THE SIGNAL

Newsletter of the
Bella Vista area Radio Club

Arkansas' Largest Amateur Radio Club

Celebrating 30 YEARS

Febuary 2023

Monthly Meetings: 1st Thursdays @ 7 p.m.
Arkansas Law Enforcement Training Academy (ALETA)
3424 S. Downum Road, Springdale AR

HAM 101 Q&A Session for Newcomers @ 6pm preceding meeting

Club Call: N5BVA
Website: www.bellavistaradioclub.org

WEEKLY NETS:

BVRC Legacy Net
Wednesdays @ 8 pm on the
BVRC Dual Linked Repeaters
N5BVA/Bella Vista: 147.255, +offset, pl 162.2
N5BVA/Springdale: 444.100, +5 MHz, pl 162.2

BVRC 3.830 KHz Roundtable
Sunday Afternoons
4 pm during CST
4:30 pm during CDT

BVRC Wide-Area-Net
Tuesdays @ 8 pm on the
WX5NAS Skywarn Link System:

Bentonville – 146.865, -offset, pl 103.5
Fayetteville – 147.315, +offset, pl 97.4
Huntsville – 443.625, +offset, pl 97.4
Green Forest – 145.310, -offset, pl 103.5

NEXT BVRC MONTHLY MEETING

THURSDAY, FEBRUARY 2, 2023 @ 7PM
ARKANSAS LAW ENFORCEMENT TRAINING ACADEMY
3424 S. DOWNUM ROAD
SPRINGDALE, AR

FEBRUARY MEETING INFORMATION

Bella Vista area Radio Club strives to supply its members and guests with the best monthly meeting programs, topics, and speakers possible. February's program will be no exception, as we have a real treat lined-up for you. Ed Calianese from the National Weather Service office in Tulsa will be gracing us with his presence and his presentation on NOAA and the NWS Storm Spotter training program. Ed has been with the NWS for many years and has conducted hundreds of excellent storm spotting classes throughout NW Arkansas and NE Oklahoma. Spring is just around the corner and with it comes the annual severe weather season, where ham operators are an intricate part of communications and weather reporting. Ed will be supplying the Club with important information for those wishing to become certified storm spotters. Ed is a radio amateur himself, with callsign W5SVR.

This will be a hugely important program packed with vital information on how to deal with severe weather conditions, along with emergency preparedness. *DON'T MISS THIS GREAT MEETING WITH A GREAT SPECIAL GUEST SPEAKER!!!*

Bella Vista area Radio Club Announces Amateur Radio General License Class !

ATTENTION ALL BVRC TECHNICIAN CLASS LICENSEES!!!

Are you ready to "take it to the next level"? Do you want to be able to operate more HF (high frequency) bands? Do you wish to increase your knowledge of the great hobby you have encountered?

Enroll today for the BVRC General License Class!
Classes begin on Sat., January 28!

Event: BVRC General License Class
Instructor: Glenn Kilpatrick – WB5L
Place: Arkansas Law Enforcement Training Academy
Springdale, AR
Class dates: Jan. 28, Feb. 4, Feb. 11, Feb. 18, Feb. 25, Mar. 4
Class duration: 1:00 – 5:00pm, each Saturday afternoon
Testing: VE test session on Mar. 4 after last class on Feb. 25
Registration: To register for the class, complete form here
(Enter in comments if you want to have a license manual ordered for you: $25.00)

BVRC January Meeting Features Excellent Program on Coax

Once again, a full house was on hand for the January meeting of the Bella Vista area Radio Club. This month's meeting lasted longer than usual, as there were many announcements to be made on the exciting activities on tap for 2023 to celebrate BVRC's 30th anniversary, as well as voting on the approval of several Committee Chair positions and one Board position (which is what it's all about!). Even so, the evening sped by fairly fast with lots of great information, culminating with an excellent presentation on 'Coax 101' by BVRC's 2022 Elmer of the Year, Mark Whatley – K5XH.

One of the exciting moments of the evening was the first time calling to order of, and presiding over, the meeting by BVRC's new President, Jan Hagan – WB5JAN. Jan did a stellar job conducting club business for the month, election of new appointed officers and one Board position (more on that in the next Signal issue), and announcing all the great activities that will be occurring in 2023 as BVRC celebrates its 30th anniversary.

Jan Hagan – WB5JAN calls the meeting to order as BVRC's new President for 2023

Mark then stepped into the spotlight and began his program with a very interesting history of how coax actually originated, which was with *telegraph lines.* Signals were transmitted by current through wires to a 'sounder' on the receiving end. After a period of time and as the telegraph network expanded, a problem arose: The longer the distance that the signal had to travel, the weaker and more distorted the signal became at the receiving station.

Then, two pairs of lines were run side by side, but one pair would interfere with the other, termed "crosstalk". It was then that Oliver Heaviside developed the idea of wrapping a wire with another wire which decreased the amount of distortion. This in itself was the first primitive coax.

Heaviside also postulated the theory of the ionosphere having the capability of reflecting electromagnetic waves back to the earth.

K5XH addresses the full house of January BVRC meeting members and guests

Mark said there are other methods to transfer RF from the transmitter to the antenna such as ladder line, twisted pair, waveguide, etc. Coax, however, is the most often method used.

He then described the main components of coaxial cable: the center conductor, the dielectric, the braid (or shield), and the jacket (outer layer). Mark then described the various types of coax and coax connectors:

Things to consider when constructing a transmission line:

- Characteristic impedance of the coax
- Attenuation (in db per length)
- Velocity factor
- Bend radius
- Installation factors
- Environment
- Cost

Mark Whatley – K5XH

Mark then unveiled a characteristic of coax unknown to many who were in attendance. – Most people think that a standard coax has two conductors: the center conductor and the shield. However, Mark advised that coax actually has *three* conductors: the center conductor, the inner portion of the shield, and the outer portion of the shield.

He then discussed coax connectors which are basically of two types: solder and crimp (solderless). In a nutshell, Mark illustrated how – even though solder connectors do work – there is nothing to compare with crimp connectors in that the quality of the connection in crimping the shield to the connector greatly surpasses a soldered connection, and removes excessive heat that is needed in solder connectors, other than the small amount of heat generated from having to solder the center conductor. (This is speaking of a PL-259 connector.)

Mark then discussed several other coax connectors and adapters and their applications: quick slip-on connectors, barrel connectors, bulkhead connectors, right angle connectors, and adapters.

After installing and securing a connector in the shack, on the tower, and/or on the antenna he advised you definitely need to weatherproof connections located out of doors. Some of the popular types of sealers are Coax Seal, Scotch 33T, and Temflex.

Thanks for an outstanding presentation Mark, as well as your dedication to BVRC!

Some of the more common coax connectors and adapters

BOARD MEMBERS

President
Jan Hagan – WB5JAN
janhagan51@gmail.com

Vice President
Joe Hott – W5AEN
joe.hott@gmail.com

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dana.hill1979@gmail.com

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Glenn Kilpatrick – WB5L
wb5l@arrl.net

Member At Large and Public Information Officer
Tom Northfell – W5XNA
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don_c@hotmail.com

Elmer 911 Committee
Chair: Vinson Carter – WV5C
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Nets Committee
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EmComm Committee
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wb5l@arrl.net

Newsletter Editor
Don Banta – K5DB
arsk5db@gmail.com

From the Desk of the President

Our BVRC membership is made up of amateur radio operators with a wide variety of experience levels. Yes, many of our members have decades of experience and serve as Elmers for us all. However, some of our members are newly licensed technicians, some live in an HOA antenna restricted community, and some are yet unlicensed but interested members. If any of these describe you, then we have a great schedule of 2023 activities just for you to work HF stations and expand your horizons!

There is no reason you can't get on the air worldwide in 2023! The Bella Vista area Radio Club has several activities that represent a wonderful opportunity to operate an HF amateur radio station – many in interesting locations – under the sponsorship and guidance of experienced club members. Among all the exciting events and activities of the Bella Vista area Radio Club this year, the activities highlighted below are wonderful opportunities for you to operate an HF station and get more involved with, and become more active in, our wonderful hobby.

We hope to see you at one or more of these events. Look for more details on our website, in our newsletter, and at our upcoming meetings:

(Events on next page)

March 3rd-6th – "Jan and Glenn's Big Adventure #1" – Parks on the Air Camping Trip Natural Falls State Park

April 16th – ARRL Rookie Roundup Contest

April 29th – BVRC 30th Year Special Event Station Operation, Elm Springs City Park

May 11th-15th – "Jan and Glenn's Big Adventure #2" – Parks on the Air Camping Trip to Beaver Lake Dam Site Campgound

June 24th – BVRC Field Day Event at Metfield Park, Bella Vista

October – BVRC 30th Year Special Event Station Operation TBA

Year Round "Fox Hunting" – VHF and UHF signal finding adventures TBA

These opportunities and more await you in 2023. We truly hope your club membership will help you progress in your amateur radio journey!

73 – Jan, WB5JAN

BVRC Monthly Programs Needed

Would you like to present a radio-related program at a club meeting? Or would you just like to suggest an interesting topic for a presentation?

Contact Jan – WB5JAN at janhagan51@gmail.com,
Joe Hott – W5AEN at joe.hott@gmail.com,
or any Club officer

BVRC Dual Linked Repeaters Now on the Air!!!

BREAKING NEWS

By Don Banta – K5DB

Wednesday, January 11, was a red letter date for the Bella Vista area Radio Club, when the planned link between the N5BVA/Bella Vista flagship repeater located on a high point just across US-71/B from the Jane, MO Wal-Mart, and the new N5BVA/Springdale repeater on Dodd Mountain in Springdale, became a reality.

The final linkage and adjustments were completed late Wednesday afternoon, Jan. 11, just in time for the weekly BVRC Legacy Net. As a result, 22 check-ins were logged for the evening and a very good time was experienced by all who participated, articulating their excitement of the linkage. The Jan. 18 net experienced a whopping 30 check-ins!

The linking procedure began on Tuesday, Jan. 10, with past BVRC Technical Officer Steve Werner – K5SAW, current BVRC Technical Officer Tem Moore – N5KWL, Club Trustee Glenn Kilpatrick – WB5L, and assistance from Jon Williams – K5DVT on hand, to install the linking equipment. Everything went like clockwork until a high SWR was detected in the link antenna and plans to complete the link had to be aborted for the day. However, true to their form, dedication, and expediency, Steve and Tem were right back at the tower site the following day, Wednesday, with a new and better link antenna. After some small glitches were corrected in the link programming, the two repeaters were paired and on the air!

N5BVA / Bella Vista Tower Site – Jane, MO

K5SAW, N5KWL, and WB5L prepping the link equipment and coax run for installation

N5BVA/Bella Vista VHF repeater with linking radio and controller ready to be installed

BVRC is elated over this huge addition to its repertoire, to provide the best VHF/UHF service to all its valuable members.

The N5BVA/Bella Vista repeater now consists of a new Icom repeater, a Motorola CDM1150LS UHF linking radio, and a Computer Automation Technology CAT 250 controller. The linking radio is powered by an Alinco 32 amp switching power supply.

The group was definitely blessed with two beautiful days to install and get the link operational as the temperature reached 70º, unusually warm for January to say the least. Tem performed the task of climbing the tower and installing the link antenna, while Steve and Glenn prepared and installed the hardware and feedline.

The N5BVA/Springdale repeater was installed by Jon – K5DVT last fall. Before the decision to link the two repeaters was made, a weekend of signal testing of the Springdale machine was made by numerous club members, emphasizing signal testing with Handi-Talkies running 5 watts or less. The main objective of the tests was to observe how the Springdale repeater received weaker signals from HTs. If the tests were successful, this would prove that the receiving capability of the repeater would be adequate enough to enable new hams in the southern BVRC membership area – who might presently only have a Handi-Talkie – to easily access the linked repeaters. This would not only enable them to participate in the Wednesday evening BVRC Legacy Net, but also to have the ability to contact other hams throughout the NW Missouri, and NE Oklahoma coverage area on a daily basis. The tests conducted that weekend were phenomenal, making the final decision to link the two repeaters very easy.

The Springdale repeater, as we say in ham lingo, has “great ears”, being able to receive a handi-talkie running as low as 1 watt from as far away as extreme southern Washington County and in eastern Oklahoma, just across the state line from Siloam Springs. This was evidenced during the Wednesday evening BVRC Legacy Net on January 11, which premiered the linked repeaters.

The big story behind the new N5BVA/Springdale machine lies with Jon Williams – K5DVT. Jon had an extra DB22 repeater antenna already setting atop the Dodd Mountain tower in Springdale, but had not been in use for some time. Jon decided to offer an immense heartfelt gesture and donate a repeater he wasn't using to BVRC for use as the club's Springdale repeater, feeding the available repeater antenna on Dodd. ***This was huge.*** *An infinite, eternal, and colossal "THANK YOU!!!" goes out to Jon for this vital contribution.*

The N5BVA/Springdale repeater consists of a Kenwood repeater and a Telewave TPRD-4544 duplexer. A fine installation from Jon!

So, in summary: For hams in the northern coverage area, the N5BVA/Bella Vista flagship repeater is operating as always.

For persons in the southern coverage area, *and especially our members who are new to the hobby and may only have an HT* which is often difficult to access the Bella Vista repeater with, you should now easily be able to check-in to the Club's weekly Wednesday night Net through the N5BVA/Springdale machine! *NOTE: You will need a radio with UHF (440 MHz) capability, as the new Springdale machine is a UHF repeater.*

The dual repeater information is:

N5BVA/Bella Vista (VHF)
Frequency: 147.255
Offset: + 600 KHz
Pl Tone: 162.2

N5BVA/Springdale (UHF)
Frequency: 444.100
Offset: +5 MHz
Pl Tone: 162.2

Also, there is a most important point to remember when using these linked repeaters:

These repeaters now being linked is totally different from a single, standalone repeater. When accessing the repeaters, please remember after pressing your mic button to transmit, WAIT AT LEAST 1-2 SECONDS before speaking. This wait time will enable both repeaters to synchronize with each other. If you do not, the first portion of your transmission will be cut-off and the receiving station you're in contact with will possibly not understand what you're conveying, due to not hearing your full transmission.

N5BVA/Bella Vista installed and in the rack

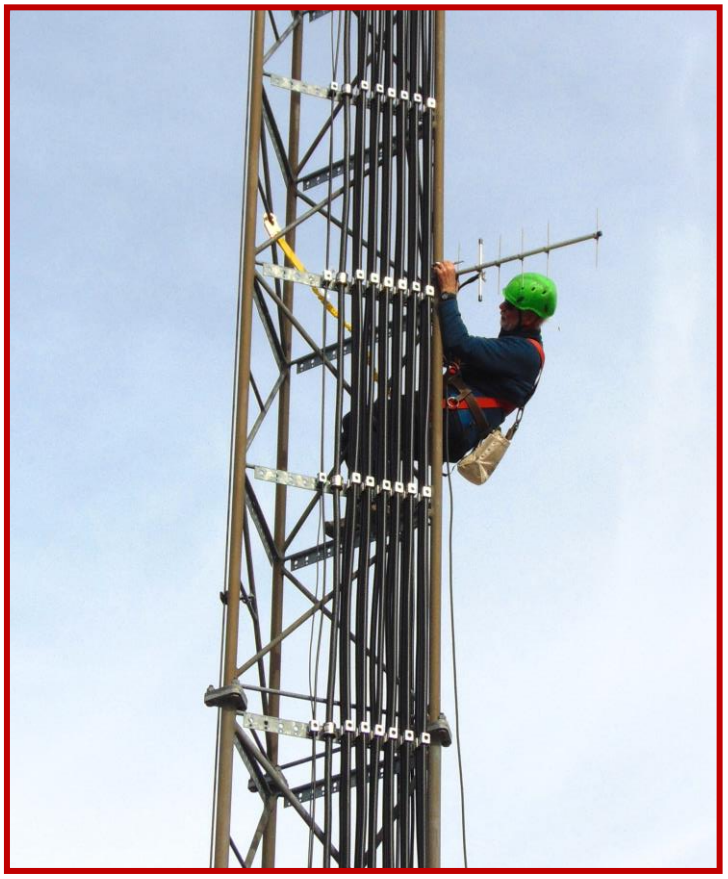
Remember this important point, and enjoy the repeaters.

Also remember that these repeaters will be linked full time, 24/7/365, to enable you to enjoy contacting others farther away than you're accustomed with the combined coverage areas!

Going forward, we hope to hear many new voices and callsigns checking-in to the BVRC Wednesday Legacy Net and in normal daily use as well, as the club enjoys these two great linked repeaters.

Also, enjoy the remainder of this article with additional pictures of the two repeater installations……
And especially to our newcomer hams, 73 and C U on the repeater! (Photos courtesy K5DB)

N5BVA/Bella Vista main antenna



Tem – N5KWL installing the link antenna

Steve-K5SAW, Tem-N5KWL, and Glenn-WB5L at the N5BVA/Bella Vista tower site

N5BVA/Springdale
repeater installation

N5BVA/Springdale tower site and antenna,
Dodd Mountain

BVRC VE REPORT

From Don Cooper – KC7DC, BVRC VE Coordinator
January 14, 2023

CONGRATULATIONS!!

Joe Hott – W5AEN – Rogers
New Amateur Extra!

Christopher Johnson – KI5ZJT – Bentonville
New General!

Aileen Ramsey – KI5ZKZ – Bella Vista
New Technician!

Test sessions are conducted each 2nd Saturday of the month:
- ***10 am at Shiloh Museum, 118 W. Johnson Ave, Springdale***
- ***2 pm at Bella Vista Fire Station #1, 103 NE Towncenter, Bella Vista***

Help promote the availability of the Club's monthly test sessions.
Tell your friends and acquaintances!

ATTENTION ALL NEWCOMERS TO AMATEUR RADIO AND THE BELLA VISTA AREA RADIO CLUB!

HAM 101

Each month before BVRC's regular monthly meeting at 7:00 pm, we offer a unique benefit for all new hams – HAM 101.

HAM 101 is a special meeting that convenes at 6:00 pm, one hour before the regular monthly meeting, just for you. Each month, one of our veteran hams moderates the meeting with a topic, followed by a Q&A session on any and all topics of amateur radio. It is a great time of discussion, learning, fellowship, and fun. If you're new to our hobby, these meetings are geared for you. Bring your questions and we'll see you there!

TIME: 6pm, before each regular BVRC monthly meeting at 7

PLACE: Arkansas Law Enforcement Training Academy (ALETA)
3424 S. Downum Road
Springdale, AR

READ ALL ABOUT IT!

BVRC celebrates 30th anniversary with two portable POTA operations!

In addition to two Special Event Stations scheduled for 2023, BVRC adds two other events that will be of interest to many of our members as we celebrate BVRC's 30th anniversary!

BVRC President Jan-WB5JAN and BVRC Webmaster Glenn-WB5L will be hosting two portable station operations in 2023. Each of these will be at a nearby campground within a POTA park. We are sending this alert to those who enjoy camping. All are cordially invited. If you're not a camper, you are welcome to stop by anyway and operate with us!

If you would like to join them for either or both radio camping trips, contact Jan (janhagan51@gmail.com) or Glenn (wb5l@arrl.net) for more information about sites, food, fun, etc. Then make your reservations with the links provided below. Campground site reservations fill fast nowadays, but there are still available sites at each campground for these trips.

FIRST OPERATION:
Natural Falls State Park (Oklahoma) POTA #K-2796
Friday, March 3 through Monday, March 6, 2023
Campsites: Partial hookups for any size RV or Yurts for non RVrs

Natural Falls Reservations: (be sure to click on the "special rates" tab to find the senior discount)
https://guestrez.megasyshms.com/6W9C2/natural-falls-state-park-campground/SearchCriteria/

SECOND OPERATION:
Dam Site Lake Campground, Beaver Lake Wildlife Management Area
POTA #K-7262
Thursday, May 11 through Monday, May 15, 2023
Campsites: Partial hookups for any size RV.

Beaver Lake Dam Site Lake Reservations:
https://www.recreation.gov/camping/campgrounds/234651

These operations, coupled with the two Special Event Stations in April (info in January Signal issue) and October (TBA), and BVRC's annual Field Day bash in June, gives all our members some great opportunities to join-in on the operating fun and ham radio fellowship as we celebrate our 30th year! Mark your calendar!

DON'T FORGET OUR VHF/UHF WEEKLY NETS!

BELLA VISTA RADIO CLUB LEGACY NET

The BVRC Legacy Net meets each Wednesday evening at 8pm local time on 147.255+ / pl tone 162.2 or 444.100+ / pl tone 162.2 You do NOT have to be a BVRC member to participate. All licensed amateurs are welcome to join us for on-the-air fellowship and good discussions. This is an excellent way for all new hams to become accustomed to operating protocol and procedure, and gain experience in operating through a repeater. Join-in on the fun!

BVRC WIDE-AREA NET

The Wide-Area Net meets each Tuesday evening at 8pm local time on the WX5NAS Skywarn Link System. All licensed operators in the NW Arkansas/SW Missouri/NE Oklahoma area have a standing invitation to join-in on great discussion topics, announcements of upcoming events, good ol' VHF/UHF fun, and sometimes very useful information. Hams from all over the area participate in this Net, and a good time is experienced by all each week. *NEW HAMS ARE ESPECIALLY WELCOME!* You can access the Linked System through any of 4 repeaters. (The list of the repeaters used in the Linked System are on page 1 of this issue of The Signal.) See you on the nets!

NCVEC Releases 2023 – 2027 General Class Question Pool

The National Conference of Volunteer Examiner Coordinators (NCVEC) Question Pool Committee has released the *2023 – 2027 General Class FCC Element 3 Question Pool & Syllabus* into the public domain. It is available as a *Word* document or PDF. The graphic required for the new General question pool is available within the documents, or separately as PDF or JPG files.

The new 2023 – 2027 question pool is effective July 1, 2023 – June 30, 2027

ABOUT THE NEW GENERAL EXAM

1. Its 432 questions were modified slightly to improve wording or to replace distractors.
2. 51 new questions were generated, and 73 questions were eliminated. This resulted in a reduction of 22 questions, bringing the total number of questions in the pool from 454 to 432.
3. The difficulty level of the questions is now more balanced, and the techniques and practices addressed have been updated.

If you are planning on taking the General exam in 2023, be advised if you're using the current question pool you will need to take the exam before June 30, 2023. Otherwise, if you take the exam on July 1 or after, you will have studied the current question pool but will be faced with the new questions from the new 2023-2027 pool. This could cause problems for you when taking the test. If you plan to test after July 1, you will need to study the questions in the new question pool.

WELCOME NEW BVRC MEMBERS!

Peter Brighton – WØGOD – Lowell

Nate Stevens – KF5RPK - Fayetteville

If you are relatively new to the hobby and have just acquired your General and/or Amateur Extra license, welcome to the world of HF! You possibly have a thousand questions on what to do and where to go from here. Of course, hands-on learning is the best way to acquire knowledge and BVRC's Elmers will be happy to help you in your endeavor to get on the air and comfortably operate with your new HF privileges. Just go to the 'Elmer 911' tab on the BVRC website, complete the form, and you will be put in contact with one of them.

In the meantime, the ARRL has a great book for amateur radio newcomers by Steve Ford – WB8IMY that you will invariably find very useful: *YOUR FIRST AMATEUR RADIO HF STATION.*

In this publication, you will find many excellent starting points for such areas as:

- What kind of antenna should I use?
- What radio should I buy?
- Do I need an amplifier?
- What about a computer?
- What types of accessories do I need?
- Electricity – good and bad.

You can order your copy direct from ARRL. The price is $22.95, but if you're an ARRL member, your price is $19.95.

You can order the book by clicking here

BVRC HAMS LICENSED THREE YEARS OR LESS:

JOIN US, AND PARTICIPATE IN THE 2023 SSB ARRL ROOKIE ROUNDUP!!!

The ARRL Rookie Roundup is a contest aimed at amateurs who have been licensed for three years or less, to introduce them to HF operation. This fun-filled 6 hour event is held three times per year (April for SSB, August for RTTY, and December for CW).

The Rookie Roundup for SSB (microphone) this year is on Sunday afternoon, April 16, 2023, from 1800 – 2359 UTC (1pm – 6:59pm local time)

As we do for each year, several of our BVRC experienced operators will be welcoming you into their shacks to host this event. If you presently do not have HF privileges and/or do not have an HF station, *you can still operate* from one of the experienced operator's locations and enjoy & learn the fun world of HF! You will also learn the fun of logging contacts.

(The experienced operator will be there as a Coach and control operator for you, but they are not allowed to operate or log……YOU will do the logging and operating!)

You will be using a callsign chosen by your Coach/control operator, BUT… If your station wins in one of the categories, you will win a certificate with *your* callsign on it:

If you were first licensed any of the years 2020-2023 – *no matter which class of license you hold* – you are eligible to participate! Several new BVRC hams have already signed-up for this fun event!

Our coaches for this year are:
Don Cooper – KC7DC – Bella Vista
Glenn Kilpatrick – WB5L – Bella Vista
Jan Hagan – WB5JAN – Bella Vista
Mark Whatley – K5XH – Fayetteville
Tom Northfell – W5XNA – Fayetteville
Vinson Carter – WV5C – Springdale
Don Banta – K5DB – Springdale

If you would like some real ham radio HF experience and fun, get on the sign-up list today! To sign-up, send an e-mail indicating your interest to participate to:

Don Banta – K5DB
arsk5db@gmail.com

See you April 16!

DXing Over The Air TV

By Mike Schroeder - NØALJ

Back in 2011, I put up two TV Antennas in my attic. I went with the *RCA ANT751* and pointed it to Fayetteville. Then I went with the *Antennas Direct Clearstream 4* and pointed it to Joplin, MO.

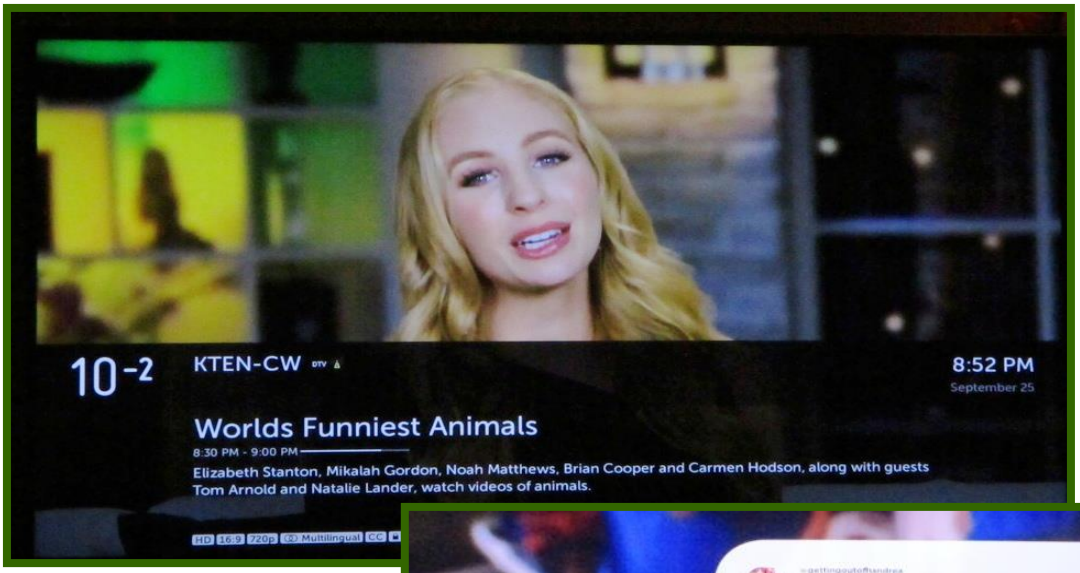
It was good to be able to get channel 12 KODE ABC, 16 KSNF NBC, especially when the tornado hit Joplin, and Channel 26 KOZJ Ozarks Public TV. They had different PBS programming than Arkansas PBS. I could also sometimes get channels from Springfield, MO, and even Wichita, KS and Kansas City, MO on rare occasions.

(I have included some screen captures of my “TV DXing” experiences for this article.)

I ran two separate coax lines, from the two attic antennas, down the wall to my TV. There I used a wall plate with double female coax connectors. On the coax line from the TV, I put a push-on F male coax connector so that it was possible to easily select either antenna of my choice and not have to use a rotator.

Over time, more new channels came on the air greatly expanding the local programming selection. Today it's up to about 60 channels and all are free. Some are high power transmitters, and some are low power. Then came the FCC rep-pack and we lost the upper portion of the UHF TV band.

Stations had to adjust accordingly as UHF RF channels now only go up to channel 36 when you perform a channel scan. I no longer could get channel 26 from Joplin after this. All the channels that Joplin had, we also now had locally in N.W. Arkansas. So later I decided to point my Clearstream 4 west to Tulsa so that I could get low power TV station channel 48 from Centerton and also DX new channels from Tulsa on UHF. I don't get Tulsa channels all the time but quite frequently as there are openings to N.E Oklahoma. I also like to get to see Tulsa channels during storm season. Tulsa has several channels on the VHF TV Band too like 2, 8 and 11 so I later added an Antennas Direct Clearstream 5 VHF only antenna. It is basically a QUAD by design. I ran its third coax to a different TV.

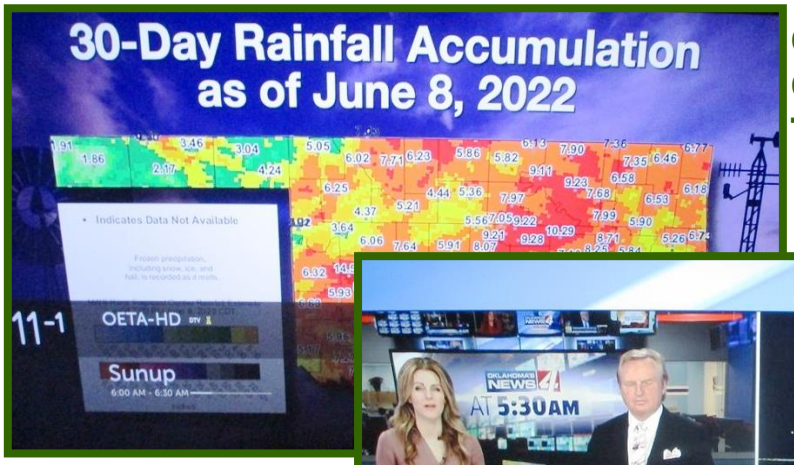


KTEN
Channel 10
Ada, OK

KOCO
Channel 5
Okla. City, OK

Ever since over the air TV changed from analog to high definition digital, the picture quality vastly improved with 1080i resolution and also added a new concept of sub channels to increase available programming choices. But the new digital protocol created the confusing system of a TV channel having a real RF channel and a virtual mapped channel. While on a few channels, these are the same, but most are not.

Unless you perform a new channel scan, at the time of the band opening to catch new channels, you will have to punch in the RF channel. Some TVs have channel scans that just add new channels, without erasing everything and starting over from the top. The other irritating thing is that some TV's sometimes drop their channels from memory when signal quality is poor. Knowing the RF channel allows you to just punch in the channel to get it back again without performing a channel scan.



OETA
Channel 11
Tulsa, OK

KFOR
Channel 4
Okla. City, OK

What's new on the horizon? 4K quality video over the air! This is known as NextGen TV and the rollout has begun but only in major cities to start with. It will take time, being a gradual rollout, to reach more cities later. Unfortunately, unless your TV has a ATSC 3.0 NextGen compatible tuner, you will have to either buy an add-on external NextGen ATSC 3.0 tuner or upgrade to a newer 4K TV with the ATSC 3.0 NextGen tuner built in.

At the time of this writing, only the more expensive TV's have the new tuner already built in them. I already have a 4K TV but it does not have an ATSC 3.0 NextGen TV tuner, just an ATSC 1.0 tuner. Since I wanted to follow the NextGen TV rollout, and I like TV DXing, I decided to go with an add-on external NextGen ATSC 3.0 tuner for the future. Currently, NextGen TV is not yet available in NW Arkansas but is supposed to be in Springfield, MO now and coming to Tulsa soon. I decided to go with a ZapperBox. It has the capability of identifying ATSC 3.0 NextGen channels and is compatible with both ATSC 1.0 and ATSC 3.0:

https://zapperbox.com/ Happy TV DX hunting!

RFI – – – HOW TO PUT YOUR SHACK ENEMY ON THE RUN

By Don Banta – K5DB

RFI – Radio Frequency Interference – has been with us for a long time. It can unexpectedly (and aggravatingly) occur anywhere at any time. RFI can develop from a multitude of variables: bad coax (shielding is insufficient), bad connectors, poor internal shielding of electronic devices (TVs, radios, computers, garage door openers, test equipment, etc.), and many others. It can lock-up computers, cause VFOs to jump frequency, cause terrible emissions in the transmitter component of your transceiver, and many other problems.

If you basically run low power on your rig, you probably will have little or no trouble with RFI. But if you decide to place an amplifier in-line, you're going to get introduced to the "RFI world", not only in your radio equipment, but many other devices throughout your house. And if your spouse or significant other enjoys TV or Facebook on their PC, *THAT* can cause serious problems.

So, what are you going to do – take the amp back to the store for a refund? Or – get rid of that pesky RFI and make *everyone* happy?

That's the good news! – you don't have to be plagued with it! Put "Ol' Man RFI" on the run! You may have to sacrifice a few extra dollars to do this, but it is a very simple project and usually can be alleviated fairly quickly.

The answer basically lies in two solutions: ferrite beads and/or toroid cores.

Ferrite beads and toroids are made of the same materials that are used in broadband transformers, but the ones *you* would use are made for much higher frequencies. Ferrite beads and toroids are sold in different "mixes", meaning that the material in them is comprised of different combinations of elements for different frequencies.

For example, ferrite Mix-43 is used for tuned circuits in the frequency ranges 0.1 to 1 MHz. It is efficient and losses are low. But – if it used in the 1 to 1000 MHz range, it is lossy. So, when you clip a bead of Mix-43 over a wire and there is RF in its choking range going down the wire, it is just as though you placed a resistor on the wire. But you did not have to cut the wire to insert the resistor; you just clip a bead over the wire. If the resistance of one bead is not enough, you can add more beads or add longer beads to get more resistance. The beads, unlike a resistor, do not affect the wire at low frequencies, so the audio, DC, or other low frequency components go through the wire, as though the bead were not there.

Ferrite beads are excellent for situations where the plug/connector on the end of a cable is too large to go through a toroid (toroid discussion coming up). The bead is split and simply slips (or clips) onto the wire or cable, then it is closed and locked onto the cable. As shown in the picture above, sometimes looping the cable through the bead several times enhances the resistance of the bead, which can be very beneficial in eliminating RFI.

Ferrite beads can be used anywhere to choke-out RFI. There are various methods in using a ferrite bead, and you can find those on websites devoted to this subject. But the simplest thing to remember when installing a bead on a cable is usually to locate the bead as close to the electronic device as possible (this is in regard to power cables for computers, TVs, washers, dryers, other appliances, entertainment devices, and other electronic components).

When you buy beads you must specify both the physical size of the inside diameter of the bead, and the material (Mix-43 for example).

There are several bead materials in general use: Mix-77, Mix-43, Mix-61, and Mix-31. Mix-43 is the best for all-around use. It works from 0.1-1 MHz. Mix-77 is a little better at the lower frequencies, so if your major problems are occurring on 80 and 160 meters, use that one. Mix-61 is a little better on the higher frequencies, so if your problems are mostly on 2 meters and up, use this mix for that range.

Again, ferrite beads are excellent for choking-out RFI problems in mostly household electronic devices: computer, TVs, DVD players, burglar alarms, landline telephones, smaller coax sizes, etc.

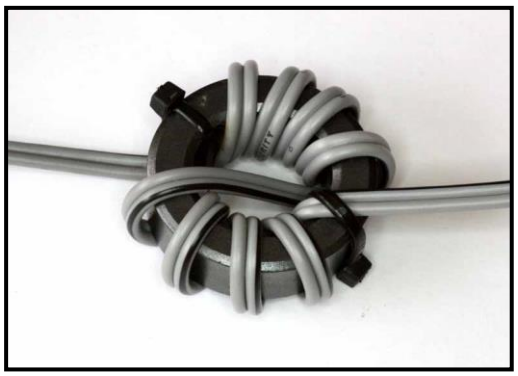
Now, let's talk about TOROIDS:

Toroids can come in really handy, and especially dealing with COAX. When we start talking about slipping beads over coaxial cable and making several loops in the bead with larger diameter cables such as coax, this becomes impossible because the bead hole is not big enough. Fortunately, a variety of ferrite toroid cores are available with holes as large as 1.4" diameter.

The photo on the following page, top left, illustrates RG-8X coax coiled 9 times around a Mix-61 toroid.

Mix-43, 31, and 61 are available in toroids, and you would use them for the same application as with the ferrite beads.

When wrapping a smaller cable around a toroid, you can wrap it tightly using zip ties to secure the ends to the toroid, as in the picture below, which I used for the telephone power cable on our landline phone:



Sometimes however, this is not possible with coaxial cable, especially such as RG-8 or RG-8X. When you put that big plug or reasonably sized coax through the toroid hole several times, you'll find that the toroid fits the cable very loosely, as in the picture at the top of this left-hand column. – Don't worry. – It will still work fine. If there is room to do it, loop the cable around and run it through the toroid again. Do this as many times as you can. *Each turn is like adding another toroid.*

Whether you use a ferrite bead or a toroid, that will be up to you and the characteristics of the problem.

The RFI problem involving a power cord in the below picture, was solved using not one but two large ferrite beads in series with two loops of cable through each.

Several years ago, the XYL and I replaced our 20+ year old Kenmore washer and dryer with a new Whirlpool pair. I had never had a RFI problem with the Kenmore pair, but ah!.....the new Whirlpool pair had advanced components and circuit boards! The first time I got on 10-meters with 500 watts, she hollered at me and said, "Don, the washer and dryer are going nuts!" I easily remedied the problem with two of these large Mix-43 ferrite beads like the ones in the photo above, one for each unit, and placing the beads in line on the power cables to each unit with one loop through each bead, as close to the back of the unit as I could get them. No more demented washer/dryer.

Again, each RFI issue is unique to itself. You may not have a washer/dryer issue as I did because your units may be far enough away from your station that the RFI field may not reach or affect them. Our washer/dryer is less than 10 feet from my radio room, which were affected but again, the large ferrite beads did a great job in choking-out the stray RF.

Another example I could relate to you is our wireless landline telephone. I had to place ferrite beads on the base units' power cords in the radio room and living room, but the unit in our back bedroom was not affected, obviously being far enough away from my transceiver and amplifier, and not needing a ferrite bead.

The above picture shows the solution that another ham friend of mine used when RFI was playing havoc with his computer monitor. He used both a toroid and a ferrite bead. The RF was choked-out in this case using a toroid for his power cable (on the left) and a bead was used for his HD cable coming from the computer (on the right). For more insurance against RFI in this scenario, he also used a larger ferrite bead with several turns through the bead on the other end of the HD cable coming out of his PC. This solved the problem! 'Ol' Man RFI" no longer aggravates him.

When it comes to RF intermittently interrupting the internet on a PC, you have a completely different 'animal' with this issue, but still solvable.

Wi-Fi frequencies are usually 2.4 GHz or 5 GHz. So, these frequencies are well out of the choking ability range of a Mix-43 toroid that only works for the 25-300 MHz range. My XYL's desktop PC, which I hard-wired to our modem with a Cat6 ethernet cable, was seriously affected whenever I transmitted on any of the bands, 20-meters and above. When I transmitted, RF would interrupt and cut-off the internet signal to the PC, then when I ceased transmitting the connection would return after about 5 seconds – very aggravating for the wife. I tried several other mix toroids, but no luck.

Our great friend Steve Werner – K5SAW (who has written some excellent articles for The Signal) referred me to Chris Perri – KF7P in Salt Lake City, UT. Chris owns and operates *KF7P Metalwerks* website.

I e-mailed Chris with my problem, and he promptly replied with some great advice and solutions (this guy KNOWS his RFI issues):

- Use Wi-Fi instead of a hard-wire connection for the internet, or
- Use his RFI Ethernet Choke Kit (below)

My particular dilemma was that my wife's PC is too far away from the modem to receive a strong enough signal and operate to my liking on Wi-Fi, hence I really needed for her to stay on hard wire but still choke-out the RF.

Chris has discovered for this type of RFI issue, that using a Cat6 *ribbon* ethernet cable, winding it 14-15 loops around a Mix-31 toroid then placing it in line between the end of the ethernet cable run and the PC see photo above), will solve the problem……it did. I also used a Mix-61 toroid for the router power cable.

Chris also stocks an ample selection of items for towers, RF grounding, and wire antennas.

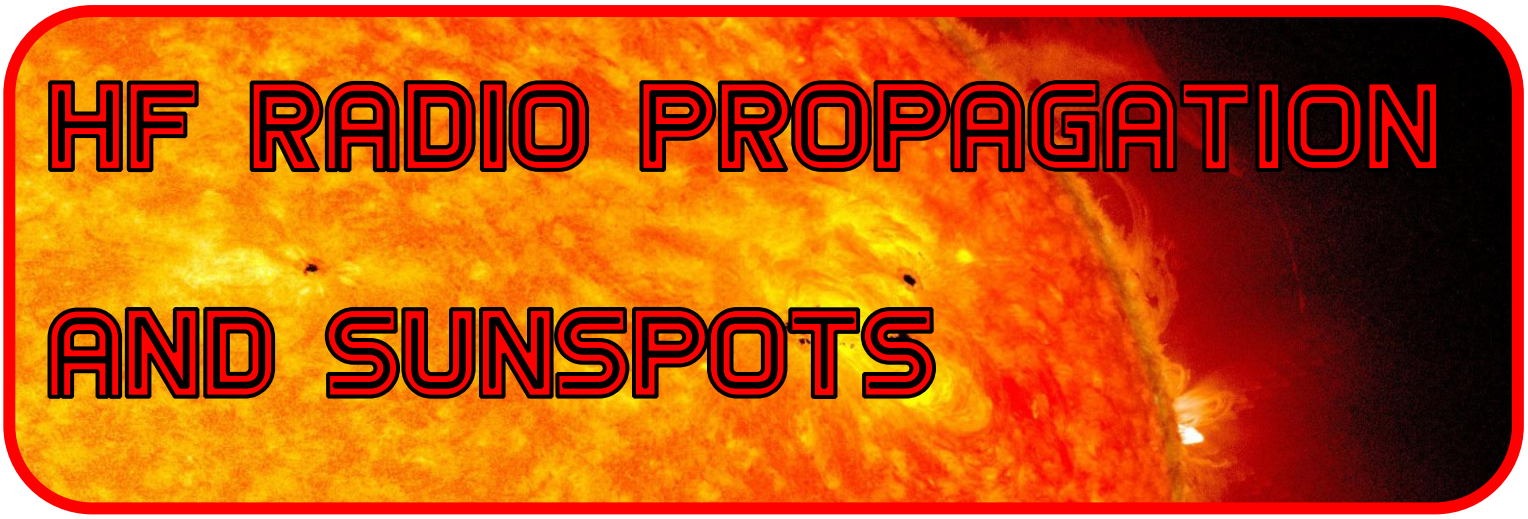
Again, each RFI problem is different. You have to try this, and try that, until you find a solution. Here are a few locations where you can obtain beads and toroids:

https://www.kf7p.com/KF7P/Products.html

https://www.dxengineering.com/search/product-line/dx-engineering-ferrite?autoview=SKU&sortby=Default&sortorder=Default

https://palomar-engineers.com/

https://www.mfjenterprises.com/productsearch.php



HF RADIO PROPAGATION AND SUNSPOTS

We are currently in Solar Cycle 25. Solar Cycles began being numbered in 1755. They last approximately 11 years, with 5½ years on the upward swing and 5½ years on the decline. We are roughly two-thirds into the current cycle and on the upward swing. Cycle 25 will peak around the latter part of 2024 and first part of 2025. So far, this is the best cycle in at the past 20-30 years.

Solar cycles are paramount to radio communication, as to whether it is great or less than favorable. If you are licensed for the HF bands, you probably are already aware of this. If you are planning on upgrading to General or Amateur Extra class, are planning on operating on HF, and are not aware of this very important aspect of radio communications, this article will help you with that understanding.

As electromagnetic waves, and in this case, radio signals travel, they interact with objects and the media in which they travel. As they do this the radio signals can be reflected, refracted or diffracted. These interactions cause the radio signals to change direction, and to reach areas which would not be possible if the radio signals travelled in a direct line.

HF radio communications of various forms including two-way radio communications, maritime mobile radio communications, standard broadcasting, amateur radio communications, and in fact any form of radio communications that uses the HF bands and ionospheric radio propagation, is very dependent upon the state of the ionosphere. The higher the levels of radiation received from the Sun, the greater the levels of ionization in the ionosphere and in general this brings better propagation conditions for HF radio communications.

It is found that the number of sunspots on the Sun has a considerable effect on the levels of radiation emitted and hence impacting on the ionosphere. The higher levels of radiation received from the Sun, the greater the levels of ionization in the ionosphere, and in general this brings better propagation conditions for HF radio communications.

What are sunspots?

If the sun is viewed by projecting its image onto a screen, dark areas can be seen from time to time. These can last from a few

hours right up to several weeks. These spots are cool areas (relatively speaking) on the surface of the sun. The temperature is around only 5400°F against a sizzling 11,000°F for the rest of the surface. It is much hotter under the surface, reaching temperatures in excess of a billion degrees Fahrenheit.

(WARNING!!! : Under no circumstances should the sun ever be viewed directly, even through dark glasses. In the past, many people have had their eyesight damaged by doing this. Use only ISO approved glasses – such as those for solar eclipses – to directly view the sun.)

These sunspots are areas where there is intense magnetic activity. The fields in these areas are enormous and as a result the surface of the sun is disrupted. In these areas the surface cools dramatically causing a darker region to be perceived.

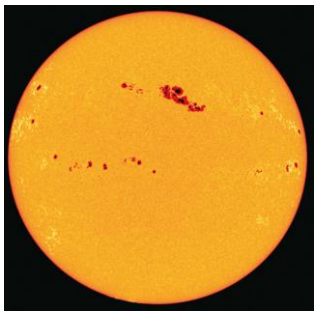
Around the sunspot there is an area called a "plage". This is slightly brighter than the surrounding area and it is a large radiator of cosmic rays, ultra-violet light and X-rays. In fact, it results in the overall level of radiation coming from the sun to increase. In turn, this increased radiation level from around the sunspots causes the ionosphere to become ionized to a greater extent. This means that higher frequencies can be reflected from the ionosphere.

As sunspots appear in groups, especially the larger ones a sunspot number was devised. This is not the number of sunspots that are observed but a number indicating the level of sunspot activity. The number is very closely related to the actual amount radiation received from the Sun. In this way, it is a good measure of solar activity. The daily readings are smoothed mathematically to take out the erratic variations to give the Smoothed Sunspot Number. Sometimes the abbreviation SSN is seen, and it is this smoothed sunspot number that it refers to.

Eleven-year cycle

The number of sunspots on the surface of the sun varies with time. At times, very few or even none may be visible, whereas at other times the number is very much greater. Although the number varies greatly over short periods of time as the sun rotates, careful analysis using the SSN reveals a longer-term trend. It is found that there is a period of approximately eleven years over which the sunspots vary. At the peak of this 11-year cycle, conditions on the bands at the top of the short-wave spectrum are very good. Low power stations can be heard over remarkably long distances. At the bottom of the cycle, bands around 30 MHz will not usually support normal propagation via the ionosphere.

Sunspots have been observed by the Chinese since before the birth of Christ. However, it was not until the mid-eighteenth century that astronomers started to keep records of sunspot numbers. By looking at these over the years it is possible to see the trend, and the cycles which have occurred since then. For example, Cycle Number 22 officially started in September 1986. It started with a sunspot number of 12 and rose rapidly over the following 33 months to reach a peak of 158. From its peak, the sunspot number fell slightly and rose again to give a second, smaller peak before falling to bring the cycle to an end in 1996.



Sunspot activity is of great importance to anyone involved in HF radio communications. The level of sunspot activity has an enormous effect on the ionosphere, and hence, HF radio propagation conditions.

Accordingly, even a basic understanding is advantageous, especially when striving for long distance (DX) communications.

BVRC members – if you've been enjoying the articles and stories in THE SIGNAL, I'm sure there are a LOT of you that have had *some* type of ham radio related experience along those same lines during a vacation trip, around the house, or around town.

Don't think for a minute that your story would be "boring". Send it to us! Interesting stories – short or long – go a long way in making the newsletter interesting because they are coming from folks that we know and interact with in the club.

I always get excited when a club member sends-in an article to place in the newsletter! We already have had quite a few submit some really good ones, with more to come! Jump on the bandwagon with us and send 'em in! We look forward to hearing about any and all interesting radio related stories from you!

Send your story or article to Don-K5DB at: arsk5db@gmail.com

THANKS & 73!

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