

CQ Chatter

APRIL 2020

VOLUME B20 • ISSUE 2

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

April Business Meeting to be Held On-air

On account of the corona virus outbreak and the Governor's order to avoid large aggregations of people, the WCARC has elected to hold the April meeting over the air. The meeting date and time is as earlier planned—April 13th at 7:30 pm. As it stands now the meeting will be held on the 147.18/444.475 MHz repeater, but in case of a problem the Wood County ARES machine at 146.79-MHz (PL 103.5 Hz) will be used.

The procedure that will be followed is similar to the operation of the Tuesday evening net. The President, WB8NQW, will call the meeting to order as net control. He will then take check-ins as usual. The difference is that there is no

round table discussion; instead the discussion will be directed by Bob from a written agenda.

If you want to put an item on the agenda, please let Bob know before the meeting day and you will be recognized in turn. If a member wishes to have the "floor", he needs only to break in. When feasible, Bob will recognize the person to state his business. If a motion is presented and seconded, the vote will be taken by roll call and tallied. As is always the case, people wishing to break in or second a motion, for example, should allow ample turn-around time. This is the first time in recent memory that this method has been used, so we're all trying it for the first time. Please bear with us in attempting to proceed in using the repeater to hold a business meeting. ■

Net Check Ins

Mar 10 **Traffic: 0**

WB8NQW (NCS)
KE8CUZ/M
KE8CVA
KD8RNO
WD8LEI
KD8NJW
N1RB
K8BBK
WD8JWJ
WE8TOM
KG8FH (11)

Mar 17 (ARES) Traffic: 0

KD8NJW (NCS)
K8BBK
KC8EKT
KG8FH
KE8CVA
WD8LEI
KE8NEC
WB8NQW
KD8RNO
KD8VWU
N8VNT
N1RB
WE8TOM
WD8ICP
WD8JWJ
KG8FU (16)

Mar 24 (ARES) Traffic: 0

WB8NQW (NCS)
KE8OCK
KE8CVA

BRAIN TEASERS

1. How many microfarads are equal to 1,000,000 picofarads?
 - a.) 0.001 μF
 - b.) 1 μF
 - c.) 1,000 μF
 - d.) 1,000,000,000 μF
2. What happens to the current at the junction of two components in parallel?
 - a.) it divides between them dependent on the values of the components
 - b.) it is the same in both components
 - c.) its value doubles
 - d.) its value is cut to one-half
3. What is the current through a 100 Ω resistor connected across 200 V?
 - a.) 20,000 A
 - b.) 0.5 A
 - c.) 2 A
 - d.) 100 A

April Contests

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

Apr 4-5 Nebraska QSO Party	<i>1300 to 0100 Z</i>	160 m to 10 m all modes
Apr 4-5 Louisiana QSO Party	<i>1400 to 0200 Z</i>	160 m to 10 m all modes
Apr 4-5 Mississippi QSO Party	<i>1400 to 0200 Z</i>	80 m to 10 m all modes
Apr 4-5 Missouri QSO Party	<i>1400 to 2000 Z</i>	160 m to 10 m all modes
Apr 4-5 SP (Poland) DX 'test	<i>1500 to 1500 Z</i>	160 m to 10 m CW/SSB
Apr 11-12 New Mexico QSO Party	<i>1400 to 0200 Z</i>	160 m to 10 m all modes
Apr 11-12 North Dakota QSO Party	<i>1800 to 1800 Z</i>	160 m to 10 m all modes
Apr 11-12 Georgia QSO Party	<i>1800 to 2359 Z</i>	160 m to 10 m all modes
Apr 18-19 YU (Serbia) DX 'test	<i>0700 to 0659 Z</i>	80 m to 10 m CW/SSB
Apr 18-19 Michigan QSO Party	<i>1600 to 0400 Z</i>	80 m to 10 m all modes
Apr 18-19 Ontario QSO Party	<i>1800 to 1800 Z</i>	160 m to 10 m all modes

The Sun and Radio-III

by Paul Harden, NA5N

The Physics of a Solar Flare

Until recently, the physics behind a solar flare was not well known. They are extremely energetic events on the Sun that can produce emissions across the entire spectrum – in the optical wavelengths, gamma and x-rays, down to the HF frequencies.

In many ways, a solar flare is very similar to a nuclear detonation. Imagine for a moment, you are about to witness



Trinity Site - Main Bunker

the detonation of an atomic bomb, say the Trinity test in New Mexico on July 16, 1945. Sitting in the main bunker, you are surrounded by radio equipment to see what effect, if any, will occur on the HF and VHF frequencies.

At 5:29 am, the world's first atomic bomb is detonated. You see a tremendous flash of light; the gamma and x-ray detectors are immediately triggered, and you hear deafening blasts of noise

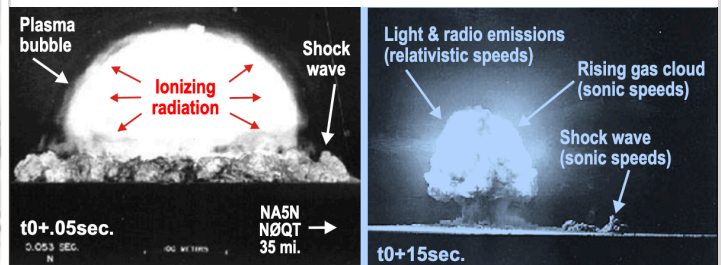
coming from your receivers. Light, ionizing radiation and radio waves are the first forms of energy to arrive at the bunker – instantly. They are traveling at relativistic speeds



Radio Equipment Set-up

– the scientific terminology for the “speed of light.”

For the first few seconds, you see a huge, brilliant bubble of plasma and



burning gases. Everything inside this bubble is vaporized from the extreme temperatures. After several seconds, the production of gamma and x-rays begins to subside. After about 10 seconds, the rising gas cloud begins to take the familiar mushroom shape. These are the hot burning gases, electrons, protons and debris rising at about the speed of sound, or sonic speeds. Along the ground, you can see a wall of debris being blown away from the explosion by the shock wave.

Several seconds after the detonation, you hear the thunderous boom of the air

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WCARC Weekly Net

Tuesdays at 2100 all year

147.18 MHz 67 Hz PL

Net Control Roster

Apr 7	N1RB
Apr 14	KD8VWU
Apr 21	KD8NJW
Apr 28	K8OVO
May 5	WB8NQW
May 12	N1RB

NEXT MEETING

Business Meeting

Monday

April 13

TIME: 7:30 PM/7:00 EB

PLACE

**Sheriff's Training Room
S. Dunbridge Rd. & E. Gypsy
Lane 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

Mar 24-CONT.

KG8FH
KC8EKT
WD8ICP
KG8FU
KD8RNO
K8BBK
KD8NJW
WD8LEI
K8JU
W8PSK
N1RB
KE8NEC
KA8VNG
N8VNT
WE8TOM (18)

Mar 31 **Traffic: 0**

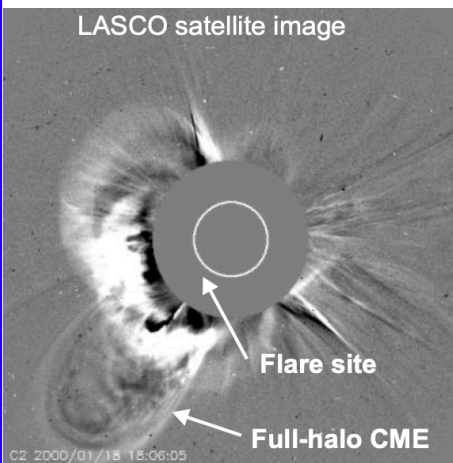
WB8NQW (NCS)
KE8CUZ
KE8CVA
KC8EKT
KG8FH
K8BBK
WD8LEI
KD8RNO
KD8NJW
W8PSK
N1RB
WE8TOM
N8VNT
WD8JWJ
KG8FU
KE8NEC
KC8NKC (17)

Brain Teaser answers: (T) 1-b, 2-a, 3-c

sun—from p. 4

shock arriving. Several minutes later, the shockwave hits the bunker. This is a blast of hot wind traveling over 100 mph, carrying with it dirt, rocks and other debris carried along the way.

A solar flare is not much different. While the exact mechanism triggering a flare is not precisely known, it is believed that the strong magnetic field lines emanating from sunspots becomes so strong that hot burning gasses from the sun are suddenly sucked out of the interior and carried along the magnetic field lines of the disturbance in a violent explosion. While the interior of the Sun is exposed at the flare site, gamma and x-rays are allowed to escape, traveling outward at relativistic speeds. This explosion creates



a shockwave at supersonic speeds, usually around 1,200–2,000 km/sec. Being well above the 350 km/sec. escape velocity of the Sun, this shockwave carries some of the burning solar mass out into space. This shockwave and rising gas cloud of solar mass, being

Full Halo CME ejected from the Sun, is called a Coronal Mass Ejection, or CME. It is traveling outwards at supersonic speeds and could strike the Earth if the trajectory and geometry is correct. Some of the burning mass gets caught in the magnetic field lines of the disturbance, forming an illuminated loop or halo, and is called a full-halo CME. The key point is that a solar flare releases several major forms of energy that can affect VHF and HF propagation on Earth:

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April Contests-cont

Apr 25-26 Helvetia (Switzerland) 'test	1300 to 1259 Z	160 m to 10 m all modes
Apr 25-26 Florida QSO Party	1600 to 2159 Z	40 m to 10 m all modes

April Hamfests

Apr 19 GM ARC Hamfest. Madison Place Convention Center, Madison Hts., MI.
web: <http://gmarc.org> **CANCELLED**

Apr 11 Cuyahoga Falls ARC Hamfest. Emilio and Sons Banquet Center, Cuyahoga Falls, OH.
web: <http://cfarc.org/hamfest.php>. **CANCELLED**

May 21-23 Dayton Hamvention. **CANCELLED**

sun—from p. 6

- Ionizing radiation, electrons and protons at relativistic speeds (arrives at earth immediately and for the duration of the flare event)
- A supersonic shockwave riding along with the solar wind
- Dense particles behind the shockwave (last two arrive at Earth 2-3 days after the flare event)

Optical Emissions

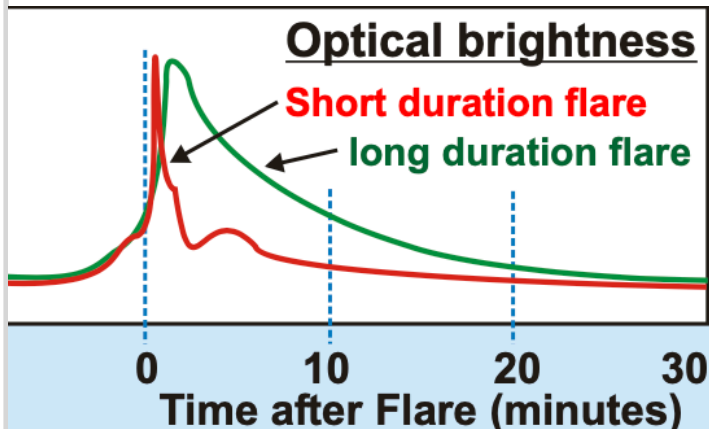
The emissions from a solar flare in the optical (visible) wavelengths are illustrated below for a typical short-duration flare and

the less common long-duration flare. An actual brightness plot of a flare, measured by photon counts from satellite instrumentation, is also shown. This is the optical evidence of the flare, which is actually very difficult to detect due to the normally bright surface of the Sun. For this reason, flares are now determined by the nature of the x-ray radiation, detected onboard the GEOS, LASCO and SOHO satellites, not optically.

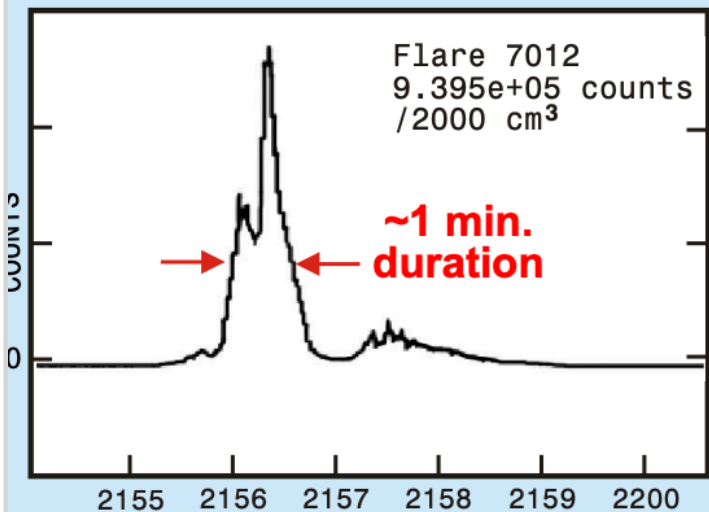
The optical properties of a flare are not particularly important to the ham or

continued on p. 8

sun—from p. 7



Actual brightness plot of a short duration M-class solar flare



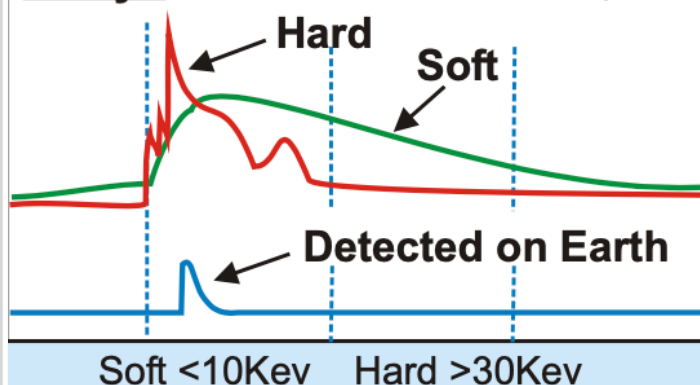
Optical Nature of Solar Flares

QRPer, other than indicating that other things are about to come!

X-ray and Gamma Radiation

The next figure shows the x-rays released from a solar flare. The hard x-rays, those >30 KeV (kilo electron-volts), is the ionizing radiation striking the Earth's atmosphere. The hard x-rays last only a minute or two, while the soft x-rays can persist from tens of minutes to over an hour – all the while showering the earth with ionizing radiation. X-rays from very

X-rays As detected in space



X-ray Signature of a Solar Flare

large flares can also penetrate our atmosphere, all the way to the ground (a GLE, or ground level event). This will highly ionize the D-layer as well, causing an HF radio blackout for several tens of minutes following a major flare. This is fairly rare, occurring only a few times each solar cycle.

QRP Propagation Hint: If you're in a QSO when a major flare causes an HF blackout, it seldom lasts more than an hour. If you're working a contest, this hint could be useful. Take a break, but don't QRT!

These x-rays do provide extra ionization to the E/F layers for improved reflectivity and a higher MUF. Exploit the benefits of a solar flare.

QRP Propagation Hint: Good DX contacts are possible immediately following a solar flare until sundown due to the improved reflectivity (better signal-to-noise ratio for QRP signals) and the higher MUF opening the higher bands – especially during the solar minimum years. ■

**WOOD COUNTY ARC
P.O.BOX 534
BOWLING GREEN, OH
43402**

