Volume 22, Issue 1

January 2026

THE AERO AERIAL

THE NEWSLETTER OF THE AERO AMATEUR RADIO CLUB

Holiday Party and Meeting

JANUARY 7 AND 21

Ham News

January 7: Aero Club Holiday Party

From Rob, AE3B

Please join us Wednesday, 1/7/26, at 6:30pm at Pizza Johns for our Holiday Party. If you show a bit early, no problem!

Please RSVP to w3pgaclub@gmail.com so we can get a head count.

We look forward to seeing you!

Merry Christmas, Happy New Year, and enjoy the celebrations!

Events

Winterfest

Date: 1/10/2026

Location: Harrisburg, PA

Sponsor: Harrisburg RAC

Website: http://www.w3uu.org

Winterfest 2026

Date: 3/15/2026

Location: Vienna, VA

Sponsor: Vienna Wireless Society

Website: http://viennawireless.net/wp/winterfest/

FredFest 2026

Date: 3/21/2026

Location: Frederick, MD

Sponsor: Frederick ARC

Website: http://frederickarc.org/Fredfest26

Thawfest IV

Date: 4/11/2026

Location: Madison, VA

Sponsor: Greene County ARC

Website: https://www.arrl.org/hamfests/thawfest-iv

More Ham News

Band Plan Generator

From Amateur Radio Weekly

Allows completely customizable frequency ranges and segments generating a well-designed plan for screen or print. Try it now

Ham Radio Keeps People Connected, Even "When All Else Fails"

From Farm and Dairy

Across the country, from rural farms and small towns to emergency shelters and even the International Space Station, amateur radio – often called ham radio in reference to old slang for an operator with a poor or heavy-handed keying style – connects people without relying on the internet, cell towers or power grids, blending technical skill with public service and community. Read more

Connecting Classrooms to Space: Ham Radio Explainer by NASA Astronaut Nichole Ayers

From NASA Johnson

NASA astronaut Nichole Ayers walks through the step-by-step process of setting up a live ham radio contact, showing how schools and organizations bridge the gap between Earth and orbit. Watch the video

Kids Talk to Santa Claus Over Ham Radio

From WOWK 13 News

Santa took some time out of his busy schedule to talk to kids over ham radio at the museum of radio and technology. Watch now

More Events

Delmarva Amateur Radio and Electronics Expo, ARRL Delaware State Convention

Date: 4/18/2026

Location: Georgetown, DE

Sponsor: Sussex Amateur Radio Association

Website: https://www.arrl.org/hamfests/delmarva-amateur-radio-and-electronics-expo-arrl-delaware-state-convention-1

In case you missed it,


Volume 21, Issue 12 December 2025

THE AERO AERIAL

THE NEWSLETTER OF THE AERO AMATEUR RADIO CLUB

HAPPY HOLIDAYS

Ham News

America250 WAS

From Steven Fook, K2EJ

The League is planning America250 WAS, a year-long, all-states operating event celebrating the 250th Anniversary (Semiquincentennial) of the signing of the Declaration of Independence. Steven will be the state coordinator for Maryland and DC, and will be handling the scheduling and collecting the logs to forward to the League. As of now, Maryland is scheduled to activate W1AW/3 from 5/6 - 5/12, and from 11/11 - 11/17. If you are interested in operating, contact Steven directly at steven@k2ej.com. Visit the event page for more information

Meetings

DECEMBER 3 AND 17

W3PGA Middle River, MD 1

check out the December issue.

SKYWARN, ARES, RACES

SKYWARN® is a national network of volunteer severe weather spotters. The spotters are trained by local National Weather Service Forecast Offices on how to spot severe thunderstorms, tornadoes, hail and flooding. In some parts of the country, spotters also report snowfall and ice accumulation.

To learn more about SKYWARN® and how to become a spotter, click here.

Harford County ARES/RACES Group meets at the Harford County Emergency Operations Center in Forest Hill, MD, the first Thursday of each month, 7:00-9:00 p.m. Let them know in advance if you would like to attend, via email to Steven Fook (K2EJ), Harford County Emergency Coordinator.

To learn more about Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES), click here.

Training

SKYWARN® Classes

Basics, February 12, 6-8 pm, Fairfax, Virginia

Basics, February 17, 6-8 pm, Location TBD

Basics, February 24, 7-9 pm, Stafford, Virginia

Basics, March 4, 6-8 pm, Lovingston, Virginia

Radio License Exams

The Aero Amateur Radio Club sponsors Amateur Radio License Exams with the ARRL VEC. Examination sessions are offered throughout the year (dates TBD). Visit our new licensing page to prepare:

https://w3pga.net/getting-your-license/

W3PGA Exam Location

TBD

Contact

Patricia Stone, AC3F
email: ac3f@juno.com
landline: 410-687-7209

VE Corner
Pat Stone, AC3F

Next testing date TBD.

Other Maryland Test Sites
Confirm in Advance

1/10/26, 2:30 pm: Catonsville, walk-ins allowed

1/11/26, 12:15 pm: Davidsonville, walk-ins allowed

1/14/26, 5:00 pm: Fort Washington, register or call ahead

1/17/26, 9:00 am: Laurel, walk-ins allowed

1/17/26, 9:30 am: New Oxford, register or call ahead

1/17/26, 10:00 am: Rising Sun, walk-ins allowed

2/1/26, 12:00 pm: Falls Church, walk-ins allowed

2/3/26, 5:45 pm: Severna Park, register or call ahead

2/7/26, 2:30 pm: Catonsville, walk-ins allowed

2/7/26, 9:00 am: Rising Sun, walk-ins allowed

2/14/26, 12:15 pm: Davidsonville, walk-ins allowed

2/21/26, 9:00 am: Laurel, walk-ins allowed

2/28/26, 8:45 am: Forest Hill, walk-ins allowed

3/3/26, 5:45 pm: Severna Park, register or call ahead

3/7/26, 2:30 pm: Catonsville, walk-ins allowed

3/11/26, 5:00 pm: Fort Washington, register or call ahead

3/14/26, 12:15 pm: Davidsonville, walk-ins allowed

3/15/26, 10 am: Vienna, walk-ins allowed

3/21/26, 10:00 am: Rising Sun, walk-ins allowed

Contest Corral

January 2026

Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**. Check **https://contests.arrl.org** for recent results. Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish Date-Time		Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0000	1	0100	3.5	AGB New Year Snowball Contest	CW Ph Dig	RST, serial, mbr (if any)	**www.qsl.net/eu1eu/agb_nysb.htm**
1	0000	2	0300	7	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, name, mbr or pwr	**qrpcontest.com/pigwalk40**
1	0800	1	1100	3.5,7	SARTG New Year RTTY Contest	Dig	RST, serial, name, happy new year (native language)	**www.sartg.com**
1	0900	1	1200	3.5-14	AGCW Happy New Year Contest	CW	RST, serial, mbr (if any)	**www.agcw.de**
1	1700	1	1800	3.5	IRTS 80m Counties Contest	CW Ph	RS(T), serial, county	**www.irts.ie**
3	0000	3	2359	3.5-28	PODXS 070 Club PSKFest	Dig	RST, SPC	**www.podxs070.com**
3	0700	3	2100	3.5-14	Marconi Club ARI Loano QSO Party Day	CW	RST, mbr or serial	**www.ariloano.it**
3	1200	4	1200	1.8-28	WW PMC Contest	CW Ph	RS(T), PMC abbrev or CQ zone	**www.s59dcd.si**
3	1800	4	2359	3.5-28	ARRL RTTY Roundup	Dig	W/VE: RST, SP; non-W/VE: RST, serial	**www.arrl.org/rtty-roundup**
3	1800	3	2359	3.5-14,18, 21, 24, 28, 2-m rptrs	ARRL Kids Day	Ph	Name, age, QTH, favorite color	**www.arrl.org/kids-day**
3	2000	4	0700	1.8	EUCW 160m Contest	CW	RST, name, mbr or "NM"	**www.uft.net**
4	1200	5	1200	1.8-28,50	FOC Old School Classic 1960s QSO Party	CW	RST, 3-letter class, year first licensed, name	**www.g4foc.org**
6	0100	6	0300	3.5-28	ARS Spartan Sprint	CW	RST, SPC, pwr	**ars-qrp.com**
7	2000	7	2100	3.5	UKEICC 80m Contest	Ph	6-char grid square	**www.ukeicc.com**
10	0000	10	2359	3.5-28	YB DX Contest	Ph	RS, serial	**ybdxcontest.com**
10	0500	10	0859	3.5-28	Old New Year Contest	CW Ph	RS(T), sum of operator age and years on air	**www.contest.ru/old-new-year-contest**
10	1200	11	1200	3.5-28	UBA PSK63 Prefix Contest	Dig	RSQ, UBA section or serial	**www.uba.be**
10	1200	11	2359	1.8-28,50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	**www.skccgroup.com**
10	1800	11	0559	1.8-28	North American QSO Party, CW	CW	Name, SPC	**www.ncjweb.com/NAQP-Rules.pdf**
11	0630	11	0830	3.5,7	NRAU-Baltic Contest, SSB	Ph	RST, serial, 2-letter fylke/län/province/region	**www.nraubaltic.eu**
11	0900	11	1059	28	DARC 10m Contest	CW Ph	RS(T), serial, DOK (if any)	**www.darc.de**
11	0900	11	1100	3.5,7	NRAU-Baltic Contest, CW	CW	RST, serial, 2-letter fylke/län/province/region	**www.nraubaltic.eu**
12	0100	12	0300	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or pwr	**www.4sqrp.com**
14	2300	18	2300	1.8-14	AWA Linc Cundall Memorial CW Contest	CW	RST, eqpt year, input power (see rules for format)	**www.antiquewireless.org**
15	0000	16	0300	14	Walk for the Bacon QRP Contest	CW	Max 13 WPM; RST, SPC, name, mbr or pwr	**qrpcontest.com/pigwalk20**
15	1900	15	2000	3.5-14	NTC QSO Party	CW	Max 25 WPM; RST, mbr or "NM"	**pi4ntc.nl/ntcqp**
17	1200	18	1159	1.8-28	Hungarian DX Contest	CW Ph	RS(T), 2-letter county (if HA) or serial	**ha-dx.com/en/contest-rules**
17	1200	18	1159	3.5-28	PRO Digi Contest	Dig	RST, serial, "M" (if mbr)	**proradiocontestclub.com**
17	1800	18	0559	1.8-28	North American QSO Party, SSB	Ph	Name, SPC	**www.ncjweb.com/NAQP-Rules.pdf**
17	1800	18	0559	1.8-28	NA Collegiate Championship, SSB	Ph	Name, SPC (if NA)	**www.w9smc.com/nacc**
17	1900	19	0359	50 and up	ARRL January VHF Contest	CW Ph Dig	4-char grid square	**www.arrl.org/january-vhf**
17	2000	18	0559	1.8-7	Feld Hell Sprint	Dig	See rules	**sites.google.com/site/feldhellclub**
18	2300	19	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or pwr	**qrpcontest.com/pigrun**
19	2000	19	2200	3.5-28	RSGB FT4 Contest	Dig	Signal report	**www.rsgbcc.org**
22	0130	22	0330	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or pwr	**naqcc.info/sprint_rules.html**
23	2200	25	2200	1.8	CQ 160m Contest, CW	CW	RST, SP or CQ zone	**www.cq160.com**
24	0600	25	1800	3.5-28	REF Contest, CW	CW	RST, French dept or serial	**concours.r-e-f.org**
24	1200	25	1200	3.5-28	BARTG RTTY Sprint	Dig	Serial (no signal report)	**bartg.org.uk**
24	1600	25	2159	No WARC	Winter Field Day	CW Ph Dig	Category, ARRL Section, MX or DX	**www.winterfieldday.com**
25	2200	26	1000	1.8-28	Australia Day Contest	CW Ph Dig	RST, 4-char grid square	**www.wia.org.au**
28	0000	28	0200	1.8-28,50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	**www.skccgroup.com**
28	2000	28	2100	3.5	UKEICC 80m Contest	CW	6-char grid square	**www.ukeicc.com**
29	0130	29	0330	1.8	NAQCC CW Sprint	CW	RST, SPC, mbr or pwr	**naqcc.info/sprint_rules.html**
31	1300	1	1300	3.5-28	UBA DX Contest, SSB	Ph	RST, serial, ON section (if ON)	**www.uba.be**

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**. All dates and times refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in* QST *2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

Special Event Stations

Working special event stations is an enjoyable way to help commemorate history. Many provide a special QSL card or certificate!

Jan. 2 – Jan. 31, 0000Z – 2359Z, K3Y, Ellicot City. Straight Key Century Club. **20th Annual Straight Key Month**. 3.550 7.055 14.050 21.050. Certificate & QSL. SKCC c/o Ted Rachwal, K8AQM, 6237 Twin Lakes Dr., Smiths Creek, MI 48074. **www.skccgroup.com/k3y**

Jan. 9 – Jan. 11, 1600Z – 2200Z, WØJH, Stillwater, MN. Stillwater Amateur Radio Association. **Remembering Father Metcalf**. 3.860 7.260 14.260 21.360. Certificate. Shel Mann, NØDRX, 1618 Pine St. W, Stillwater, MN 55082. **www.radioham.org**

Jan. 10, 1600Z – 2230Z, W9RH, Milwaukee, WI. Milwaukee Radio Amateurs' Club. **MRAC 109th Anniversary**. 7.250 14.250 145.390. Milwaukee Radio Amateurs' Club, P.O. Box 26938, Milwaukee, WI 53226. **www.w9rh.org/special-event-station**

Jan. 24, 1330Z – 2100Z, K3S, Odenton, MD. Nuclear Ship *Savannah* ARC. **First Wireless-Coordinated High Seas Rescue 1909**. 14 18 21 28. QSL. Ulis Fleming, 980 Patuxent Rd., Odenton, MD 21113. *Check spotting networks for frequency.* **www.qrz.com/db/k3s**

Jan. 25 – Jan. 27, 1700Z – 0100Z, AG6AU, Placerville, CA. El Dorado County ARC. **Discovery of Gold in California 177th Anniversary**. 7.248 14.248 21.348 28.348. QSL. El Dorado County ARC, P.O. Box 451, Placerville, CA 95667. **www.edcarc.net**

Certificates and QSL cards: To obtain a certificate from any of the special event stations offering them, send your QSO information along with a 9 × 12-inch self-addressed, stamped envelope (3 units of postage) to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, use the ARRL Special Events Listing Form at **www.arrl.org/special-events-application**, or email information to **events@arrl.org**.

Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; a special event listing for **April** *QST* would have to be received by **February 1**. In addition to being listed in *QST*, your event will be listed on the ARRL Web Special Event page. Note: All received events are acknowledged. If you do not receive an acknowledgment within a few days, please contact us. ARRL reserves the right to exclude events of a commercial or political nature.

You can view all received Special Events at **www.arrl.org/special-event-stations**.

Life Members

Elected November 4, 2025

Abie Alexander, AB1F
Andrew S. Alexander, KC4WD
Jonathan Anderson, KI7BSJ
Jeffrey E. Bail, NT1K
Mark W. Bailey, N6DY
John P. Bailey, III, WR1M
Paul D. Beihold, KA9SDQ
Aaron G. Bentley, KJ5LKW
Carla S. Berg, KI5KTE
Patrick R. Boutall, KK4WZR
Chase D. Boyd, KG7HWS
Lucas T. Bridges, KF7KNH
Michael D. Brown, KFØDXV
David J. Burt, W4OFO
James R. Carpenter, KE7TJG
Charles E. Church, AD6UX
William D. Cohron, WD4AMC
Robert L. Cosentino, WB6AGE
Jeffrey A. Craig, KE7FEK
Matthew R. Crook, Sr., W1MRC
Joseph F. Decker, N7AO
Drake B. Doyle
Keith E. Doyne, KC3ZXE
Susan J. Edmonds, N2GNN
Tyson C. Eppink, N1TXN
Brian D. Erickson, N5ANW
Christopher T. Fahrenbach, WB9G
Timothy Fitzpatrick, KN6QYX
Diann R. Gentile, KD2BND
Albert J. Goto, N6SX
Frank S. Greco, ACØTT
Jeremy E. Griffel, K2GRI
Michael F. Grimsley, KF4W
Stephen L. Haggard, W3SLH
Richard E. Hoerner, KB3VAE
Aubrey L. Holt, KC5VLC
Timothy R. Holzheimer, N6DIY
Scott B. Howard, N9SBH
Kurt R. Jackson, W1OBQ
John C. Keel, Jr., AA5JK
Michael R. Keller
Mark S. Kempisty, AA3K
Gregory D. Knippa, KD5HLV
Brian F. Knoll, AA4BK
Uwe Koenneker, DL8OBF
John K. Lamb, II, KU5D
Matthew A. Lankford, AA5ML
Gordon B. LaPorte, K1VHR
John N. LaRock, K8XD
Lora L. Lemons, NJ2J
James D. Lowery, KI4USA
Benito Loyola, Jr., K4BLV
George E. Maynard, KQ4ARK
Daniel R. Mc Eleney, AC1JL
Nicholas R. Mclarty, N4AMU
Louis A. Molettiere, W1LAM
Eric M. Morehead, K4UXO
James L. Norris, III, K4JLN
Louis E. Paulerio, AE6LP
Justin Plock, KC1LMF
Douglas L. Preston, K7VVW
Greg W. Putman, AD8PF
Scott C. Rock, KQ4RTN
Jason J. Sample, KB1PQB
Matt Schooley, KDØNZL
Jeffrey P. Seaman, KJ7TTY
John F. Sheaffer, W6TXR
John T. Shingara, II, WB3EYB
James S. Simeone, KC2AOF
Lawrence A. Simpson, KF5TX
Stephen T. Smith, N4TYL
George C. Strother, KL7GS
Robert L. Toellner, WB5EKS
Rex A. Turvin
Bryant H. Walley, K5KRZ
Jason E. Woods, KG5OHV
Joel D. Wright, W4TZY

ARRL Year of the Club

We're celebrating the 100th anniversary of ARRL's Field Organization by focusing on clubs throughout 2026.

Mike Walters, W8ZY
ARRL Field Services Manager

It's been 100 years since ARRL's Field Organization was developed. This is a major milestone for the volunteer-based administrative and operational structure of the League, which allows ARRL programs and activities to be managed at local levels throughout the US and its territories. One of the major contributors to this local-level management is the ham radio club. That's why we're celebrating this landmark year by declaring it the Year of the Club.

Honoring Community Contributions

ARRL Affiliated Clubs (**www.arrl.org/affiliated-club-resources**) have been a major part of the growth and development of ARRL and its Field Organization over the years, with the oldest Affiliated Club — Dallas Amateur Radio Club, W5FC — being affiliated since 1919. It leads the list of more than 2,800 ARRL Affiliated Clubs across the country, with more joining each month.

Local clubs are holding licensing classes, performing Volunteer Examiner sessions, supporting community events like races and fairs, and providing emergency communications on a regular basis. They also frequently work with schools to give young students the opportunity to talk with astronauts aboard the International Space Station or to launch a pico balloon that can be tracked across the country or around the globe. Radio clubs are often the first introduction to the hobby that a new ham receives, and they're the face of ham radio for the public, community officials, and emergency agencies.

Members of the Providence Radio Association, W1OP, visited W1AW on December 9, 2021, to celebrate 100 years of ARRL affiliation. [Mike Walters, W8ZY, photo]

In addition to recognizing community contributions, the Year of the Club honors club diversity — contest clubs get together and operate on-air contests, repeater clubs operate and maintain local repeaters, some clubs are formed to bring together DX operators as they strive to get elusive contacts, EmComm clubs work with local emergency services in times of need, school clubs allow students and teachers to learn about the many aspects of STEM through wireless communication, and general interest clubs may represent many aspects of the hobby.

It's important to note that clubs, like the rest of the ARRL Field Organization, are made up of volunteers who give their time, experience, and often money to make a club successful. These clubs and the many ham radio volunteers (without whom we would not have the diverse hobby that we have today) deserve to be celebrated. No matter their size, all clubs share the same vital fundamentals — they care about ham radio and their communities, and they want to see the hobby continue to grow.

Ongoing Celebrations

As a part of the Year of the Club festivities, we've initiated contests for club newsletters (**www.arrl.org/news/arrl-year-of-the-club-newsletter-contest-call-for-submissions**) and club websites (**www.arrl.org/news/arrl-year-of-the-club-website-contest-call-for-submissions**) and will be holding on-air club-focused events. Also, a new Worked All States award is available for 2026 — W1AW will travel to all 50 United States, and you'll be able to hear "W1AW/" from a different location on the air nearly every week of the year!

Follow the activities on the Year of the Club website at **www.arrl.org/year-of-the-club**. As more information and activities are announced, links will be posted there. Be on the lookout for related stories in *ARRL Club News* (**www.arrl.org/club-news**) and *The ARRL Letter* (**www.arrl.org/arrlletter**), as well as on the ARRL website at **www.arrl.org**.

Dave Casler, KEØOG, askdave@arrl.org

Ask Dave

Get more information from the "*QST:* Ask Dave" YouTube playlist at **https://bit.ly/3z2MBMI**.

Propagation, Radials, and Coax

The Grayline Propagation Phenomenon

Q Ernie Martin, WØAUU, asked, regarding grayline propagation: I see these screens with the world map on it, and it will have a top half of a sine wave-looking area in the middle that is light and to the right and left is dark. Is that light area the grayline? Should I point my beam at countries in the light area? Is that how it works?

A The map you're describing is a Mercator projection, one of many ways to depict a spherical Earth on a flat sheet of paper, as shown in Figure 1A. This projection depicts the areas around the equator with relative accuracy, but the closer you get to the poles, the larger the distortion.

In reality, the earth is nearly spherical (an oblate spheroid) and is constantly rotating, with a full rotation every day. The sun shines on half of the earth, and the other half is in darkness, as illustrated in Figure 1B. We call the boundary between night and day "twilight." A band of twilight circles the earth at any given time, and you experience twilight twice a day, at sunrise and sunset. In Figure 1B, the light portion of the map is daytime, the dark part is nighttime, and the gray area — the grayline — is twilight.

As the earth turns, twilight circles the planet, but the parts of Earth being swept by twilight vary with the seasons due to the planet's axial tilt. During twilight, the ionosphere changes from daylight to nighttime conditions, or vice versa. Unusual propagation can sometimes occur between ham stations that are both in twilight, even if they're on the other side of the earth. To contact a station with grayline propagation, wait until twilight and point your antenna toward a station that is within the grayline at the same time. The parts of the globe that are in twilight at the same time as you change with the seasons. So, if you have an area you wish to contact, prediction tools like DX Atlas (**https://dxatlas.com**) can determine what time of year is best for your DX attempts.

There are actually three different subcategories of twilight. Civil twilight, from sundown to when the sun is 6 degrees below the horizon, is still bright enough to read a newspaper outside. Nautical twilight is when the sun is between 6 and 12 degrees below the horizon; you probably can't read in the low light, and some brighter stars appear. During nautical twilight, the horizon is still visible at sea, making nautical measurements and navigation easier. Astronomical twilight puts the sun between 12 and 18 degrees below the horizon. During astronomical twilight, stars are visible, but sunlight is not completely gone. Once the sun is 18 degrees below the horizon, astronomical night is in full swing. All this is reversed for morning twilight.

Note that grayline propagation is a possibility, not a given. That said, if you're interested in contacting a very distant DX station, grayline propagation may offer what you're looking for.

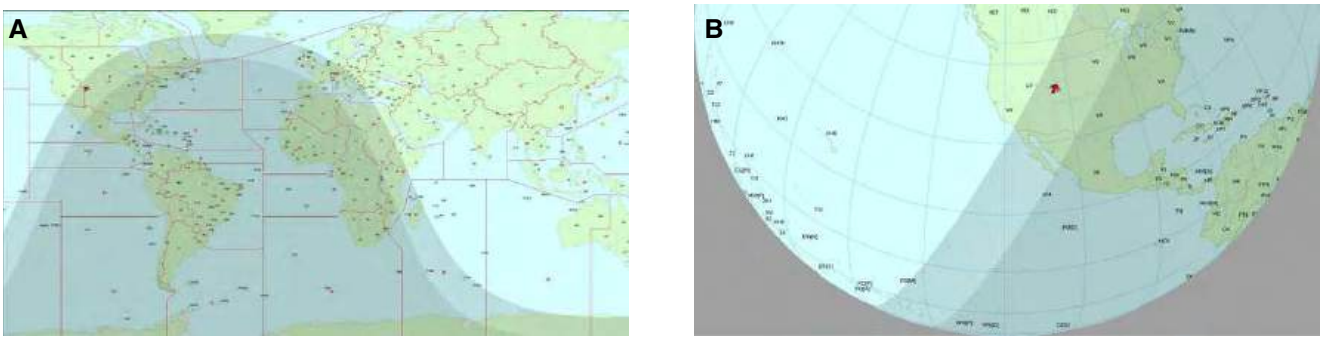

Figure 1 — Maps of Earth from DX Atlas (**https://dxatlas.com**). The first map (A) is a Mercator projection showing daylight, nighttime, and twilight. The map is distorted, particularly as you move toward the poles. On this map, twilight is depicted as a gray band, known as the "grayline." The second map (B) shows a spherical Earth as seen from space. Note that you can set DX Atlas to display civil twilight alone, both civil and nautical twilight, or civil, nautical, and astronomical twilight.

Sloping Ground vs Radials

Q Tom Gauvin, KC1PVO, asks: I am putting up a ground-mounted multiband vertical antenna at the edge of a level part of my yard — it slopes down from there. About half of the radials will be on level ground, but the other half will be on the 45-degree slope. How will this affect the antenna's input impedance and radiation pattern?

A A resonant ground-mounted vertical antenna with radials has about a 30 Ω input impedance. As a result, no matter how carefully you tune it, you will not get much better than a 1.6:1 standing wave ratio; however, most HF radios these days have antenna tuners that can handle this. The radials that slope down actually cause the impedance to rise, making your antenna tuner's job easier. Note that most VHF vertical antennas have built-in radials that slope down about 45 degrees, which tends to raise the input impedance closer to 50 Ω. Your downward-sloping radials will do the same thing. There is nothing wrong with this configuration.

The radiation pattern will change a bit to favor a downslope pattern, but this effect will not be pronounced.

Selecting Coax

Q Joel Chaney, K8SHB, asks: How do I pick the right coaxial cable to use between my transceiver and antenna?

A The radio and antenna are connected via a transmission line. There are two types of transmission line: parallel wires and coaxial cable. Coax is constructed with a center conductor placed inside a hollow or insulation-filled tube in such a way that the two can't short together (see Figure 2). This cable type dates back to the first transatlantic telegraph cable in 1858, years before it was finally satisfactorily explained mathematically by Oliver Heaviside in 1880.

Each type of coax has a characteristic impedance, or the ratio of the voltage to the current when the cable is carrying RF energy. In amateur radio, we generally use coax with 50 Ω impedance. Each end of a coax line has one of three types of plug: PL-259 — so-called "UHF" cable, matched to an SO-239 receptacle — BNC, or SMA. In the US, PL-259 connectors are usually used for 100 W radios and antennas; in Europe and other regions, so-called "N-connectors" are commonly used.

Common coaxial cables used in amateur radio include RG-8U, a thick cable that can handle high power; RG-8X, a thinner cable that can easily handle 100 W radios; RG-213, a flexible cable the size of RG-8U with a stranded center conductor; LMR-240, a Times Microwave cable similar to RG-8X but with a double outer conductor, and LMR-400, a Times Microwave cable similar to RG-8U but much better shielded. I suggest buying your cable from a reputable source, as there's a lot of low-quality cable sold at online marketplaces. But even the best cable does not last forever — water ingress and faults in the plastic outer sheath are common reasons for coax degeneration.

Figure 2 — Cutaway view of a Times Microwave LMR-400 coaxial cable. [Dave Casler, KEØOG, photo]

All cables exhibit a frequency-dependent RF signal loss per foot. At HF, all the cables mentioned above are fine, but at VHF and above, including 2 meters and 70 centimeters, you'll want to go with a lower-loss cable, such as RG-213 or LMR-400, to connect your station to a rooftop antenna.

Coaxial cable is not cheap, typically running more than a dollar per foot for RG-8X (my favorite cable) and even more for the thicker varieties. Coax is available from nearly all ham radio dealers. On your QRZ page, you say that you run about 600 W. At this power level, Belden RG-213 with PL-239 connectors on each end is a good choice. You can purchase this with the connectors already mounted. Don't forget to include lightning arrestors in your cable runs. If you want to go for something more deluxe, use Times Microwave LMR-400. Times Microwave sells PL-259 crimp connectors, but you will need their specialized connector mounting tools. It would be less effort to get the cable with connectors already attached.

Send your questions to **askdave@arrl.org**. I answer some questions here, and some via videos on my YouTube channel (**www.youtube.com/davecasler**), or during my weekly livestream on Thursdays at 6:45 to 8:15 PM Mountain Time on my channel.

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

CW Sunday Net

2 Meters (146.550 MHz simplex) @ 8 p.m. Local Time

Net Reports

440 Net Report, From Joe Miko, WB3FMT

Held on November 12, 20:00-20:13, with three participants:

W3PGA	NCS	Joe	Essex
KB3VAE		Richard	Essex
KB3QWC		Larry	Middle River
KC3YGF		Jeffrey	Middle River

Vecteezy

Local Area Nets

Day	Time	Freq. (MHz)	Net Name
Daily	9 – 10 am	146.670	Oriole Net
Daily	6 pm	3.820	Maryland Emergency Phone Net
Daily	6:30 – 7 pm	146.670 PL 107.2	Baltimore Traffic Net
Daily	7 pm & 10 pm	3.557 CW	MD/DC/DE Traffic Net
2nd Tue	7:30 pm	146.670	Baltimore County RACES Net
2nd & 4th Tue	7 pm	146.775, (-) PL 146.2	Harford County, MD, ARES
3rd Fri	8 pm	WASH_DC Node 6154	MDC Section EchoLink
When activated by NOAA		147.030	SkyWarn (primary)

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From the Skies Over Mt. Essex

SKY Events for January 2026

Jan 1, Wednesday HAPPY NEW YEAR 2026 A.D.

Date	EST (h:m)	Event
Jan 01	16:43	Moon at Perigee: 360348 km
03	05:03	FULL Winter or Wolf MOON
03	12	Earth at Perihelion: 0.98330 AU, 91,403,637 miles from the Sun.
03	17	Quadrantid Meteor Shower
03	17:01	Jupiter 3.7°S of Moon
03	22:28	Pollux 3.0°N of Moon
04	07:26	Latest Sunrise at 40°N
06	06	Mercury at Aphelion
06	11	Venus at Superior Conjunction
06	11:20	Regulus 0.5°S of Moon
07	06:22	Moon at Descending Node
09	05	Mars in Conjunction with Sun
10	03	Jupiter at Opposition
10	10:48	LAST QUARTER MOON
10	18:50	Spica 1.6°N of Moon
13	15:48	Moon at Apogee: 405437 km
14	14:28	Antares 0.6°N of Moon
18	14:52	NEW MOON
21	11	Mercury at Superior Conjunction
21	19:03	Moon at Ascending Node
22	15	Venus at Aphelion
23	07:31	Saturn 4.3°S of Moon
25	23:47	FIRST QUARTER MOON
27	16:07	Pleiades 1.1°S of Moon
29	16:53	Moon at Perigee: 365878 km
30	21:31	Jupiter 3.8°S of Moon
31	08:45	Pollux 3.0°N of Moon

Planet Lookout at Mid-Month

Sunrise 07:14 EST and Sunset 17:09 EST

Mercury EMorning Rise 7:20 Set 16:41; Mag -1.0 Size 4.7 arc seconds Sup Conj, too close to the Sun to be seen

Venus Evening Rise 07:37, Sets 17:13, Mag -3.9 size 9.8 arc seconds. Hidden by the Sun

Mars Evening Rise 7:24, Sets 16:54, Mag +1.2 size 3.95 arc seconds. Hidden By the Sun

Jupiter Evening, Rise 16:26, Sets 07:12, Mag-2.7 size 46.5 arc seconds.

Saturn Evening, Rise 10:25, Sets 22:09, Mag+1.2 size 16.8 arc seconds.

Uranus Evening Rise 12:56 Sets 03:18; Mag +5.7 size 3.6 arc seconds.

Neptune Evening Rises10:27 Sets 22:23; Mag +7.9 size 2.4 arc seconds.

Upcoming Events in 2026

Planets – Mercury and Venus in 2026

Maximum Eastern and Western Elongations

		Date	°	
Mercury	EE	2/19	18.1° E	
		06/15	24.5° E	
		10/12	25° E	
	WE	04/03	27.8° W	
		08/02	20° W	
		11/20	19° W	
Venus	EE	08/15	46°E	WE not Visb

Mars Opposition **None in 2026**

Moon 2026

Blue Moon – (3rd FM in a Season of 4 FMs) - **05/01/26**

Harvest Moon **Sept. 26, 2026**

Hunter Moon – **Oct. 26, 2026**

Super Moons -Full Jan. 3, Nov. 24th, Dec 23rd, 2026

Largest Moons Dec. 24th Smallest May 31h 2026

Lunar Eclipses in 2026 - 1 Tota, 1 Partial Eclipse 03/03/26T and 08/28/26 P

Friday 13th in 2026 – 02/13/26, 03/13/26 & 11/13/26

Sun Ended Sunspot cycle 24, began cycle 25 in Dec. '19

Solar Eclipses in 1 visible in 2026 8/12/26 09:15 – 11:29 Partial Eclipse 11%

Meteor Showers for 2026 Predictions - 1 Good, 2 Fair

Quadrantids 1/3	Full Moon	Poor	>120 per hr
Eta Aquarids 5/6	1st Quarter	Fair	50 per/hr
Delta Aquarids 7/31	Full	Poor	25 per hr
Perseids 8/13	New	Good	80-100 per hr
Orionids 10/21	1st Quarter	Poor	20 per hr
Leonids 11/18	1st Quarter	Poor	15 per hr
Geminids 12/14	1st Quarter	Fair	>150 per hr

Seasons in 2026

Earth Perihelion	01/03/2026	12:15 EST
Earth Aphelion	07/06/2026	13:30 EDT
Vernal Equinox	03/20/2026	10:46 EDT
Summer Solstice	06/2 1/2026	04:24 EDT
Autumnal Equinox	09/22/2026	20:05 EDT
Winter Solstice	12/21/2025	10:03 EST

Daylight Saving Time 2026

Starts 03/08/2026 - Ends 11/01//2026

Easter Dates 2026 Full Moon 04/01/2026

Good Friday (Western) April 03,2026
Good Friday (Greek) April 10, 2026
Easter Sunday (Western) April 05,2026
Easter Sunday (Greek) April 12,2026

About the Aero Amateur Radio Club

Officers		Committees	
President	Joe Miko, WB3FMT	*Repeater*	Phil Hock, W3VRD Ken Erisman, NE3A Dave Brunner, AC3EO
Vice President	Rob Ballou, AE3B	*VE Testing*	Pat Stone, AC3F
Recording Secretary	Larry Hill, KB3QWC	*Public Service*	Bob Landis, WA3SWA
Corresponding Secretary	Pat Stone, AC3F	*Webmaster, Facebook*	Rob Ballou, AE3B
Treasurer	Tom Hawkins, WA3QLY	*Trustee*	Dave Frederick, KB3KRV (W3PGA) Jim Marshall, KC3FBL (AE3RO)
Resource Coordinator	Ron Distler, W3JEH	*Club Nets*	Joe Miko, WB3FMT
		Contests	Harry Rundall, AC3EK
Newsletter Editor	Cathy Feinman, W3CLF		

Aerial archives dating to 2004 are available at https://w3pga.net/the-aerial-newsletter-library/

Website: http://w3pga.net

Facebook: https://www.facebook.com/W3PGAClub

Email: w3pgaclub@gmail.com

Meetings

We meet via Zoom at 7:00 PM ET (channel will open around 6:00 PM).
Check your email for the link or inquire at w3pgaclub@gmail.com.
All are welcome to attend. Arrive early to socialize.

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