



*Nature's Fireworks*

## ***The Aero Aerial***

The Newsletter of the Aero Amateur Radio Club  
Middle River, MD  
Volume 16, Issue 8  
August 2020

Editor Georgeann Vleck KB3PGN

### ***Officers***

President	Joe Miko WB3FMT	Repeater	Phil Hock W3VRD Jerry Cimildora N3VBJ Ken Erisman NE3A Dave Brunner AC3EO
Vice-President	Rob Ballou KC3ROB	VE Testing	Pat Stone AC3F
Recording Secretary	Larry Hill KB3QWC	Public Service	Bob Landis WA3SWA
Corresponding Secretary	Pat Stone AC3F	Webmaster, Facebook	Jerry Cimildora N3VBJ
Treasurer	Warren Hartman W3JDF	Trustee:	Dave Fredrick KB3KRV (W3PGA) Jim Marshalek KC3FBL (AE3RO)
Resource Coordinator	Ron Distler W3JEH	Club Nets	Joe Miko WB3FMT
		Contests	Bob Venanzi ND3D

Website: <http://w3pga.org>

Facebook: <https://www.facebook.com/pages/Aero-Amateur-Radio-Club/719248141439348>

# About the Aero Amateur Radio Club

## Meetings

The Aero Amateur Radio Club meets at 7:30 pm on the first and third Wednesdays of the month at Essex SkyPark, 1401 Diffendall Road, Essex. Meetings begin at 7:30 p.m. local time. Meetings are canceled if Baltimore County Public Schools are closed or dismiss early.

## Repeaters

**W3PGA**      **2 M :** INPUT : 147.84 MHz, OUTPUT : 147.24 MHz, PL 123.0  
**W3PGA**      **70 Cm:** INPUT : 444.575 MHz, OUTPUT : 449.575 MHz, PL123.0  
**W3JEH**      **1.25 M:** INPUT : 222.24 MHz, OUTPUT : 223.84 MHz

## Club Nets

Second Wednesday Net – 70 Centimeters (449.575 MHz Repeater) @ 8 p.m. Local Time

Fourth Wednesday Net – 2 Meters (147.24 MHz Repeater) @ 8 p.m. Local Time

Fifth Wednesday Net – 10 Meters (28.445 MHz) @ 8 p.m. Local Time

## Radio License Exams

The Aero Amateur Radio Club sponsors Amateur Radio License Exams with the ARRL VEC. Examination sessions are throughout the year. Walk-ins are welcome; arrive no later than 30 minutes after start time. \$15 charge.

### 2020 Examination Schedule DUE TO COVID19 May and June DATES May be **Canceled!**

Time:	1:15 pm	1:15 pm	
Dates:			
Where:			

White Marsh Library, 8133 Sandpiper Circle, White Marsh, MD

Contact:      Patricia Stone AC3F, email: [ac3f@juno.com](mailto:ac3f@juno.com), landline: 410-687-7209

## LOCAL AREA NETS

Day	Time	Freq. (MHz)	Net Name
Daily	9 – 10 am	145.330	Oriole Net
Daily	6 pm	3.820	Maryland Emergency Phone Net
Daily	6:30 – 7 pm	145.330 no PL	Balto. Traffic Net (b/u 146.670 PL 107.2)
Daily	7 pm & 10 pm	3.643	MD/DC/DE Traffic Net
2 <sup>nd</sup> Tue	7:30 pm	146.670	Baltimore County RACES Net
2 <sup>nd</sup> Wed	8 pm	449.575	Aero ARC Net
4 <sup>th</sup> Wed	8 pm	147.240	Aero ARC Net
5 <sup>th</sup> Wed	8 pm	28.445	Aero ARC Net
Fridays	7:30 pm	145.330	Back in the Day Net
When activated by NOAA		147.030	SkyWarn (primary)

# **FIELD DAY REPORT**

## ***Field Day 2020 v 2.0***

The Aero Amateur Radio Club continued its tradition of Field Day participation amid COVID-19. This year instead of a 5A station configuration we opted for a 3A setup. No press or invited guest, only a basic setup. The setup consisted of a 3-dipole setup in an "L" configuration: an Off-Center Fed Dipole and G5RV on one leg and another Off-Center Fed Dipole on the other leg.

The Aero FD site is located at the Essex Skypark W48, located in Essex, Maryland, in Eastern Baltimore County. The Skypark relinquishes the Community Hanger for the weekend for our use. We shared the hanger with two aircraft in various stages of repair and modifications.

Five members helped in the antenna and station setup: Dave KB3KRV, Ray N3RES, Larry KB3QWC, Bob WA3SWA, and Joe WB3FMT. Bob also set up the logging PCs and the LAN as well as setting out the cookies and coffee pot.

By Friday evening all the antennas were up, PCs and logging software working, and three rigs were working. The object was to have one station on CW/Digital, one on 20 meters, one the other bands. A Yaesu FT-991 was used for CW/Digital, a Yaesu FT-450A various bands and a Kenwood TS-570D on 20 meters. We were ready to start at 14:00 local.

Meanwhile on Saturday mid-morning Pat AC3F was getting ready for an outdoor VEC Test session. We were told to expect up-to 12 participants. Because of COVID-19 we were following county medical guidelines for Social Spacing "with signs reminding people to stay at least 144 MHz apart and to wear masks. Testing began with an introduction by Pat and testing material was handed out. There were 9 takers for the Technician class, all passed, and 1 General to Extra, he also passed.

FD started. Weather was hot and Baltimore Humid! At 17:10 local, thunder in the distance, everything was shut down and we waited ..... nothing. The storm went south of the airport and we were up and running at 17:45. At 20:26 local the generator stopped – low oil light. Dave had some extra and added oil, and were back up in less than 15 minutes.

Pat, Bob, and others brought snacks and soda and ice water. And coffee! For dinner we had Pizza John Pepperoni Pizzas.

Oh, by the way, the club had 17 Aero Operators and 1 Guest Operator joined us during the weekend. We utilized 3 pavilions for breaks and social gatherings. The guest operator "Molly KC3OUU" joined the club at the July 1<sup>st</sup> meeting.

## FD Stats for the Aero ARC

18 Participants, 8 Operators

Total contacts -- 219: CW = 77 Phone = 142

By Band and Mode:

Band	CW	Phone	Total	
80	31	22	53	24%
40	36	81	117	53%
20	0	39	39	18%
15	<u>10</u>	0	10	5%
	77	142	219	100%

US States (36 states) 201 CONTACTS

Canada	15
Puerto Rico	1
Slovak Republic	1
Vatican City	1

The Aero ARC preliminary score for 2020 is: Bonus 950 + QSO 592 = 1,542 Total Points.

Maybe next year we can send someone to Delaware so we can get that State!

Thanks to the operators that worked the event: Larry KB3QWC, Pat AC3F, Ray N3RES, Dave AB3CO, Joe WB3FMT, Rob AE3B, Bob WA3SWA, and Steve KD3TP. And Susan for baking and Bob for bringing the Cookies: oatmeal, chocolate chip, and molasses.

Due to the heat and humidity two members got ill but were better the next day or so after consuming some dihydrogen monoxide.

Thanks to all,

*Joseph Miko*

## CLUB NEWS

### ***Aero ARC Meeting Notes via Zoom Video Conference Call***

Start Time: 07:30pm End time: 08:02 Date: 7/15/2020

**Members Present:** Bob WA3SWA, Harry AC3K, Don K3DON, Jerry N3VBJ, Joe WB3FMT, Rob AE3B, Larry KB3QWC, Rich KB3VAE, Dave KA3SNY, Gus AA3GG, Georgeann KB3PGN, Don N3FQC, Richard KB3VAE, George 14 members present

**Treasury Report:** Bank \$2,811.29 On Hand: \$  
Check for \$100 from the club for fuel and food. Spent \$133.78 (-\$2.78)

**Repeater Report:** 2 mtrs: No Problems 70 cm: No Problems

**Correspondence:** None

**Public Service:** We still need for members to continue checking in with and helping neighbors and your fellow hams if possible.

**EmCOM:** Nothing scheduled before the end of hurricane season.

**SKYWARN Classes** - Classes will resume in the Fall

---

**VE Testing :** Last test session was held outside the community hanger on FD Saturday the 27<sup>th</sup>. There were ten test takers. All went home with either a new license or an upgrade. As of 7/7/20 all had their license posted by the FCC.

I have tentative approval from Mandy at the Essex Skypark to use the community hanger on **September 26, a Saturday** from **12:00 to 2:30 pm**. As done on the FD the same COVID-19 protocols will be followed.

1. Meet the 6-foot social spacing and require a face mask.
2. Testing will be done inside the community hanger. With the main hanger door open. Using the skypark long tables. Mask must be worn if required by the County.

**Old Business:** **BSA Event Rescheduled**

Aviation Scouting event at the Essex Skypark has been rescheduled for November 6, 7, 8, the first weekend in November. We will be doing the same as we did last year. We need the following topics support for this event:

Morse Code, American Sign Language, Braille, Semaphore, Nautical Flags, Aircraft Signals, Radio Operations Voice and CW

The club will setup and operate a station during the event.

**Wings and Wheels event**

There is **no official** information about the September Wings and Wheels event at this time, but it looks unlikely.

**Field Day 2020 v2.0** - review of former discussion

**New Business:**

The club voted to spend up to \$800.00 to purchase a six can duplexer. Warren and Phil have been notified. I talked to Phil about Yaesu letter dated July 1<sup>st</sup>- Dec 31, 2020, they are offering the DX2 and

DX1 repeaters at a reduced cost. I talked to Jerry N3VBJ and he said the DX1 would work for the club. I have a call in to Warren.

Dave called me the other afternoon and said he might be able to get a 140 MHz can for the club. I said I would contact Phil and give him Dave's number.

The next meeting on August 5<sup>th</sup> will be a ZOOM Meeting.

*Please Note: Due to CONVID19, if any one does not feel comfortable, do not feel you must attend. If you are a care giver, reside with older people, or for any reason you are uncomfortable with? Take the safe route for you and yours.*

JMM 7-15-20 rev

---

## *Net Reports*

### **7-8-20: 440 net, 20:00 to 20:24 Local.**

W3PGA NCS Joe Essex, KB3VAE Richard Middle River, AC3F Pat Middle River, N3FQC Don Perry Hall, W3VRD Phil Essex, N3RES Ray Baltimore City

6 people on the net

### **7-22-20: 2-meter net, 20:00 to 20:31 Local.** There were 8 people on the net

W3PGA NCS Joe Essex, KB3JVP Ken Middle River, N3FQC Don Perry Hall, AC3EK Harry Rosedale, KC3NMT Lou Baltimore, W3JEH Ron Perry Hall, K3DON Don Joppatown, KB3VAE Richard Middle River

8 people on the net

### **7-29-20: 10-meter net, 20:00 to 20:24 Local.**

W3PGA NCS Joe Essex, AC3F Pat Middle River, N3FQC Don Perry Hall, W3JEH Ron Perry Hall, W3VRD Phil Essex, KB3VAE Richard Middle River, KC3FBL James Parkville

7 people on the net

---



## VE CORNER

by Pat Stone, AC3F

The AERO VE Team held its 5<sup>th</sup> annual Field Day VE exam session on June 27th. We served 10 applicants this year. Congratulations to new Extra: John KC3AJH, and new Techs: Altarique KC3POJ, Nick KC3POK, Kyle KC3 POL, Tony KC3POM, Dan KC3PON, Kathy KC3POO, Derek KC3POQ AND Gerard, KC3POR.

Many thanks to our courageous VEs: Joe WB3FMT, Dave AC3EO, Harry AC3EK, Steve KD3TP, Ray N3RES, Dave KB#KRV, Rich KB3VAE and John KN4GXD who served this session with me. It's always a pleasure working with all of you. We can't do this without you.

Our next test session will be held on Saturday, Sept. 12th, at 1pm at the Essex Sky Park. Hope to see you then.

---

## HAM NEWS

### QSO Today Virtual Ham Expo Announces Full Lineup of Speakers

The first [QSO Today Virtual Ham Expo](#), which takes place the weekend of August 8 - 9, has confirmed what it's calling "a packed lineup of over 70 great speakers" for the ARRL-sanctioned event. Attendance is free and [registration](#) is open.

Presentations will cover a range of topics, with two tracks focused on providing hands-on, practical advice for those just getting started in amateur radio. Steve Johnston, WD8DAS, will demonstrate basic soldering techniques for repairing equipment and building projects. Marcel Stieber, AI6MS, will offer an overview of common battery types, discussing the pros and cons of each -- including battery chemistry, common uses and misuses, and everyday application tips.



For experienced operators, topics will cover new techniques, equipment upgrading, 3D printing, and more. Glenn Johnson, W0GJ, will attempt to answer the question, "Is 3 dB Worth a Divorce?" and cover a wide range of antenna topics. Jim Veatch, WA2EUJ, will explain how to build a QRP radio. In his

presentation, "The Slot Antenna -- Undiscovered Country for Most Hams," John Portune, W6NBC, will demonstrate how a satellite TV dish can be "slotted" to make an effective outdoor 2-meter or UHF antenna for use in antenna-restricted neighborhoods.

Prominent youth educator Carole Perry, WB2MGP, will moderate a lineup featuring amateur radio's future leaders. Audrey McElroy, KM4BUN, will speak on "Getting Girls Involved in STEM, Specifically Amateur Radio!", while hot-air ballooning will be the focus of a talk by Jack McElroy, KM4ZIA, "Highly Flying Kids with HAB."

*QSO Today's* Eric Guth, 4Z1UG, says that one challenge to any ham radio convention, whether in person or virtual, is keeping the content of presentations from becoming overly complicated and overwhelming. "For our inaugural virtual Expo, we've made sure that there are great speakers for both beginners and experienced hams," Guth said. "We've asked all of our speakers to be laser focused on their topics while providing hands-on, practical advice." Each presentation will wrap up with a live question-and-answer session.

For more information or to register, visit the [\*QSO Today Virtual Ham Expo\*](#) website. Attendance is free, and there are early bird prize incentives for registering by July 24.

## **Rescued Radio Amateur Says, "Ham Radio Saved My Life"**

Alden Sumner Jones IV, KC1JWR, of Bennington, Vermont, is thankful for amateur radio, after he suffered a medical incident and lost consciousness on June 15 while hiking with others along a remote section of the Long Trail, not far from his home. An EMT from Appalachian Mountain Rescue (AMR), who was hiking nearby, saw Jones pass out, but was unable to connect with 911 via his cell phone. Jones, 41, regained consciousness and was successful in contacting Ron Wonderlick, AG1W, via the Northern Berkshire Amateur Radio Club's K1FFK repeater on Mount Greylock. Wonderlick initiated what turned into an 8-hour effort to get Jones off the trail and to a medical facility, acting as a relay among Jones, emergency crews, and other agencies involved. As the *Bennington Post reported*, "The Vermont State Police also received assistance from several licensed amateur radio operators who helped facilitate communications, greatly assisting in the rescue."



**A helicopter-supported litter carries Alden Sumner Jones IV, KC1JWR, to safety. [Vermont State Police photo via the Bennington Post]**

Matthew Sacco, KC1JPU, headed to a staging area where rescue crews were gathering. When he could not make it into the repeater, he employed some ham radio ingenuity to fashion a J-pole antenna from some window line he had on hand, casting it into a tree using a fishing pole. That did the trick. An individual on site was able to obtain an accurate location for Jones using the GPS on his cell phone.

After it was determined that rescuers could not reach Jones using an all-terrain vehicle, arrangements were made to have a search-and-rescue crew from New York retrieve Jones by helicopter. Amateur radio participants were able to relay critical information, including an accurate location, as preparations continued.

Jones, meanwhile, took advantage of his time with the EMT and other rescuers to talk up amateur radio and explain

how to get licensed. According to one account, rescuers were having trouble making contact with the helicopter, so Jones loaned them a better antenna he happened to have.

Jones was eventually flown to a hospital in Albany, New York, again taking advantage of the occasion to promote amateur radio to the helicopter pilot and crew. Jones is said to be recovering. "Ham radio saved my life last night, and I am very thankful for how everyone helped me," Jones said afterward.

Source: *The ARRL Letter* for June 25, 2020

## ALL IN A DAY'S WORK

**A radio amateur's call for help was relayed from across the Atlantic.** When Richard Tashner, N2EO, of Massapequa, New York, suffered a medical emergency on May 18, his DMR portable was closer than his phone. His call for help was answered by Maxis Johnston, GM0MRJ, who put out a call for "anyone in the States." Kent County Amateur Radio Club member Ken Dix, KB2KBD, in Delaware heard the call on the local 146.91 MHz repeater, which was linked to the North American talk group. Dix called authorities in Tashner's vicinity, and help was dispatched. Dix said the dispatcher in New York was able to hear part of the call and was amazed at how an amateur radio communication had gone from New York to Scotland to Delaware and then back to New York. The dispatcher expressed surprise at how quickly the information had been relayed across the Atlantic. -- *Thanks to the [ARES E-Letter](#) via Jerry Palmer, N3KRX*

Source: *The ARRL Letter* for June 25, 2020

## **Ham radio assisted a pedestrian in distress in the ARRL Maryland-DC Section.**



**A Baltimore radio amateur** has an alert member of the Anne Arundel Radio Club ([AARC](#)) in Maryland to thank for responding to his call for help on July 22. The man, who has not been identified, apparently became overcome by the heat while out for a walk. Not feeling well and with his cell phone dead, he reached for his handheld, which he fortunately had taken with him, and put out a call on the W3VPR 147.075 MHz repeater. An AARC member, who was operating mobile at the time, responded promptly, gathering the pertinent information to relay to a 911 operator. Within minutes, the Baltimore man was receiving treatment and was able to report that everything was okay a short time later. W3VPR repeater transmissions are linked to a "Broadcastify" feed, so that hams out of local range or away from their radios can still monitor the repeater online. -- *Thanks to Maryland-DC Section Manager Marty Pittinger, KB3MXM*

Source: *The ARRL Letter* for July 30, 2020

## **"Last Man Standing" Still Standing**

Sitcom whose lead character is a ham (on the show and in real life) is renewed for a third season on Fox. Details on this story and more are online in the CQ Newsroom at:

<http://cqnewsroom.blogspot.com/>

Source: *CQ Newsroom Update*, June 18, 2020

---

## **Hamfests**

### **CANCELLED Sunday, Oct. 4, 2020: CARAFest 2020**

Location: Howard County Fairgrounds, 221 Fairgrounds Rd., West Friendship, MD 21794

Website: <http://www.carafest.org>

Sponsor: Columbia Amateur Radio Association

Talk-In: 147.390/R+ (PL 156.7)

Public Contact: David Parkison , KB3VDY, P.O. Box 911 Columbia, MD 21044, Phone: 443-492-9501

Email: [vendorsales@carafest.org](mailto:vendorsales@carafest.org)

### **NO NOTICE OF CANCELLATION AS OF 7/31/20**

### **Saturday, December 12, 2020: SantaFest**

Sponsors: American Legion and Prince George's County Emergency Radio Association

Location: American Legion Youth Camp, 9201 Surratts Road, Cheltenham, MD 20623

Website: <http://www.pgares.org/>

Talk-In: K3ERA Repeater, 145.230- PL 110.9

Public Contact: Charles AA3WS, Phone: 301-535-1666, Email: [selbynet@hotmail.com](mailto:selbynet@hotmail.com)

## **NO NOTICE OF CANCELLATION AS OF 7/31/20**

### **Sunday, March 14, 2021: Winterfest, ARRL Virginia Section Convention 2021**

Location: Richard Ernst Community Center, Northern Virginia Community College, 8333 Little River Turnpike, Annandale, VA 22003

Website: <https://viennawireless.net/wp/events/winterfest/>

Sponsor: Vienna Wireless Society

Talk-In: 146.910 (no tone)

Public Contact: Harry Mamaux , K3NF, 8425 Peace Lily Ct Apt 316 Lorton, VA 22079, Phone: 703-395-6721, Email: [k3nf@cox.net](mailto:k3nf@cox.net)

---

## **FEATURE ARTICLE**

### **It's what you don't know that can Kill you!**

**7-10-20**

It's by virtue of being a ham operator we all know electricity! Well, for some of us that knowledge is work-related, for others self-taught, and others "Hey man, hold my beer". In any case, electricity should be respected and handled with due care.

From Wikipedia, the free encyclopedia: "Electricity is the presence and flow of electric charge. Using electricity we can transfer energy in ways that allow us to do simple chores. Its best-known form is the flow of electrons through conductors such as copper wires."

A few months back I did a review of Grounding and Bonding for the Radio Amateur, a very good book practical care of and handling of electricity. Before reading this book, I thought I knew what electric could do to a human body. I WAS WRONG!! First, I knew the following:

1. Not to handle electric in stocking feet standing on wet or dry concrete.
2. Let's say, anything over 120V can hurt!
3. Only use one hand.

By reading and taking to heart what is contained in its 6 chapters, one should be able to protect their radio equipment, their property, and more importantly, possibly their life.

The following few pages describe the differences between AC and DC voltages and their effect on men and women – yes, there is a difference. Also, whether you are wet (sweaty) or dry, and the amount of current it takes to hurt or possibly kill a person.

In the publication, Figure 4.1, a map of the United States including Alaska and Hawaii, lists the average number of thunderstorm days a year for the Maryland and DC area. MD has 30-40 thunderstorm days a year as opposed to Florida 80 to 100 thunderstorm days per year.

Also, Figure 4.2 lists the estimated number of lightning strikes per year based on the number of thunderstorm days in your area. In the MD area there is a graph of lightning strikes per year for Antennas or Towers by Height.

I suggest you make this one of your mandatory radio reference books in your radio library or your club's library.

I also included several abbreviations used throughout this book.

73,  
Joe Miko

The following pages are used by permission from the ARRL's *Grounding and Bonding for the Radio Amateur*, © 2017-2018 by the ARRL.

## Electrical Shock Hazards

(The following material is adapted from the website "The Danger Associated with Electricity" published by Signals Power & Grounding Specialist, Inc. at [www.spgs-ground.com/information/shock-hazard](http://www.spgs-ground.com/information/shock-hazard).)

An electrical shock to a human can be as mild as a slight tingling sensation or as severe as instant death. Ohm's Law will determine how much electrical current will flow on the grounding conductor of the human body. This electrical current flowing through the human body will create some type of shock to the human.

To better understand the amount of amperage that will affect the human body and how the body reacts to these averages levels, we must first review the examples of body resistance of human contact points under different conditions, as shown in .

The condition necessary to produce  $1000 \Omega$  body resistance don't have to be as extreme as what is presented, either (sweaty skin with contact made on a gold ring). Body resistance may decrease with the application of voltage so that the constant voltage a shock may increase in severity after the initial contact. What begins as a mild shock - just enough to "freeze" a victim so they can't let go - may escalate into something severe enough to kill them as their body resistance decreases and current correspondingly increases.

AC is more dangerous than DC, and 60-cycle current is more dangerous than high-frequency current. Skin resistance decreases when the skin is wet or when the skin area in contact with a voltage source increases. It also decreases rapidly once continued exposure to electric current.

The real measure of shock's intensity lies in the amount of current forced through the body used and not the voltage. Any electrical device used on a house wiring circuit can, under certain condition, transmit a fatal current. The resistance of the human body varies so widely it is impossible to state that one voltage is "dangerous" and another one is "safe."

The path through the body has much to do with the shock danger. A current passing from finger to elbow through the arm may produce only a painful shock, but the same current passing from the hand to hand or from hand to foot may well be fatal. Therefore, the practice of using only one hand (keeping one hand behind your back) while working on high voltage circuit end of standing or sitting on an insulating material is a good safety habit. (See Figure 3.2.)

Some people or highly sensitive to current, experiencing involuntary muscle contraction with shocks from static electricity. Other can draw large sparks from discharging static electricity they hardly feel it, much less experience a

muscle spasm. Despite the differences, approximate guideline had been developed through tests which indicate very little current being necessary to manifest harmful effects parentheses.

## The physiological effects of electric shock

Electric current damages the body in three different ways: (1) it harms or interferes with proper functioning of the nervous system and heart ; (2) subject the body to intense heat ; And (3) it causes the muscle to contract. Table 3.B summarizes the effects of current at different levels. Note that none of the current listed below will trip a 15 A breaker or fuse.

**Table 3.A**

### Typical Body Resistance

Type of Contact	Dry	Wet
Wire touch by finger	40,000 - 1,000,000 $\Omega$	4000 - 15,000 $\Omega$
Wire held by hand	15,000 – 50,000 $\Omega$	3000 - 5000 $\Omega$
Metal pliers held by hand	5000 - 10,000 $\Omega$	1000 - 3000 $\Omega$
Contact with palm of hand	3000 - 8000 $\Omega$	1000 - 2000 $\Omega$
1.5 inch metal pipe grasped by one hand	1000 - 3000 $\Omega$	500 - 1500 $\Omega$
1.5 inch metal pipe grasped by two hands	500 – 1500 $\Omega$	250 – 750 $\Omega$
Hand immersed in conductive liquid		200 – 500 $\Omega$
Foot immersed in conductive liquid		100 – 300 $\Omega$

**Table 3.B**

### Effects of Current at Different Levels

AC (mA at 60 Hz)	DC (mA)	Effect	Body Resistance Required to Create Current At 120 V ac	Body Resistance Required to Create Current at 50 V dc
0.3 (Women)	0.6	Slight sensation felt at hand(s)	400,000 $\Omega$	83,333 $\Omega$
0.4 (Men)	1	Slight sensation felt at hand(s)	300,000 $\Omega$	125,000 $\Omega$
0.7 (Women)	3.5	Threshold of perception	171,428 $\Omega$	14,285 $\Omega$
1.1 (Men)	5.2	Threshold of perception	109,090 $\Omega$	9,615 $\Omega$
6 (Women)	42	Painful, but voluntary muscle control maintained	20,000 $\Omega$	1190 $\Omega$
9 (Men)	62	Painful, but voluntary muscle control maintained	13,333 $\Omega$	806 $\Omega$
10.5 (Women)	51	Painful, to let go of wires	11,428 $\Omega$	980 $\Omega$
18 (Men)	76	Painful, to let go of wires	7,500 $\Omega$	657 $\Omega$
15 (Women)	60	Severe pain difficulty breathing	8,000 $\Omega$	833 $\Omega$
23 (Men)	90	Severe pain difficulty breathing	5,217 $\Omega$	555 $\Omega$
25 (Women)		Painful shock, muscular control is lost	4,800 $\Omega$	
30 (Men)		Painful shock, muscular control is lost	4,000 $\Omega$	
20 – 75		This shock is more serious. You'll receive a painful jolt and muscle control will be lost resulting in the inability to let go of	1,600 $\Omega$	

	something you may have grabbed that is shocking you	
75 -100	As the current approaches 100 milliamperes, ventricular fibrillation of the heart occurs and damage is done	1,200 $\Omega$
100 (Women)	500 Possible heart fibrillation after 3 seconds	1,200 $\Omega$
100 (Men)	500 Possible heart fibrillation after 3 seconds	1,200 $\Omega$
100 – 200	Ventricular fibrillation occurs and death can occur if medical attention is not administered quickly	600 $\Omega$
>200	Severe burns and severe muscle contractions occur, Your heart can stop during a shock because the chest muscles put pressure on the heart. Internal organs can be damaged at this stage and If you survive, a painful recovery can be expected. That through this clamping effect on the heart, Ventricular fibrillation is avoided and the chances' of a person's survival is good if the victim is removed from the electrical circuit	600 $\Omega$
1000 – 4300	Ventricular fibrillations. (The rhythmic pumping action of the heart ceases.) Muscular contraction and nerve damage occurs. Death is most likely.	27.9 $\Omega$
6000	Sustained ventricular contraction followed by normal heart rhythm. (Defibrillation). Temporary respiratory paralysis and possibly burns.	20 $\Omega$
10,000	Cardiac arrest, severe burns and probable death	0.012 $\Omega$

**1 milliampere = 0.001 ampere**

**10,000 milliampere = 10 amperes**

(3.6 and 3.7 Chapter 3 AC Power System Grounding and Bonding)

ARRL Grounding and Bonding for the Radio Amateur by H. Ward, NOAX © 2017 - 2018

Figure 4.1 – Average number of thunderstorm days each year throughout the U.S. The most frequent occurrence is in the southeastern states, with Florida having the highest total ( 80 – 100+ days per year). Map courtesy of NOAA

Maryland has 30 – 40 thunderstorm days per year.

Figure 4.2 – Estimated number of lighting strikes per year based on the number of thunderstorm days in your area from Figure 4.1 and the height of your antenna or tower. [Based on information from Living with Lighting, Seminar Notes #ECP826B Version F, GE Mobile Radio Technical Training © GE 1985]

In the MD area (30-40 thunderstorm days/year)

Antenna or Tower Tower Height	Strikes per yr.
200 ft	3 – 5
175 ft	3.5 – 3.75
150 ft	1.5 – 2.75
125 ft	1.1 – 1.9
100 ft	0.8 - 1.1
75 ft	0.4 - 0.8
50 ft	0.1 – 0.2
25 ft	0.01 – 0.1

## Lighting Detectors

(You can build one, too; see Radmore, "A Lightning Detector for the Shack" Apr. 2002 QST, pp 59-61.)

Also, ACU>RITE makes a portable Lightning Detector Model: 02020CA Alerts when the Thunderstorm is within 20 miles and updates with lightning strikes and distances. Cost is <\$30.00

## ARRL Grounding and Bounding for the Radio Amateur

### Abbreviations

AFCI	Arc Fault Circuit Interrupter
AGL	Average Ground Leve
AHJ	Authority Having Jurisdictions
AWG	American Wire Gauge
CADWELD	Welded connection exothermic welding
CATV	Cable television
DPDT	Double Pole Double Throw knife switch
EFHW	End Fed Half Wave antenna
EMI	Electrogenic Interface
EMP	Electromagnetic Pause
GDT	Gas discharge tube lightning protector on feedlines
GFCI	Ground Fault Circuit Interrupter
LAN	Local Area Network
LNB	Low Noise Block down converter
MAAP	High temperature soldering using methylacetylene propadiene propane
MOV	Metal Oxide Varistors
NEC	National Electric Code
NFPA 70	National Fire Protection

NM	Nonmetallic Building Wire
OCPD	Overcurrent Protection Device
PLDO	Power Line Duplex Outlet
POTS	Plain Old Telephone Service
QRP	Low transmitting power <25 Watts
R56	Motorola R56 standard and guidance for communication sites
RF	Radio Frequency
RF Ground	Myth even the earth can't maintain a constant voltage
RFI	Radio Frequency Interference
RGB	Rack Ground Bus bar
RMS	Root Mean Square for voltage
SPGP	Single Point Ground Panel
SRF	Self Resonance Frequency
SWR	Standing Wave Ratio
THHN	Thermoplastic High Heat Resistant Nylon
Ufer	Concrete enclosed electrode
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair
VFO	Variable Frequency Oscillator

# From the Skies over Mt. Essex

## SKY Events for August 2020

Aug 1st - The Moon passes 1.5° south of Jupiter at 20:00 EDT

Aug 2<sup>nd</sup> - Saturn 2° N of the Moon 09:00 EDT

Aug 3rd -- Full Moon, "Sturgeon Moon" for Traditional Plum Moon" and the for the Shawnee American Indian.

Aug 9<sup>th</sup> - The Moon passes 0.8° south of Mars

Aug 11<sup>th</sup> - Last Quarter Moon

Aug 12<sup>th</sup> - Perseid meteor shower peaks 09:00 EDT

Aug 15<sup>th</sup> - Double shadow transit on Jupiter 00:08 EDT.

Aug 19<sup>th</sup> - New Moon

Aug 22<sup>nd</sup> - Double shadow transit on Jupiter 02:32 EDT.

Aug 25<sup>th</sup> - First Quarter Moon

Aug 28<sup>th</sup> - The minor planet Ceres at opposition, Mag +7.8 at 08:00 EDT and First Carrington Class Solar Superstorm recorded in 1859.

### Planet Lookout at mid-Month EDT

**Sunrise 06:19 EDT and Sunset 19:53 EDT**

**Mercury -- Morning** Rises 06:06 Sets 19:54 Mag – 1.8; Size 5 arc seconds

**Venus -- Morning** Rises 02:49, Sets 17:04 Mag -4.3 and 23.2 arc seconds.

**Mars -- Late Evening** Rises 22:37, Sets 11:18, Mag -1.4 and 12.8 arc seconds.

**Jupiter -- Evening** Rises 17:54 Sets 03:37; Mag -2.7 size 43.1 arc seconds.

**Saturn -- Evening**, Rises 18:23 Sets 04:17; Mag 0.2 size 18.3 arc seconds.

**Uranus—Late Evening** Rises 23:07, Sets 12:46; Mag 5.8 size 3.5 arc seconds.

**Neptune -- Evening** Rises 21:00 Sets 08:38; Mag +7.9 size 2.4 arc seconds.

*"I bless the rains down in Africa" Toto*

Using the information from the Sky & Telescope article I ran two planetarium programs the "The Sky" and "Cartes de Ciel" to view what the Ancient Egyptians saw and what we can see in early August. A few things to notice are that the dates change from mid-July to the beginning of August a span of about 15 days but why? This is caused by wobbling of the Earth. The Earth wobbles like a top, only our wobble takes 25,770 years to make a complete circle. The wobble is called precession!

It not only changes our North Pole star, but it also changes our Vernal (Spring) Equinox (a point where one of the two intersections of the ecliptic and the celestial equator). it is now in Pisces, around 0AD in was in Ares, it currently moving westward.

The **heliacal rising** or **star rise** of a star occurs annually when it briefly becomes visible above the eastern horizon at dawn just before **sunrise**, after a period of less than a year when it had not been visible. This rising was a calendar event which foretold the coming of the annual Nile Flood. Sirius the Dog Star would rise just before the Sun on this day. The Greeks had their own heliacal rising star it was Pleiades known as M45. The rising of the Pleiades heralded the start of the Ancient Greek sailing season, using celestial navigation.



This is the Heliacal rising of Sirius; the Sun is object on the yellow ecliptic line and Sirius is Alpha α Canis Major rising on the right side of the diagram. This diagram shows the pair at 04:30 local time on July 19<sup>th</sup> in the year 3000BC.

Below is diagram of what the August 3,2020 will look like.

