



June 26-27

The Aero Aerial

The Newsletter of the Aero Amateur Radio Club
Middle River, MD
Volume 17, Issue 6
June 2021

Editor Georgeann Vleck KB3PGN

Officers

President	Joe Miko WB3FMT
Vice-President	Rob Ballou AE3B
Recording Secretary	Larry Hill KB3QWC
Corresponding Secretary	Pat Stone AC3F
Treasurer	Warren Hartman W3JDF
Resource Coordinator	Ron Distler W3JEH

Committees

Repeater	Phil Hock W3VRD Jerry Cimildora N3VBJ Ken Erisman NE3A Dave Brunner AC3EO
VE Testing	Pat Stone AC3F
Public Service	Bob Landis WA3SWA
Webmaster, Facebook	Jerry Cimildora N3VBJ
Trustee:	Dave Fredrick KB3KRV (W3PGA) Jim Marshalek KC3FBL (AE3RO)
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.

2021 Examination Schedule DUE TO COVID-19 DATES May be **Canceled!**

Time:	1 pm	1 pm	
Dates:	September 18	November 20	
Where:	American Legion, Rosedale	American Legion, Rosedale	

American Legion Post 180, 1331 Seling Ave., Rosedale, MD 21237

Contact: Patricia Stone AC3F, email: 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 nd Tue	7:30 pm	146.670	Baltimore County RACES Net
2 nd Wed	8 pm	449.575	Aero ARC Net
4 th Wed	8 pm	147.240	Aero ARC Net
5 th 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)

CLUB MEETINGS

5-5-21: Aero ARC ZOOM Meeting

7:00 to 7:58 pm

12 Members Present Via ZOOM: Pat AC3F, Harry AC3K, Don N3FQC, Jerry N3VBJ, Tom WA3QLY, Richard KB3VAE, Dave KB3KRV, Lou KC3NMT, Dave KA3SNY, Gus AA3GG, Georgeann KB3PGN

9 Members Present at the Skypark: Joe WB3FMT, Rob AE3B, Ray N3RES, Don K3DON, Steve KD3TP, Bob WA3SWA, George KB3TBH, Phil, W3VRD, Shane KC3PPM

Total Present 21

Treasury Report: Bank ±\$2,538.77. As of 5/5/21 the club has \$114.00 dues and 50/50 money. A check #551 for \$169.60 was sent to MD Portable Restroom on 4/28/21 for a Handicap Portapotty. The club decided not to rent the handwashing station.

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

Correspondence: Status on Tax filing for State has been received and approved by the State. The Federal is due at a later date. Pat has the club's paperwork.

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

EmCOM: Baltimore City / County ARES Group is forming. For more info please contact Joseph Cotton W3TTT, 443-248-8446 email cottonj@gmail.com

SKYWARN Classes – for information or to register for Online Classes, see the SKYWARN site.

VE Testing : The American Legion Hall in Rosedale is the new testing location will be continued to be used for the near future. The AL Post it is located at 1331 Seling Ave. Rosedale 21237. The next testing dates are May 15 at the AL Post and June 26 at the Skypark. Pat already has 6 takers for the May 15th session at the Hall. Standard Covid-19 protocols will be followed.

Old Business: Dues: I still have some members that still owe dues for this year! If you are in question, send me an email at joseph.miko@verizon.net or call me a 443-956-0197.

New Business: FIELD DAY Prep:

Last year we ran a 3A station with 3 HF transmitters, using 1 G5RV and 2 off-center fed dipoles. We were able to make 219 contacts, total points aggregate (2) score 1,664. What about a 4A with 1 station being a digital only station???? Voice is 1 point and CW and digital are 2 points each.

This year I would like to use the 20-meter beam with a rotor, just to see how well it would work?

The plans are to use the proposed plans for 2020. That is a 4A configuration. 1 digital/CW, one 20-meter w/beam and two 10 – 80 phone stations off-center fed dipole (OCFD) and/or G5RV.

Jerry will bring in a vertical and a digital/cw station. He needs some assistance with one of the digital modes.

Proposed antenna layout: 2 OCFD running end to end, parallel to the runway, the digital vertical at the end mount for the OCFD and the 20 meter beam, near the fire box in the field between the hangers.

Four tables will be set up as operating stations. There may be some equipment in the hanger, if so we can work around it.

Food: Dinner, provided by Susan Landis, will be BBQ Pulled Pork, Calico Beans, Tossed Green Salad, and Mini Honey Corn Muffins. The cost is \$5.00 honor system, just throw money in the bucket or jar. Oh, yes there will be cookies.

I will bring my Yaesu 991 if needed, Jerry is bringing a radio for digital. Bob is bringing all the computers for logging.

Portapot - Same configuration as last year, just place it by the fence, not in front of the gate opening. Hopefully it will be in place by noon on Friday with a Monday pickup.

Tags for the trailer - per Richard, the stickers for the trailer are due (March), Warren has been made aware and will get them before FD.

Elections: Don't forget Club elections take place the second meeting on May 19th.

- If anyone has any questions, please give me a call at 443-956-0197.
- I am not sure if I got everything. If I left something out or whatever?
- Please let me know. Thanks jmm

Aero ARC ZOOM Rag Chew Meeting Notes 5/19/21

07:00 pm to 08:20pm

Members Present via ZOOM (10): Richard KB3VAE, Harry AC3EK, Pat AC3F, Tom N3TJR, Dave KB3KRV, Dave KA3SNY, Georgeann KB3PGN, Gus AA3GG, Jerry N3VBJ, Lou KC3NMT

Members Present at SKYPARK (7): Joe WB3FMT, Don K3DON, Bob WA3SWA, Phil W3VRD, Larry KB3QWC, Rob AE3B, Ray N3RES

Total Members Present 17

Joe had a laptop running Zoom at the Airport.

50/50 winner of \$ 5.00 went to Joe.

AERO AMATAEUR RADIO CLUB ELECTIONS

Phil Hock was volunteered to be the Election Chairperson.

Office (Elected)	Current Member	New Member
President	Joseph Miko	Joseph Miko
Vice-President	Robert Ballou	Robert Ballou
Recording Secretary	Larry Hill	Larry Hill
Corresponding Secretary	Patricia Stone	Patricia Stone
Treasurer	Warren Hartman	Warren Hartman
Resource Coordinator	Ron Distler	Ron Distler
Committee (Volunteer)	Current Member	New Member
Repeater	Phil Hock Jerry Cimildora	
VE Testing	Patricia Stone	
Public Service	Bob Landis	
Web Master	Jerry Cimildora	
W3PGA Trustee	Dave Fredrick	
AE3RO Trustee	James Marshalek	
Club Nets	Joseph Miko	
Contest	Bob Venanzi	
Aerial Editor	Georgeann Vleck	

No changes for the current officers of the club. All that we saw was the FRED (Flashing Rear End Device)! Newly elected members will take office on June 2, 2021.

Club Presentation

For this meeting there was a "You Tube" presentation about Automatic Level Control (ALC) <https://youtu.be/iA8I22DNIZQ> to the subject ALC.

Background: Ham Dave Casler, KE0OG, has a Thursday Night Q&A session from 9-10 pm on "YouTube". Here is the link to Dave Casler's "YouTube" home page: <https://www.youtube.com/c/DavidCasler/featured>

If you like the reports by Dave Casler let me know, and I will look for more of them!

If you have any topics you would like to have discussed about RADIO, Astronomy or Weather or if you have seen a neat presentation and think the club would like it send me the link and we will run it for a Rag Chew meeting.

Business minutes are released at the first meeting of the months, the **RAG Chew minutes** are released following the RAG Chew session.

Items covered at the meeting:

RF Exposure Rules: The FCC has announced that rule changes detailed in a lengthy 2019 Reports and Order (R&O) governing RF exposure standard go into effect May 3, 2021. The new rules do not change existing RF exposure (RFE) limits but do require that stations in all services, including amateur radio, be evaluated against existing limits, unless they are exempted. For stations already in place, that evaluation must be completed by May 3, 2023. After May 3rd of 2021, any new station, or any existing station modified in a way that's likely to change its RFE profile – will need to conduct an evaluation by the date of activation or change. Check the ARRL web site for additional info and RFE aids. *Source: the ARRL Letter for April 15, 2021*

FRN and Email Address Required on License Applications: Beginning May 20, 2021, all amateur examination applicants will be required to provide an FCC Registration Number ([FRN](#)) to the Volunteer Examiners (VEs) before taking an amateur exam. This is necessary due to changes the FCC has made to its licensing system. The new application Form 605 requires an FRN and an email address. If these are not provided, the FCC will not process that Application. In addition, after June 29, all applications will be required to contain an email address for FCC correspondence. Applicants will receive an email directly from the FCC with a link to the official electronic copy of their license whenever a license is issued or changed. ARRL VEC suggests that those without access to email should use the email address of a family member or friend. Licensees will be able to log in to the ULS using their FRN and password to download the latest version of their license at any time. The FCC no longer provides paper license documents. *Source: The ARRL Letter for May 13, 2021.*

Porta Pot and wash - Pat got a quote from the Maryland Portable Restrooms Inc., (MPR) for a Handicap portapotty and Hand wash station. The portapotty was listed at \$160.00, a 4-station sink was listed at \$110.00. A vote taken during the meeting and showed a unanimous rejection of the 4-station sink. The Club will provide hand sanitizer and wipes. A check for \$169.60 was sent to MPR.

Field Day 2021 rules and regs are posted and the ARRL has extended FD rule Waivers from 2020 to 2021 and Add Class D and E Power Limits.

Airport News - The Skypark Fly-in Pancake Breakfast was a GO! The date is Saturday May 8th time is 8:30 am to 11:30 am, Social Distancing and Mask are required. The cost is free, but donations are welcomed. Come hungry and bring money! The clouds and rains came, but also the community. Per Dean, one of the cooks, this was the largest group in the last 5 or 6 years. The Skypark had to

spend extra because of the pandemic for individual portions and utensils. Made over \$800 cost approx. \$550, profit about \$250.00. Oh, and to let you know it was an official Fly-in breakfast, one aircraft made it through the weather.

Upcoming SKYWARN® Classes - free and open to the public!

CLASS	DATE	TIME	COUNTY	LOCATION	REGISTRATION
Basics Classes					
Basics	Thur. June 24, 2021	6 pm - 8 pm	Anne Arundel County, MD	Online	https://www.eventbrite.com/e/skywarn-basics-anne-arundel-county-md-tickets-154499790031
Basics	Wed. July 21, 2021	6 pm - 8pm	Baltimore County, MD	Online	https://www.eventbrite.com/e/skywarn-basics-baltimore-county-md-tickets-154500664647
Further classes will be scheduled over the next few months.					
Online Classes are open to all of the general public.					

ZOOM Info: This is the last ZOOM session for the club, at this time. A Great thanks to Rob AE3B for running and Hosting the ZOOM's for the last 14 month. Hope to see all of you for the June 2, 2021 meeting.

73,
Joe M

Net Reports

5-12-21: 449.575r MHz, 20:00 to 20:37 local.

W3PGA NCS Joe Essex, K3DON Don Joppatowne, AC3F Pat Middle River, N3FQC Don Perry Hall, W3VRD Phil Essex, WA3QLY Tom Middle River, KB3VAE Richard Middle River

7 members on the net

5-26-21: 147.24r MHz, 20:00 to 20:21 local.

W3PGA NCS Joe Essex, AC3EK Harry Overlea, K3DON Don Joppatowne, AC3F Pat Middle River, W3VRD Phil Essex, N3FQC Don Perry Hall

6 members on the net



VE CORNER

by Pat Stone, AC3F

Here are the 2021 test dates we have reserved at the American Legion Hall Post 180 in Rosedale, Md. All dates are Saturdays, and all tests will start at 1 pm.

September 18, November 20

We will also have our annual FD exam session at the Sky Park at noon on June 26.

Our next test session will be held at 12 pm on Saturday, June 26 at the Essex SkyPark. Hope to see you then.

Hamfests

Sunday, June 20, 2021, 8 am – 2 pm: Father's Day Hamfest at Arcadia

Location: Arcadia Fairgrounds, 16920 Carnival Ave., Upperco, MD 21155

Website: <http://W3FT.com>

Sponsor: Baltimore Amateur Radio Club

Admission: \$5

Talk-In: 146.67 (PL 107.2)

Public Contact: David Shadwell , AB3TE, P.O. Box 120 Reisterstown, MD 21136, Phone: 410-252-2878,

Email: W3FT67@yahoo.com Attn: Hamfest Chair

2021 BARC Father's Day Hamfest and Marketplace *(from the website, edited)*



Features a giant flea market for traditional tailgating, miscellaneous items, and food. Featured items include: amateur radio gear, electronics, radio control, and disaster preparedness items. Hours: 8 am.-2 pm. Location: the [Arcadia Volunteer Fire Company grounds, 16020 Carnival Avenue, Upperco, MD 21155](#). Admission: \$5 attendance and \$10 per tailgating space.

[Truck Of Deliciousness](#) has been selected as our food vendor and will be

there early with a breakfast menu, plenty of coffee, lunch items, and other goodies.

Plenty of tailgating spaces and free customer parking. Indoor rest room facilities!

[Includes free deer with admission, where applicable. Ed.]

Remember, our event is the last area hamfest before the annual [ARRL Field Day](#) for those last minute shoppers. Please join us on [Father's Day](#) 2021 for our next event. [2021 printable hamfest flyer](#).

Sunday, October 3, 2021: CARA Fest

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

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

Sponsor: Columbia Amateur Radio Association (CARA)

Talk-In: 147.390 MHz /R+ CTCSS 156.7 Hz

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

Email: vendorsales@carafest.org

Ham News

Amateurs' Email Addresses Will Continue to Be Kept Private, FCC Says

Starting on June 29, all applications filed with the FCC must include an email address for FCC correspondence. After receipt of the initial announcement that all future applications would require an email address, ARRL was concerned for the privacy of its members and requested that amateurs' email addresses not be made public. This week, the FCC agreed, stating in an email to ARRL counsel that it will continue to "mask" amateurs' email addresses from public view in the Universal Licensing System ([ULS](#)). The FCC will use the email address supplied by amateurs to correspond with applicants, including to send a link to the official electronic copy of the license when an application is granted.

The FCC is transitioning to fully electronic correspondence and no longer mails hard-copy licenses. Amateurs are able to view, download, and print their official license grant using the ULS. When a license is first granted, each applicant will receive an email with a direct link to the license. Although the link expires in 30 days, the license itself will remain available in the ULS and may be downloaded at any time by signing into the licensee's account using their FCC Registration Number (FRN) and password.

On or after June 29, a valid email address must be provided with each application, and must be kept current by filing a modification application, as necessary. Under the amended Section 97.23, "The email address must be an address where the grantee can receive electronic correspondence. Revocation of the station license or suspension of the operator license may result when correspondence from the FCC is returned as undeliverable because the grantee failed to provide the correct email address."

Applicants lacking an email address should consider using the email address of a friend or family member on their FCC applications. Read [an expanded version](#).

Source: the ARRL Letter for May 20, 2021

Spring ARRL Section Manager Election Results Announced

In the only contested election this spring, Utah ARRL members elected Pat Malan, N7PAT, as their new Section Manager (SM) for a 2-year term commencing July 1. Malan, of South Jordan, received

419 votes, while incumbent Mel Parkes, NM7P, garnered 339 votes. Parkes had served as Utah Section Manager for 22 years. ARRL Headquarters counted and verified the ballots on May 18.

In New Hampshire, Pete Stohrer, K1PJS, of Concord, was the only nominee for Section Manager when nominations closed on March 4. Stohrer, having previously served as SM from 2013 until 2019, will succeed John Gotthardt, K1UAF, who decided not to seek a new term.

Six incumbent Section Managers faced no opposition and were declared re-elected, effective July 1: **Marty Pittinger, KB3MXM (Maryland-DC)**; John Bigley, N7UR (Nevada); Bob Buus, W2OD (Northern New Jersey); Bob Beaudet, W1YRC (Rhode Island); John Litz, NZ6Q (San Joaquin Valley), and Dale Durham, W5WI (West Texas).

Source: *The ARRL Letter for May 13, 2021*

ARRL Learning Network Webinars

Ask the Lab: How ARRL's Technical Information Service Can Help You -- ARRL Laboratory Manager Ed Hare, W1RFI / Tuesday, June 8, at 1 PM EDT (1700 UTC)

Learn all about the ARRL Technical Information Service (TIS) and the expert ARRL Laboratory staff who answer thousands of questions each year from members. Get tips about projects, suggestions to address various station installations, and help for some of your most pressing ham radio questions. You'll discover how to search ARRL's extensive Periodicals Archive, find helpful articles, read test reports, access technical forums, and find answers to technical questions beyond the Lab.

These Learning Network presentations are sponsored by Icom.

ARRL members may register for upcoming presentations and view previously recorded [Learning Network](#) webinars. ARRL-affiliated radio clubs may also use the recordings as presentations for club meetings, mentoring new and current hams, and discussing amateur radio topics.

The ARRL Learning Network schedule is subject to change.

Source: *The ARRL Letter for April 29, 2021*



Feature Article

Zoom to the Rescue

by Joe Miko 5/31/21

The old adage, "When all else fails - Ham Radio", was certainly true during the COVID-19 pandemic. My first interaction with the pandemic lockdowns occurred on March 13th, oh, and it was a Friday the 13th. I was a 15-year part-time employee at the Maryland Science Center, working in the

Observatory. We were notified that the entire center would have to go through a disinfectant procedure, starting at 5:00 pm Friday evening.

It seemed that everything in the state came to a halt. Inside and outside activities came to a halt. Our last Aero meeting prior to Covid-19 was March 4, 2020. From that date forward we became house-bound and mask covered. All of the businesses in the state were affected, either by reduced customer capacity or shut down all together.

The club routinely has two face-to-face meetings per months held at the Essex Skypark and up to three radio nets per months.

Utilizing radio nets and Plain Old Telephone System (POTS), one of our members, Rob Ballou AE3B, suggested we use an internet-based app to do an audio/video conference call. Rob volunteered to host this program. So, on April 1st (no fooling) we had our first Zoom conference call with our club members.

Although ZOOM is not ham radio, it happens to be in the bag of tricks that hams can utilize when needed.

The unique feature about ZOOM is the number of platforms and systems it will operate on: various PCs, iPad, iPhone, and others, and a mix of devices at the same time. Through the course of next 14 months of Zooming we never had a problem with anyone trying to get on the conference calls.

The first conference call ran for 3 hrs 43minutes. We had 20 members on that call, and on that day, it became hit, and the go-to meeting place.

Beginning April 1st thru December 2020 we had 16 zoom conferences, the calls normally started at 7:00pm and would run to about 8:30pm. Since the club has two meeting per months a change was made in the format for the second meeting. It went from a business type meeting to an open format Rag Chew meeting containing a Youtube presentation about ham radio stuff.

Harry Randall AC3EK, is a fan of Dave Casler KE0OG, a retired engineer and a ham, who has over a thousand YouTube presentations. He also has a podcast every Thursday evening. Harry would send me selected links to topics on new and old radio trivia, technical updates, and questions and answers from Youtube followers.

If you are interested in Dave Casler the following information should get you started: Thursday Night Q&A session from 9-10 pm on YouTube. Here is the link to Dave Casler's home page:

<https://www.youtube.com/c/DavidCasler/featured>

A bunch of numbers for your information: April 1, 2020, through December 16, 2020, the club had 16 ZOOM sessions for a total of running 14 hours and 26 minutes including 266 participants. We also had 27 radio nets, 17 hours, and 20 minutes with 248 participants.

January 6, 2021, through May 19, 2021, the club had 10 ZOOM sessions for a total of running 13 hours and 2 minutes including 136 participants. We also had 10 radio nets, 5 hours, and 4 minutes, with 71 participants.

Again, a gracious thanks to Rob AE3B, for sharing his ZOOM product to provide and host ZOOM video conferencing for the Club for the last 14 months.

For now ZOOM has been placed in the back pocket, hopefully to be used sparingly.

From the Skies over Mt. Essex

SKY Events for June 2021

+4.3 plus +4.9 Equal + 3.8 Right!

Jun 2nd - Last quarter Moon

Jun 3rd - Hale 200" telescope dedicated in 1948.

Jun 7th - Uranus 2° N of the Moon 02:00 EDT

Jun 10th - New Moon

Jun 11th - Pluto the planet downgraded to a Plutoid, a TNO in 2008
And Double shadow transit on Jupiter 15:15UT, 11:15

Jun 13th - Mars is 3° of the Moon 20UT 16 EDT

Jun 14th - Earliest 05:42 EDT

Jun 18th - First Quarter Moon

Jun 20th - Solstice 23:32 EDT, Longest day 15h 01m @40° N

Jun 22nd - Glenn L. Martin JRM Mars Seaplane first flight in 1942.

Jun 24th -- Full Moon, Traditional the Rose Moon,
Celtic Moon of Horses, largest Moon in 2021.
And a Super Moon

Jun 26th - Double shadow transit on Jupiter 05:03UT, 01:03 EDT.
& Charles Messier born in 1730

Jun 27th - Latest Sunset 20:26 EDT @ 40° N

Jun 30th Tunguska meteor event 1908

Measuring the apparent brightness of a star is not easy, no matter what method is employed. The brightness of a star can be measured visually by looking at it and comparing it with other stars for thousands of years this was the only method. The brighter stars such as Sirius were marked first magnitude and the dimmest stars 6th magnitude as mentioned above. Fortunately, the response of the human eye is over a large range of brightness is nearly logarithmic, and the sensitivities of most individual to different colors are much the same much the same, so these measurements give a useful foundation for further work1

The method is put to good use even now by members of the American Association of Variable Star Observers (AAVSO) they minimized its difficulty by locating a series of standard stars immediately around the star whose variability they wish to measure (the standard stars must each be consistent in brightness, their brightness must differ by small amounts and together their brightness must cover the entire range to be measured the standard stars must all be the same color as the variable and all the stars -- variable and standards must be visible together through the eyepiece of the telescope without moving the instrument).

You just can't add star or planets magnitudes to get an apparent brightness. Mr. Lumpkin. First the two objects must be close enough to appear as a single point. (Think of an approaching aircraft seen at night with its landing lights on, at some distance from you it will look like a single light, at some point you will be able to detect separate light sources.)

Through studies it was found the maximum separation for stars that are one is 208 arc seconds. An example of this is the double star Epsilon Lyra this separation seems about right limit for sharp eyes to see two stars, but many eyes cannot.2

Combine Magnitudes of Two Stars That Are Seen as One

Difference of Magnitude	Brightening Effect
0.0 to 0.2	0.7 mag
0.3 to 0.4	0.6 mag
0.5 to 0.7	0.5 mag
0.8 to 1.0	0.4 mag
1.1 to 1.4	0.3 mag
1.5 to 2.0	0.2 mag
2.1 to 3.3	0.1 mag
3.4 and up	0.0 mag

+4.3 and +4.9 Equal = + 3.8 Right! (The difference is 0.6 mag. add 0.6 to +4.3 you get a 0.5 increase in mag)

Planet Lookout at mid-Month EDT

Sunrise 05:41 EDT and Sunset 20:24 EDT

Mercury - Too close to the sun to be seen.

Venus - Evening Rises 7:14, Sets 21:57, Mag -3.8 and 10.6 arc seconds.

Mars -- Evening Rises 08:36, Sets 22:55, Mag 1.8 and 4.1 arc seconds.

Jupiter -- Morning Rises 00:18, Sets: 11:11, Mag -2.5 size 42.5 arc seconds.

Saturn -- Morning, Rises 23:19 Sets 09:37, Mag 0.4 size 17.9 arc seconds.

Uranus— Morning Rises 03:19, Sets 16:59; Mag 5.8 size 3.3 arc seconds.

Neptune -- Morning Rises 01:12 Sets 12:53; Mag 7.9 size 2.3 arc seconds.

1 Naked Eye Stars by Richard Lumpkin

2 Naked Eye Stars by Richard Lumpkin