

CQ Chatter

SEPTEMBER 2020

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WOOD COUNTY AMATEUR RADIO CLUB

President	WB8NQW	Bob Willman
Vice President	KD8VWU	Doug Perez
Secretary	N1RB	Bob Boughton
Treasurer	KD8NJW	Jim Barnhouse
Board Member	KE8CVA	Terry Halliwill

Minutes

WCARC Meeting

August 10, 2020

Due to corona virus restrictions the meeting was conducted on the 146.18/444.475 MHz repeater system

Bob-WB8NQW, presiding

Present: WB8NQW-Bob, WD8LEI-Eric, N8MSU-John, WE8TOM-Tom, K8LL-Stan, W8PSK-Phil, N1RB-Bob, KE8CVA-Terry, WB8VUL-Hoot

Meeting called to order: at 7:30 with Pledge of Allegiance.

Minutes: of June business meeting as published in July CQ Chatter were approved.

Treasurer's Report: no report requested due to public nature of meeting.

Old Business:

- Bob asked PSK for a rundown on the latest work on the repeater. Phil reported that he and RB had done some work on the audio combiner to replace the mini pots by ordinary pots with shafts to provide easier access. At the same time the Wires-X computer was set so that hopefully there would be no more shutdowns on account of Windows 10 auto-updates.
- Bob reminded all about the CW net each Tuesday at 8:00PM on 28.050 MHz. Stan asked how one can begin to

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Net Check Ins

Aug 4 **Traffic: 1**
N1RB (NCS)
WD8LEI
KE8CVA
KC8EKT
KG8FH
WB8NQW
KD8NJW
W8PSK
WE8TOM
KD8RNO
KA8VNG
KE8NEC
WD8JWJ
K8JU
KG8FU (15)

Aug 11 **Traffic: 1**
KG8FU (NCS)
WD8LEI
KE8CVA
W8PSK
KB8QEW
WB8NQW
KD8NJW
KA8VNG
KD8RNO
N1RB
KC8EKT
KE8CUZ (12)

Aug 18 **Traffic: 0**
WB8NQW (NCS)
KE8CUZ
K8BBK
KE8CVA
KC8EKT
KD8RNO
KB8QEW
W8PSK

BRAIN TEASERS

- Which of the following is true concerning access to frequencies?
 - nets always have priority
 - QSOs in progress always have priority
 - Except during emergencies, no amateur station has priority access to any frequency
 - contest operations must always yield to non-contest use of frequencies
- What percentage of power loss would result from a transmission line loss of 1 dB?
 - 10.9 %
 - 12.2 %
 - 20.6 %
 - 25.9 %
- What happens when the impedance of an electrical load is equal to the output impedance of a power source, assuming both are resistive?
 - source delivers minimum power to the load
 - the load is shorted
 - no current can flow through the circuit
 - source can deliver maximum power to the load

September Contests

The contest lineup for the month of September is given below. Please note that the WARC bands (60, 30, 17 and 12 m) are never open to contesting.

Sep 5-6	<i>0000 to 2359 Z</i>	80m to 10 m
All Asian DX 'test		SSB
Sep 5-6	<i>1300 to 0400 Z</i>	160 m to 10 m
Colorado QSO Party		all modes
Sep 6-7	<i>1800 to 0300 Z</i>	160 m to 10 m
Tennessee QSO Party		all modes
Sep 12-13	<i>0000 to 2359 Z</i>	80 m to 10 m
WAE DX 'test		SSB
Sep 12	<i>1400 to 2200 Z</i>	80 m to 10 m
Ohio State Parks on the Air		SSB
Sep 12-13	<i>1400 to 2000 Z</i>	160 m to 10 m
Texas QSO Party		all modes
Sep 12-13	<i>1500 to 0300 Z</i>	80 m to 10 m
Alabama QSO Party		all modes
Sep 19-20	<i>1400 to 0200 Z</i>	160 m to 10 m
Iowa QSO Party		all modes
Sep 19-20	<i>1600 to 0359 Z</i>	80 m to 10 m
New Jersey QSO Party		all modes
Sep 19-20	<i>1600 to 2200 Z</i>	160 m to 10 m
New Hampshire QSO Party		all modes
Sep 26-27	<i>1200 to 1200 Z</i>	160 m to 10 m
Maine QSO Party		all modes

minutes— from p. 1

learn code and it was suggested that listening to W!AW code practice or to any of the multitude of on-line Morse tutors is a way to gain proficiency.

- Bob asked for any comments regarding the Club's Field Day activities. He mentioned that the TS-440/NVIS combo was quite effective, citing his own experience. The NVIS antenna presently resides with KB8QEW. Stan (LL) mentioned that he used the special call K8L from his station. CVA used his transceiver with an 80-40m trap dipole and RB used a TS-850/loop combo on CW. All comments made were favorable and appreciative of the site and the cooperation and skill of the Club members in setting things up.
- Eric (LEI) gave a brief update on ARES activities. He mentioned Project 20 and the need for practice in handling traffic. Other than that the EOC is on standby activation.
- Phil (PSK) mentioned his contact with some of the TMRA ARDEN-mesh group and was able to make some valuable connections during a TMRA VE session in Haskins. He has ordered some equipment and will keep those

interested apprised of his progress. He emphasized that it is only common sense that anything WCARC does in this area must be compatible with TMRA's configuration.

New Business:

- Bob mentioned the national Fusion net at 8:30 PM on Mondays in Room #21493. Tune in if you have any Fusion questions/problems.
- In keeping with tradition, Bob stated that the Club should develop an Officer Slate for 2021 by the next Business meeting. He added that he will not serve as President next year and so someone else will need to step forward.
- The next foxhunt is slated to be held after the Sept. 5 Breakfast meeting at Frisch's. N1RB will serve as the fox. As usual, the meet-up will be on the 147.18 repeater. After log-ins are completed, the fox will move over to the simplex frequency 146.55 MHz. Then the fun begins.

Adjournment: at 8:00 PM (CVA/PSK). ■

September Hamfests

Notice-all local area (OH, MI, IN) hamfests for September have been cancelled—includes Findlay, Adrian and Berea.

WCARC Weekly Net

Tuesdays at 2100 all year
147.18 MHz 67 Hz PL

Net Control Roster

<i>Sep 1</i>	<i>WB8NQW</i>
<i>Sep 8</i>	<i>N1RB</i>
<i>Sep 15</i>	<i>KG8FH</i>
<i>Sep 22</i>	<i>KD8VWU</i>
<i>Sep 29</i>	<i>KD8NJW</i>
<i>Oct 6</i>	<i>WB8NQW</i>

NEXT MEETING

Breakfast Meeting
Saturday September 5

TIME: 9:00 AM

PLACE

Frisch's Big Boy
N. Main St. &
E. Poe Rd.
Bowling Green, OH

10 meter Net

informal group
meets

Sunday

@ 20:30

on 28.335 MHz

Fusion Net

Thursday

@ 19:30

on 442.125 MHz

67 Hz PL on FM

Informal net

Net Check Ins

Aug 18 **CONTINUED**

N1RB
 KA8VNG
 WD8ICP
 K8LL
 WD8LEI
 WE8TOM (14)

Aug 25 **Traffic: 0**

(NCS)
 KD8NJW
 KE8CVA
 KG8FH
 WB8NQW
 W8PSK
 KB8QEW
 KA8VNG
 KD8RNO
 N1RB
 KC8NKC (10)

Sep 1 **Traffic: 1**

(NCS)
 WB8NQW
 WD8LEI
 WE8TOM
 K8BBK
 KG8FH
 KE8CVA
 KC8EKT
 KE8NEC
 N1RB
 W8PSK
 KD8NJW
 KD8RNO
 WD8JWJ
 KE8PDS-Dallas
 K8OVO
 KE8CUZ/M (16)

Brain Teaser answers: (G) 1-c, 2-c, 3-d

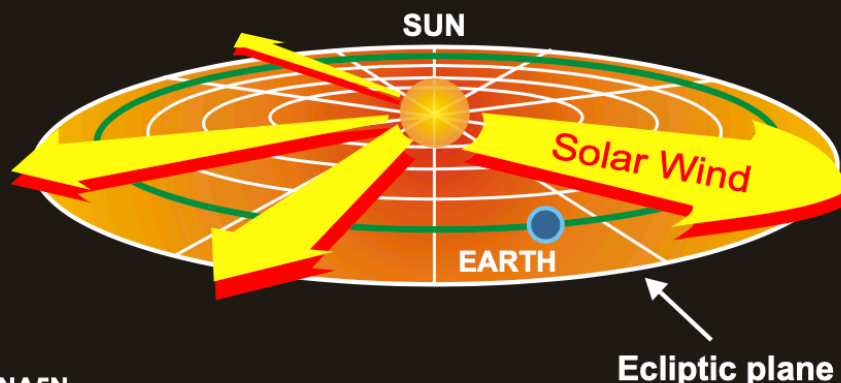
Foxhunt Planned

A foxhunt is planned to be held after the Sept. 5th Breakfast meeting. N1RB is the fox, and will start on 147.18 at around 10 AM and then move to 146.55 MHz simplex. ■

The Sun and Radio-V

by Paul Harden, NA5N Radio Emissions from a Solar Flare

Fig. 12 – Classical model of the Sun's Electric Field and flow of the Solar Wind



GEOMAGNETIC STORMS

The Solar Wind

Disturbances to the solar wind, from a solar flare or coronal hole, can cause serious disruptions to HF by triggering a geomagnetic storm. The solar wind is the constant outflow of gasses, electrons, and particles from the sun and travel along the ecliptic plane, as shown in Fig. 12.

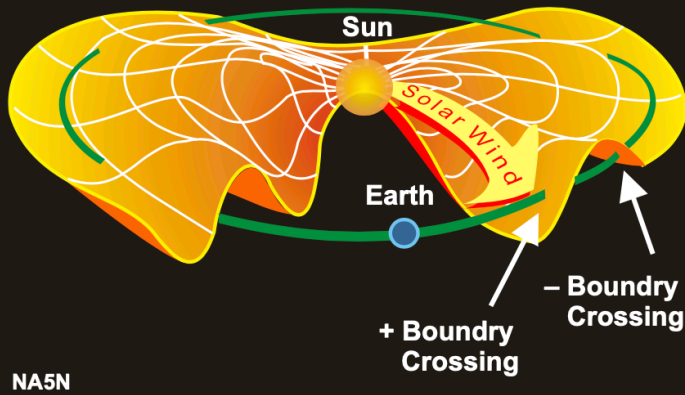
It was long believed that the solar wind was fairly constant, at around 350 km/s, the escape velocity of the Sun. We now know that the solar wind is highly variable, ranging from a minimum of 350 km/s to 2,000

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Sun—from p. 6

km/s or more, following a major solar flare. From years of satellite data, we now know that the Sun's electric field is

Fig. 13 – “Balerina Skirt” model of the Sun’s Electric Field and flow of the Solar Wind

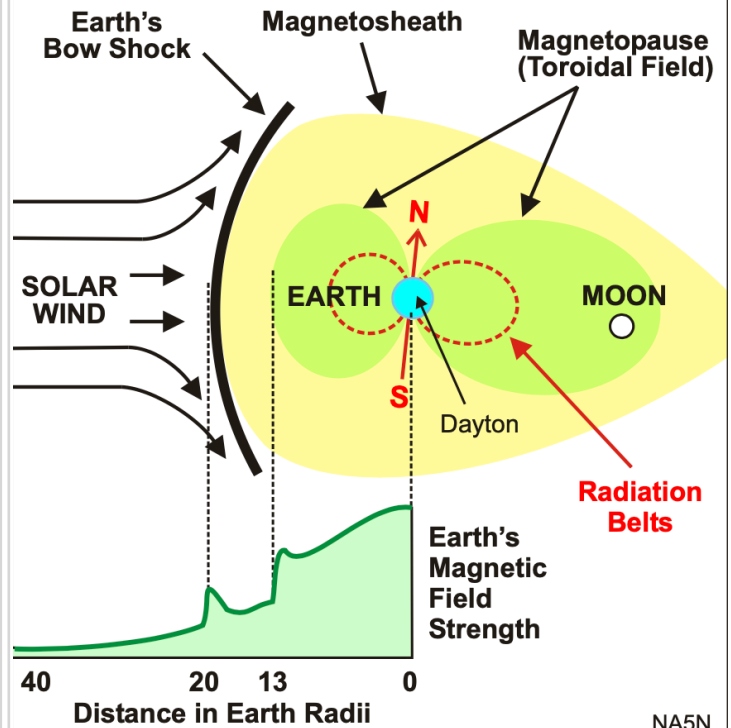


not flat, but instead looks more like the “ballerina skirt” model shown in **Fig. 13**. When the Earth's orbit enters or exits the skirt, it is called a boundary crossing, often reported by NOAA. The sudden change in the solar wind speed, and direction of flow, can trigger a geomagnetic storm.

A negative boundary crossing causes a stronger geomagnetic storm than a positive crossing. However, they are seldom severe and last only a few hours. **Fig. 13** shows why the solar wind is constantly changing, causing minor geomagnetic storms, even during very quiet solar conditions. The solar wind exerts a pressure on the Earth's magnetic field, which distorts the toroidal pattern as shown in **Fig 14**. If this pressure should suddenly change, such as with the arrival of a shockwave from a solar flare, our

magnetic field suddenly changes shape in response, causing it to wiggle like a bowl of jello. This, in turn, generates strong electric currents by the dynamo effect,

Fig. 14 – The Earth's Geomagnetic Environment Illustrated



traveling along our magnetic field lines far above our heads. This, in turn, generates noise on the HF bands. While our geomagnetic field is wiggling, it can often produce strong, bursty noise, or “static crashes.” As the geomagnetic storm begins to subside, it settles down to an elevated noise level.

QRP Propagation Hint: Often our magnetic field gets very quiet following a strong geomagnetic storm for 12–24

continued on p. 8

Sun—from p. 7
 hours. This is an excellent time to work 40–160m due to very low noise levels.

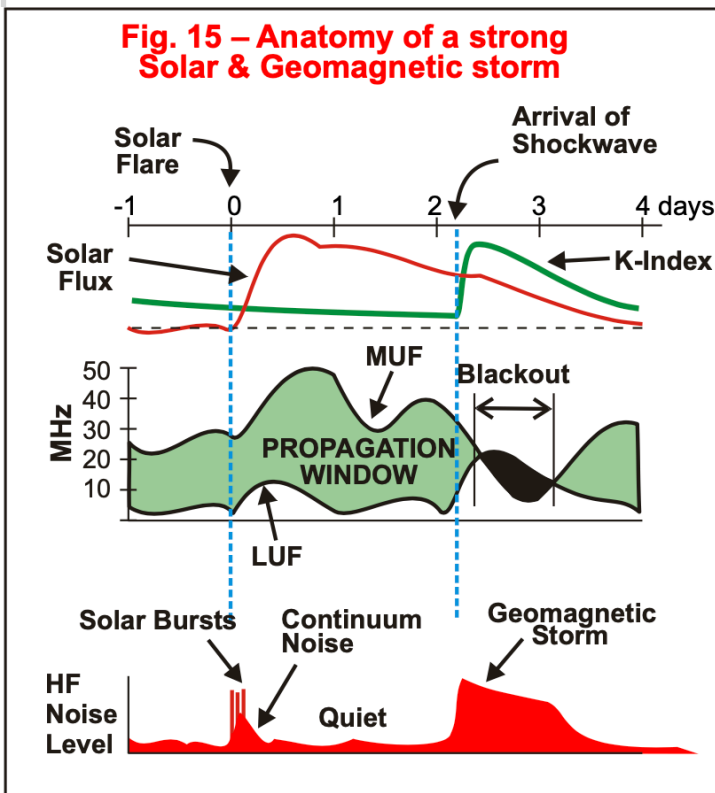


Fig. 15 – Anatomy of a strong Solar & Geomagnetic storm

The K and A Indices

Magnetometers on the Earth measure the condition of our magnetic field. The amount of movement (or, “wiggling”) is averaged and reported by NOAA as the K-Index every 3 hours. The K-index is a scale from 0– 9 representing quiet to severe conditions.

The K-indices are averaged over 24-hours to form the A-Index, representing the overall planetary geomagnetic conditions for the UTC day. The A-index ranges from 0–20 for quiet conditions, up to 400 for extreme conditions. A chart showing the correlation between the K-

and A-Indexes to HF noise levels is shown in **Fig. 16** on the following page.

QRP Propagation Hint: Use the current K-Index from WWV or the internet to determine the current geomagnetic conditions. The A-Index is actually yesterday’s geomagnetic condition, and

Fig. 16 – Geomagnetic Indices & Conditions

	K Index	Ap Index	Geomagnetic Conditions	HF Noise	Aurora
NORMAL	0	0–2	Very Quiet	S1–S2	None
	1	3–5	Quiet	S1–S2	None
	2	6–9	Quiet	S1–S2	Very low
	3	12–19	Unsettled	S2–S3	Very low
STORM	4	22–32	Active	S2–S3	Low
	5	39–56	MINOR storm	S4–S6	High
	6	67–94	MAJOR storm	S6–S9	Very high
	7	111–154	SEVERE storm	S9+	Very high
	8	179–236	SEVERE STORM	Blackout	Extreme
	9	300–400	EXTREME storm	Blackout	Extreme

Fig. 17 – Solar Flare Classifications

Flare Class	Type of Flare	HF Radio Effects (30M to 10M)	Geomagnetic storm (<20M)
A	Very small	None	None
B	Small	None	None
C	Moderate	† Low absorption	† Active to Minor
M	Large	† High absorption	† Minor to Major
X	Extreme	† Poss. blackout	† Major to Severe

† Conditions cited only if Earth is in the trajectory of the flare’s shockwave.

does not represent present conditions.

QRP Propagation Hint: Four websites with solar information, solar flux, K and A indices and solar wind data are: <http://www.sec.noaa.gov/today.html>, <http://www.dxlc.com/solar>, <http://www.spaceweather.com> and <http://umtof.umd.edu/pm>

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Sun—from p. 8

Anatomy of a Solar/Geomagnetic Storm

Putting everything together, a typical strong solar and geomagnetic storm is illustrated in **Fig. 15**. The solar flare occurs at time 0, noted on Earth by 10-30 minutes of noise bursts (Type I, II, III bursts) and elevated noise. Almost immediately, the ionizing radiation increases the MUF (whether or not it increases the solar flux). 30 minutes or more after the flare, HF noise levels return to normal, quiet conditions.

QRP Propagation Hint: This is an excellent window for QRPers, right after the flare. As soon as the solar storm ceases, HF noise levels become quiet with an elevated MUF, lasting until sundown. Night time conditions on 80-40m can be excellent. The daytime MUF the next day may be elevated as well.

Shortly after day 2, the shockwave arrives, compressing our magnetic field and triggering a major geomagnetic storm. HF noise levels immediately rise, and in severe cases, may cause an HF blackout. Electrons from the shockwave enter the earth at the poles, causing a Polar Cap Absorption (PCA) event. This causes blackout conditions on HF in the higher latitudes. The next 3-hourly K-Index will be high (6–9), sufficient to also trigger auroral activity. A major geomagnetic storm ($K > 6$) can last 12–24

hours. When it finally subsides, our magnetic field often becomes very quiet, producing low noise levels on HF.

QRP Propagation Hint: This is the other window for QRPers, when the geomagnetic storm subsides. Night time noise levels on 40-80m can be very low.

A Few Final Thoughts

- The solar flux, indicating the level of ionization, affects HF propagation above about 10 MHz. The solar flux does not affect 40M and below, since the MUF seldom drops below 10 MHz. This is why the lower bands are always open.
- The K-index, indicating the geomagnetic condition, indicates HF noise primarily below about 10 MHz, except in severe cases. During a storm, high noise levels on 40M doesn't mean high noise on 20M.
- 30M is the ham band caught between the 2 worlds. It can be affected by both solar flux and the K-index. On the other hand, it is more often not bothered by either. It is a good band throughout the solar cycle.
- Every solar flare and the resultant storm is different. No two are alike, nor accurately predictable.
- Never let reports of flares or geomagnetic storms scare you from getting on the air and checking it out. ■

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