The Compass!

Official Newsletter of the Great South Bay Amateur Radio Club, INC.

November 2024 | Volume 52 | #9

Inside this edition of The Compass!:

Long Island's Friendliest Amateur Radio Club!

PRESIDENT'S MESSAGE

Well, fall has officially arrived. It's a great time of year for many reasons. We first think about antenna projects and the cool morning air. It sure is a pleasure to work outside with low humidity. Trust me: I know all too well, spending 38 years working outside in all types of weather. If you missed the September general meeting, we did vote on some changes to the constitution and bylaws. After much discussion, the members voted and the changes were approved by the members. Please check out the updated constitution on the groups.io page for the club. We also voted on a spending increase for the board and purchasing a 100-watt repeater to replace the 40-watt repeater for W2TOB in West Islip.

The meetings are now back to the last Thursday of the month. We plan on having presentations and guest speakers at our meetings. The guest speakers will remote in.

If you think you can help out by finding someone who would like to present to our club, please reach out to us via email at @ info@gsbarc.org Another change was the spending limit of the board and on increasing a budget item as well.

On Oct. 5, several members of the Town of Babylon RACES ARES AUXCOM crew were at the Deer Park Fire Department's open house. We were asked to show off the trailer and its capabilities. Everyone was impressed to see what we could do WHEN ALL ELSE FAILS. We demonstrated what Winlink and our digital modes can do. We also did a demonstration of transmitting ICS forms. We had a few kids stop by and they got kick out of FT8.

We spent Oct 12 cleaning out the trailer and reorganizing where we store the HF antennas, removing some equipment. As you know, we had to get it ready for the Suffolk County Marathon.

Thank you to crew who took part in that task. Our club trailer upgrades have made it so easy to set up and be on the air in a very short amount of time -- not to mention the performance of the new antennas. The capabilities of all three IC-7100 radios, VHF, UHF, HF, LSB, USB, CW and digital modes and being able to do VHF, UHF, HF Winlink gives us the ability to help get messages out. We can transmit from an area without any infrastructure to loved ones or to get the help needed to that area.

We will also have an Air Force MARS station soon in the trailer. If you have not seen the trailer in action then I would recommend that you come to the events we bring it to so you can see for yourself what it can do.

A very big thank you to all of you who took part in the Suffolk County Marathon on Oct. 20. As you all know all funds raised go to benefit Long Island veterans. Your unwavering dedication to this event shows everyone that amateur radio is still a very valuable asset.

Thank you to the very early crew who was there for setup. Thank you to all the Net Controls and behind-the-scenes personnel. To all the operators on the beach posts, thank you so much. We know it's a tough post and we thank you immensely for occupying those posts. To all the medical post operators, thank you for your clear communications. You all know how important that information can be. Thank you, everyone, and thank you to all who have been part of this event for the last 10 years. To all the newer operators thank you for getting involved. We know for some of you this was the first event you've done. You did a great job.

We were thanked by the head of Suffolk County FRES and the OEM staff who once again were very pleased with everything. A big thank you to the crew who helped with the set up on Oct. 19 and to the Net Control and support staff who arrived at 04:00. The marathon was well covered by all of you who were there, and we thank you all so much. To those who were stuck on the course the whole day a special thank you to you all. I know it was a long day. Great job locating the runner who was supposed to do a 10K and ran the full marathon. To those who sent in pictures thank you very much.

A reminder: Check your RF connections! It's a little thing to think about It was 4:30 a.m. and I was in my shack watching the FT8 screen. I saw a rare contact, so I fired up. All of a sudden I heard what sounded like an arcing sound when I transmitted. This was cause for concern, so I powered down and found that my

feedline's PL-259 on both sides of my common noise choke had loosened up. So before it happens to you, look at all inside RF connections. It's a very weird thing that connectors loosen up after being moved.

Next thing we need to do is get a lot more operators on the NYS RACES NET on Sunday mornings. It starts at 09:00 on LSB 7281.00 kHz. We are Region 1. This is a training net for handling messages using Radiograms. After the phone portion, they send out the drill message on 7.081.500 USB digital mode,1500 on the sub band or waterfall. If you need help with fldigi ask us. We can help, no worries. We are more than willing to assist you in getting up to speed. We can assist using AnyDesk if needed.

Starting Nov. 1, the net will go back to 3.993.50 LSB and 3.583.5 USB, 1500 on the waterfall for the digital portion of the net

A very special event is going to be held on Nov. 9. We are honoring Walt Grosser W2TE, one of our founding members and the second president of GSBARC. Our permit has been granted for that day between 08:00 – 16:00. We will run three stations. We will be setting up the Buddihex again and one end-fed for 40 meters. We welcome everyone to come on down and operate. Please bring your own chairs to relax in. Walt was a huge fan of DX and CW so to all our HF operators, please make this event a must for you all. CW operators, please bring your CW Key.

We will nominate club officers at our November general meeting on Nov. 21. We hope to see you all there. Elections will be at our general meeting on Dec. 19.

The 26th annual Ham Radio University educational conference will be held on Long Island on Saturday, Jan. 4, 2025, at LIU Post college in Brookville.

Our club trailer will be there once again as the special event station. There will be three stations, all modes, using the best mode to make contacts CW FT8 SSB

When we do events, we encourage you all to take part so please try to come to all our special events and operating outings. Winter Field Day will be Jan. 25-26. We welcome everyone. We will need overnight operators once again and would like to have all three stations making contacts the whole time. We have a very busy year ahead so please come out and support the club and have some fun.

Stay radioactive and have fun chasing DX or if you are a contester go rack up those points. If you're an HF net person have fun also and to those who ragchew for hours on end have at it. There is something for everyone so go have some fun..

— John Melfi, W2HCB

The 26th annual *Ham Radio University Educational Conference* will be held on Saturday, January 4, 2025 on the campus of *LIU Post* college.

Founded by Phil Lewis, N2MUN (SK), HRU-2025 also will be the annual convention of the ARRL NYC-Long Island Section.

The all-day event is expected to draw some 300 hams to the *LIU Post* Hillwood Commons Student Center, 720 Northern Boulevard, Brookville, NY 11548 The gathering will feature two dozen presentations by experts in a broad range of Amateur Radio activities including: Building an HF station, Practical Antennas, Basics of HF Operating, Contesting and DXing, Operating FT8, VHF/UHF Operating, Communicating Through Amateur Radio Satellites, and Parks on the Air.

There also will be a VE session in the afternoon for individuals who would like to take an FCC license exam to become a ham or upgrade their amateur radio license. *Ham Radio University* is supported by area clubs that will have displays in a Club Room to provide information about their licensing classes, public service events and other activities. As in years past, **attendance at *HRU 2025* will be free of charge,** with an optional suggested donation of ten dollars. There will be free parking and a cafeteria will be open for breakfast and lunch. **Further information and the presentations schedule is on line at: https://hamradiouniversity.org/**

Reactive Components, Time Constants and the Collapse of a Magnetic Field

By Kevin AB2ZI

Reactance and impedance are sometimes difficult concepts to grasp. When we first learn electronics, some of the first things we learn about are resistors and their units, Ohms (Ω). We learn how they oppose the flow of current, consume power and develop a difference of potential across them, which we refer to as a voltage drop.

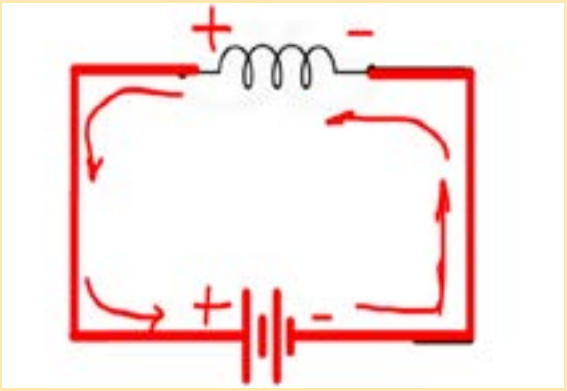
Next we are introduced to inductors and capacitors and are taught that these are reactive components, that is, they have a quantity called 'reactance,' (X), also measured in Ohms, whose value changes with frequency, and which we also refer to as an 'impedance.' A capacitor may have 100 Ohms of reactance/impedance at one frequency and 1,000 Ohms at another frequency. We also refer to this as an AC resistance.

After a discussion of what physically makes a capacitor or inductor, we next explore how they store and release energy. This is usually also when we learn about inductor and capacitor time constants. An inductor or capacitor charges and discharges at a rate based on a function of the natural logarithm, e, and resistance in the circuit.

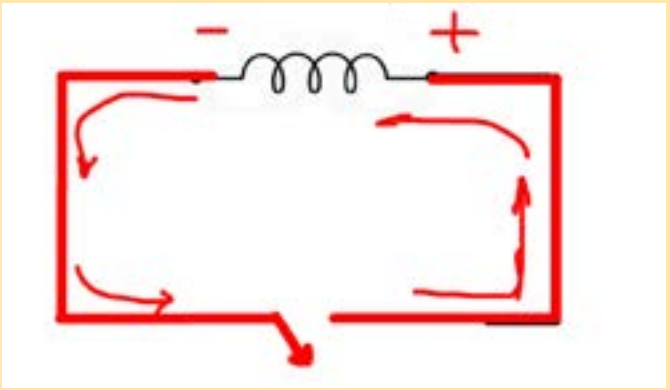
Now, you may have noticed that in class (and most books) we use the capacitors to show how this works. The reason we use the capacitors and not inductors is because of the way the physics works.

Capacitors and inductors each take five time constants to charge or discharge. In the case of capacitors, the time constants normally have values in seconds or longer, while inductors are generally in the microsecond or faster range. For capacitors the time constant is calculated by R times C (resistance times capacitance). E.g., a 220 µF capacitor paired with a 1 megohm resistor has a time constant of 220 seconds. That's just 1 time constant. Remember, it takes 5 time constants to charge or discharge so the full time to charge or discharge this capacitor would be 1,100 seconds, or 18.3 minutes. If this was a power supply filter capacitor you would need to wait about 20 minutes to ensure it's discharged before working on it. 220 seconds is a time we can understand readily.

The difference with inductors is that the time constant is calculated as L/R (inductance divided by resistance). If we used the same numbers as with the capacitor, we'd have a 200µH inductor divided by 1 megahom which would be 220 picoseconds! (220 x 10^{-12}). The inductor would be completely discharged after five of these time constants. This means 220 picoseconds times 5 equals 1.1 nanoseconds. That's FAST, and such a fast pulse of current in such as short time means extremely high voltages. This causes arcing across switch contacts or through transistors if that's what's being used to control the current, and that means damage.



There is a tiny voltage drop across the inductor due to the resistance (miniscule but measurable) of the wire.
When current is interrupted the magnetic

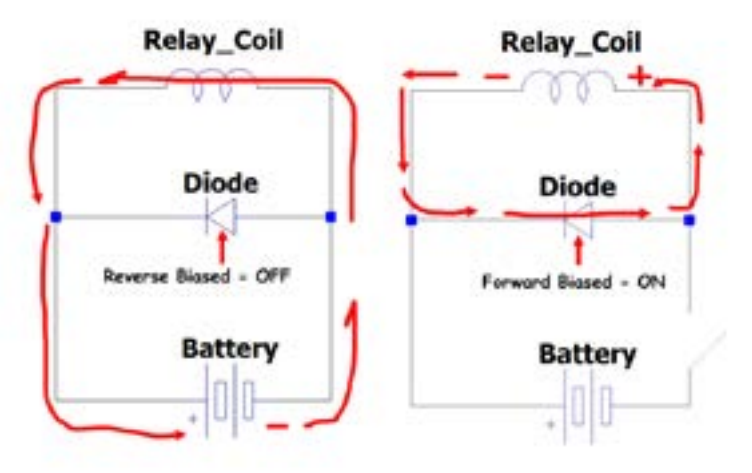


field collapses and its polarity reverses to become a current source.

This is the reason you will see a diode placed across the coils of relays. When a current is passing through

a coil there is a small voltage drop across it. When the current decreases or stops, the magnetic field collapses and the coil becomes a current source with a reversed polarity. Think of this as a transition from a negligible load (resistance) to a current source, like a battery but with the magnetic field squeezing all those electrons out almost instantaneously. They will pile up at the switch contact and have nowhere to go but across the gap.

The switch does not have to be a physical switch either. Many times the control circuit uses a transistor as the switch and a massive voltage spike from a discharging inductor can instantly destroy the transistor. By placing a reverse biased diode across the coil we protect the switch (transistor) by providing a path for the current to dissipate back through the coil.



On the left we can see the diode is reverse biased and so does not conduct. All the current flows through the coil, back to the battery. On the right the circuit from the battery is opened allowing the coil to discharge. When the coil discharges it becomes a current source like the battery with a polarity reversal that now forward biases the diode allowing current to flow freely back to the inductor.

One other misconception that comes up from time to time is a misunderstanding of the relationship between the time constants and applied voltage, that is, if the time constant is 30 seconds and 12 volts is applied, what is the change if you apply 120 volts? Will it take longer? Time constants are based on the value of the component and the resistance in the charge/discharge path. The first time constant when charging is ***always*** 63.2 percent of the applied voltage. One time constant will be 63.2 percent of 12 volts, or 7.6V, and if 120 volts are applied to the same components, the voltage would be 63.2 percent of 120, or 75.8 volts.

AB2ZI's YouTube Pics

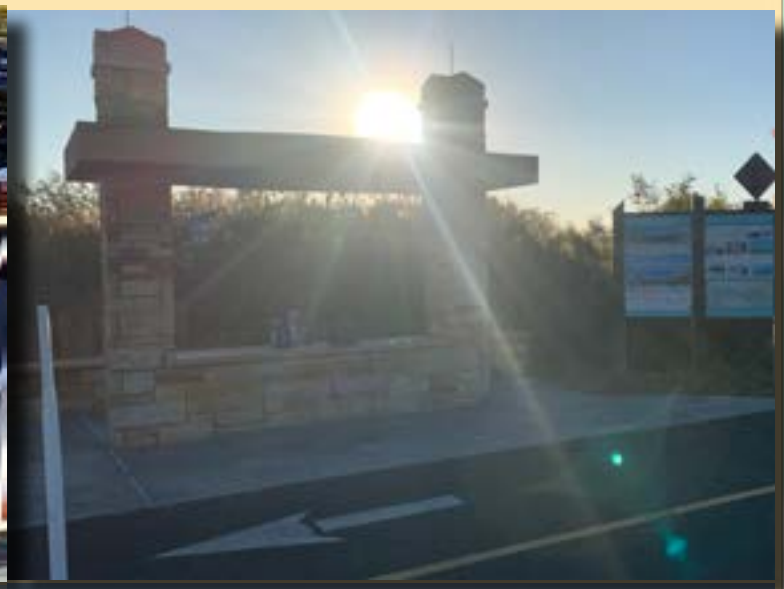
The Secret Life of The Radio (remastered)

Neat Method To Remove PCB Connectors / Desoldering Connectors

Big Power! 14000 Watt 892-R Transmitter Tube - Will It Work? Power It Up!

Suffolk County Marathon ARES Event


AWESOME
AWESOME




STOP


W2KFG


Cedar
Beach
5 miles
Jones
Beach
13.7 miles


MILE
18


BEAST
239

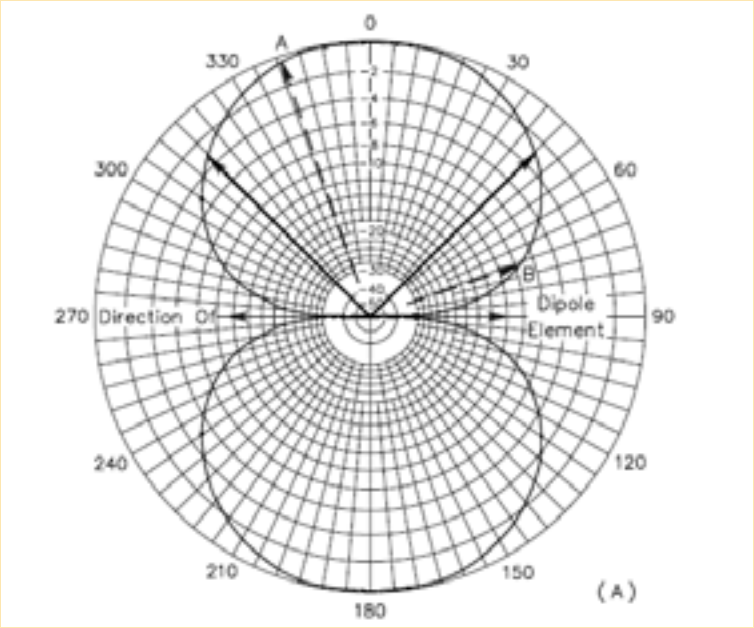

MILE
15

Making Sense of Antenna Patterns

By Kevin, AB2ZI

A topic that often generates confusion in class (besides decibels in general) is that of interpreting antenna patterns. There is confusion, specifically, about why an antenna has a gain of say, 6dB, but the outer circle on the plot is labeled 0dB?

First let's take a look at a simple ***azimuth pattern*** for a dipole antenna.

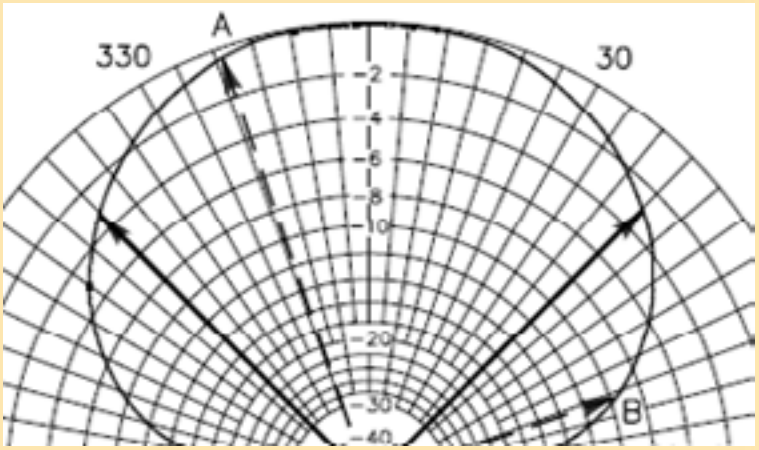


This is the pattern looking down from above the wire which is suspended from left to right. The outer circle of the diagram is drawn where the gain is at maximum and is labeled 0dB. This is the maximum gain of the antenna. 0dB represents a multiplication factor of 1, or 100%. All other circles inside the outer 0dB circle represent less gain and are labeled as negative decibel units (i.e., loss) to reflect this.

Reading this graph we see that the direction of maximum gain is at 0 and 180 degrees. As we move around the antenna we will see a decrease in gain and can see just how much by the plotted figure, in this case a squashed figure 8, and where it crosses the inner circles. For example: at 60 degrees azimuth we see the line crosses the -6dB circle, so we can expect to see 6dB less than whatever the maximum gain is.

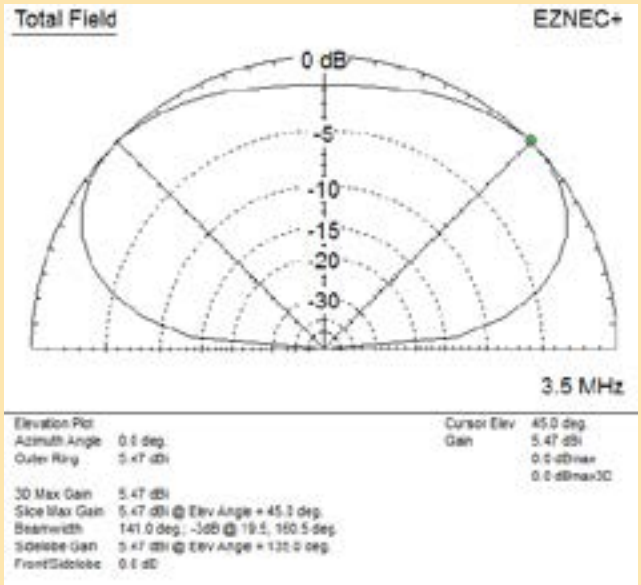
Some of the specifications you'll see mentioned for antennas are ***beamwidth, main lobe, sidelobe, rear lobe, front-to-back ratio, front to sidelobe ratio and takeoff angle***.

Let's take a look at beamwidth: The beamwidth of an antenna is measured at its half-power points. Remember that 3dB is a gain of 2 times and -3dB is a loss of ***one-half***, so ***the half-power points are the -3dB points***. Looking at the plot we see this marked here with solid lines and arrows pointing to where the pattern crosses the -3dB circle:



Each of the azimuth lines here represents 5 degrees and we have 45 degrees to each side for a beamwidth of 90 degrees.

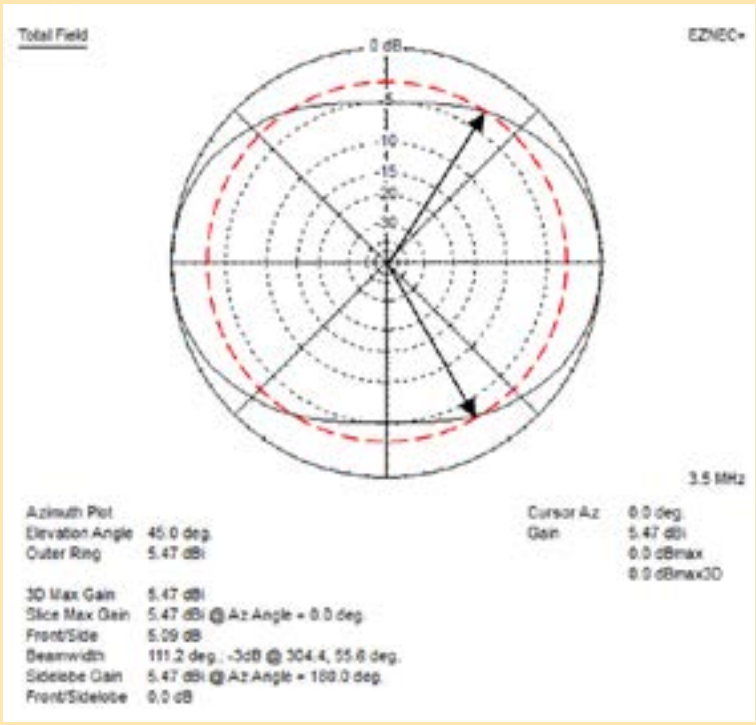
Takeoff angle is the angle above ground where the maximum gain is directed. We see the takeoff angle by looking at the antennas elevation pattern. Let's take a look at a model of a real antenna. In this case it is my 135' inverted V dipole modeled at a height above ground of 35 feet: Here's the elevation pattern as calculated by EZNEC+ at 3.5 MHz:



The elevation plot here from EZNEC+ antenna modeling software shows us a wealth of information. We see a green dot on the outside at the max gain elevation which is specified in the lower table in 2 places. On the right is a variable table showing the gain and angle of the "cursor" which is what the green dot represents. When in the modeling software we can move that cursor around and read the gain at any given point and angle. On the left is a list of useful information such as how much gain the outer ring, here again labeled as 0dB, is representing. Here it is representing 5.47dBi.

We're told the maximum gain of this dipole is 5.47dBi and that gain is at a takeoff angle of 45 degrees. The antennas beamwidth is given as 141 degrees at the -3dB points which are listed as being at 19.5 and 135 degrees. It's important to note that the beamwidth on the elevation plot is the width of the beam vertically.

Now let's look at the azimuth plot for this antenna:

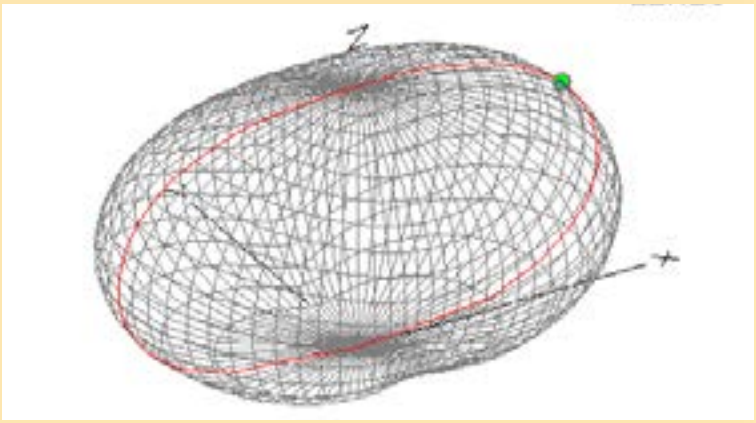


The azimuth pattern shows us that the maximum gain is at 0.0 degrees (and also 180 degrees opposite) with an azimuth beamwidth of 111.2 degrees at 304.4 and 55.6 degrees. I've added a dashed circle at the -3dB ring and a set of arrows pointing to where the pattern crosses the -3dB points. The beamwidth is between those arrows.

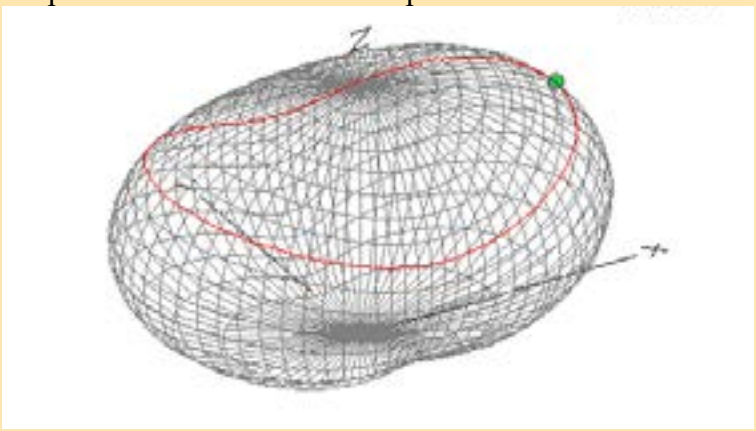
Also listed is the ratio of front-to-side gain. Here it's 5.09dB and is the difference between the main lobe and the gain at 90 degrees to it. You can see the pattern cross the -5dB circle and that's what is being referenced.

Notice that the list of specs mentions "Slice Max Gain." To get a better visual representation of what is meant by the "slice" being taken, let's look at the 3D pattern with those slices highlighted. Here's the elevation slice:

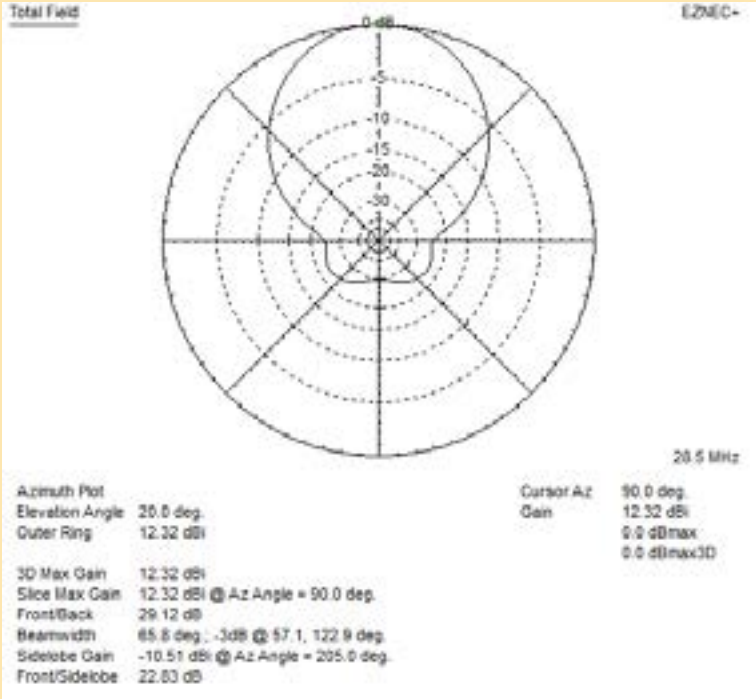
…and the azimuth slice:



The modeling software automatically selects the slice with the maximum gain for the plots. The dipole wire in these plots is along the Y-axis which is from top to bottom in the 2D plots or the Y-axis in the 3D plots.



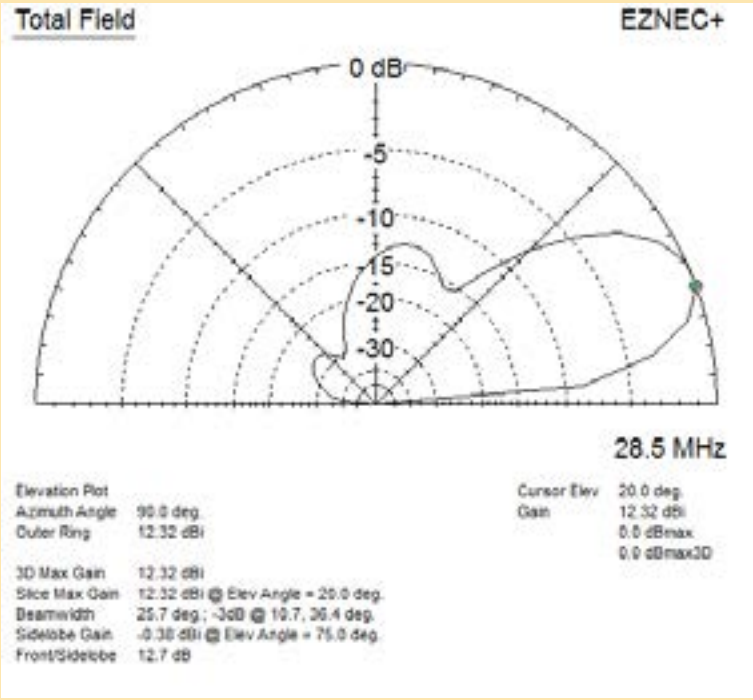
Now we'll look at the plots for a directional antenna, specifically a 3-element, 10-meter Yagi:



This is a directional antenna, so most of the gain is in a single direction. In this azimuth plot the elements are from left to right with the direction of gain being to the top of the

plot. Convention puts 0 degrees at the 3 o'clock position, so our direction of max gain is 90 degrees and we're given 12.32dBi as the max gain figure. Again we're given a lot of information on this antenna. Notice there's a new line of information in the list called Front/Back (for front-to-back ratio). Look at the pattern 180 degrees from the main lobe. See how there's almost no lobe at all there? The pattern is down and touching the -30dB ring. The exact reading is given as 29.12dB. This means that signals radiated off the back of the antenna would be over 29dB less than those in the direction of maximum gain. -30dB represents a factor of 1/1000th. More importantly, remember that gain is reciprocal. So received signals would have 12.32dB of gain in front. Any noise to the rear of this antenna would be 29dB lower. Signals at the sides are also weaker by almost 23dB.

Notice in the next elevation plot that there are three lobes. The main lobe is at an elevation of 20 degrees with a sidelobe radiating upward at 75 degrees and having a gain of -0.38dBi (12.32dBi max – 12.7dBi = -0.38dBi).



Analyzing the combined beamwidth figures we see that this antenna puts out its main power with a horizontal width of 65.8 degrees and a vertical beamwidth of 25.7 degrees centered on an elevation of 20 degrees above the horizon.

Learning to read antenna patterns will help you evaluate antenna claims and make informed decisions based on your needs. In the end, it's all about familiarization. At first these plots can look like advance quantum mechanics, but if you take the time to look at them carefully and analyze what the numbers are telling you and how they relate to the plotted patterns they'll soon make sense. You'll be able to tell a lot about any antenna just by quickly looking at its plot.

The Squirrel Cage

By Caryn, KD2GUT

We are emerging from a month-long season of ham radio horror, but this was all in fun, after all. In mid-October, things got hairy with the chase for an on-the-air Bigfoot marking Sasquatch Awareness Day. Then CW ops tested their bones in the annual QRP "Zombie Shuffle." In past years, fans of the Sleepy Hollow classic awaited the Headless Horseman special event in late October.

Let's face it, Halloween and ham radio seem to form a natural partnership.

The rest of the year delivered other horrors. We suffered possession by the sun's evil spirit when the ionosphere was subsumed by a CME. We were left in the dark during an HF blackout. And we were haunted by strange disembodied voices from beyond – in other words, many of us got QRM'd while contesting, calling CQ POTA or were in the middle of a casual ragchew. We defended ourselves as best we could against the crazed personalities of the "Up" police who obliterated the final minutes of a DXpedition even as they claimed to protect the integrity of its split operation. Just as egregious were the operators who could be found in their favorite HF haunts chanting in the ancient language of that not-so-lost City of Profania.

There seems no ghost of a chance to get them gone. They are with us always, with every turn of the VFO. Ah, if only we could grab a hold of that Sasquatch one more time. We'd get him to put his big foot down.

Great South Bay Amateur Radio Club, Inc.
Upcoming Meeting and Events Schedule

- **October 26th —** Simulated Emergency Drill – On Air
- **October 31st —** General Meeting — Go Kit Presentation by VE6LK, Vince d'Eon
- **November 9th —** W2TE Memorial Special Event Station
- **November 14th —** Board Meeting
- **November 21st —** General Meeting – Nominations
- **December 19th —** Annual Business Meeting & Elections

2025

- **January 4th —** Ham Radio University
- **January 25th & 26th —** Winter Field Day
- **March 23rd —** Babylon Village St. Patrick's Day Parade
- **April 25th —** Marconi Day
- **May 17th —** Armed Forces Day — American Air Power Museum
- **June 28th & 29th —** Field Day
- **July TBA —** Maggie Fischer Cross Bay Swim
- **July TBA —** Tesla Science Center Expo
- **August 16th & 17th —** International Lighthouse and Lightship Weekend @ Fire Island Lighthouse

ARES/ RACES Information

Div. 1—Town of Babylon ARES/RACES
Net: 146.685/R, Mondays 8:15 PM
EC/RO: John Melfi, W2HCB, (631) 669-6321

Div. 2—Town of Huntington ARES/ RACES
Net: 147.210 MHz +600/ PL 136.5, Mondays 7:00 PM
EC/RO Steven W. Hines, N2PQJ, ***Huntingtonnyaresraces.org/***

Div. 3—Town of Islip ARES/RACES
Mondays 8:30 PM
Net: K2IRG 147.345 +600/PL 100.0
EC/RO: Philip Jacobs, W2UV, 631-838-2500

Div. 4—Town of Smithtown ARES/ RACES
Net: 145.430 MHz, PL136.5, Mondays 7:30 PM
EC/RO: Rich Johnston, KC2TON, 631-872-4039

Div. 5—Town of Brookhaven ARES/ RACES
EC/RO: Ed Wilson, N2XDD, 631-484-8826

Div. 6—Riverhead ARES/RACES
EC/RO: Steve Casko, W2SFC, 917-701-3919

Div. 7—Southampton ARES/RACES
EC/RO: Removed & Currently Vacant

Div. 8—Southold ARES/RACES
EC: Don Fisher, N2QHV, 631-765-2757
RO: Charles Burnham, K2GLP, 516-779-4983

Div. 9—East Hampton ARES/RACES
EC/RO: Eddie Schnell, WZ2Y, 864-973-9250

Div. 10—Shelter Island ARES/RACES
EC/RO: Vacant
(Neal Raymond, N2QZA, SK)

Suffolk County ARES/RACES Net:

Mon 2100 Local, 145.330/R (136. 5PL)

Alt. Frequency—146.820 (136.5 PL)

New York State RACES Net (HF)

2024 VE Sessions

- ~~January 27th~~
- ~~February 24th~~
- ~~March 30th~~
- ~~April 20th~~
- ~~May 25th~~
- ~~June 29th~~
- ~~July 27th~~
- ~~August 31st~~
- ~~September 28th~~
- October 26th
- November 30h
- December 28th

All sessions are at the Town of Babylon EOC at 10 a.m., located in the basement in the rear of town hall. Please bring photo ID, a copy and your original amateur radio license (if you have one) and any CSCEs you may have. Nonprogrammable calculators are allowed. The exam fee is $15 payable by cash or a check made out to "ARRL VEC."

IMPORTANT!

If you do NOT already have an FCC FRN (Federal Registration Number) you MUST Visit the FCC Universal Licensing page to register for an FRN to use on the paperwork.

Club Name Badges

Club name badges are available from ***The Sign Man*** (***thesignman.com***) of Baton Rouge, LA.

The badges which are 1-3/4 in. x 3 in. If you visit The Sign Man's webpage you can order the badges by using a drop down selection on the orders page and clicking on:

"Great South Bay ARC, NY"

GSBARC Repeaters

146.685 W2GSB -shift 110.9 Hz Encode - 127.3 or CSQ decode

146.685 -shift 127.3 Encode/ Decode (south — receiver site linked to 146.685)

438.475 - shift 136.5 Hz Encode/ Decode

223.860 W2GSB -shift 110.9 PL Enc/ Dec w/ECHOLINK

223.860 -shift 156.7 PL Enc/Dec Local use

440.850 W2GSB + shift 110.9 PL ***Encode, 127.3 PL Decode (NEW)***

446.775 KB2UR -shift 110.9 PL Enc/Dec Fusion Steerable

927.3125 W2YMM -shift D606 Enc/ Dec

440.250 W2TOB/B + shift DSTAR REF020A Babylon

147.255 W2TOB/C + shift DSTAR Steerable

445.725 WD2NY/B -shift DSTAR *REF020A* Selden

Echolink W2GSB-R
AllStar ACESS NODE 465710 affiliated repeater

KB2UQK 449.23750 - SHIFT 114.8 ENCODE / DECODE

Portable Event Repeater (Trailer): KB2UR 446.3875 - 110.9 Enc/Dec W2GSB TRP

Club Apparel

Want a shirt, jacket, hat, sweatshirt or T-shirt with a Great South Bay club logo?

We use ***VIKING*** *(previously Mr. Shirt)* located at 80 East Montauk Hwy. in Lindenhurst. Click ***MrShirt*** to visit their webpage. Now you can get color matched backgrounds on your logo too. Check them out...