TALES FROM THE SWAMP

September 2023

Editor: Kevan Nason, N4XL

Thank you to our group leadership:

President – Ed, K3DNE
Vice President - Dave, WN4AFP
Treasurer – Scott, KG9V
Secretary – Kevan, N4XL

Web Master – Frank, KG4IGC
SFCG Webpage: swampfoxcontestgroup.com

Contest Tips:

Annual Station Maintenance *Excerpts from the Sept/Oct 2003 issue of the National Contest Journal Contest Tips, Tricks & Techniques section by Gary Sutcliffe, W9XT*

- Inside the Shack
  - VE3PN suggests checking RCA-type audio and control cables and connectors. They sometimes spread. Unplug them. When pulg them back in make sure they are snug.
  - Clean dust and contaminants from amplifiers
  - Turn amplifiers on for 30 minutes once a month to protect the capacitors and dry the amp out.
  - K1TTT suggests checking out any new electronic equipment recently acquired for birdies and other noises.
  - W9LO said “Don’t fix it if it ain’t broke.”
- Feed Lines
  - Check feed lines and control cables for nicks, cuts, abrasion or evidence of rodent damage.
  - Look closely at rotor loops.
  - N4ZR and K4SB suggest checking feed line loss. You should measure it at installation. Replace it if loss has increased.
- Antenna
  - Check SWR and resonant frequencies. You should record them at installation. If they have moved it could be a sign of something gone bad or going bad.
  - K1TTT noted if SWR has improved it could be your coax is becoming lossy.
- Tower
  - Don K4ZA suggests starting at the top and work down noting EVERYTHING.

- K9ZA brings a can of aluminum colored paint and touches up areas of the tower as needed.
- Check guy tension, loose bolts, U-bolts, and all antenna clamps you can reach, etc.
- K4ZA and K1TTT suggest cutting brush around tower to prevent fires.
- Check rotor mounting bolts.
- Put a protective coating over control cable connections.

From Nov/Dec 2003 NCJ.

Gary W9XT says "Be Loud". Being loud is relative. You are loud at S5 on a quiet band, but weak at S9 if QRM is S9+20 dB. Know which bands and at what times you are loudest.

He also said "From time to time there will be a thread on the Internet contest forums about how contests are unfair or fixed. Usually this is started by a contester who has been contesting for a couple of years and has been unable to crack the top ten list. While the playing field is certainly not level, the reality is that some contesters spend decades developing their skills and stations. They spend countless hours between contests preparing for the next one. It would be unrealistic to make the PGA tour a year or two after picking up your first golf club. You are not going to become a world-class contester just by operating a couple of Sweepstakes."

Excerpts from the Jan/Feb 2003 issue of the National Contest Journal Contest Tips, Tricks & Techniques section by Gary Sutcliffe, W9XT

AA4NU suggests reading the NCJ. Whenever he meets a beginning contester he loans him a stack of NCJs from the last few years and tells them to read them all.

K5AF told SO2R ops "S&P low and run high." This means you should be CQing on the higher of the two bands and search and puncing on the lower one. The reason for this is that harmonics of the CQing transmitter will not fall into the band you are listening to. This is especially useful to those without elaborate filtering systems.

K9GS said when CQing, "Always strive to correctly copy the full call sign of the calling station the first time. This helps establish a rhythm which increases not only your rate but the total score."

W6EU's tips were:

- Change your goal from "making 1000 QSOs" to "staying in the chair the full allowed time."
- Set up a TV set in the shack. Turn the sound down and watch a football game while you operate. (*Editors note: Time for SO2R/SO2V instead?)*
- Test out your station and software several days before the contest.

W9XT tips were:

- Use spreadsheets to plan contest strategies. Play what if scenarios to determine optimal mix of CW and SSB QSO's (for mixed mode contests).
- If trying a different category entry, i.e.: QRP, get on the air several times before the contest using that band/mode and learn some of its idiosyncrasy's and tricks.

From the Reflector:

- Bill N1UZ is working to finish his awards and asked if DXCC, WAS, WAZ and WPX were transferrable from his old QTH in Massachusetts. Brian N8WRL and Dennis K2SX answered a bit differently with Brian saying only WAS had to be restarted and Dennis advising looking at the rules for each award. Both replies were good, and Bill reported Brian was correct when he said he thought only WAS had to be done from SC.
- Dave WN4AFP has transferred the SFCG website to a new host. Thank you Dave and others for the work.
- The NAQP SSB brought out several members. Ed K3DNE placed in the Top Ten Single Op Assisted category. Good job Ed! Check out the scores shown later in the newsletter. John K4QQG used the excuse he had a Coast Guard patrol to go on and he couldn't do a FT effort. Excuses, excuses… Burton KY4ID brought the whole family into the shack and did a Multi effort. He reported everyone had a great time.
- President Ed K3DNE reported the SFCG again moved up in the ARRL DX Combined SSB + CW standings this year. We went from 20 of 52 to 16 of 55 club entries. Thank you SFCG for helping make that happen.
- Ed K3DNE figured out how to make a 1st place SC win in the ARRL DX CW Contest even though he isn't a strong CW op. Do a single band entry. He has a certificate for 1st Place South Carolina Section for Single Operator, High Power, 15 meters. Watch out Dave WN4AFP. Ed's coming after you to see who can get the most certificates!
- John K4FT is posting quite a few entries. Good to see you so active, John.
- Bands have been hit and miss lately as exemplified by the Russian RTTY contest. Bill N1UZ summed up comments about conditions with "WOW, tough going. Not a lot of contacts." Ted K7OM said he spent about 2 hours to work only 24 stations. Ugh.
- Scott N2OG was in the market for a decent manual tuner. He ended up with a Palstar. Scott is also having problems with his AL-811 and received some advice about tube replacement.
- Watch out Ed K3DNE! Kevan N4XL has an amplifier and is thinking about using it in a contest or two! A local ham gave him an AL-811H that is "broken" along with an oil filled canned dummy load. No obvious sign of damage during a visual examination, except for an "X" drawn on top of a tube. Probably indicating it is bad? Anyway, its one more project for Kevan to add to his long Round-To-It list. You're safe for a while longer Ed. He will likely make the grounded grid and gas tube mods, and replace the 811A tubes with 572's. It's been sitting idle for a few years, so a Variac startup is needed.
- Frank KG4IGC received a certificate for #1 US 4th Call Area and #14 US in the 2022 CQWW RTTY DX contest. Frank was SOALP. Good job, Frank!
- Kevan N4XL suffered some damage to his 40/80 vertical from a thunderstorm. Thank you all who volunteered to help replace it. Hope to do that in the next couple weeks.

- Several people enjoyed the NA Spring CW. Good to see interest in that picking up. Burton KY4ID shared some advice on working that event.
- Dave WN4AFP stirred interest by discovering old QSL cards are being sold on eBay.

Disturbances to Propagation

By Carl Luetzelschwab K9LA

(This information comes from https://k9la.us/ and is found under Carl's General tab.)

The best way to do this is to summarize the information put out by the National Oceanic and Atmospheric Administration (NOAA). In March 2002, NOAA changed the format of the WWV alert (at 18 minutes past the hour) to better align it to the current understanding of disturbances to propagation. This summary is shown in Table 1 (full details here).

NOAA designator	Description	Source	Results	Comments (from K9LA)
G	Geomagnetic storm	Shock wave from **CME** or high speed solar wind from **coronal hole** affecting the Earth's magnetic field	Bad: auroral absorption, decreased F2 ionization at high and mid latitudes, skewed paths at the main trough Good: auroral-E, may increase F2 ionization at low latitudes	Generally the worst of all three due to the duration of the storm and the recovery time of the ionosphere
S	Solar radiation storm	Energetic protons from a large **solar flare**	Additional absorption in the polar cap	Low probability of happening since there are only about six events per year
R	Radio blackout	Electromagnetic radiation at x-ray wavelengths (0.1-1 nm) from a large **solar flare**	Blackout on daylight side of Earth due to increased D region absorption	Generally of short duration, with the higher frequencies affected last and recovering first

Table 1

Note that there are three general categories for disturbances to propagation: G for geomagnetic storms, S for solar radiation storms, and R for radio blackouts. Further note (by the words in bold in the third column) that CMEs (and coronal holes) are tied to geomagnetic storms, and solar flares are tied to both solar radiation storms and radio blackouts. Each of the three categories (G, S, and R) has a scale of 1 to 5, with 1 being 'minor' and 5 being 'extreme'.

CME and solar flare comments

Not all CMEs cause geomagnetic storms. The most important parameter for a CME to eventually impact the ionosphere is that it has to be Earth-directed. When a CME is Earth-directed, it is called a halo event because the explosion on the Sun can be seen all around the occulting disk of a coronagraph (a telescope that artificially produces an eclipse to see the Sun's corona). If the CME isn't directed towards Earth, the explosion is only seen coming from one location around the Sun's circumference.

Even among those CMEs that are Earth-directed, some will affect us more than others. The different qualities of a CME that can determine its "geo-effectiveness" include the amount of material ejected, the speed at which it travels, and the strength and direction of the magnetic field carried by the cloud of charged particles.

In a like manner to CMEs, not all solar flares cause solar radiation storms and radio blackouts. In general only the large solar flares are involved in these disturbances – X-class flares and M-class flares. Now let's look at the specific events of September 7 through 15.

Events of September 7-15, 2005

Table 2 summarizes the X-class flares for this period. Also included are columns indicating whether a specific flare had a concurrent CME and the daily planetary magnetic index Ap.

Date	Flare magnitude & begin/max/end time	Concurrent CME?	Ap
Sep 7	X17 1724/1728/1847 UTC	yes	15
Sep 8	X5.4 2052/2105/0042 UTC	yes	8
Sep 9	X1.1 0243/0300/0307 UTC X3.6 0942/0959/1008 UTC X6.2 1913/1946/2328 UTC	no no yes	17
Sep 10	X1.1 1634/1643/1651 UTC X2.1 2130/2211/2243 UTC	no yes	30
Sep 11			105
Sep 12			66
Sep 13	X1.5 1922/1923/2313 UTC X1.7 2315/2322/2330 UTC	Yes (from these twin flares)	51
Sep 14			25
Sep 15	X1.1 0836/0837/0936 UTC	no	43

Table 2

The period began with the fourth largest x-ray flare in recorded history – the X17 event on September 7. It had a CME associated with it. Two more CME-producing flares followed: an X5.4

flare on September 8 and an X6.2 flare on September 9. The effects of these three CMEs drove the Ap index up to 105 on September 11, and Ap remained high through September 13 due to an additional CME (from the X2.1 flare) on September 10. The Ap index quieted down on September 14, but then increased to 43 on September 15 due to the CME associated with the twin X1.5/X1.7 flares on September 13.

The impact of a geomagnetic storm

The best way to assess the impact of these geomagnetic storms is to look at a typical mid latitude ionosonde during the September 7-15 period. The Wallops Island ionosonde at 37o North geographic latitude falls into this category, and Figure 1 shows its F2 region critical frequency foF2.

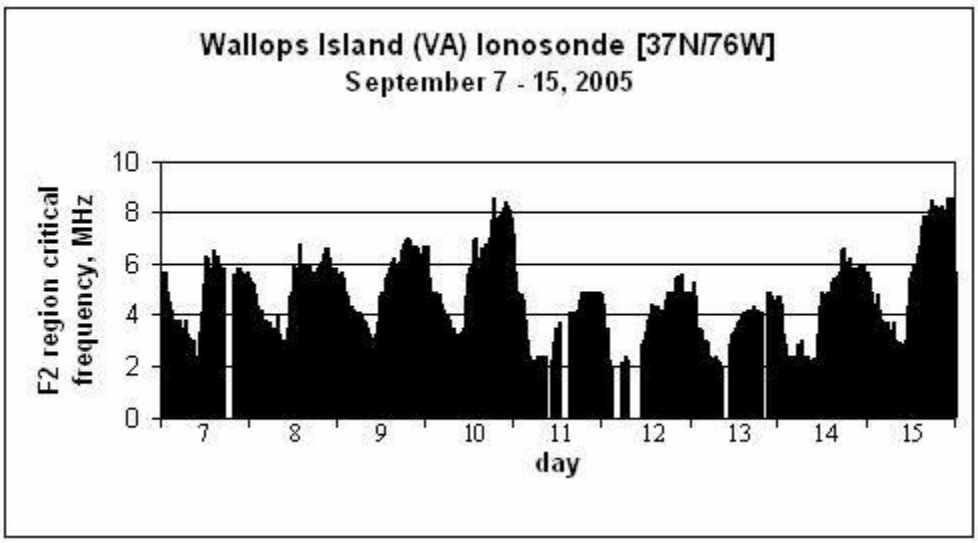

Figure 1

The F2 region critical frequency is a vertical incident (straight up) measurement, and the Earth-ionosphere geometry works out such that the MUF (maximum usable frequency) for a 3000km low elevation angle path will be approximately three times higher than the critical frequency.

Up through September 10 the F2 region over Wallops Island could support propagation on 17m (and maybe even on 15m on the 9th and on 12m on the 10th) if Wallops Island was the midpoint of a 3000km hop. But on September 11 and the following couple days, propagation could only be supported on 20m. The decrease in foF2 (and thus the MUF) on September 11 and after was due to those three CMEs on September 7, 8, and 9.

The impact of a solar radiation storm

As stated in Table 1, sometimes a large solar flare can send out very energetic protons. These protons are guided into the polar cap (the area inside the auroral oval and centered on the magnetic pole) and cause additional absorption. The amount of additional absorption can be measured by a riometer (relative ionospheric opacity meter). A riometer measures the signal strength of cosmic noise at the upper end of the HF spectrum (usually around 30MHz). A 'quiet' time plot is determined, and then the additional absorption is calculated from the decrease in

signal strength during an event (which is commonly known as a PCA – a Polar Cap Absorption event). Figure 2 shows the absorption on September 8 (the times on the horizontal axis are UTC) from a riometer in the polar cap (the riometer at the Sodankylä Geophysical Observatory in Finland).

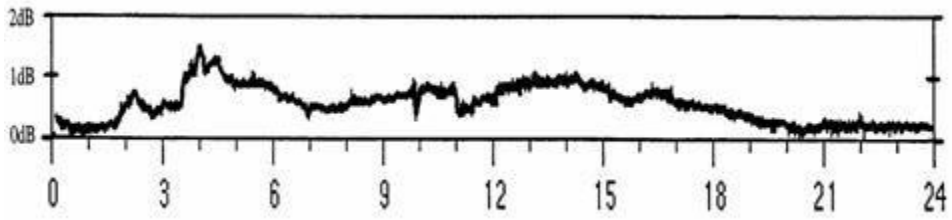

Figure 2

The absorption is at quiet-time levels until just after 0200 UTC, when it spikes up to about 0.8dB absorption. It then settles back down a bit until it spikes up to about 1.5dB around 0400 UTC, and then stays elevated throughout most of the day. The cause of this additional absorption on September 8 starting around 0200 UTC is the energetic protons sent out by the big X17 flare that began at 1724 UTC on September 7.

The 1.5dB absorption may not sound like much, but it's for a 30MHz signal passing through the D region only once from straight above. For a 3000km one-hop path on 20m across the polar cap, the 1.5dB translates to greater than 10dB.

The impact of a radio blackout

A great way to see the impact of a solar flare in relation to radio blackouts is to look at WWV signal strength during a flare. Figure 3 does this for the path from WWV on 15MHz to New York for the X1.5 flare on September 13.

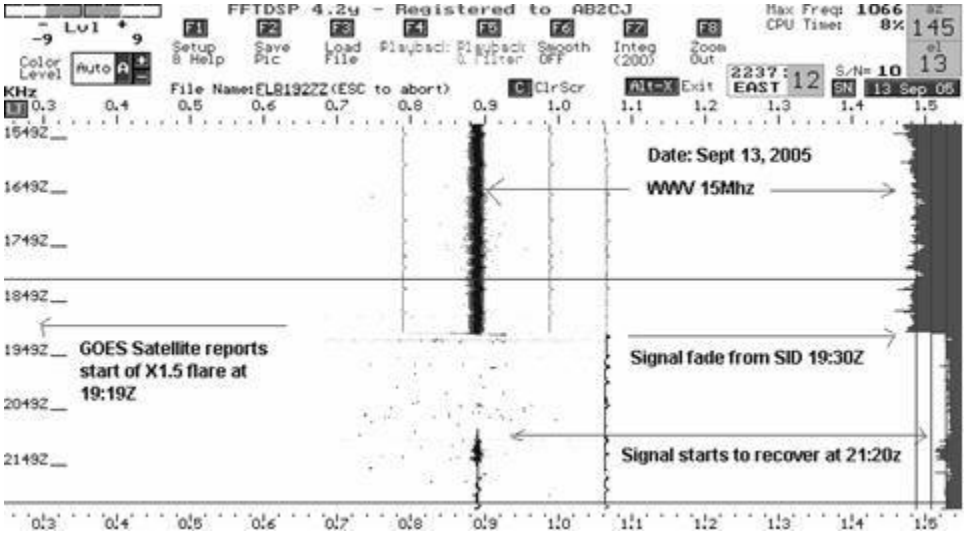

Figure 3

The WWV signal level is on the right side of the plot, and it is fairly steady up until the flare starts – after which it takes a big dive. The amount the signal strength decreases and the duration of

the decrease depend on the peak flare intensity (even M-class flares can decrease the signal strength a bit), the solar zenith angle at the two locations where the electromagnetic wave goes through the D region (the most absorption occurs when those two locations are directly under the overhead Sun), and the duration of the flare.

The flare in Figure 3 was of long duration, so the signal strength didn't come back right away. Since the amount of absorption is inversely proportional to the square of the frequency, WWV on 20MHz would have been affected to a lesser extent – but WWV on 10MHz would have been affected to a greater extent.

Advanced notice of Region 808

An interesting question to ask is "did we have advanced warning of Region 808?" Since the Sun rotates approximately every 27 days, knowing that Region 798 was large and active the last time around hinted that it could come around again about a month later and cause more propagation problems. As a side note, the Sun's 27-day rotation period is an average, as the Sun is a ball of gas and is not rigid like the solid planets and moons. The Sun's equatorial regions rotate faster (about 24 days) than its polar regions (more than 30 days).

Thanks to space-age technology, we have a more elaborate method of forecasting sunspot regions before they rotate into view. It's called helioseismic holography. It's an acoustic imaging process that allows us to see sunspot regions on the far side of Sun. The details for this are at spaceweather.com (on the left side of the web page). Figure 4 shows soon-to-be Region 808 on the far side of the Sun.

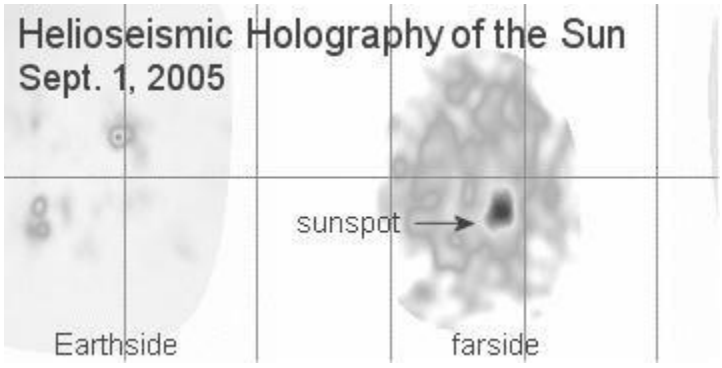

Figure 4

Note that Figure 4 is dated September 1 – that's a week before Region 808 rotated into view. Figure 4 doesn't tell us if we're going to get hit with disturbances to propagation, but it does tell us that a large sunspot region capable of producing disturbances to propagation is coming around.

Summary

This article reviewed disturbances to propagation, and showed how each of the three categories of disturbances affects propagation. Hopefully you've come away with a better understanding of these important events.

Pre and Post Contest Checklists.

from Tim EI8IC on October 25, 2001

A Pre-Contest Checklist

With CQWW SSB fast approaching, I thought some might be interested in my own Pre-Contest Checklist :

Pre-Contest Checklist:

Set the computer clock to the correct date and exact GMT time.

Caps Lock and Num Lock set as required.

Configure Logging Program for this contest.

Load the CW or Voice Memories and listen to them through the rig.

Prepare the Keyboard Overlay sheet.

Simulate five qsos on computer, then erase log file.

Check computer is on same band and mode as transceiver.

Print out full Contest Rules and re-read them.

Print out latest Propagation Forecast for the bands needed.

Print out Contest Band plans from EI8IC's pages.

Print out Announced Operations from NG3K's pages.

Print out your Logging Program command-set.

Prepare Floppy Disc or SmartDrive for log dumps.

Visual check of all antennas and cabling.

Check rotators are calibrated and functioning.

Test station on all bands, noting for any RFI.

Check the position of all knobs and switches, especially:
Attenuator
Noise Blanker
RIT
Vox Delay
Split Frequency
Upper/Lower Sideband

Tape card behind linear amplifier and ATU controls and mark all tuning positions in colored text.

Un-plug the shack telephone and turn on answering machine.

Gather together all contest necessities:
Notepad and pencils
Spare headphones and microphone
Eyeglasses
Throat Lozenges
Damp cloth and towel for accidents
Food and Drink

Clean clothes for mid-contest shower
Torch and spare operating-light bulbs
Box of fuses and test-meter

Check location of all backup-equipment and cables.

Review past contest logs and magazine results.

Plan strategy and prepare band change and off-time plan.

Feed the cat.

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Post-Contest Checklist:

Make a backup of the log on floppy disc.

Make a backup copy of the log on another computer.

Don't try to edit the log whilst you are tired.

Unplug all power and antenna plugs.

Respond to answering-machine messages.

Feed the cat.

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** Please visit the EI8IC Contesting Website. **
Recently re-written, with over 50 new pages of information
for all HF Contesters, including Budget Contesting, Beginner's
FAQs, Graphical Bandplans, and Big Gun Contest Stories.
All this and more at www.qsl.net/ei8ic/
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Observations by the Editor:

- W7WZ's muti contest station is coming along nicely. John is working hard and is relying heavily on Dave's AA4VT technical expertise. The group is planning on another series of workdays October 1 through the 4th. It is an excellent chance to see a major station going together. Contact John W7WZ or Dave AA4VT for further information. Some are only coming for a day.
- Thank you to those who have offered to help me replace my downed antennas. Not sure when I'll free up time to do that work, but think I have enough local help. Will reach out if that falls through.
- As I prepare to add an amplifier to my shack, I am reminded I need to follow my own advice more diligently. Despite having read many times one should document shack information I now realize I haven't done a very good job of doing that. Some details are missing. What is the power rating of the balun on my yagi? What is the power rating of the ICE lightning protection units? Where am I using RG58 instead of LMR400? I never recorded the SWR and return loss of my antennas upon initial installation. After replacing my low band antennas I will be sure to record that information this time.
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N1MM+ Tips:

- About once a month someone asks for help on the N1MM reflector because their F-key messages don't play correctly. An example might be the message in F4 plays when the F3 key is pressed. Virtually every time it is because they have somehow skipped an F-key number. There are 12 Run and 12 S&P messages and all 24 must be included in the F-key message editor to keep the sequence correct. That is true even if you don't use all 24.
- MorseRunner is built into N1MM+. It can be activated in Configurer from the Other tab. There is a description of how to use it in the N1MMplus.pdf file.
- When in ESM mode, you sometimes need to repeat whatever you last sent, be it your call or exchange element or other function key. The "=" key will do that. Rather than look at the Entry Window and figure out which function key to send, just press the equal key if you just want to send what you last sent again. Easy!
- ESM on Phone – One Special Feature

  There's every reason, when running CW or RTTY, to use stored messages for almost every transmission. Phone is different – you may not want to have the computer talk for you all the time.

  • Most operators choose to say callsigns and serial numbers themselves, rather than having the computer assemble them from individual letters and numbers. See the next section for more discussion of these issues, and for information on how to set up your Function Key definitions, whether you choose to let the computer do it all or not.

  • In some contests like CQWW, the exchange is so short that it may be more hassle than it is worth to have the computer voice your CQ zone.

  Or… you may forget, particularly when you are running tired, and say the other station's call and your exchange before you realize you've done so.

  To deal with this, N1MM Logger incorporates some additional flexibility. Here's how it works, courtesy of the inventor, N2IC:

  You are in Run mode. A station answers. You type in the callsign, and you use your live voice to send the callsign and exchange. Now, the station you are working is about to send his/her exchange. If, at this point, you hit the Enter key, your exchange wav file would be sent. That is bad – you already used your live voice to send the exchange. Instead of hitting the Enter key, hit the space bar. Now, type in the other station's exchange. Hit the Enter key, and the "Thanks" message will be sent, and the QSO will be logged.

  In summary, the decision of whether to use the Enter key or the Space bar at that step in the logging process depends on whether you use your live voice to send your exchange, or a wav file.

- When something goes wrong, it seems as if the first reaction of many users is to uninstall and reinstall the program. This is almost never the recommended response. The vast majority of problems are due to either a corrupted settings file (n1mm logger.ini) or a corrupted database file and uninstalling and reinstalling will not fix either of these, unless you take the additional drastic step of deleting your user file area. Usually, you can achieve the same result just by deleting a single file (the n1mm logger.ini file) without going through the hassle of uninstalling and reinstalling

Upcoming Contests:

See the WA7BNM webpages https://www.contestcalendar.com/contestcal.html

SFOTA Current Leaderboard:

Sep-15-2023

Current Leaderboard

2023 OVERALL STANDINGS

	CALL	Contests	CW QSO'S	SSB QSO'S	DIGITAL QSO'S	RTTY QSO'S	TOTAL QSO'S
1)	N4XL	9	5814	2101	0	0	7915
2)	K3DNE	13	392	6512	388	102	7394
3)	WN4AFP	65	4666	2085	0	0	6751
4)	N4IQ	22	3153	450	604	1717	5924
5)	WB4HRL	84	4197	189	782	517	5685
6)	K4FT	72	5072	344	0	182	5598
7)	K4QQG	35	0	4286	0	259	4545
8)	NU4E	8	1263	3218	16	0	4497
9)	KZ3P	43	0	3565	0	0	3565
10)	KG4IGC	16	685	762	0	2021	3468
11)	K7OM	22	1302	0	0	2102	3404
12)	N4QI	67	2215	539	0	531	3285
13)	KY4ID	21	2477	0	0	0	2477
14)	AC4MC	5	769	933	0	0	1702
15)	KD4S	12	924	160	128	421	1633
16)	NJ4Z	4	267	968	0	0	1235
17)	NE4EA	7	630	477	0	0	1107
18)	KS4YX	4	122	0	0	718	840
19)	N2OG	5	47	473	0	119	639
20)	N1UZ	4	53	0	289	144	486
21)	KG9V	1	0	465	0	0	465
22)	NI7R	2	451	0	0	0	451
23)	KM4RK	3	0	100	0	0	100
24)	WA2BCK	2	0	63	0	0	63
25)	KB1QU	1	0	57	0	0	57

2023 INDIVIDUAL MODE STANDINGS

CALL	CW QSO'S
N4XL	5814
K4FT	5072
WN4AFP	4666
WB4HRL	4197
N4IQ	3153
KY4ID	2477
N4QI	2215
K7OM	1302
NU4E	1263
KD4S	924
AC4MC	769
KG4IGC	685
NE4EA	630
NI7R	451
K3DNE	392
NJ4Z	267
KS4YX	122
N1UZ	53
N2OG	47

CALL	SSB QSO'S
K3DNE	6512
K4QQG	4286
KZ3P	3565
NU4E	3218
N4XL	2101
WN4AFP	2085
NJ4Z	968
AC4MC	933
KG4IGC	762
N4QI	539
NE4EA	477
N2OG	473
KG9V	465
N4IQ	450
K4FT	344
WB4HRL	189
KD4S	160
KM4RK	100
WA2BCK	63
KB1QU	57

CALL	DIGITAL QSO'S
WB4HRL	782
N4IQ	604
K3DNE	388
N1UZ	289
KD4S	128
NU4E	16

CALL	RTTY QSO'S
K7OM	2102
KG4IGC	2021
N4IQ	1717
KS4YX	718
N4QI	531
WB4HRL	517
KD4S	421
K4QQG	259
K4FT	182
N1UZ	144
N2OG	119
K3DNE	102

3830 Activity:

Contest	Call	Class	Power	Score
50FallSprnt				
8/27/2023 13:09	K3DNE	Single Op	HP	42
AlQP				
9/13/2023 14:04	K4FT	SOCW	LP	40
9/10/2023 15:45	K4QQG	SOSSB	HP	4
9/14/2023 14:44	WN4AFP	SOMixed	LP	364
ARRL Sep VHF				
9/11/2023 3:13	K3DNE	Single Op-All Modes	HP	16,954
9/11/2023 18:55	KD4S	Single Op-All Modes	HP	286
9/11/2023 10:32	NU4E	Single Op-All Modes	HP	357
CoQP				
9/3/2023 22:32	K4QQG	SOPh	HP	16
CWOpen				
9/2/2023 23:25	K4FT	Single Op	LP	9,100
9/2/2023 4:03	KY4ID	Single Op	LP	59,983
9/4/2023 13:40	WB4HRL	Single Op	HP	2,304
9/4/2023 13:51	WB4HRL	Single Op	HP	5,390
9/2/2023 17:28	WN4AFP	Single Op	LP	22,560
HiQP				
8/27/2023 22:04	K4FT	SOAB	LP	119
KsQP				
8/27/2023 22:05	K4FT	Single Op	LP	9,577
8/27/2023 13:48	K4QQG	Single Op	HP	816
MDC QP				
8/18/2023 22:26	WN4AFP	Standard	LP	132
NA Sprint CW				
9/10/2023 4:08	KY4ID	Single Op	LP	8,280
9/10/2023 2:10	WN4AFP	Single Op	LP	2,808

Contest	Call	Class	Power	Score
NAQP SSB				
8/20/2023 5:04	K3DNE	Single Op Assisted	LP	95,312
8/20/2023 12:33	K4FT	Single Op	LP	5,550
8/20/2023 17:31	K4QQG	Single Op	LP	12,780
8/20/2023 17:57	KY4ID @KY4ID	M/2	LP	66,504
8/20/2023 18:47	KZ3P	Single Op Assisted	LP	19,035
8/20/2023 17:18	N2OG	Single Op	LP	14,400
8/20/2023 17:39	N4IQ	Single Op	LP	69,750
8/22/2023 13:38	N4VGE	Single Op	LP	3,131
8/20/2023 5:04	N4XL	Single Op Assisted	LP	64,860
8/24/2023 12:40	WB4HRL	Single Op Assisted	HP	108
8/20/2023 16:34	WN4AFP	Single Op	LP	22,428
OhQP				
8/27/2023 22:07	K4FT	Single Op	LP	3,420
8/27/2023 13:46	K4QQG	Single Op	HP	64
Rus RTTY				
9/3/2023 19:14	K7OM	SOAB	HP	1,400
9/3/2023 22:08	KG4IGC	SOAB	LP	3,900
9/3/2023 1:05	N1UZ	SOAB	LP	5,605
SARTG				
8/20/2023 23:42	K7OM	SOAB	HP	88,075
8/20/2023 15:19	KG4IGC	SOAB	LP	183,675
8/20/2023 16:00	N1UZ	SOAB	LP	83,835
TnQP				
9/4/2023 2:33	K4FT	SO FixedCW	LP	6,600
9/3/2023 22:27	K4QQG	SO FixedSSB	HP	243
9/4/2023 13:19	WB4HRL	SO FixedMixed	HP	8,943
9/4/2023 3:07	WN4AFP	SO FixedMixed	LP	43,312
WAE CW				
8/18/2023 23:25	WN4AFP	Single Op	LP	1,372
WAE SSB				
9/11/2023 17:32	KZ3P	Single Op	HP	1,591
9/10/2023 23:25	NU4E	Single Op	HP	492,744

Contest	Call	Class	Power	Score
WW RTTY				
8/28/2023 18:34	K7OM	SO/Single Xcvr	HP	2,336
8/28/2023 9:52	KG4IGC	SO/Single Xcvr	LP	16,492
WWDigi				
8/27/2023 13:04	K3DNE	SOSB20	LP	9,734
8/27/2023 12:35	N1UZ	SOAB	LP	24,960
8/27/2023 5:38	N4IQ	SOAB	HP	165,710
8/30/2023 3:04	WB4HRL	SOAB	LP	41,055

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73 es QRT de N4XL