

443.300 – Plus offset (5 MHz), tone 67 Hz  
145.430 – Minus offset (600 kHz), tone 67 Hz  
146.460 – Plus offset (1 MHz), tone 67 Hz  
146.685 – Minus offset (600 kHz) DMR



*VE Testing Policies; test sessions begin at 6PM – just prior to the 7PM monthly meeting on the 3rd Tuesday of each month.*



# SMRA AMATEUR RADIO CLUB

[WWW.N3TWT.ORG](http://WWW.N3TWT.ORG)

## ED OTTO, W3ETO - PRESIDENT'S MESSAGE

**TUESDAY 17 MAR 2026 AT 7:00 PM**

**GENERAL SMRA MONTHLY MEMBERSHIP MEETING**

**ALSO STREAMED ON ZOOM**

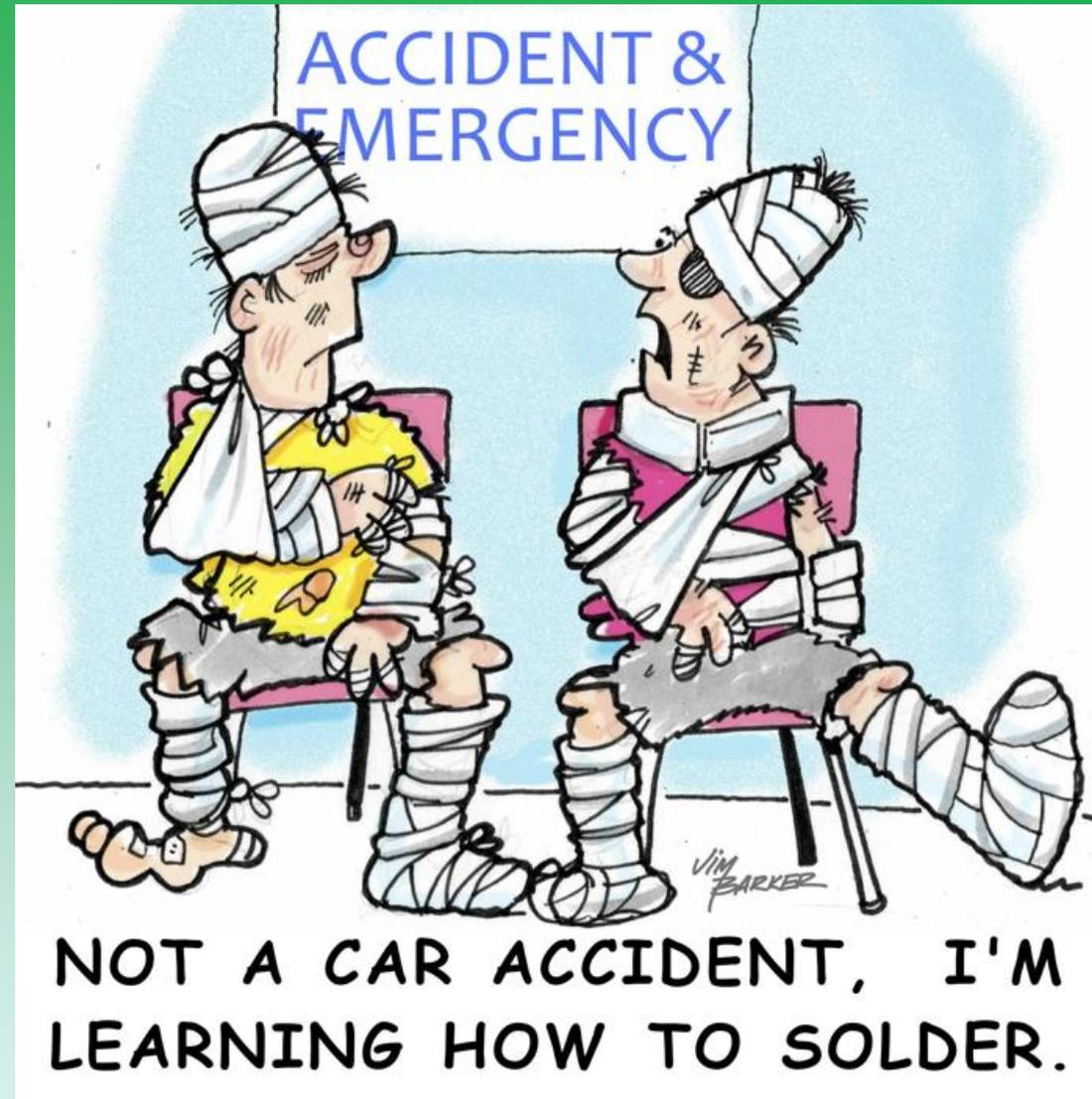
# CALL TO ORDER

- ▶ Recognition of guests
  - ▶ New member applications
  - ▶ Acceptance of new members
- 
- ▶ New Members: We use the message system Groups.io for communicating to members. You will see a request to join SMRA.Groups.io



# TONIGHT:

- ▶ Dues
- ▶ Presentation: HexBeam Antennas
- ▶ SMRA Project Updates
- ▶ Volunteering and thanks!
- ▶ Shack-of-the-Month or Gadget of the Month
- ▶ Emcomm/ARES
- ▶ Website
- ▶ Summer Field Day Planning
- ▶ Officer's report
- ▶ Nets
- ▶ Announcements, Contests and Events
- ▶ Around the Room – as time permits



# SMRA DUES:

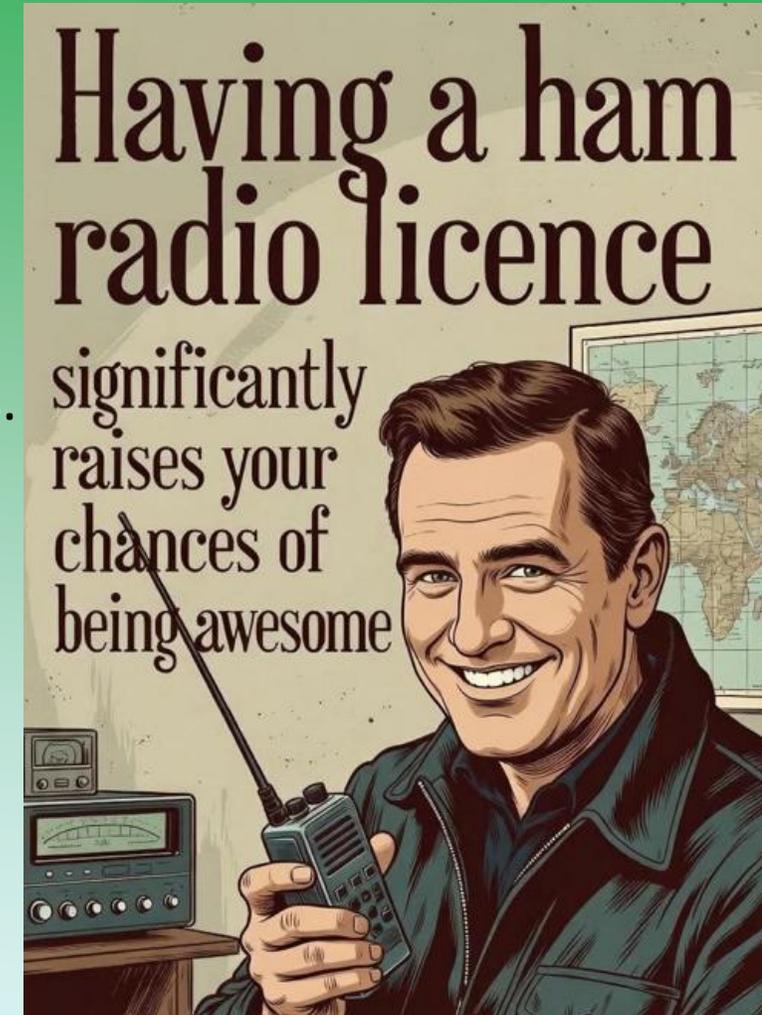
- ▶ Due on the **last day of February 2026**
- ▶ Easy to Pay on the Club Website: <https://n3twt.org/renew-membership-2>
- ▶ Sign in is current, so if you are **RED**, you owe dues for the year.
- ▶ Dues: **\$10.00 via PayPal** on our website or \$12.00 by check\*.
  - ▶ **PayPal** is preferred and much easier for the club.
- ▶ Family dues: \$18.00
- ▶ Lifetime dues: \$100.00 **\*\*\* Best deal going.**
- ▶ Lifetime family dues: \$140.00

\*Mail your \$12.00 Check to:

South Mountain Radio Amateurs c/o Mike Giordano-K3ESQ,  
221 West Main Street, Mechanicsburg, PA 17055.

# GROUPS.IO FOR SMRA CLUB INFO:

- ▶ We have a great number of unique SMRA sub-groups on Groups.io
- ▶ Members may not know about them
  - ▶ NOTE: Groups.io emails can easily be blocked by SPAM Blockers.
- ▶ Don't need to email all groups, the same content.
- ▶ **SMRA@Groups.io – Goes to everyone.**
  - ▶ Announcements, Events, Interesting HAM radio news
  - ▶ Discussion and Questions welcome
  - ▶ **Are you on this group and receiving emails?**



## South Mountain Radio Amateurs

**Hex Beam Antenna is a modified Yagi antenna; how well does it work?**  
**17-march-2026 jerry sodus..km3k**

**K4KIO**  
**Six-Band**  
**Hex Beam**



**Six Band G3TXQ HD Hex Beam by MW0JZE**



Mike Traffie invented the Hex Beam; **G3TXQ** improved it in 2007.  
His re-design is more broadbanded and usable without a tuner; it is now the basis for all manufacturers.

General disclaimer: I have no interest in any company mentioned in this presentation.

## Road-map...

The two electrical parts of a “Hex Beam” (Yagi) antenna and its “directivity”.

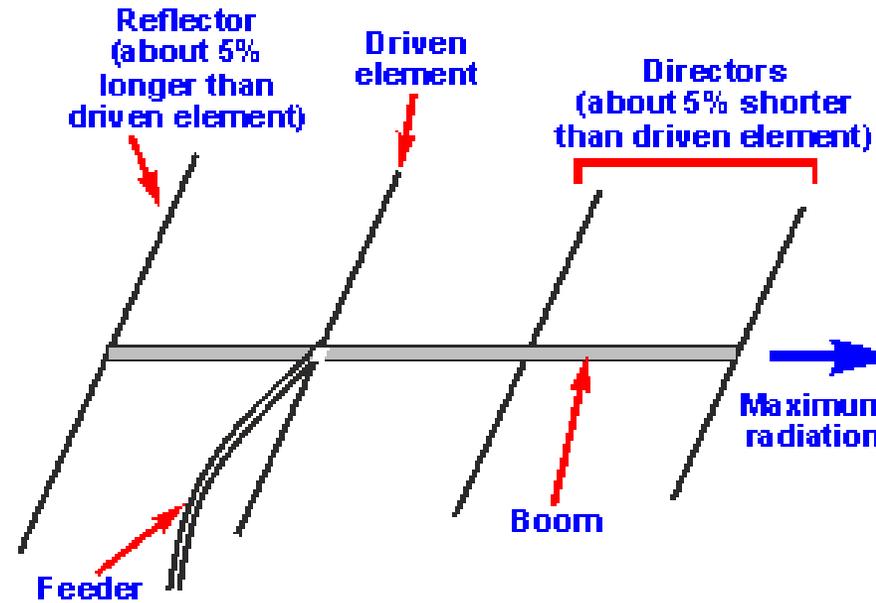
1. First a “four slide” crash course on the “Yagi” antenna; some basic facts.
2. The dipole is the “driven-element.
3. The “parasitic-elements”.
4. What is a Yagi good for?
5. Now for the “Hex Beam” (Yagi) antenna and its two parts; also “directivity”.
6. #6a. To explain all those wires.  
#6b. A look at a VHQ center-post and connections there.
7. It is useful to look at the specifications for a hex beam antenna.
8. Performance data for a hex beam antenna (from K4KIO website).
9. Why “free space” seen on earlier slides?
10. #10a. Explaining why the transmitted signal goes in a concentrated direction.  
#10b. How it works; a different look; this is copied, with editing, from K4KIO.
11. A look at the Hex Beam’s Gain, Front-to-Back ratio (F/B), SWR; we can compare it to a standard yagi.
12. Compare hex beam to dipole performance.
13. Talk a bit about mounting height and other considerations about robust construction.
14. Balun.
15. A look at some USA manufactures with \$\$\$ too.
16. Why a Hex Beam?
17. <https://www.k4kio.com/hex-ed-articles/>.
18. Bibliography.  
(There are nine slides included at the end that are not part of this presentation...slide-22 to slide-30.)

## #1. First a “four slide” crash course on the “Yagi” antenna; some very basic facts.

1. The Yagi has to have at least two parts: a **driver** and a **reflector**.

This is a picture of a 4-element Yagi.

It has:  
a driver,  
a reflector,  
and two directors.



2. A normal Yagi has a metal boom for structural strength; a boom, for 20m, can be quite long (6', 20', 40').

3. **The driver is a dipole antenna**; so you know it has two pieces and is fed in its middle.

These two pieces are **“electrically isolated”** from the metal boom.

**The driver does the “main” radiating; much more will be said later about this.**

Since it is a dipole, the driver must be a “half-wavelength long”.

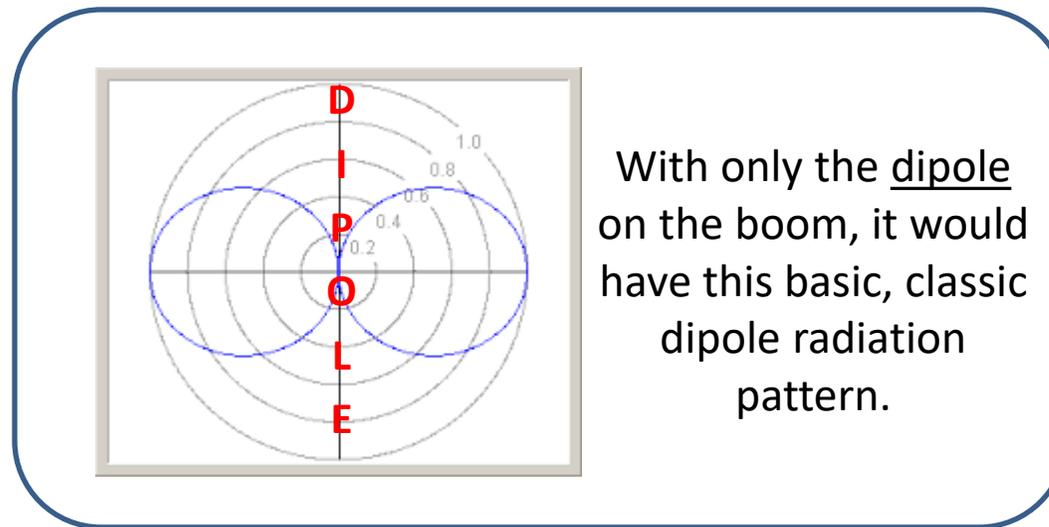
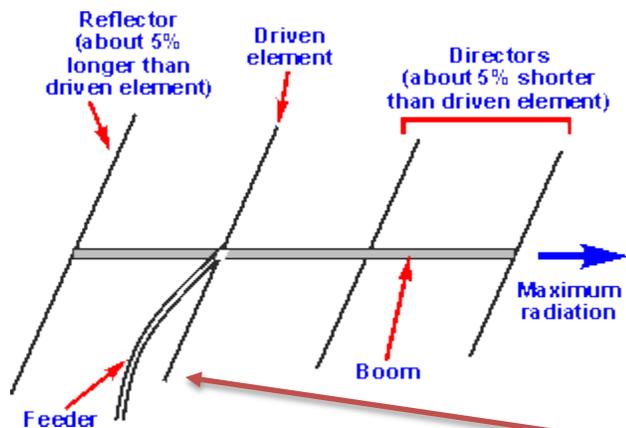
So, for the 20m band (65.6 feet), a “half-wavelength” is 32.8 feet long, which means each piece is 16.4 feet.

In actual practice, the driver is a tad bit shorter.

3a. A Yagi can also have additional parts called **directors**; see picture’s comments.

3b. The reflector and all directors are **connected electrically to the metal beam**; a short-circuit.

## #2. The dipole is the “driven-element”.



With only the dipole on the boom, it would have this basic, classic dipole radiation pattern.

The Yagi antenna design has a dipole as the “main” radiating or **driven-element**.

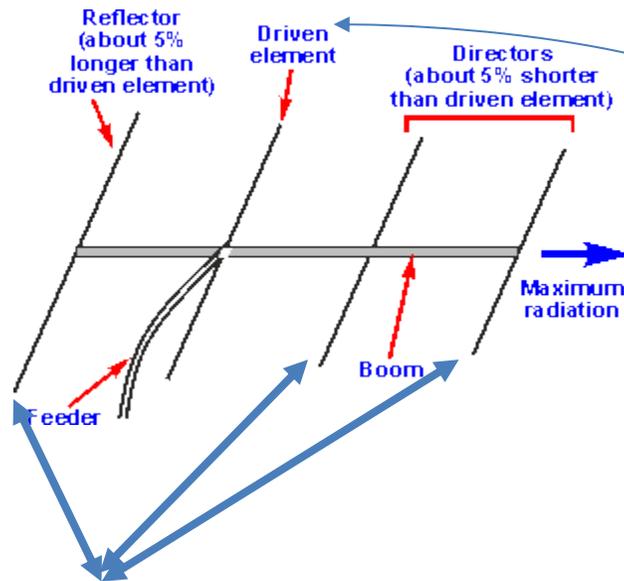
Since it is a dipole, it has two conductive metal parts.

Keep in mind that a dipole is just a transmission-line spread apart.

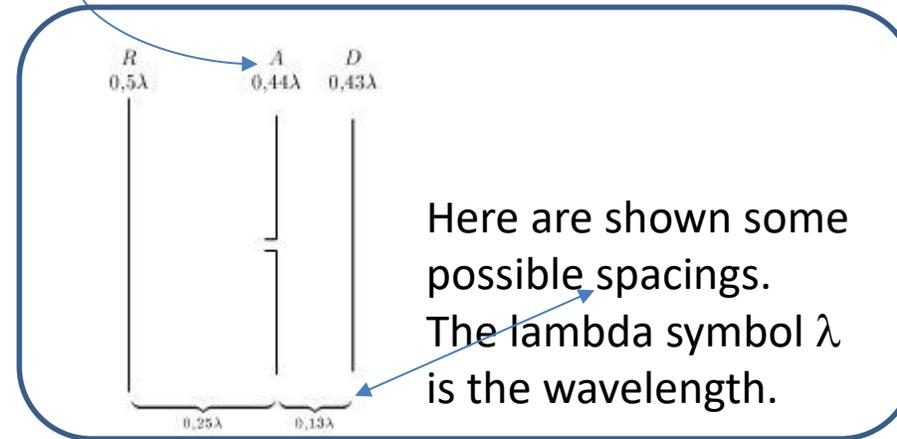
The “**driven-element**” must be electrically isolated from the conductive metal boom.

The feeder is attached to that “**driven-element**”; a yagi’s impedance is low...10 to 40 ohms.

A dipole is balanced; so, if coax feed is used, it must be fed thru a “balun”, which is a simple device to change a coax-cable’s unbalanced-feed to a balanced-feed.



### #3. The “parasitic-elements”.



‘Parasitic-elements’ (reflector and directors) are not directly connected to the driven element.

What is different here is each parasitic-element is one solid conductive metal piece and is **directly connected** to the metal boom; this greatly simplifies mechanical details.

The **reflector** element has the most “bang for the buck”; you have about 4.5dB gain.

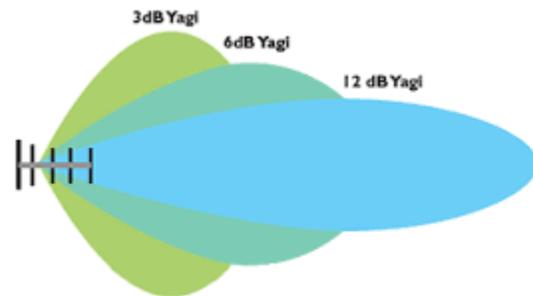
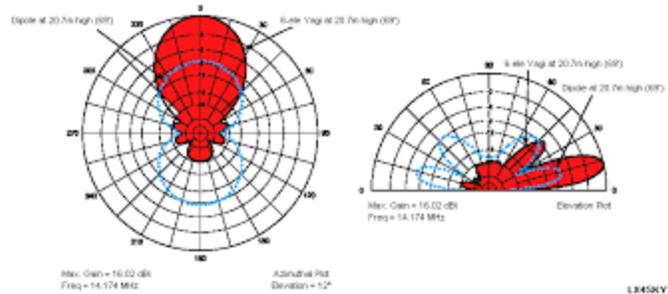
This means that a 100 Watt signal can look like 281 Watts.

If you have just the **reflector** and a **driven-element**, you have a “two-element yagi”.

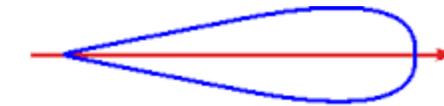
Roughly speaking, the first **director** adds 2dB gain, so the 281 Watts gets to 444 Watts. But each additional **director** adds only 1dB at the expense of greatly lengthening the boom, which adds enormous size and weight to be handled by the rotor and tower.

## #4. What is a Yagi good for?

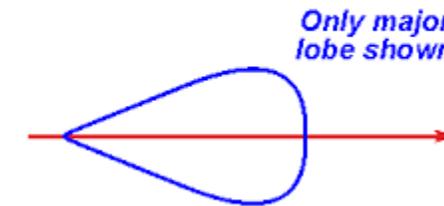
1. The Yagi's most attractive feature is its directivity.  
It is able to “re-direct” most of the RF energy into a desired direction.  
It is not an amplifier, so it does not create gain.
2. Reduces QRM (man-made noise) from other directions making receiving easier.  
**Also has gain for receiving due to reciprocity.**
3. Has a decent low “take-off” angle for DX.



Only the major lobe is shown.

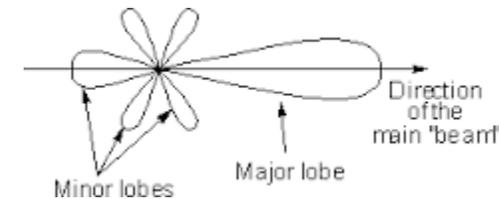


More gain  
narrower beamwidth

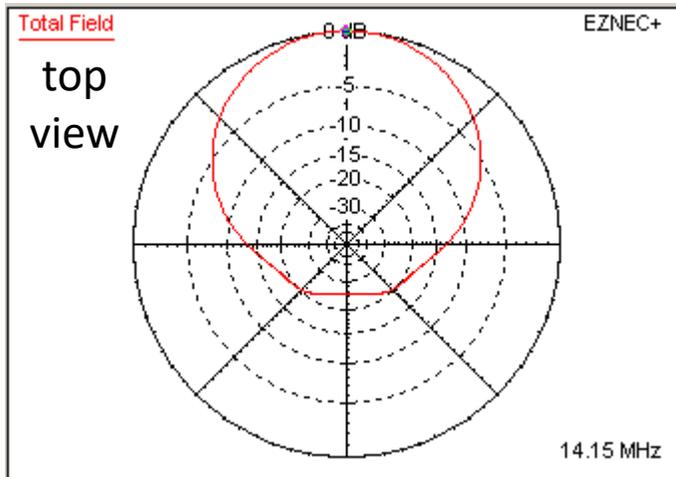
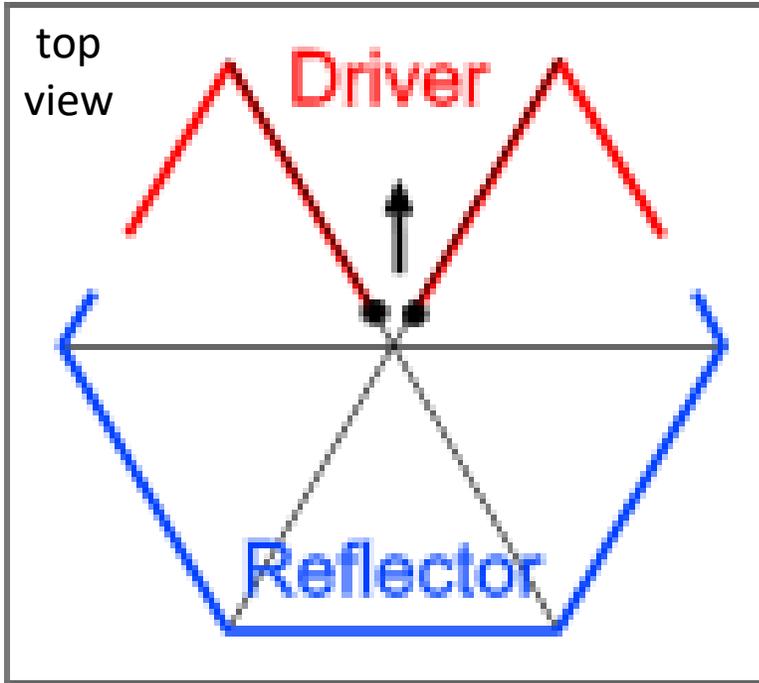


Only major  
lobe shown

Less gain  
wider beamwidth



## #5. Now for the “Hex Beam” (Yagi) antenna and its two parts; also “directivity”.

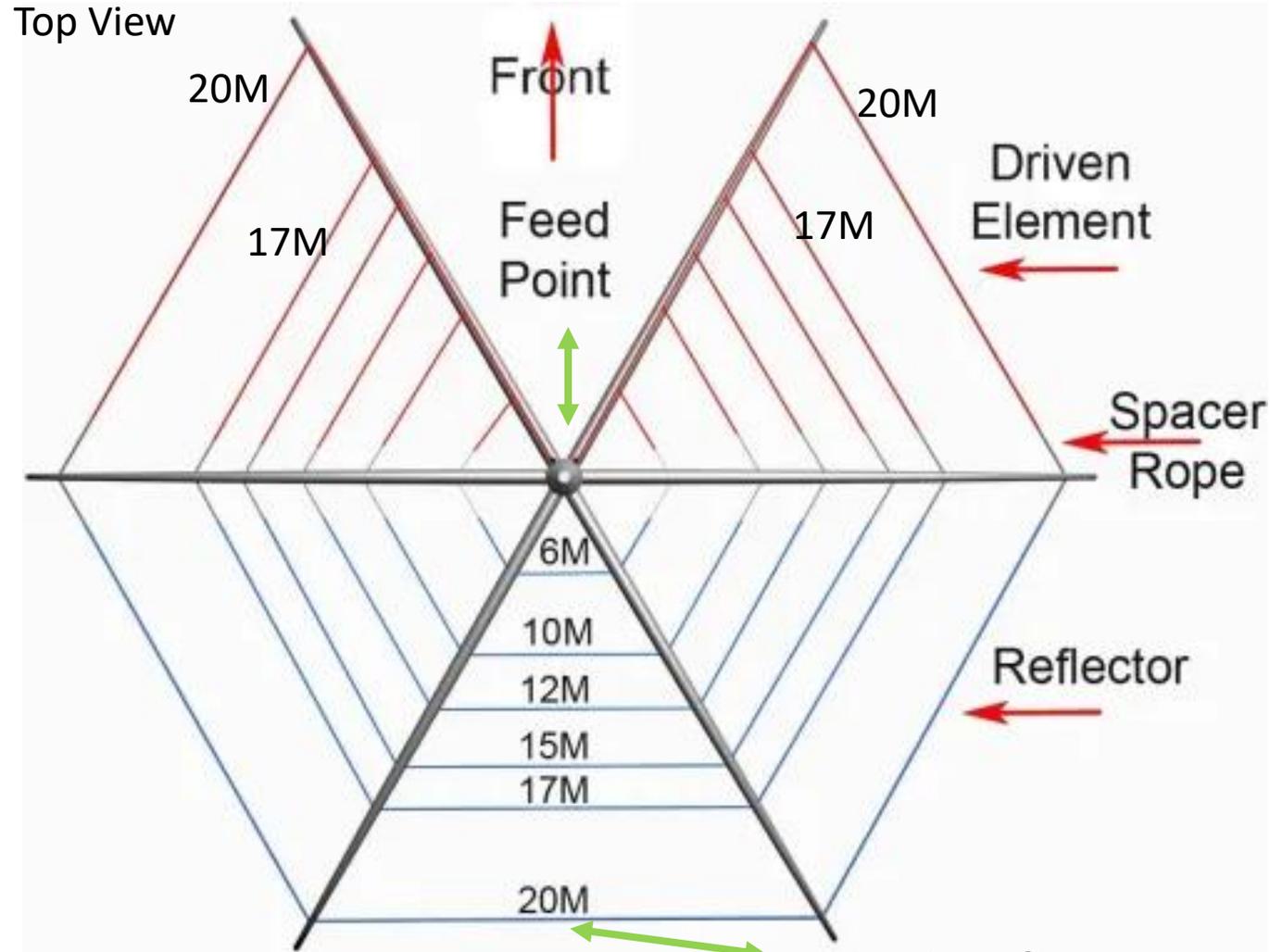


1. The Hex Beam has only two electrical parts; the **Driver** and the **Reflector**.  
So the Hex Beam is a basic “2-element Yagi”.
2. The Hex Beam design warps the **Driver** to “**M**” shape and the **Reflector** to “**U**” shape to compress the overall size.
3. There is no boom.
4. The highly desired directivity is maintained.
5. Notice the **Reflector** is not split in its middle.  
The wire really is a “**short-circuited transmission-line**”.  
(For more details, see slide-28.)

In March-2024, I gave a presentation to the club on Yagi-antennas.  
The material to the left was used in that work.  
The web address I used to get it is no longer active in year-2026 for ham-radio;  
when I was preparing for today, it took me to a gambling website.

#6. To explain all those wires.

<https://wa4nzd.wordpress.com/2014/10/15/hexagonal-beam-antenna-presentation-by-rob-conklin-n4wgy/>



The driver wires on the left side each connect individually to the center post (Feed-Point).

Likewise for the right side.

Do you recall the wire lengths of the 20m Yagi??  
Reflector is ~32.8'  
Driver Elements are ??

The hexbeam is fed with 50-ohm coax.

Notice the reflectors are not split in the middle.  
Technically, it is a **“short-circuited transmission-line”**.



#6b. A look at a VHQ center-post and connections there.

Starting at the top:

1. Support rods to the “spreaders”; two per spreader (top and half-way).
2. Coax feed.
3. Notice the ferrite-bead balun.
4. Connections for the six drivers 20m, 17m, 15m, 12m, 10m, 6m.
5. Take note how the “spreaders” are secured at the base-plate.
6. Just above the base-plate, see the pinkish item. VHQ makes a BIG deal about that piece not failing. Lifetime warranty all their parts.
7. VHQ would not tell me what is inside the center post.

## #7. It is useful to look at the specifications for a Hex Beam antenna.

- **Specifications** (copied from the K4KIO website for their hex beam antenna)
- Bands 20, 17, 15, 12, 10, 6 meters
- Antenna elements 2 per band
- Gain (free space) Peak Approx. 5.4 dBi (Next slide has gain over ground by band)
- Front/Back (free space) Peak >10 dB, (See. below for F/B by band)
- VSWR Less than 2:1 across nearly all bands
- Feed line 50 ohms, single coax cable for all bands
- Turning Radius 10.8 Ft (3.3m)
- Diameter of the beam 21.6 Ft (20M beam), 16.6 Ft (17M beam), 15.0 Ft (15M beam)
- Height of the beam 39 in. (99 cm) from base plate to top of center post
- Weight 26 lbs (11.3kg)
- Wind Load Area 5 Sq Ft (0.46 sq m)
- Power 2,000 watts P.E.P.
- Mast requirement Several mast sizes

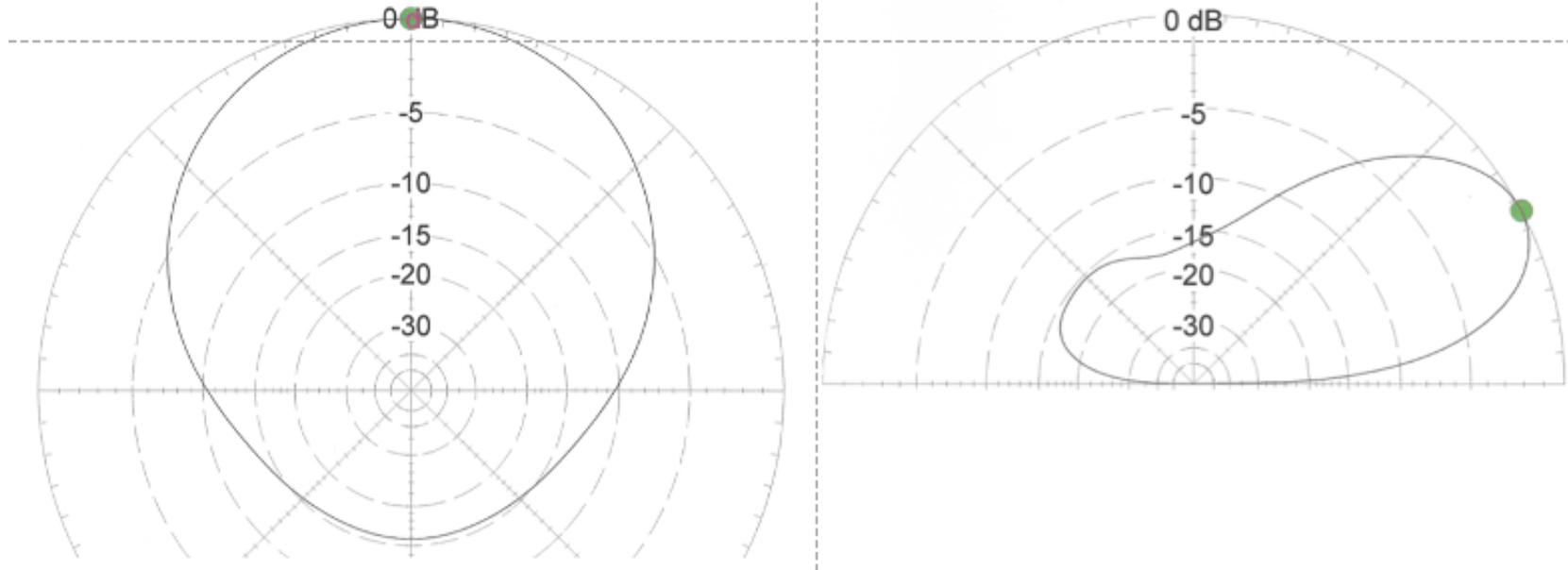
## #8. Performance data for a Hex Beam antenna (from K4KIO website).

KIO Technology Hexbeam Performance (Higher number is better.)

BAND	20	17	15	12	10	6
Gain (dBi)	9.6	10.1	9.4	9.6	9.3	10.4
F/B (dB)	15.7	11.8	9.8	13.6	13.7	10.9

Data are as modeled for antenna performance at 33 ft over average ground and for the optimal vertical takeoff angle. Free space gain peak is 5.4 dBi.

Below azimuthal and vertical radiation patterns for 20 meters only are shown



## #9. Why “free space” seen on earlier slides?

- Free space gain is a pretty standard means of comparing antenna forward gain performance.

Actual forward gain is higher because the radio wave is reflected off the ground and the reflected wave combines with the direct wave to result in a higher gain at a particular vertical angle.

It happens that, if the antenna is  $1/2$  wavelength above ground, the maximal gain will be angled upward about 30 degrees off the horizontal.

But, if the antenna is only  $1/4$  wavelength above ground, the reflected wave and the direct wave will combine for a resultant radiated lobe that is at a higher angle.

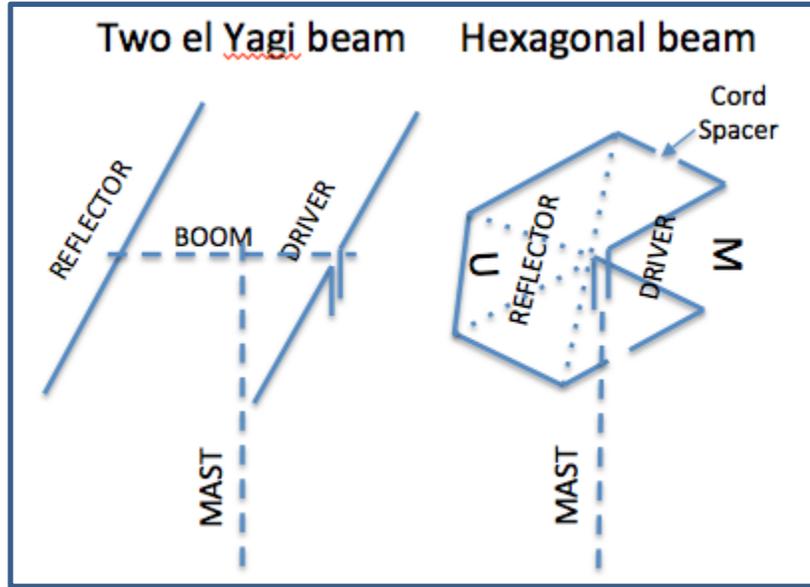
This is important because the lower the skip angle, the longer the skip.

- The height of the antenna affects its performance obviously.  
Manufacturers generally use Free space gain (with the units designated dBi, for isotropic gain) to eliminate the need to discuss the height of the antenna.

Two antennas with different heights can be compared in a valid manner by referencing the free space gain. Higher number is better.

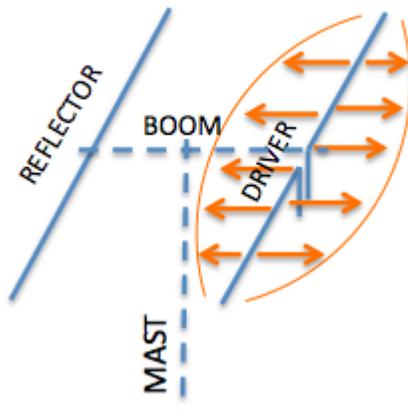
Height is not a factor when talking about free-space-gain nor is ground.

#10a. Explaining why the transmitted signal goes in a concentrated direction.

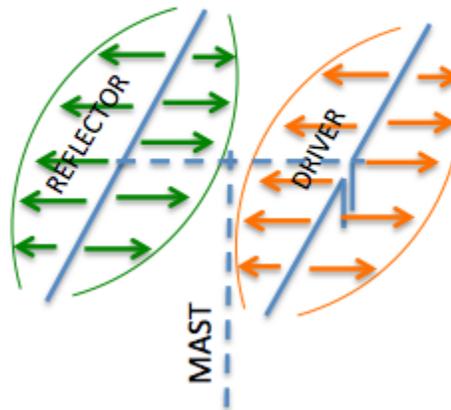


<https://www.k4kio.com/how-does-a-hex-work/>

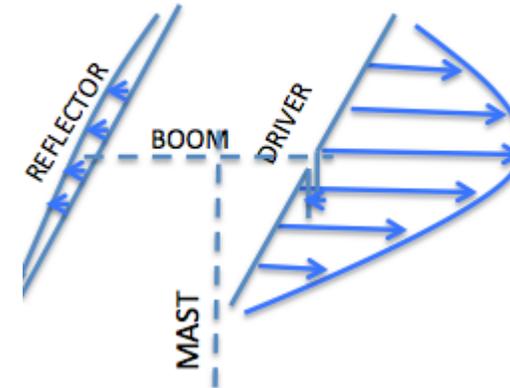
YAGI Driver radiates  
In both directions



Radiation is induced  
into the reflector element



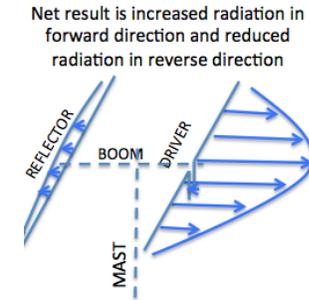
Net result is increased radiation in  
forward direction and reduced  
radiation in reverse direction



## #10b. How it works..a different look; this is copied, with editing, from K4KIO.

So there are two elements radiating;  
the **driver** radiates from energy fed directly from the transmission line;  
the **reflector** radiates from "received" energy.

The energy waves combine with each other  
to cancel in the **reverse direction** and add in the **forward direction**.



Because of the distance between the driver and the reflector elements,  
the reflector wave combines with the driven wave in the **forward direction (right)**  
but subtracts from the driver wave in the **reverse direction(left)**.

This causes, in the **forward direction**, a resultant **stronger** wave than either one of them alone.  
This is how "gain" is achieved in the forward direction.

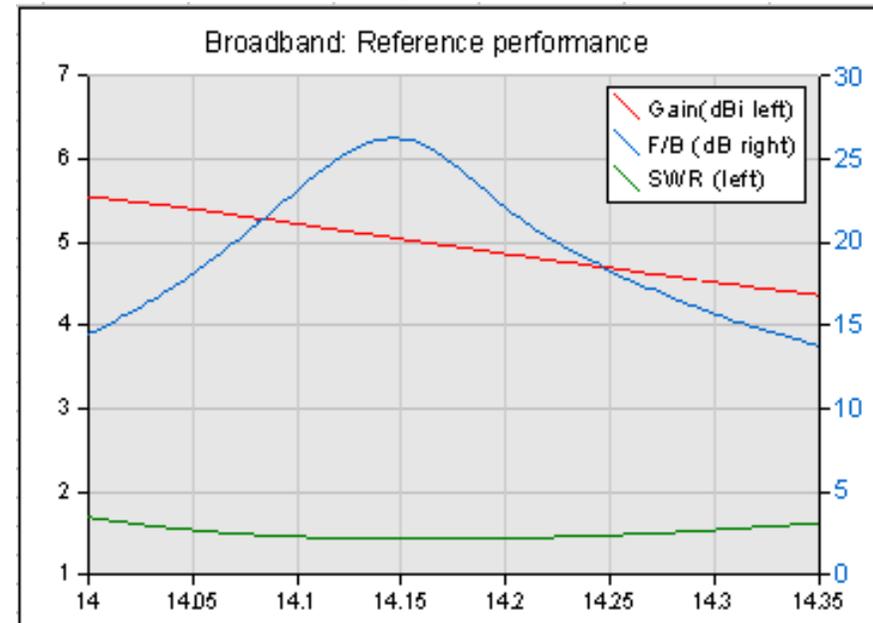
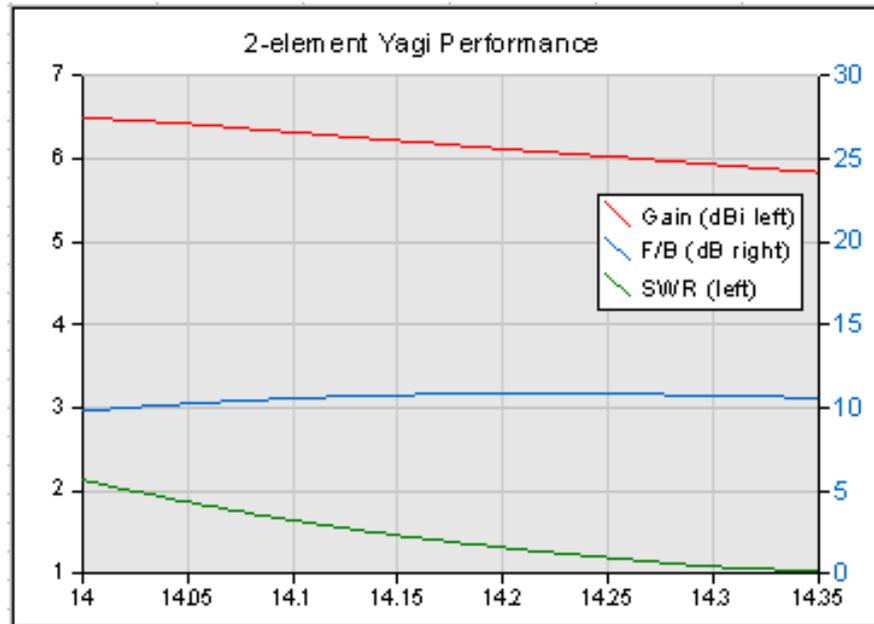
At the same time, in the **reverse direction**,  
the original wave and the reflector's wave tend to cancel each other  
with a net result of a **reduced** RF signal.

This is how the "front/back" effect is achieved; a high number is better.

A parasitic beam does not actually generate any new RF energy.  
It merely results in a focused beam of the original energy fed to the driven element.

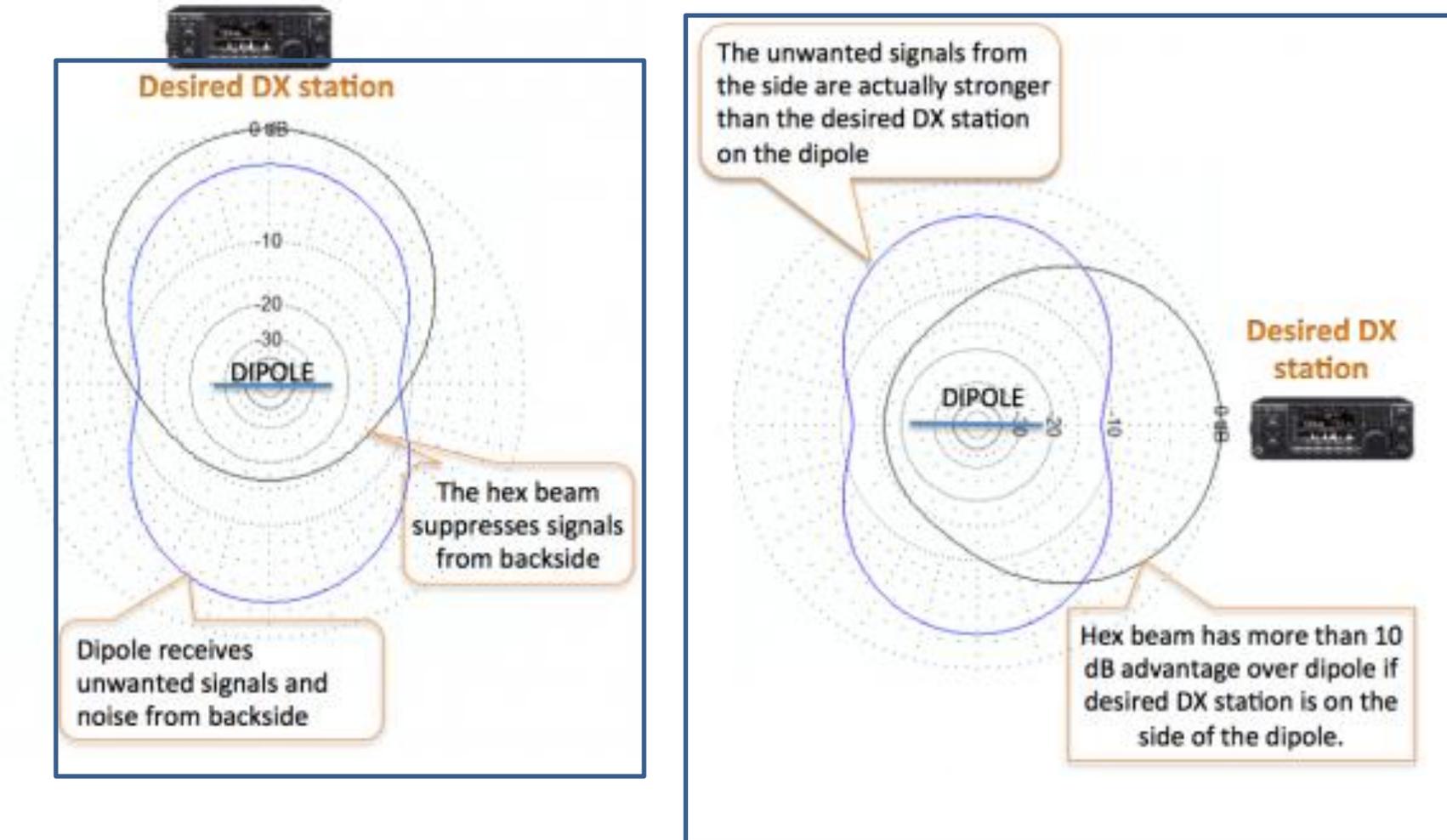
#11. A look at the Hex Beam's  
Gain, Front-to-Back ratio (F/B), SWR;  
we can compare it to a standard 2-element Yagi.

We want high gain, high F/B and low SWR.



As we saw in an earlier slide, where the above came from in year-2024 is now a gambling website.

#12. Compare Hex Beam to dipole performance; this is vitally significant.



## #13. Talk a bit about mounting height and other considerations about robust construction.

### **What is the best height for a Hex Beam antenna?**

#### **Around 35ft**

The Hex Beam works best at heights around 35ft or more but **it gives a good account of itself even at 20ft** – particularly if it isn't pointing towards any close obstructions.

You will see a markedly improved SWR when raised to a reasonable height and away from nearby obstructions such as buildings.

The main differences among Hex Beams are in the physical construction details.

### **How robust is the Hex Beam?**

#### **How will it fare in salt water environments, wind, snow and ice?**

Sturdiness and survivability are important and you can make a hex beam like an M1 Abrams tank but what is the cost and is it too heavy to mount on an inexpensive mast or do you have to have a broadcast quality tower to support it?

As with all good engineering, it is a matter of balancing cost vs survivability. You can spend huge bucks and get a beam that might withstand a Category 5 hurricane but if you just want one that will stand the weather conditions in 99.9% of the time, you won't have to pay your retirement nest egg for it.

## #14. Balun; material taken from K4KIO website.



- **Is a Balun Needed?**
- Yes, a balun is recommended.

- All balanced antennas such as dipoles, Yagis and hexbeams that are fed with unbalanced feed lines such as coax, require a choke balun. Without a choke balun, common mode RF currents flow on the outside of the coax making the feedline act like another antenna.

The radiated RF power this causes will tend to distort the front/back performance or front/side performance of your hex beam. A simple way to greatly reduce this is by use of a good choke balun.

- There are several approaches to a choke balun but **we recommend the use of ferrite beads on the coax cable itself.** A very inexpensive unit such as the ones we sell are quite effective.

- On our hex beams, **we recommend that the choke balun be located at top of the center post and physically strapped to the center post with tape or velcro.**

- Our ferrite bead baluns are available in two different sizes to fit your cable. All of our kits contain five ferrite beads and are generally the same electrically; it's just a matter of the size of your cable. Make your selection of which size ferrite bead choke balun you need in our store.

- **Note that the ferrite bead baluns do not require any coax connectors which is a good thing as our experience has shown that coax connectors in the feedline are the most frequent cause of trouble because of the ingress of water that results in corrosion in the cable.**

The coax connector shown in the photo here should always be wrapped with an appropriate sealant or rubberized tape to keep moisture out of the cable.

The photo shows the coax connector without sealant.

#15. A look at some USA manufactures with \$\$\$ too; there are European choices too.

Maker	Model	Price	Other
<a href="#">Radiowavz</a>	Sentinel	\$1,000	4 Bands (20, 15, 10, 6)
<a href="#">Buddipole</a>	BuddiHex	\$749	6 Bands
<a href="#">NA4RR</a>	NA4RR Hexagonal beam	\$640	6 Bands
<a href="#">VHQ Hexbeam</a>	VHQ Hex beam	\$1,789	6 Bands
<a href="#">KIO Technology</a>	KIO Hex beam	\$561 – \$891	1 – 6 Bands

## #16. Why a Hex Beam?

YouTube videos claim it can work DX just 6' or 10' above ground in a bucket of sand.

● Deep Dive into Ham Radio HEX Beam Antennas: Use, Application, and Installation

# Hexagonal Beam

## You Can Build Your Own

### Why A Hex Beam

- Gain and front/back comparable to a two element Yagi.
- Five or More bands with low SWR
- Broadband characteristics
- Low weight and low wind load
- Construction from general hardware components
- Ease of adjustment
- Requires Less Space to Setup and Use



Southwest FL

TECH NET

www.swfltech.net

18:32 / 44:01

zoom

## [#17. https://www.k4kio.com/hex-ed-articles/](https://www.k4kio.com/hex-ed-articles/)

- Learn more about the amazing hex beam antenna in these Hex Education articles.
- How do I trouble shoot my hex beam?
- What's so hot about the hex beam?
- What about 40 meters on a hex beam?
- Why is a hex beam superior to the dipole?
- Which is better; the Spiderbeam or a hex beam?
- Why is a hex beam better than a vertical?
- How does a hex beam work?
- What is the history of the hex beam?
- Should I paint my hex beam?
- What is a good mast for my hex beam?
- What kind of feedline cable do I need?
- What's a thrust bearing and how is it used with a hex beam?
- Is SWR really all that important?
- Will my hex beam interact with other antennas?
- Which Hex Beam works best?
- What is the direction of my hex beam?
- Does rain on my hex mess it up?

## 18. Bibliography.

1. **ARRL's "Handbook" (2011).**
2. **ARRL's "Antenna Handbook"; 21<sup>st</sup> edition.**
3. Telecon with Leo Shoemaker K4KIO.
4. <http://www.k4kio.com/hexagonal-beam-compared-with-a-dipole/>
5. <https://www.k4kio.com/how-does-a-hex-work/#:~:text=A%20parasitic%20beam%20does%20not,shape%20of%20the%20letter%20M.>
6. <http://www.w8ji.com/antennas.htm>
7. <http://www.voacap.com/antennas/squeezing-decibels-out-of-dipole/>
8. <http://www.radio-electronics.com/info/antennas/yagi/yagi.php>
9. [https://en.wikipedia.org/wiki/Yagi-Uda\\_antenna](https://en.wikipedia.org/wiki/Yagi-Uda_antenna)
10. **"Array of Light" by Tom Schiller, N6BT.**
11. [https://en.wikipedia.org/wiki/Fall\\_of\\_Singapore](https://en.wikipedia.org/wiki/Fall_of_Singapore)
12. <https://www.k4kio.com/which-hex-beam-works-best/#:~:text=Which%20hexbeam%20performs%20the%20best%3F,on%20air%20about%20the%20same.>
13. <https://www.k4kio.com/is-a-balun-required/#:~:text=Yes%2C%20a%20balun%20is%20recommended,feedline%20act%20like%20another%20antenna.>
14. <https://wa4nzd.wordpress.com/2014/10/15/hexagonal-beam-antenna-presentation-by-rob-conklin-n4wgy/>
15. <https://www.vhqhex.com/>
16. <https://www.g3txq-hexbeam.com/index.php/shop-test/products.html?id=184>
17. **Omission of any credit is a regretful and unintended error on my part.**

**We are at the end;  
so that's it, folks.**

**Questions??**

**After this slide,  
there are 9 slides (slide-24 to slide-32)  
that were considered for this presentation.  
There is much useful, helpful “Yagi” information there.  
Also quite interesting.  
I encourage you to take a look.  
All, except the last one, were used in the 2024 Yagi PPT.**

## Dipole-101.

The dipole is the basic building block of many antennas; true for the yagi-uda.

A dipole, in free-space, has 2.15dBi gain over an isotropic radiator, which is a theoretical antenna in free-space.

The notion a dipole has around 2.15 dBi gain is only true for free-space.

**But, bringing that dipole down to one wave-length over good ground, it now has about 8 dB gain over an isotropic radiator.**

8dB ≈ 2.15dBi + 3dB from putting it over ground + 3dB from ground reflection gain.

Always remember this thought when you see antenna-gain over earth given in dBi;

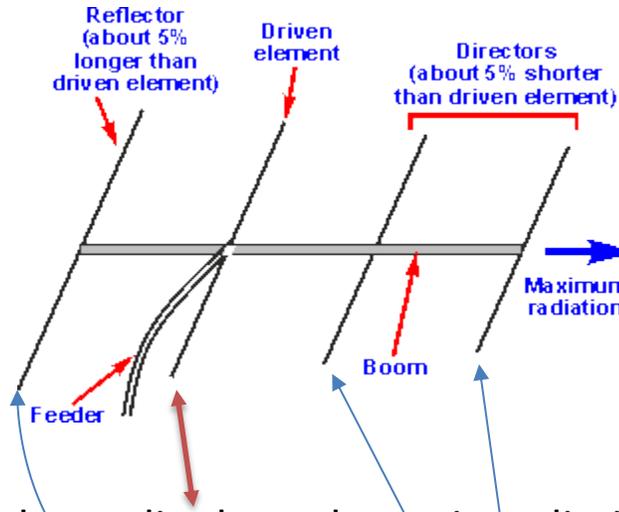
**“If any antenna over earth shows a ‘gain’ of about 8 dBi, its gain is doing no better than a dipole.”**

That said,

it may have other redeeming qualities as we have seen on the previous slide.

(The above material is adapted from websites by W8JI & OH6BG.)

## What are the names of its parts?



The Yagi-Uda antenna design has a dipole as the main radiating or **driven-element**. Another name you may see or hear used for this part is “**driver**”.

‘Parasitic-elements’ called “**reflector**” and “**director**” are added, which are not directly connected to the driven element.

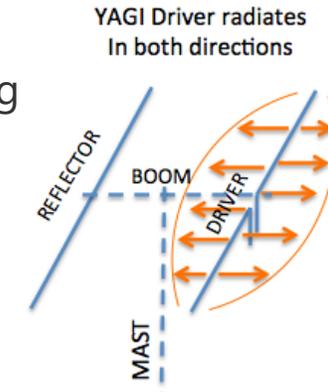
The **boom**, of necessity, must be structurally sound and so is typically conductive metal; the boom is electrically at ground potential.

The yagi shown above has four elements... one “**reflector**”, one “**driver**”, and two “**directors**” and so is called a “four-element yagi”.

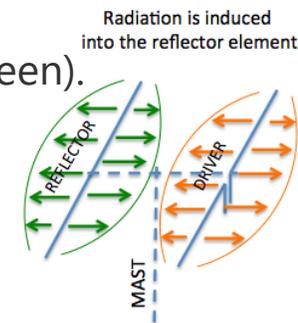
## How it works..a different look; this is copied, with editing, from K4KIO.

A two element Yagi has a **driver** and a **reflector** made of aluminum tubing that is mounted on a boom and supported by a mast.

Basically, the **driven element** configured as a dipole radiates in both directions broadside to its axis as shown in orange.



When the RF wave strikes the reflector element, it induces current in the reflector causing it to radiate also in both directions (green).



## Finally....how it works.

We need to talk about some basic stuff here to get ready for the next slide.

1. This #1 has nothing to do with a yagi...just leading up to something.

Lets say we have a resistor connected across a battery's terminals.

Direct-current (DC) will flow thru that resistor and its wires.

The electrons in direct-current move in **one** direction, namely from the battery's negative-terminal thru the resistor to the battery's positive-terminal.

Those moving electrons are making something special happen.

There is a magnetic-field around the wire...it is static...fixed in position and time.

2. Lets now replace that battery with Alternating-Current (AC), say at 7 MHz.

Now our electrons are moving back and forth (a tiny distance) at 7 million cycles per second.

The electrons will speed up, slow down to stop, speed up to go the other way, slow to stop, etc.

To do this, our electrons accelerate and de-accelerate to a stop, then change direction.

As before, there will be a magnetic-field around each wire

but this time, as the electrons accelerate and de-accelerate, the magnetic-field changes too.

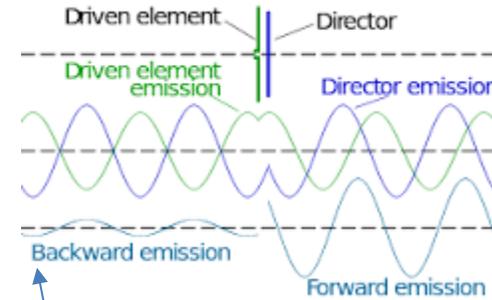
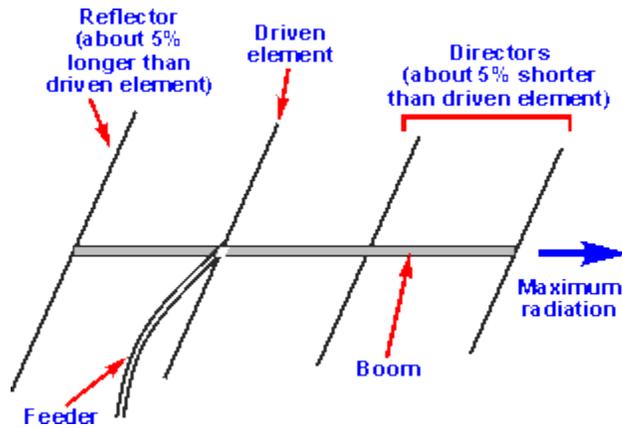
3. Here the key to our hobby...the **electro-magnetic wave**:

3a. That changing magnetic-field has a companion...it makes a changing electric-field.

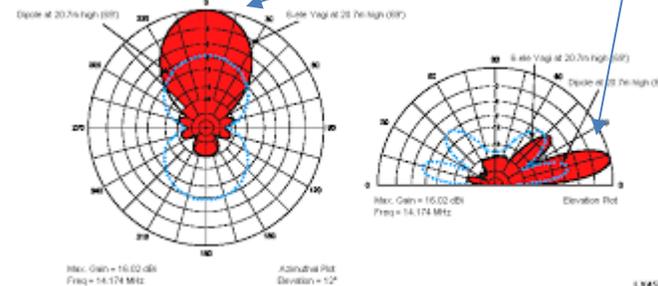
3b. That changing electric-field causes a changing magnetic-field.

3c. That's what makes our hobby possible...that's propagation.

## Graduate course....how it works.



1. The “**driven-element**” radiates a signal as a dipole; call this the “main-signal”.
2. A very short time later, each “**parasitic-element**” receives that signal and current flows in it.
3. When the current in a “**parasitic**” reaches the boom (remember there is a short circuit there), that **alternating-current** is reflected up the “**parasitic**” since it is a shorted transmission-line,
4. Each **parasitic-element** is now acting like a driven-element and radiates its own signal, albeit ever so slightly later in time to that of the **driven-element**.
5. Adding up the two signals, the “main-signal” is both cancelled out and reinforced.
6. Research shows that the amplitude and phase of the **alternating-current** that is induced in a parasitic element is dependent upon its length and the spacing between it and the dipole.



The **bandwidth of an antenna** is defined as the width of the band of frequencies having a gain within 3 dB (one-half the power) of its maximum gain.

The Yagi–Uda array in its basic form has very narrow bandwidth, 2–3 percent of the center frequency, which is still pretty decent.  
You could QSY quite a bit there.

There is a tradeoff between gain and bandwidth, with the bandwidth narrowing as more elements are used for more gain.

Multi-band yagi are sold but performance suffers over a single band yagi.

## What are its negative qualities for HF?

1. Antenna's cost....can be quite expensive.
2. Usually need a tower...more expense.
3. May need Professional Engineer for soil-test...think here about Leaning Tower of Pisa.
4. Need space for big booms.
5. **Big wind and ice loading.**
6. Slow to rotate into position if there is a 'spot' to which you want to make a QSO and you are not aimed that way.
7. As mentioned earlier, the yagi's impedance is low....10 to 40 ohms typically, so matching can be challenging.

## Short story how it came to be.

Between the two World-Wars,  
[Dr. Shintaro Uda](#), assisted by [Dr. Hidetsugu Yagi](#),  
developed a “proof-of-concept” for this antenna.  
The engineering details proved to be quite difficult.  
Later, Yagi translated the work into English and it was published.

During WWII, the Japanese won the Battle of Singapore  
(February 1942; the largest British surrender in its history)  
and interrogated a captured British radar-technician  
about some of his notes that mentioned a Yagi antenna.

That was the first the Japanese military learned about this antenna.  
However the British, Americans and the Germans made extensive use of the Yagi  
antenna during that war.

Dr. Yagi always attributed the design to Dr. Uda.

<https://www.k4kio.com/hexagonal-beam-vs-spiderbeam/#:~:text=So%20the%20Spider%20beam%20is,are%20in%20for%20some%20work.>

- the Spider beam is going to have a bit more gain on several bands than a hex. The two weigh about the same but the Spider beam is about 33 feet across at its widest point compared with 22 feet for the hex. If you buy a Spider beam, you are in for some work. Sep 20, 2015

# 2026 PRESENTATIONS:

Meeting Date	Presentation Topic / Title	Name	Call Sign
1/20/2026	Surface Mount Components	Jeff Orner	W3JKO
2/17/2026	Pillars of Radio	Hugh Irwin	K3ECT
3/17/2026	Hexbeam Antennas	Jerry Sodus	KM3K
4/21/2026	Balloon Launching	Dick Goodman	WA3USG
5/19/2026	Winlink Part 1	Andrew Mummert	W3AND
6/16/2026	Winlink Part 2	Andrew Mummert	W3AND
7/21/2026	Testing a Yagi/directional Antenna	Hugh Irwin	K3ECT
8/18/2026	Intro to Fox Hunting	Rick Stoner	KC3DRU
9/15/2026	Making a Go-Box / Go-Bag	Sean Schulze	KC3YWX
10/20/2026	Getting Started with CW	Emily Saldaña	WC3R
11/17/2026	EME Moon Bouce	John Jaminet	W3HMS
12/15/2026	Restoring a used radio from Ebay	Chaz Smith	KB3ZPB
1/19/2027	Setting up Ham Dashboard (VA3HDL)	Jeff Kisner	W3JWK

## INFO:

# APRS Balloon Launch

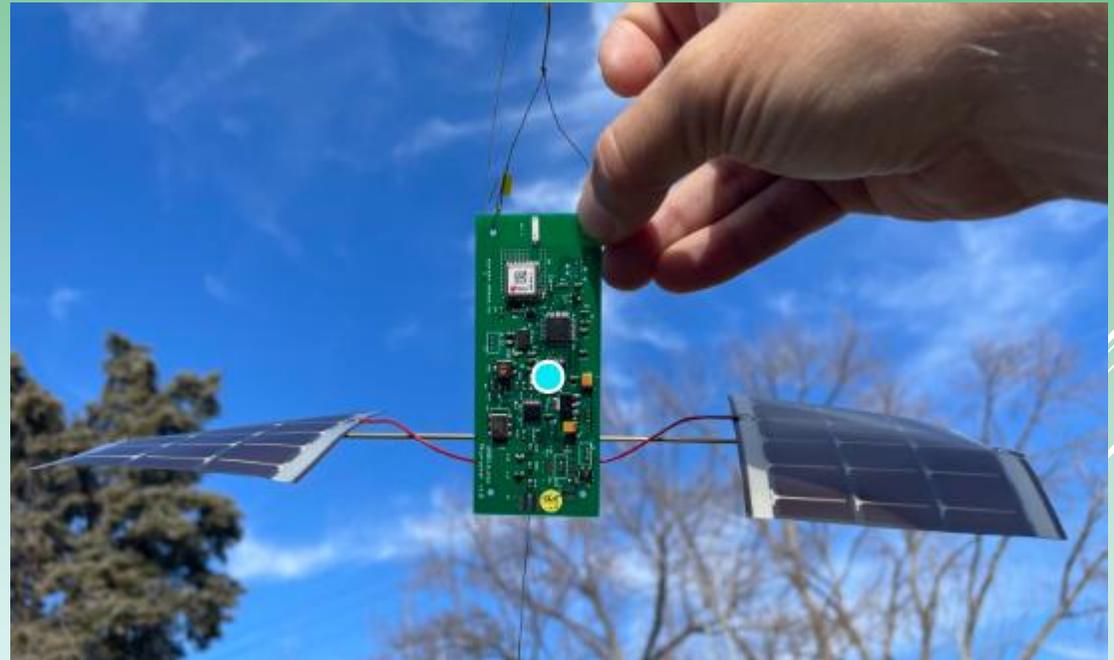
- Independent launch BUT you are invited to help
- Balloons – Received
- APRS 2 Lite Board
- Solar Panels – Ordered
- Super-Capacitors – donated
- Assembly?
- Programming??
- He

**Interested in Joining the Build Group?**

Email [W3ETOradio@gmail.com](mailto:W3ETOradio@gmail.com)

Or contact a Board Member

## UPDATE



INFO:

# EOC Upgrades

## NO UPDATE

- Upgrades Approved!!
- County sent forward to Funding
- Once awarded, Team will purchase materials
- Quote approved.
  - County pays labor
  - We pay cable and connectors
- This will greatly improve our capabilities in the county.
  - **AND---Be able to Demo Radios in the Conference room!**
- BL: Ed, W3ETO, Met with EOC on better integration and uses for SMRA Emcomm/RACES Members. More trainings and involvement coming soon.



# REPEATER INFO:

## Tower Migration

- County notified SMRA that their vendor will begin moving SMRA Repeaters and antennas in the next few weeks
- Will need some assistance – stand by
- Huge project and win for SMRA



# NEW MAGAZINE AND RESOURCES:

- ▶ 1) **SWR Magazine**– Free! and good for all HAMs
  - ▶ <https://swrmagazine.org/>
- ▶ 2) **Amateur Radio News Line** (~20 Minutes weekly)
  - ▶ <https://www.arnewsline.org/>



- ▶ 3) **Join ARRL Several Magazines Online:**

New HAMs – On The Air  
All HAMS – QST Magazine  
Special – QEX  
Contesting – NCJ

\*\* Get all online with membership or pay for paper magazine



# COMMS: Motorcycle Events 2026

- **June 20** - DeVal Michaux Dual sport
- **June 27 - 28** - Oxbo Haresramble
- **July 19** - DeVal Foggy Mountain Enduro
- **Sept 13** - SPER Michaux Enduro
- **April 12**-Buck Ridge Burn Trail Running Races
  - Pine Grove Furnace State Park (SMRA not the primary but many do assist)



# DATES TO REMEMBER:

- **26 June** – Carlisle Summer Fair and SMRA booth setup at the EOC
- **27 – 28 June** – SMRA Field Day!!!  
Bring Friends – Volunteer – Advertise Participate – Have Fun
- **4 AUG** – National Night Out – Shooting for Carlisle this year!



# VOLUNTEERS NEEDED:

SMRA is one of the most active clubs in this area. We do an amazing number of monthly activities to keep members engaged, learning and exploring. To keep these fun activities going we need members to step forward take charge of an activity and assist.

- Emergency Comms
- Teaching and Testing FCC Licensees
- QRP Outing Coordinator\*\*
- Field Day \*\*
- National Night Out and Community engagements
- Motorcycle Emergency communications in Forests

\*\* Actively looking – Give back!



# THANK YOU TO JOHN - W3HMS:

- Thank you for sharing your **73 years** of being a Ham and sharing your knowledge with us and so many more.
- If it is Ham Radio, John has likely done it.
- John is not going anywhere; he's just reducing his enormous workload.
- John has been a key figure in the SMRA club and hosts its many monthly functions.
- We have some volunteers stepping up to help, but are still looking for members to help.
  - MTM (60 session) – Brendan, KC3VEB, and Chaz KC3ZPB
  - Saturday Breakfasts – John will retain – Daylight Driving!
  - CW Practice – Bill DeVore, W3PNM
  - QRP/POTA/GOO (Get Outside and Operate) activities
    - **Seeking someone to take the helm on these excellent events!**



# NEW SMRA NETS:

- ▶ 1) **Monday Night Net** – Test your Radio, Get Club info
- ▶ 2) **The Elmer TechNet** on Monday Nights following our Net
  - ▶ Ask Questions and discuss radio
  - ▶ Everyone has something to contribute!

## ▶ **Wednesday Morning Humpday RagChew 0900**

- ▶ Just talk and make friends- make conversation
- ▶ No net control – Enjoy Radio!
- ▶ Lambs Gap Repeater 443.30MHz, Tone 67

## ▶ 3) **Digital Net** on Sunday Nights 1900-2000

- ▶ SMRA .43 Repeater
- ▶ Will likely run until Jun then we will pause until late fall
- ▶ Anyone can do this! Even a PC and HT will work – Try it. Excellent free experimental training.



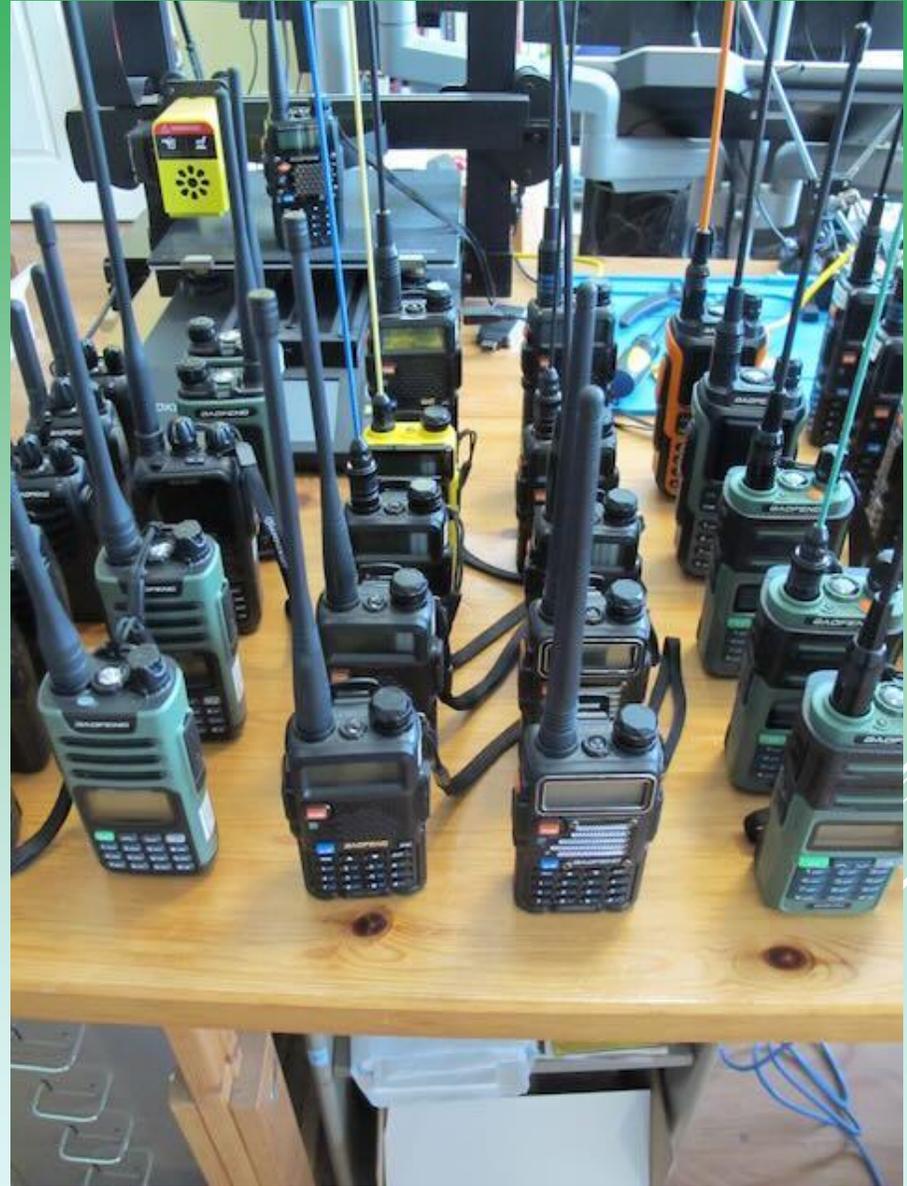
# The Shack of the Month

- ▶ Can be **simple** or **complex**
- ▶ Gives members ideas on building or modifying their shack
- ▶ Volunteer!!
- ▶ Just send me a few photos to put into the monthly presentation.
- ▶ Discuss it at the meeting.



# MEET THE GANG...







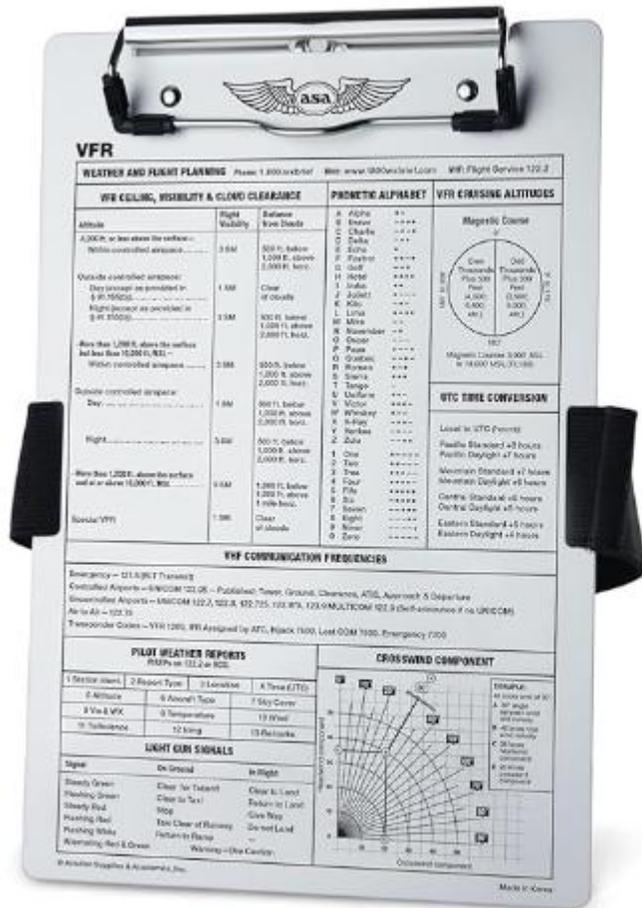
# GADGET OF THE MONTH –

**Do you have a new Ham Toy that others may like to explore?**

- ▶ New Antenna, Radio, HT, Battery box, flux-capacitor
- ▶ Volunteer for a short infomercial
- ▶ No need for a full presentation
- ▶ Works like Shack of the Month
- ▶ Just email me a photo or two and I'll call on you to talk about it – from your seat!



# GADGET OF THE MONTH – JEFF W3JKO



[Click to see full view](#)



## ASA KB-1-A Aluminum VFR Kneeboard with Quick-Reference Flight Data

Visit the ASA Store

4.8 ★★★★★ (1,264)

Amazon's Choice

100+ bought in past month

-14% \$25<sup>81</sup>

List Price: \$29.95

Get Fast, Free Shipping with Amazon Prime

FREE Returns

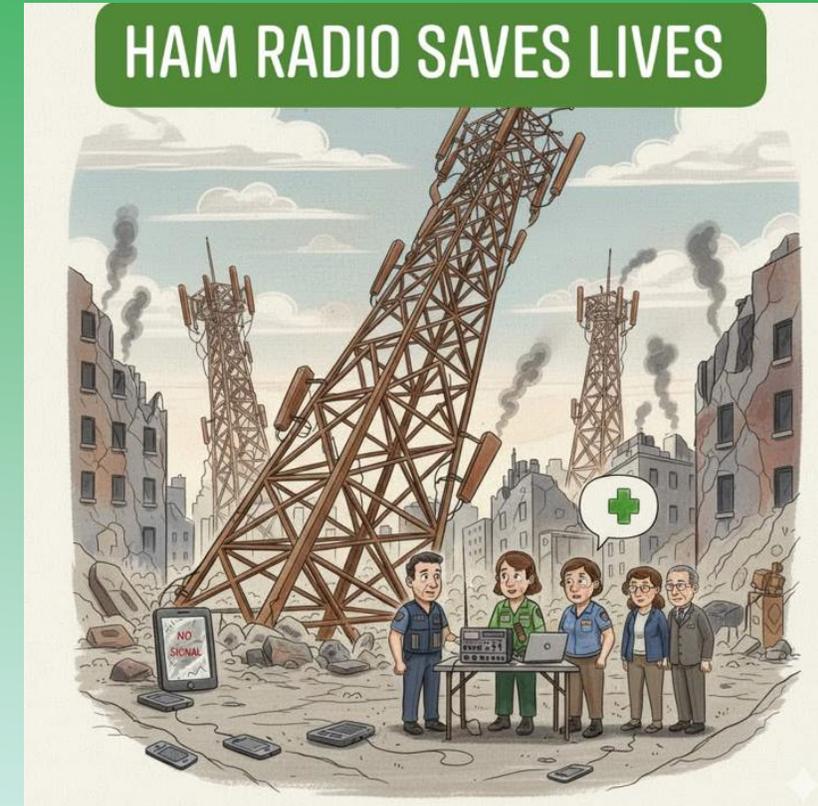
Get \$50 off instantly: Pay \$0.00 \$25.81 upon approval for Amazon Visa. No annual fee.

Available at a lower price from [other sellers](#) that may not offer free Prime shipping.

Brand	ASA
Model Name	ASA New VFR
Vehicle Service Type	Airplane
Screen Size	1.5 Inches
Special Feature	Crosswind Component Chart
Connectivity Technology	vfr

# EMERGENCY COMMUNICATIONS

- Coming Thursday 19 March 1900
  - Learn basics of emergency communication
  - Be prepared to help both locally and nationally
  - Learn how to build or repair communications cables or power cables
  - Learn to build antenna's
  - Learn key skills to be able to communicate anywhere on multiple modes.
  - Become an ARES certified member (3 levels)
  - Send files, photos, emails, forms without the Internet!
- Interested in being part of the group or helping Sign up!



# N3TWT.ORG WEBSITE: N3TWT.ORG

443.300 - (+5 MHz), tone 67 Hz  
145.430 - (-600 KHz) tone 67 Hz  
146.460 - (+1 MHz), tone 67 Hz  
146.685 - (-600 KHz) DMR



*VE Testing Policies; test sessions begin at 6PM – just prior to the 7PM monthly meeting on the 3rd Tuesday of each month.*

Sig Noise  
HUF US Bo  
N3TWT  
Copyright Pa



- HOME
- ABOUT/GET INVOLVED ▾
- NEW HAMMS ▾
- ACTIVITIES & EVENTS ▾
- ON THE AIR ▾
- JOIN SMRA/RENEW

## Welcome to South Mountain Radio Amateurs

Connecting Carlisle, Camp Hill, and the Greater Cumberland County Amateur Radio Community.

Whether you are a seasoned amateur, a newly licensed Technician, or someone just curious about how to get started in the world of Ham Radio, you've found the right place. SMRA is an [ARRL Special Service Club](#) dedicated to education, community service, and the advancement of the radio arts. We have regular meetings at the [Carlisle EOC located at 1 Public Safety Drive, Carlisle, PA.](#)

Join us on [Groups.io](#) to ask questions, stay up to date on our club events, or just to see what others in the club have to say! You do not need to be a club member to join. If you're interested in learning more about the hobby, subscribe today!

### Subscribe to SMRA Groups.io



### Get Your License & Keep Learning

We are one of the most active teaching clubs in Central Pennsylvania.

- Technician Classes:** We hold regular, free licensing courses at the **Bosler Memorial Library** in Carlisle and the **Fredricksen Library** in Camp Hill. Check our News and Calendar for upcoming classes.
- Licensing Testing:** We hold monthly licensing testing. Join our testing sessions if you're looking to get your Technician license or upgrade to your General or Extra.
- Meet the Mentors (MTM):** Getting your license is just the beginning. Our *Meet the Mentors* sessions provide hands-on demonstrations and presentations to help you get on the air, build antennas, and master your gear.
- New Hams:** As a teaching and testing club new hams are always interacting with our club in some way. Visit our [New Hams](#) page for information perfect for new (or returning) amateurs!

### ARES & Emergency Communications

Amateur radio is a vital link when all else fails. Many of our members are active in **ARES (Amateur**

### Subscribe to SMRA Groups.io



## Club News

- Soldering by KC3ZPB
- Introduction to LoRa Mesh Networking
- Logo'd SMRA Apparel
- Delaware Hamfest April 18th
- Technician Class 01/26/26 Cancelled

## Join SMRA/Renew Dues

Solar-Terrestrial Data	
14 Mar 2026 19:46 GMT	
SFI: 129 SN: 85	
A: 24 K: 3	
X-Ray: 86.4	
304A: 112.2 @ SEM	
Ptn Flx: 20	
Elc Flx: 3150	
Aurora: 1/1=1.99	
Bz: -5.5 Sd: 649.0	
HF Conditions	
Band	Day Night
80m-40m	Poor Fair
30m-20m	Good Good
17m-15m	Fair Fair
12m-10m	Fair Poor
VHF Conditions	
Aur Lat	67.5°
6m EsEU	Band Closed
4m EsEU	Band Closed
2m EsEU	Band Closed
2m EsNA	Band Closed
EME Deg	Poor

## Our Repeaters & Nets

We maintain local infrastructure to keep the community connected.

- VHF/UHF Repeaters:** We operate wide-coverage repeaters in the area (check our [Nets](#) page for frequencies and tones).
- Weekly Nets:** Join us for our regular on-air gatherings to test your equipment and catch up with local hams.

## Build Projects & Field Day

From crimping coax to building antennas, we love to build. We also host **ARRL Field Day** every June—a 24-hour marathon of radio operation.

## Volunteer with the Club

**Want to get involved with building and growing the club?** We are always looking for volunteers to help with our community events and education programs. Learn how to volunteer [here!](#)

## Ready to join the fun?

- Get Involved in SMRA** — Learn more about what we have to offer and see where you can get involved! We're always looking for enthusiastic members who want to learn or bring their own expertise to the club. Whether you are a brand new Technician or a seasoned Extra, there is a place for you here.
- Read the Latest Club News & Updates** – Stay current with our weekly blog.
- Join SMRA or Renew Your Dues** – Become an official member and support our local repeaters and programs.
- View Our Event Calendar** – See when our next monthly meeting or library class is happening.
- Connect with our Social Media** – Get updates on events and club meetings going on.

## Latest news and club information

- Soldering by KC3ZPB
- Introduction to LoRa Mesh Networking
- Logo'd SMRA Apparel
- Delaware Hamfest April 18th
- Technician Class 01/26/26 Cancelled

Thank you! Brendan, KC3VEB for redoing the website

# SUMMER FIELD DAY 2026

- **27 – 28 June** - SMRA Field Day!!! Bring Friends – Volunteer – Advertise Participate – Have Fun
- Perfect for new Hams to see many new aspects of amateur radio and even try out operating!



**AMATEUR RADIO**

**FD★26**

**A NATIONAL RESOURCE**

# GOALS OF FIELD DAY:

- #1 - **Have Fun** – Socialize with Members and Guests
- Engage the Public in Awareness of Amateur Radio
- Be “HAM” Bassadors – Demonstrate our stations and have talks to engage visitors
- GOTA – Getting youth on the air.
- Eat Well
- Make some contacts
- Earn points in all categories we can – especially new ones like Winlink HF and W1AW broadcasts with PSK31
  - ◆ Note: Technician level operators will be able to operate all bands by using Clubs callsign N3TWT with a General Class or higher present !!

# THE ESTA SITE:



**LOCATION: 180 ARMY HERITAGE DR  
CARLISLE, PA 17013**

# THE ESTA SITE ARIAL:



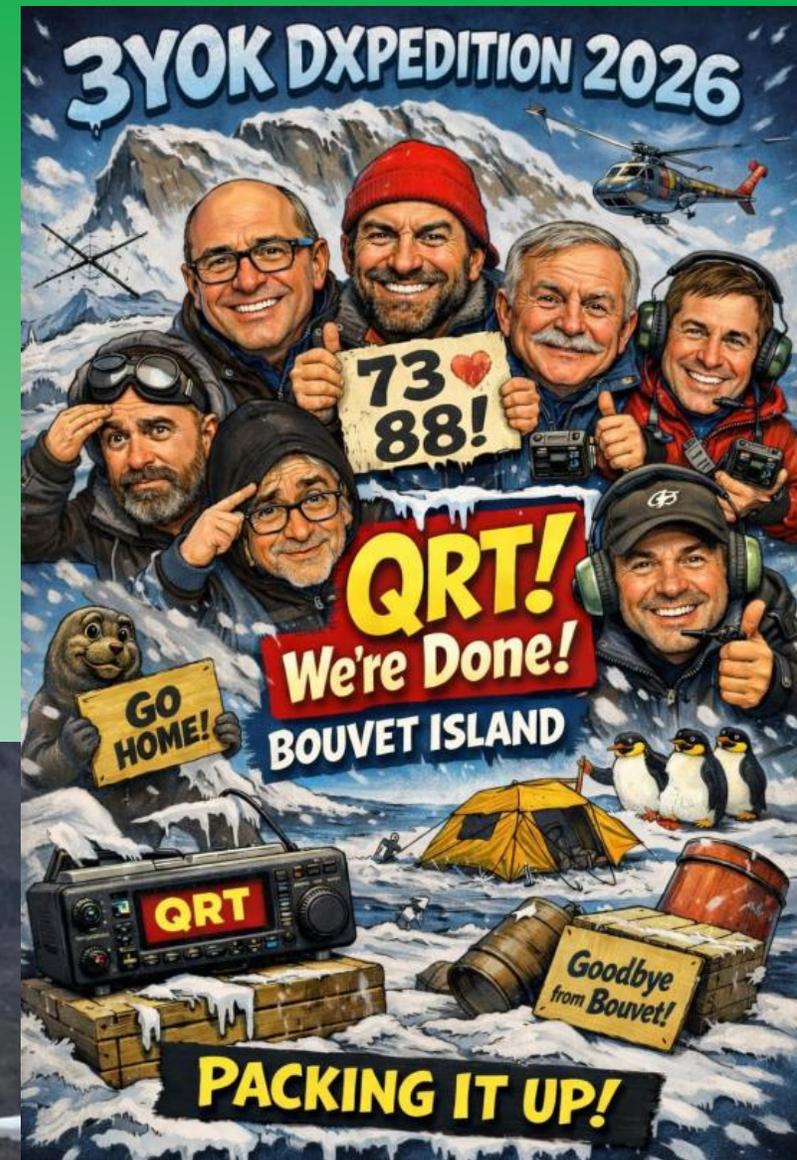


# FIELD DAY 2026:

- ▶ Our best event of the year!
- ▶ Please volunteer to help with the event
- ▶ Many hands make easy work for all
- ▶ Meetings will be via Zoom.
- ▶ Contact Ed, [W3ETOradio@gmail.com](mailto:W3ETOradio@gmail.com) or club officer to join the committee team.

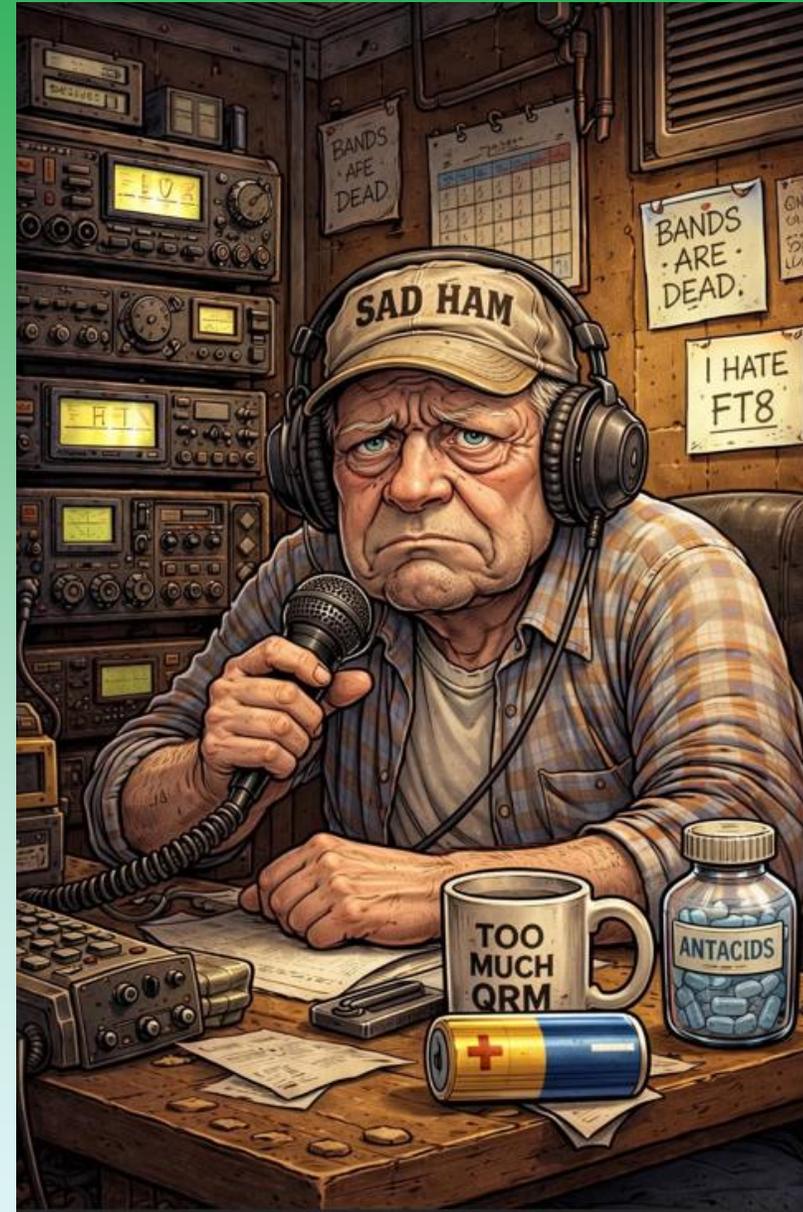
# INFO: BOUVET ISLAND:

- Breaking DX: LIVE from Bouvet Island 3Y0K | Special Livestream 3/13/26 – YouTube
- Very difficult to hear them, especially with wire antennas
- Some windows of opportunity
- \$1.7M budget



# OFFICER REPORTS

- **Secretary** – Sean KC3YXI
- **Treasurer** – Mike K3ESQ
- **VP** – Jeff W3JWK
- **Membership** – Tracey WE3H
- **PAIO** – Brendan KC3VEB



# SMRA TECHNICIAN CLASS:

- Bosler Library -Fredericksen Library
  - Complete!
  - 29 New Hams!

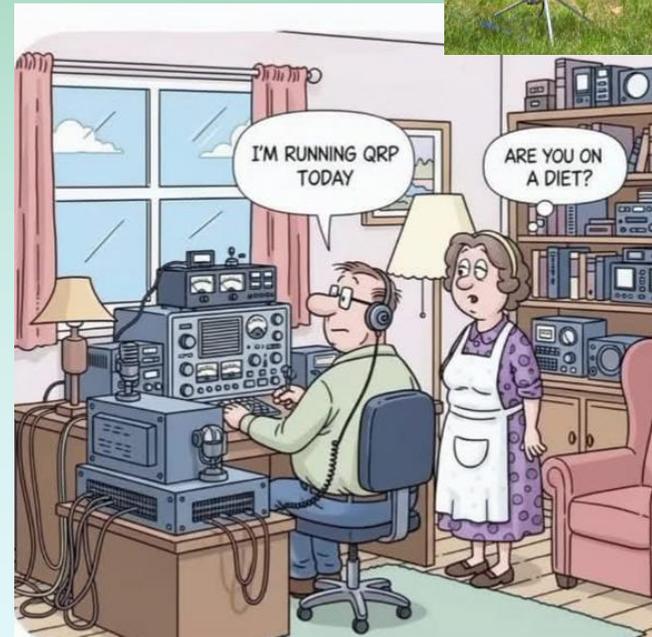


# QRP SCHEDULE FOR THE WINTER:

## ▶ **QRP Dinner – Tuesday 31 March @1730**

- ▶ CC's in Mechanicsburg
- ▶ Come Learn about QRP and POTA
- ▶ Show and Tell of QRP Radios and Antennas
- ▶ Have a good Meal (ice-cream too)
- ▶ Socialize with your Fellow Hams.

## ▶ **Looking for a Volunteer to run the QRP/POTA program!**



# CONTEST CALENDAR FOR THE MONTH:

- **Africa All Mode International DX Contest 1200Z, Mar 28 to 1200Z, Mar 29**

## **\*\*CQ WW WPX Contest, SSB \*\*\***

- **0000Z, Mar 28 to 2400Z, Mar 29**

[www.contestcalendar.com](http://www.contestcalendar.com) – Check out these Sites for lots of other contests!  
<https://www.arrl.org/contest-calendar>  
[CQ World Wide DX Contest - Home \(cqww.com\)](http://cqww.com)

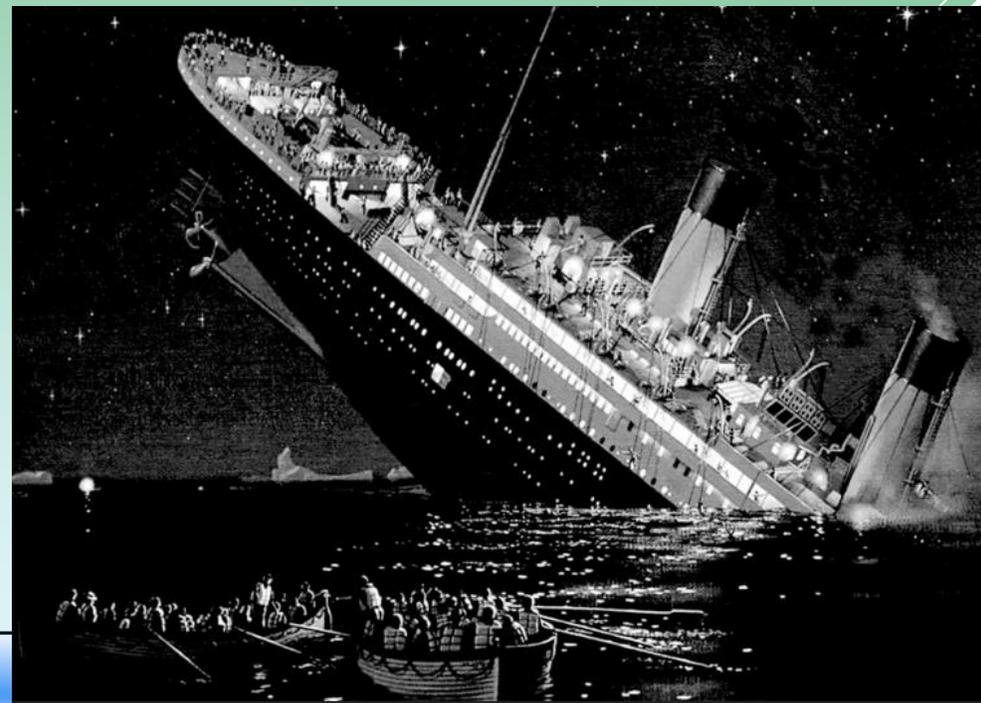
# SPECIAL EVENT STATIONS:

## **3/28/2026 | A Commemoration of Pennsylvania's State Charter, March 1681**

Mar 28-Mar 30, 0359Z-0359Z, W3P, Morrisville, PA. PENN WIRELESS ASSOCIATION. 7.050 +/- (CW) 7.250 +/- (SSB) 7.074 +/- (FT8) 146.79 -0.6 PL 131.8 (FM). QSL. PENN WIRELESS ASSOCIATION, PO BOX 925, Levittown, PA 19058. [WWW.PENNWIRELESS.ORG](http://WWW.PENNWIRELESS.ORG)

## **•04/10/2026 | The Titanic Memorial**

•Apr 10-Apr 15, 0000Z-2359Z, EG1912T, Vigo, SPAIN. Union Radioaficionados de Vigo-Val Miñor. 14025 10105 7025 5355. QSL. Carlos Reboreda, Avenida das Caldas 53, 5-E, Ourense 32001, SPAIN. [seccion.vigo@ure.es](mailto:seccion.vigo@ure.es)



# HAMFESTS:

[HTTPS://WWW.ARRL.ORG/HAMFESTS/SEARCH](https://www.arrl.org/HAMFESTS/SEARCH)

- York Hamfest 25 April – 0800-1200



# York Hamfest



Sponsored by the York Hamfest Foundation supporting 2 local Amateur Radio Clubs.  
One of the **OLDEST** Hamfests in the area, in our **70<sup>th</sup>** year.

**Saturday April 25, 2026**  
**8:00am to 12:00pm**

**\*\*Great Location\*\***

Glenview Alliance Church 10037 Susquehanna Trail S Glen Rock, PA 17327

**INDOOR SPACED / COVERED OUTDOOR SPACES / TAILGATING**  
**RAIN or SHINE FREE PARKING**

**\* Vendor and Tailgating set up at 6am Saturday morning. \***

Admission plus \$10 per 10' space outside or 1 table inside. \$5 for each additional space.  
Commercial vendors are expected to collect and remit PA sales tax.

**\* General Admission gate opens at 8am. \***

\$10 per person (FREE for children under 16 when accompanied by an adult and unlicensed spouses)

**\* Hourly Door Prizes / Radio Game Prizes / Grand Prize**

Do not have to be present to win the Grand Prize

**\* Food vendor with breakfast and lunch menu available \***

**\* Free VE testing \***

Registration starts at 10:30am with Testing starting at 11:00am  
(Paid admission fee can be refunded upon registration for testing. Full ticket and stub are required.)

**\* Card checking for DXCC/WAS/VUCC/WAC**

# ANNOUNCEMENTS & DATES:



- ▶ **Monthly Meet the Mentors**
  - ▶ 1<sup>st</sup> Tuesday – 7 APR 26 @ 1900 –EOC
- ▶ **Monthly SMRA ARES/ACS Training**
  - ▶ 3<sup>rd</sup> Thursday – 19 MAR 26 @1900 - EOC
- ▶ **Monthly HAM Breakfast**
  - ▶ 2<sup>nd</sup> Saturday – 11 APR @ 0830 - Location: Brothers Restaurant
- ▶ **Monthly General Meeting**
  - ▶ 3<sup>rd</sup> Tuesday – 21 APR 26 @ 1900 - Location: EOC
- ▶ **Monthly QRP Dinners and Outings**
  - ▶ 4<sup>th</sup> Tuesday (Generally in Winter) –31 MAR 26 @ 1730

# EXECUTIVE BOARD MEETINGS

➤ Next Executive Board (EB) Meetings: **Open to all members** - second Tuesday of even months – or as specified. 5:30 PM dinner, 6:30 PM meeting, Hoss's, 61 Gettysburg Pike, Mechanicsburg.

➤ Calendar

➤ ~~20 Jan 26 – After the Meeting~~

➤ ~~10 Feb~~

➤ 14 Apr

➤ 9 Jun

➤ 11 Aug

➤ 13 Oct

➤ 8 Dec



# AROUND THE ROOM (TIME PERMITTING):

What did you do interesting in Ham Radio this month?

- ▶ Hamfest
- ▶ Contests
- ▶ Technical Accomplishments
- ▶ Awards
- ▶ Activities – Rare DX
- ▶ New Antenna/Radio



# FINAL THOUGHTS:



Motion to Adjourn?