other stations please let me know.

As we enter Autumn, thunderstorm activity is decreasing and I am able to leave stations WØZSW and WAØTDA running almost 24/7. The key word here is "almost", because there is still thunderstorm - and therefore lightning damage - potential. If you have noticed that these stations are not on line, chances are there is a thunderstorm possibility in the forecast for overnight. Several nights in September I debated whether or not to shut the stations down because the evening was pleasant, even with a slight thunderstorm chance in the prediction - only to be awakened by heavy rain, wind and lightning.

Better safe than sorry!

73, Pat, wa0tda@arrl.net





Holly Wiste, KEØRZZ, joins the Signals editing team!

Editing your monthly Signals is a team effort, and we're delighted to add KEØRZZ to the team. Holly has editing experience and a keen eye for detail - just the sort of skill we need to make sure that we make every issue the best it can be.

Welcome, Holly - and thanks!

ARES Nets



Please post this by your radio and/or kitchen table and try to check in once or twice per month and enjoy the topic. John (KAØHYR) has the schedule for NCS and topics laid out for the year; he has left several open for “any available NCS”, so contact John jeregan3@gmail.com and get some practice as a Net Control Station. This is the most valuable ham position at a real disaster activation, so get your skills up now while practice time is available; The script for the NCS is also available. You will be surprised at how quickly your skills rise to the top or are renewed and it becomes second nature.

Washington County ARES (WASHCOARES)

3rd Wednesday of Each Month; 6:30 PM; 146.985⁻

HF Nets in MN (some ARES, some Section nets, some Club nets):

- :: SARA FLDigi Digital Net: 7 PM Sunday; 3.584.15 MHz
- :: ARRL MN Phone Net; 12 noon, 5:30 PM Daily; 3.860 MHz
- :: ARRL MN Section (CW) Net; 6:30 PM, 9:50 PM Daily; 3.568 MHz
- :: MN ARES FLDigi Digital Net: Thursday, 8 PM, 3.583.5 MHz USB, Olivia 8-500

HF Nets with Neighboring States:

- :: North Dakota: 6:30 PM Daily; 3.937 MHz
- :: South Dakota: 6 PM Daily; 3.870 MHz
- :: Wisconsin: 5:30 PM Daily, 3.985 MHz
- :: Iowa: 12:30 PM, 5:30 PM Daily, 3.970 MHz
- :: Michigan Digital Traffic Net (MIDTN), Thur. 7 PM, 3.583.50 kHz, USB, Olivia 8-500

VHF Digital Nets:

- :: SEMARC FL Digi Net: Every Wed. Sept.-May; Voice check In 146.985; digital check-in 144.950
- :: Scott County ARES Net, Monday, 7 PM; 147.165R; also 146.535 S

TNX es 73,
John (KAØHYR)
Washington County EC



Upcoming Meetings & Events

- Oct. 13: Monthly meeting; Boutwells Landing, Oak Park Heights
- Nov. 2-4: Split Rock Lighthouse Special Event; Split Rock
- Nov. 8: VE Testing; Boutwells Landing, Oak Park Heights
- Nov. 10: Monthly meeting; Boutwells Landing, Oak Park Heights
- Dec. 8: Monthly meeting; Boutwells Landing, Oak Park Heights

2018

October							November							December						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3							1
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22
28	29	30	31				25	26	27	28	29	30		23	24	25	26	27	28	29
														30	31					

SARA Needs YOU!

Get involved ...
 Make a difference ...
Have fun!



www.radioham.org

Facebook: SARA - Stillwater Amateur Radio Association

