



*Christmas Star – Look for one over your town this year! (No kidding!)*

## ***The Aero Aerial***

The Newsletter of the Aero Amateur Radio Club  
Middle River, MD  
Volume 16, Issue 12  
December 2020

Editor Georgeann Vleck KB3PGN

### ***Officers***

President	Joe Miko WB3FMT
Vice-President	Rob Ballou KC3ROB
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	1 pm
Dates:	Sat., Jan. 16	Sat., Mar. 20	Sat., May 22
Where:	American Legion, Rosedale	American Legion, Rosedale	American Legion, Rosedale

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

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)

## *From the President's Desk*

FD 2020 is in the QSR December issue page 72. There was a new way of scoring Club and individual members of a club, operating from home or another location. The ARRL combined and added the scores from multiple operators affiliated with a club. The aggregate totals were added to reach a final score.

The Aero ARC did not plan on extra people working from home using their or our club call sign, it gave us an additional 122 points for an Aero ARC total of 1,664. **Ok who was that masked person who gave us the points? Please let me know!**

Again, thanks to all who operated during the Covid-19 Field Day 2020.

*Joe M*

### **Field Day 2020 Results Published by the ARRL**

As you all know the annual Field Day event was different this year due to the Covid-19 flu pandemic. Instead of clubs meeting and participating in FD 2020, the rules were modified to allow club stations to be operated by individual stations at their QTH or wherever. The stations would then submit their files containing their contacts and their club affiliation. The ARRL would then compute the total score based on the number of stations connected to a club.

In the QST issue dated December 2020, has the results running from pages 72 – 76. For example, on page 72, the Aardvark Wireless Group had a score of 12,354, a score from a total of 10 separate operator or groups.

The Aero ARC had a combined score of 1,664, this was an additional 122 points added to our club score made by another club member. <http://field-day.arrl.org> lists the entries received grouped by Class and score. The largest aggregate number of stations in a club was 35 for the North Fulton ARL getting a score of 23,881.

The Aero ARC with both stations combined gave us an additional score of 122 points. **If you were the one working from Home, or under your call / Club please send me your stats so I can add them to the information below.**

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>	<u>0</u>	<u>10</u>	<u>5%</u>
	77	142	219	100%

US States Contacted	36	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.

Thanks to the operators that worked the event; they were Larry KB3QWC, Pat AC3F, Ray N3RES, Dave AC3EO, Joe WB3FMT, Rob AE3B, Bob WA3SWA, and Steve KD3TP. And Bob for brining and Susan for baking the Cookies, oatmeal, chocolate chips and molasses.

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

Thanks to all,  
*Joseph Miko*

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## CLUB NEWS

### Aero Radio Club Meeting November 4, 2020

Started at 7:40 PM Ended at 8:19

**Members Present: In Person:** Joe WB3FMT, Rob AE3B, Larry KB3QWC, Don K3DON, Rich KB3VAE, Ray N3RES, Phil W3VRD, Bob WA3SWA, and Pat AC3F. **Via Zoom:** Harry AC3EK, Keon KE3HAY, George AA3GG  
12 Members present.

**Raffle:** Ray N3RES \$8 and \$8 to the club. Donated all to the club.

**Treasury Report:** Finance is the same as last month. \$16 on hand.

**Repeaters:** Both repeaters are working fine.

The new repeater has been tested by Phil. Will start at 60 watts. Possible members to help set up the new repeater are Marty, Ken (NE3A), Ray, and Joe. Starting the work around 9-9:30 AM. Larry asked what connectors are on the repeater? Phil said they are all type N's. Keon asked via Zoom if we could tell him the fringes of new repeater. We don't have the answer at this time.

**Correspondence:** None at this time. Joe gave Pat a letter about the club to send out to promote the club. Items in it are meetings, repeaters, nets, and testing.

**EmCOM:** None at this time.

**VE Testing:** The VE test session will be held on Saturday, November 14 from 1 to 3:30 pm. This session will be held at the American Legion, 1331 Seling Av3., Rosedale, MD 21237. 3 possible and 1 maybe coming to the test session.

Some of members of the American Legion used to be licenced and wish to be again, so will be at the testing session.

**Old Business:** Boy Scout event canceled by the Baltimore Boy Scout Council.

**New Business:**

- Email for ARRL on the Baltimore City ARES. Don't wish it to be just an AREO Club project. Have to find equipment bought for the hospitals.
- New Fence around the FBO. Rich said the club is getting a remote for the fence gate.
- Monday 30 November is eclipse of the moon.
- Harry discussed the meteor showers that occur in November.
- Bob said that this month KDKA from Pittsburgh is 100 years old. Started as 8XK.
- Bob talked about receiving distant AM broadcast stations. He once received 640 kHz from Cuba with another station under it. With using a portable he could null it out and receive KFI in Los Angeles.

**Aero ARC ZOOM Meeting - 11/18/2020**

Start Time: 07:00 pm End time: 08:27pm

**Members Present:** Rob AE3B, Don K3DON, Joe WB3FMT, Bob WA3SWA, Shane KC3PPM, Harry AC3EK, Don N3FQC, Paul KB3KWT, Gus AA3GG, Pat AC3F, Jon N7JKR, David KA3SNY, Georgeann KB3PGN, Tom WA3QLY, Lou KB3NMT, Rich KB3VAE, Jerry N3VBJ, Larry KB3QWC  
18 members present

**Treasury Report:** Bank \$2,352.90 On Hand: \$0.00; Tires for trailer ordered

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

The New Yaesu DX-1 was installed on 11/10/20, set to Auto Mode FM and C4FM. *See For the Record dated 11/10/20*

**Correspondence:** Sent a letter to the American Legion thanking them for the use of their hall for VE testing.

**Public Service:** We still need for our 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** - The following online SKYWARN class is being presented.

Basics Thursday 11/19/20 6-8pm Calvert Co. MD Online Class

To Register for the Online Classes, see the info on the SKYWARN site.

See the info for additional online classes.

**VE Testing :** The last test session was held on Saturday, November 14, at the American Legion Hall in Rosedale, located at 1331 Seling Ave., Rosedale 21237. 15 applicants took test 13 passed. Standard Covid-19 protocols were followed.

*See For the Record dated 11/15/20* about the VEC session at the American Legion Hall.

See email about the proposed testing sessions for 2021, five at the American Legion and one during FD 2021.

**Old Business:** Phil dropped off the repeater, duplexer, extra can, amplifier, and *diagrams*. I took the equipment and set up schedule for the work group.

**Dues:** I still have 9 members that still owe dues for this year! If you are in questioned, send me an email at [joseph.miko@verizon.net](mailto:joseph.miko@verizon.net) or call me a 443-956-0197.

**New Business:** Updates

Joe sent out an email requesting a workgroup of at least 6 people, request to provide available days between 11/9 to 11/20. The new 2 meter repeater was installed on 11/10/20. An additional work group will be tasked with removing the old 440 and 24 repeaters later. See repeater For the Record 11/10/20 for additional information.

Trailer: Warren ordered tires from another distributor. I also asked him to get two new bumper jacks to replace the broken ones. I also asked him to get four jacks stands to be used to raise the tires off the ground, to be used when changing a tire.

**N.B.** There **will not be** a 2 meter net next Wednesday, November 25<sup>th</sup>. Everyone have a safe and Happy Thanksgiving day.

## **Aero ARC ZOOM Meeting: December 2, 2020**

Start Time: 07:28 pm End time: 08:25 pm

**Members Present:** Rob AE3B, Don K3DON, Joe WB3FMT, Bob WA3SWA, Shane KC3PPM, Harry AC3EK, Gus AA3GG, Pat AC3F, Jon N7JKR, Tom WA3QLY, Lou AB3QK, Rich B3VAE, Larry KB3QWC, George KB3TBH, Geigg K3POJ, Montel KA3RFI, Ray N3RES, Bill AC3DX, Chris AB3WG, Dave KB3KRV, Steve KD3TP and Danny Sliger  
22 members present

**Treasury Report:** Bank \$2,352.90 On Hand: \$0.00

Tires for trailer delivered

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

The New Yaesu DX-1 was installed on 11/10/20, set to Auto Mode FM and C4FM.

**Correspondence:** Sent a letter to the American Legion thanking them for the setup and use of the Hall.

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

**EmCOM:** Nothing scheduled before the end of hurricane season that season ended on November 30th. 30 Tropical Storms, 12 Hurricanes and 6 Hurricanes made landfall in the US or US territories.

SKYWARN Classes - None listed as of 12/2/20.

To Check on or Register for the Online Classes, see the SKYWARN site.

**VE Testing:** The last test session was held on Saturday, November 14, at the American Legion Hall in Rosedale. A larger than expected crowd can to the site for testing. Fifteen applicants showed and 13 passed. See the VE Corner for a full report. Standard Covid-19 protocols were followed.

**Old Business:** Trailer: Warren ordered tires from another distributor. I also asked him to get two new bumper jacks to replace the broken ones. I also asked him to get four jacks stands to be used to raise the tires off the ground, to be used when changing a tire. Warren has received the tires for the club trailer. He is waiting for the Jacks. They should be in the next few days. Once that happens, I will canvass the members to get a work party together. Action Item: Richard stated that Marty has jacks that will work on the trailer. I will contact Marty to find out.

**Dues:** I still have 9 members that still owe dues for this year! If you are in questioned, send me a email at joseph.miko@verizon.net or call me a 443-956-0197.

**New Business:**

- 24 Repeater - Additional work needs to be done on the 24 repeater, the amplifier needs to be placed further from the Repeater. It needs to be the last device behind the duplexers. Phil suggested that we get a used Motorola or GE amplifier, increase the cable length to ~ 10 feet and use double shielded cables. Run the repeater at 5 watts and the amp at 60 to 100 watts. I will check with Jerry and Ken for additional info. Also, to make sure a Class C amp can run C4FM digital.
- An additional work group will be tasked with removing the old 440 and 24 repeaters later.
- Jon and Marty are members of the same AL Post, and this post is interested in starting and building a radio station, AERO ARC may be able to help them out?

**New Ideas for Club Meetings:** The following suggestions were made:

- During the Covid-19 plague, do you still want to have 2 meetings per month or an extra radio net. Any changes to or for the monthly format.
- How about a presentation for the club via Zoom? If not how about sending an article to Georgeann for the Aerial!
- Anyone have a radio or astronomy topic that they would like to have it explained? Send it to me and I will see who can answer it, either in writing or a Power Point presentation.
- Suggestion to have a Zoom Meeting on the 1st Wednesday of the month and have an additional radio net on the 3rd Wednesday of the Month. That would make at least 4 nets per month. What do you say?
- Use the second ZOOM meeting as a RAG CHEW event no meeting just Chew!
- Keep the same food menu for FD 21, use FD 20, we didn't use it.
- Keep the same proposed FD 20 plans for FD 21, less work.

**Please look at the above suggestions, please let me tell me which ones you would like to do. Or do you have any other ideas the club can use? Email to: [joseph.miko@verizon.net](mailto:joseph.miko@verizon.net)**

JMM

## **Announcing the winner of the AERO ARC 2020 club contest!**



And the Winner Is.....

Harry AC3EK has taken the prize this year. Shown here with his certificate and new Maryland State mouse pad. Congratulations on a job well done! We look forward to the 2021 contest.

*Submitted by: Pat AC3F*



## Net Reports

**11-11-20: 449.575r MHz, 20:00 to 20:15 Local.**

W3PGA NCS Joe Essex, N3RES Ray Essex, KB3VAE Rich Middle River, W3VRD Phil Essex  
4 people on the net

**11-25-20: No 2 meter net**

Canceled at the ZOOM meeting on the 18<sup>th</sup> because of the Thanksgiving holiday.



### VE CORNER by Pat Stone, AC3F

The AERO VE Team held its final session of 2020 on Saturday, November 14<sup>th</sup>. We served a record 15 applicants. Congratulations to new Generals KC3QPQ Kimberly, KC3QJZ Kathy, and N3TJK Tim, and new Techs: KC3QPG Chris, KC3QPH Jim, KC3QPI Richard, KC3QPJ Aaron, KC3QPK James, KC3QPL Jared, KC3QPM Jeff, KC3QPN Matt, KC3QPO Dillon, and KC3QPP Simon.

This was the first time we tested at the American Legion Post 180 in Rosedale, and we would like to extend a very special thank you to the fantastic team of folks from Post 180. Because of their hard work we were able to safely conduct this exam session with more than the required COVID distance protocols established by the Governor's office. You guys were amazing.

Many thanks to VE's: N3RES, AC3EO, N3FQC and WA3QLY for your hard work and dedication in assisting me with this record setting session. We couldn't do this without you. Hope to see you in January. It's always a joy working with you.

Our next test session will be held on Saturday, January 16, 2021 at 1 pm at the American Legion Post 180, 1331 Seling Ave. Rosedale, MD 21237. Hope to see you then.

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.

**January 16, March 20, May 22, September 18, November 20**

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

## ***Not to Be Missed!***

### **Planets Will Align Causing Rare 'Christmas Star' to Appear in the Sky This**

**December** [John Paluska](#), ChristianHeadlines.com Contributor, Tuesday, December 1, 2020



On December 21, Saturn and Jupiter will align into a beautiful bright star. This will be the first time they align like this since the Middle Ages.

According to [Forbes](#), the two planets will look like a "double planet" and provide an extraordinary amount of light. The last time these two planets aligned like this was on March 4, 1226, according to astronomer Patrick Hartigan at Rice University.

"Alignments between these two planets are rather rare, occurring once every 20 years or so, but this conjunction is exceptionally rare because of how close the planets will appear to be to one another. You'd have to go all the way back to just before dawn on March 4, 1226, to see a closer alignment between these objects visible in the night sky," Hartigan said in a statement.

The spectacular sighting will be viewable from anywhere on earth. "The planets will appear low in the western sky for about an hour after sunset as viewed from the northern hemisphere, and though they'll be closest on December 21, you can look each evening that week.

Although the sight will be sinking towards the horizon, it will be bright enough to be viewed in at twilight. All you need is an unobstructed view to the southwest, and to look to the southwest from about 45 minutes after sunset where you are," Forbes states.

To catch it in the night sky, you'll need a regular telescope at a minimum. But for a brighter view, an astronomer's telescope or a university telescope feed would work better.

Alignments like these, called "conjunctions" are not necessarily rare, but some of them are impossibly rare or only come around once in hundreds of years. Astronomers speculate that the Star of David written of in Matthew was an exceptionally rare triple conjunction between Saturn, Jupiter, and Venus. One such astronomer was Johannes Kepler, one of the greatest astronomers of all time.

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## HAM NEWS

### FCC to Require Email Addresses on Applications

Amateur radio licensees and candidates will have to provide the FCC with an email address on applications, effective in mid-2021. If no email address is included, the FCC may dismiss the application as defective. The FCC is fully transitioning to electronic correspondence and will no longer print or provide wireless licensees with hard-copy authorizations or registrations by mail. A *Report and Order* ([R&O](#)) on "Completing the Transition to Electronic Filing, Licenses and Authorizations, and Correspondence in the Wireless Radio Services" in WT Docket 19-212 was adopted on September 16. The new rules will go into effect 6 months after publication in the *Federal Register*, which hasn't happened yet, but the FCC is already strongly encouraging applicants to provide an email address. When an email address is provided, licensees will receive an official electronic copy of their licenses when the application is granted.



Under Section 97.21 of the new rules, a person holding a valid amateur station license "must apply to the FCC for a modification of the license grant as necessary to show the correct mailing and email address, licensee name, club name, license trustee name, or license custodian name." For a club or military recreation station license, the application must be presented in document form to a club station call sign administrator who must submit the information to the FCC in an electronic batch file.

Under new Section 97.23, each license will have to show the grantee's correct name, mailing address, and email address. "The email address must be an address where the grantee can receive electronic correspondence," the amended rule will state. "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."

Source: *The ARRL Letter for December 3, 2020*

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## Hamfests

**CANCELED**

**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)

## **CANCELED**

### **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)

## **NO NOTICE OF CANCELLATION AS OF 12/4/20**

### **Sunday, June 20, 2021: Father's Day Hamfest at Arcadia**

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

Website: <http://W3FT.com> [Facebook](#) [Baltimore Amateur Radio Club](#)

Sponsor: Baltimore Amateur Radio Club

Talk-In: 146.67 (PL 107.2)

Public Contact: David Shadwell , AB3TE, P.O. Box 120 Reisterstown, MD 21136, Phone: 410-252-2878, Email: [W3FT@yahoo.com](mailto:W3FT@yahoo.com)

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## **FOR SALE**



### **RFPrecise MAG antenna**

I paid \$425.00 for it and will let it go for \$250.00.

I have the carrying case that can be used for packing it up for portable use and 25 feet of RG68 coax.

Thanks and 73,  
Lou AB3QK  
[louk288@msn.com](mailto:louk288@msn.com)

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# From the Skies over Mt. Essex

## SKY Events for December 2020

## 2020 - A Christmas Star!

*Dec 7<sup>th</sup>* - Last quarter Moon

*Dec 12<sup>th</sup>* – Venus is 0.21UY, 16 EST 3°S of Moon 21UT, 16 EST

*Dec 13<sup>th</sup>* Geminids Meteor Shower peaks up to 120 per hr, look above Castor the leading Twin.

*Dec 14<sup>th</sup>*-- New Moon

*Dec 17<sup>th</sup>* – Jupiter 3.0° N of Moon 4UT, 23EST 12/16, Saturn is 3.0° N of Moon 5UT, Midnight EST.

*Dec 21<sup>st</sup>* – Winter Solstice 10:02UT, 05:02 EST and First Quarter Moon

*Dec 21<sup>st</sup>* – Possible Christmas Star(s), The planets Jupiter and Saturn within 0.1° 14UT, 9 EST and within 1° till the 29 of December.

*Dec 22<sup>nd</sup>* - Ursids Meteor Shower peaks up to 10 per hr, look towards the bowl of the Little Dipper

*Dec 29<sup>th</sup>* - – Full Moon, Traditional Cold Full Moon, Shawnee Eccentric Full Moon.

## Planet Lookout at mid-Month EST

### Sunrise 07:08 EST and Sunset 16:46 EST

**Mercury** -- **Morning** Rises 07:02 Sets 16:31 Mag -1.0 and Size 4.7 arc seconds

**Venus** -- **Morning** Rises 05:12, Sets 15:18 Mag -3.9 and 11.3 arc seconds.

**Mars** -- **Evening** Rises 13:10, Sets 02:10, Mag -0.8 and 13.0 arc seconds.

**Jupiter** -- **Evening** Rises 09:32 Sets 19:24; Mag -2.0 size 33.8 arc seconds.

**Saturn** -- **Evening**, Rises 09:34 Sets 19:27; Mag 0.6 size 15:5 arc seconds.

**Uranus**— **Evening** Rises 13:57, Sets 03:28; Mag 5.7 size 3.7 arc seconds.

**Neptune** -- **Evening** Rises 11:55 Sets 23:25; Mag 7.8 size 2.3 arc seconds.

One of the possible explanations for the Christmas star was a conjunction of the planets Jupiter and Saturn.

Johannes Kepler a 17<sup>th</sup> century Astronomer, is associated with the idea that it was the close conjunction of Jupiter and Saturn that created the “Christmas Star of Bethlehem”.

In astronomy, a **conjunction** occurs when two astronomical objects or spacecraft have either the same right ascension or the same ecliptic longitude, usually as observed from Earth.

A conjunction is an apparent phenomenon caused by the observer's perspective: the two objects involved are not actually close to one another in space.

On December 21 Planets Jupiter and Saturn will appear to be 0.1° apart. The Full Moon is ½° or 30 arc minutes, , there are 60 minutes in 1 degree, so 1/10 of a degree is 6 arc minutes.

The planets achieve conjunction on 21<sup>st</sup>, the first celestial meeting of the two giant planets since 2000. It is their closest conjunction since 1623, Jupiter 's at magnitude of -2.0 outshines Saturn 's +0.6 magnitude by a factor of 10.

Both planets will be 30° east of the Sun. leaving a narrow window for observation in the early evening twilight. The crescent Moon passes 3° below both objects on the evening of December 16<sup>th</sup>.

On Monday December 21 at 09:00 EST the planets will be at there closest. Between the 21<sup>st</sup> and the 29<sup>th</sup> they will be within 1°.

Sunset at this time of the year is between 16:49 to 16:55 EST. The Planets set about 19:07 to 18:44 EST. Look towards the SW Azimuth 219° on the 16<sup>th</sup>.